vaunix

Vaunix Technology Corporation
Lab Brick® Family of Phase Shifter Products

Operation Manual

Lab Brick

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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Table of Contents

1.0   GENERAL INFORMATION

This guide contains information on the installation , operation and specifications of the Lab Brick® Family of Phase Shifter 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 you own safety please read this section before operating the equipment.

Warning

Before connecting your Lab Brick Phase Shifter 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 Phase Shifter 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 Phase Shifter, verify the contents of the package. The package should contain:

Quantity 1   Lab Brick Phase Shifter

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

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

2.1   System Requirements

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

- Operating System - Windows® 8, 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 Phase Shifter

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 Phase Shifter 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.
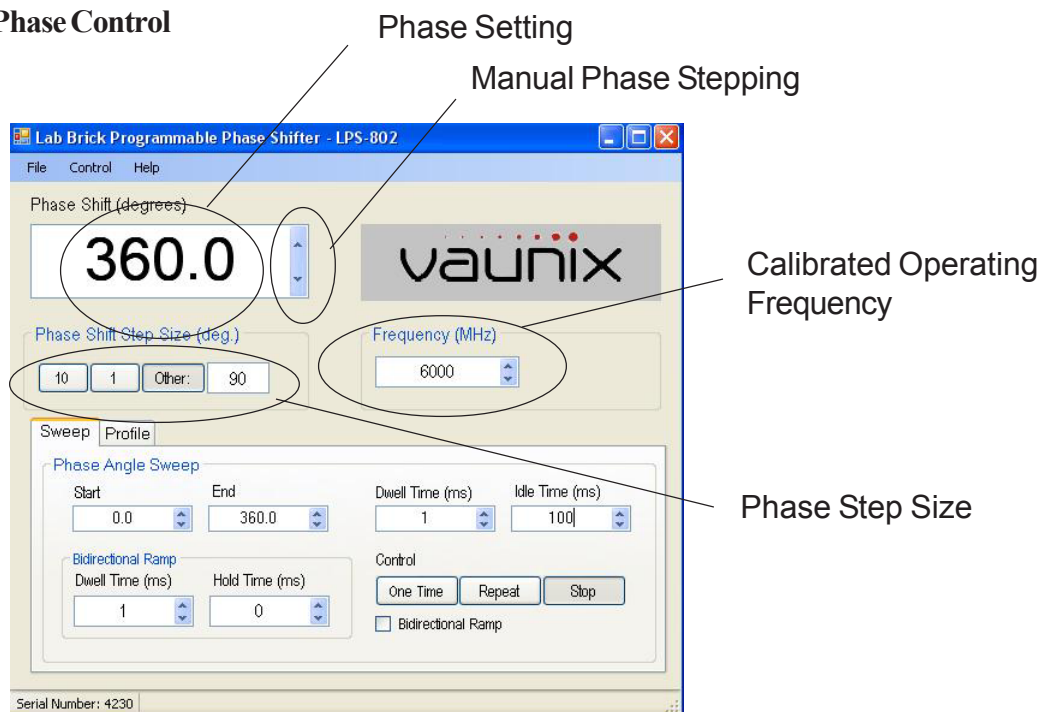
2.4   Using Multiple Lab Brick Phase Shifters

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 Phase Shifter is designed by the Vaunix engineers to be intuitive and easy to use. This section describes the available features of the Lab Brick Phase Shifter.

3.1   Phase Control

3.1.1   Setting the Operating Frequency

The Lab Brick Phase Shifter is calibrated over the specified frequency range for optimal phase accuracy. To achieve the best possible accuracy set the Frequency field to the center frequency of the device under test.

3.1.2   Manual Phase Control

The phase can be manually configured using the Phase Shift field found on the top of the GUI. Simply type the desired phase angle into the window and hit the "Enter" key on your keyboard. The phase angle will immediately adjust to the desired setting.

3.1.3   Configuring the Manual Phase Step Size

The phase may also be controlled by using the up and down arrows adjacent to the Phase Shift field. Use the controls directly below the Phase Shiftfield to set the desired step size. Quick select buttons are available for fixed phase offsets of 1 degree and 10 degrees. Custom phase step sizes may be used by selecting "other" and entering the desired phase step size.

3.1.4   Configuring the Automated Phase Step function
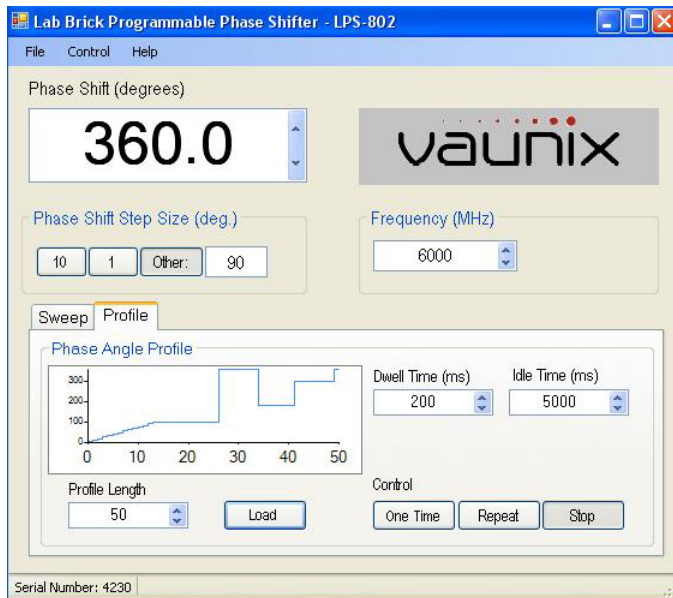
The Lab Brick can be configured to automatically step through a range of phase settings. The user must specify the starting phase, final phase, step size, dwell time (time between each step) and idle time (time between repeating sweeps). The starting and ending phase settings can be configured over the full phase range of the device. The dwell time may be configured from 1 milliseconds to 20,000 milliseconds per step. The idle time may be configured from 1 millisecond to 120,000 milliseconds. The step size is configured as described in section 3.1.2. The phase angle may increase or decrease during the sweep depending if the starting phase value is higher or lower than the ending phase setting.

When the bidirectional ramp box is selected, the bidirectional dwell time and hold time must be specified. The bidirectional dwell time defines the time at each attenuation setting from the end attenuation to the start attenuation. The Hold time refers to the time to wait after the ramp is completed.

By selecting the "One Time" control button, the Lab Brick Phase Shifter will sweep from the start to the end phase setting. Upon completing the sweep, the Lab Brick output will stay at the end phase setting. The user may stop the sweep at any time by selecting the "Stop" button.

By selecting the "Repeat" control button, the Lab Brick will repeatedly sweep from the start to the end phase setting. The user may stop the sweep at any time by selecting the "Stop" button.

3.1.5   Configuring the Phase Profile

The phase profile can be loaded with a .txt or .prf file. The file format is:

dwell time = time in seconds (ex. 0.200)

idle time = time in seconds (ex. 5.000)

length = number of phase points to follow (up to 100)

phase 1

phase 2

phase 3

etc.

To load a profile, select Load from the GUI. Locate the desired profile file and select Open. A picture of the prfile will appear on the GUI. The dwell and idle times may be modified on the GUI.

3.2   Setting the Initial Operating State

After configuring the phase 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	LPS-802
Frequency	LPS-802: 4.0 to 8.0 GHz
Phase Adjustment Range	360° minimum
Phase Adjustment Step Size	Programmable: 1° to 360° Resolution: 1°
Phase Adjustment Accuracy	± 2.5° typical
Programmable Phase Profiles	User Defined
External Triggering	Optional
Response Time	50 µsec.
Insertion Loss	5 dB typical, 7 dB maximum
Input/Output Return Loss	15 dB typical
Operating Input Power	Up to +10 dBm for linear operation
DC Power	Via USB
GUI Compatibility	Windows 7, Windows 8 2000/XP/Vista

Mechanical	
Length	3.86" (98mm) approximate
Width	2.52" (64mm) approximate
Height	0.67" (17mm) approximate
Weight	< 0.5 lbs (0.23 Kg)
RF Connectors	SMA-F
USB Cable	USB 2.0 A to Mini B

5.0   OPTIONAL ACCESSORIES

Vaunix offers the following optional accessories for the Lab Brick Phase Shifter 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/miniB male - 3 feet

USB cable TypeA male/miniB male - 6 feet

USB cable TypeA male/miniB male - 9 feet

USB cable TypeA male/miniB male - 15 feet

7.0   MECHANICAL OUTLINE