



Vaunix Technology Corporation
Lab Brick® Family of RF Switch Products

Operation Manual



Revision 1

Certification

Vaunix Technology Corporation certifies that this product met its published specifications at the time of shipment from the factory.

Warranty

Lab Brick Signal Generators are warranted against defects in material and workmanship for a period of one year from the date of shipment.

LIMITATION OF WARRANTY

The foregoing warranty does not apply to connectors that have failed due to normal wear. Also, the warranty does not apply to defects resulting from improper or inadequate maintenance by the Buyer, unauthorized modification or misuse, or operation outside of the environmental specifications of the product. No other warranty is expressed or implied, and the remedies provided herein are the Buyer's sole and exclusive remedies. Vaunix Technology Corporation shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

NOTICE

Vaunix has prepared this manual for use by Vaunix Company personnel and customers as a guide for the proper installation, operation, and maintenance of Vaunix equipment and computer programs. The drawings, specifications, and information contained herein are the property of Vaunix Technology Corporation, and any unauthorized use or disclosure of these drawings, specifications, and information is prohibited; they shall not be reproduced, copied, or used in whole or in part as the basis for manufacture or sale of the equipment or software programs without the prior written consent of Vaunix Technology Corporation.

This ISM apparatus meets all requirements of the Canadian Interference-Causing Equipment regulations.

Ce generateur de fequence radio ISM respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This instruction complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical/electronic product in domestic household waste.



To return an unwanted instrument, contact Vaunix Technology Corporation.



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1.0 GENERAL INFORMATION

This guide contains information on the installation , operation and specifications of the Lab Brick® Family of RF Switch Products.

1.1 General Safety Information

To prevent the risk of personal injury and loss related to equipment malfunction, Vaunix Technology Corporation provides the following safety information. For your own safety please read this section before operating the equipment.

Warning

Before connecting your Lab Brick Switch to other instruments ensure that all instruments are connected to earth ground. Any interruption of the earth grounding may cause a potential shock hazard.

Caution

- The Lab Brick Switch contains components which are sensitive to Electro Static Discharge (ESD). Proper ESD precautions must be maintained at all times while using this equipment.
- This equipment has no serviceable parts.
- To prevent the risk of electrical shock or damage to precision components, **do not** remove the equipment covers.
- Unauthorized entry into the unit voids all warranties.

2.0 GETTING STARTED

Prior to installing your Lab Brick Switch, verify the contents of the package. The package should contain:

Quantity 1 Lab Brick Switch

Quantity 1 Cable - USB Type A male/ Type B male

Quantity 1 Flash Drive containing the manual and the Graphical User Interface program

2.1 System Requirements

The Lab Brick Switch runs from a standard PC or lap top computer with the following minimum requirements:

- Operating System - Windows® 7, Windows® 2000, Windows® XP or Windows® Vista
- A minimum of one USB port

No other AC or DC supply is required as the power for this unit is delivered from a USB port on the computer or a self powered USB hub.

2.2 Installation of the Graphical User Interface (GUI)

The Lab Brick is controlled through the GUI program supplied on the provided USB flash drive. To install the GUI proceed with the following steps:

- Insert the supplied USB flash drive into an available USB port on the computer
- Run the program "Setup.exe"
- Follow the instructions on the screen
- After Installation is complete, remove the USB flash drive

2.3 Using the Lab Brick Switch

Start the Lab Brick program by selecting the Lab Brick Icon or selecting the Lab Brick program from the Start Menu on the computer. Attach the supplied USB cable to the Lab Brick Switch and the USB port on the computer. The green LED on the Lab Brick will illuminate as communication with the computer is automatically established. The GUI program will recognize the device and display the model number and serial number in the title bar and lower left corners respectively. The Lab Brick is now ready for operation.

2.4 Using Multiple Lab Brick Switches

Users may operate and control multiple Lab Bricks from a single computer. Start the Lab Brick GUI as described in section 2.3 for each Lab Brick that you will control from the computer. Connect each Lab Brick either directly to the USB port or through a self powered USB hub to the USB port of the computer. The green LED on each Lab Brick will illuminate as communication with the computer is automatically established. Each GUI application will automatically connect to one Lab Brick. The GUI will display the model number and serial number of the connected device in the title bar and lower left corners respectively.

3.0 OPERATING FEATURES AND CONTROLS

The general operation of the Lab Brick Switch is designed by the Vaunix engineers to be intuitive and easy to use. This section describes the available features of the Lab Brick Switch.

3.1 Switch Modes

The Lab Brick Switch offers four modes of operation outlined in the following sections.

3.1.1 Internal Switch Control - Manual Control Mode

The Lab Brick Switch can be manually controlled through the GUI. In this mode the connection is determined by the selection of the path.

- In the Switch Control window select the “Internal” button
 - In the Switch Setting window select the desired path to be connected
- Connection will now be made from RFC to the desired path.

3.1.2 Internal Switch Control - Fast Switch Mode (Pulse)

The Lab Brick Switch offers a Fast Switching mode. In this mode the active RF channel switches between RFC/RF1 to RFC/RF2. This feature is often used as a pulse modulator. The GUI will allow the user to select a pulse width and pulse repetition interval. The pulse width can be configured from a minimum of 100 ns to a maximum of 999 seconds while the pulse repetition rate has a minimum rate of the pulse width plus 100 ns.

To operate in the Fast Switch Mode:

- Select the “Internal” button from the Switch control window
- Select the Fast Switch Mode tab
- Enter the desired Pulse Width and Pulse Repetition Interval
- Under the Pulsed Output section select the “On” button to begin the programmed pulse

3.1.3 Internal Switch Control - Pattern Mode

The Lab Brick Switch also offers a Pattern Switching mode. In this mode the active RF channel can be programmed to switch in any desired sequence. The GUI will allow the user to select the connection sequence and the duration of each connection. The minimum duration at each switch location is 1 ms while the maximum duration is 100,000 seconds.

To operate in the Pattern Mode:

- Select the “Internal” button from the Switch control window
- Select the Pattern Mode tab
- Enter the desired sequence and switch durations
- Select “One Time” to run the sequence once or “Repeat” to continuously run the sequence.

3.1.3 External Switch Control

The Lab Brick Switch can be configured to operate from external control stimulus. Using TTL logic, the external inputs control the switch states. The switch control tables are located below.

SPDT

VctlA = 1, RFC to RF1

VctlA = 0, RFC to RF2

SP4T

VctlA = 1 VctlB = 0, RFC to RF1

VctlA = 1 VctlB = 1, RFC to RF2

VctlA = 0 VctlB = 1, RFC to RF3

VctlA = 0 VctlB = 0, RFC to RF4

3.2 Setting the Initial Operating State

After configuring the switch parameters, the user may select to save the current settings. From the File menu select Save Current Settings.

These settings will be stored within the Lab Brick device. The Lab Brick will now power on in this predefined state when plugged into a USB port on any computer or USB self powered hub. The user may change the saved state at any time by repeating the process.

4.0 SPECIFICATIONS

Electrical	LSW-502P Series
Operating Frequency	0.1 to 5 GHz
Insertion Loss	0.1 to 2 GHz: 1.5 dB typ. 2.5 dB max. 2 to 3 GHz: 2.5 dB typ. 3.5 dB max. 3 to 4 GHz: 3.5 dB typ. 4.5 dB max. 4 to 5 GHz: 4.0 dB typ. 5.5 dB max.
Isolation SPDT	70 dB typ. 60 dB min.
Isolation SP4T	60 dB typ. 50 dB min.
Return Loss (all ports)	20 dB typ. 10 dB min.
Input Power (for 0.1 dB Compression)	0.1 to 3 GHz: 42 dBm typ. 3 to 4 GHz: 41 dBm typ. 4 to 5 GHz: 40 dBm typ.
Input 3 rd Order Intercept	+60 dBm typ.
Max Input Power	+40 dBm (all ports terminated)
Switching Speed	90 ns max.
Control - Internal	GUI, API
Control - External	TTL signal
Control Logic SPDT	VctlA=1 RFC to RF1 VctlA=0 RFC to RF2
Control Logic SP4T	VctlA=1, VctlB=1 RFC to RF1 VctlA=1, VctlB=0 RFC to RF2 VctlA=0, VctlB=0 RFC to RF3 VctlA=0, VctlB=0 RFC to RF4
DC Power	5V/40mA via USB
Mechanical	Mechanical
Length	3.86" (98mm)
Width	2.52" (64mm)
Height	1.35" (34mm)
Weight	< 0.5 lbs (0.23 Kg)
RF Connectors	SMA-F
Cable	USB 2.0 A to B

Notes

1. These specifications are subject to change without notice.
2. Customized models are available tailored to specific performance requirements.
3. The GUI software is included with the purchase of each Lab Brick Switch.
4. A 6' USB cable is included with the purchase of each Lab Brick Switch.

5.0 OPTIONAL ACCESSORIES

Vaunix offers the following optional accessories for the Lab Brick RF Switch family. Please consult your sales representative or visit Vaunix.com for up to date pricing and availability.

4 Port USB Hub with external power adapter

USB cable TypeA male/B male - 3 feet

USB cable TypeA male/B male - 6 feet

USB cable TypeA male/B male - 9 feet

USB cable TypeA male/B male - 15 feet

7.0 MECHANICAL OUTLINE



