

Sifos Technologies

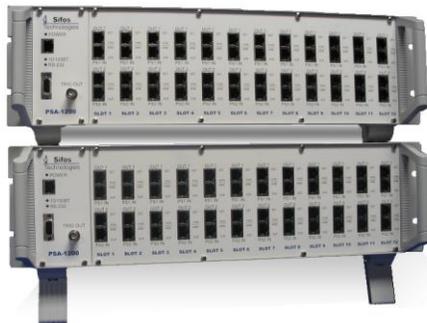
# PowerSync® Analyzer

*PSA100, PSA1200, PSA2400, PSA-PL*



## Installation Guide

Revised August 17, 2012



**Sifos Technologies, Inc.**

(978) 640-4900 Phone

(978) 640-4990 FAX

**Disclaimer**

The information contained in this manual is the property of Sifos Technologies, Inc., and is furnished for use by recipient only for the purpose stated in the Software License Agreement accompanying the user documentation. Except as permitted by such License Agreement, no part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without the prior written permission of Sifos Technologies, Inc.

Information contained in the user documentation is subject to change without notice and does not represent a commitment on the part of Sifos Technologies, Inc. Sifos Technologies, Inc. assumes no responsibility or liability for any errors or inaccuracies that may appear in the user documentation.

**Warranty**

Sifos Technologies Inc., warrants to recipient that hardware (“Hardware”) and the tangible media on which it supplies Software will be free from significant defects in materials and workmanship for a period of 12 months from the date of delivery (the “Warranty Period”), under normal and intended use and conditions. Sifos also warrants that during the Warranty Period, the Software that it supplies will operate substantially in accordance with the specifications supplied by Sifos for such Software. Sifos does not warrant that the functions contained in the Software will meet a specific requirement or that the operation will be uninterrupted or error free. Sifos shall have no warranty obligations whatsoever with respect to any Software which has been modified in any manner by any third party.

Defective Product under warranty shall be, at Sifos’ discretion, repaired or replaced or a credit issued for an amount equal to the price paid for such Product provided that: (a) such Product is returned to Sifos Technologies after first obtaining a return authorization number and shipping instructions, freight prepaid, to Sifos’ location in the United States; (b) Recipient provides an explanation of the defect or Software failure claimed; and (c) the claimed defect actually exists and was not caused by fault, neglect, accident, misuse, improper storage, improper installation, improper repair (other than by Sifos or its agents), fire, flood, lightning, power surges, earthquake or alteration (unless such alteration performed by Sifos or its agents). Sifos will ship repaired Products to recipient, freight prepaid, within ten (10) working days after receipt of defective Product. Except as otherwise stated, any claim on account of defective materials or for any other cause whatsoever will conclusively be deemed waived by recipient unless written notice thereof is given to Sifos Technologies, Inc. within the Warranty Period. Product will be subject to Sifos Technologies’ standard tolerances for variations.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NONINFRINGEMENT AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED, AND THE LIABILITY OF SIFOS, IF ANY FOR DAMAGES RELATING TO ANY ALLEGEDLY DEFECTIVE PRODUCT SHALL BE LIMITED TO THE ACTUAL PRICE PAID BY THE PURCHASER FOR SUCH PRODUCT. IN NO EVENT WILL SIFOS TECHNOLOGIES BE LIABLE FOR COSTS OF PROCUREMENT OF SUBSTITUTE PRODUCTS OR SERVICES, LOST PROFITS, OR ANY SPECIAL DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, ARISING IN ANY WAY OUT OF THE SALE AND/OR LICENSE OF PRODUCTS OR SERVICES TO RECIPIENT EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY.

# Table of Contents

<b>TABLE OF CONTENTS .....</b>	<b>3</b>
<b>ABOUT THIS GUIDE.....</b>	<b>4</b>
PURPOSE.....	4
AUDIENCE.....	4
CONTENT .....	4
CONVENTIONS .....	4
RELATED INFORMATION .....	4
TECHNICAL SUPPORT.....	4
<b>ABOUT THE POWERSYNC FAMILY OF INSTRUMENTS .....</b>	<b>5</b>
INTRODUCTION .....	5
POWERSYNC ANALYZER DESCRIPTION .....	5
POWERSYNC PROGRAMMABLE LOAD DESCRIPTION.....	5
POWERSYNC ANALYZER & PL CONTROL.....	5
PHYSICAL AND ENVIRONMENTAL SPECIFICATIONS .....	6
CERTIFICATIONS .....	7
<b>INSTALLATION AND SETUP PROCEDURES .....</b>	<b>8</b>
PC REQUIREMENTS.....	8
NETWORK CONNECTIVITY .....	8
PACKAGE CONTENTS .....	8
SAFETY PRECAUTIONS.....	9
HARDWARE INSTALLATION .....	10
<i>PSEAF-2 Card Installation</i> .....	10
<i>PSA-1200, PSA-2400 Mounting Considerations</i> .....	10
<i>Powering Up the PowerSync Analyzer</i> .....	10
<i>IP Address Set-Up</i> .....	10
<i>DHCP Address Option</i> .....	12
<i>Connect the Ethernet Port</i> .....	12
<i>Connecting Power Sourcing Equipment (PSE's)</i> .....	13
<i>Test Port LED Indicators</i> .....	13
<i>Controller LED Indicators</i> .....	14
SOFTWARE INSTALLATION & INITIAL CONNECTION .....	15
<i>Install the CD-based Software onto Microsoft Windows</i> .....	15
<i>Install the CD-based Software onto Linux Workstation</i> .....	15
<i>Connecting PSA Interactive or PowerShell Wish to the PSA1200, PSA100, or PSA-PL Instrument</i> .....	16
<i>Connecting PowerShell Tcl to the PSA1200, PSA100, or PSA-PL Instrument</i> .....	16
<i>Connecting PSA Interactive or PowerShell Wish to the PSA2400 (RackPack PSA) Instrument</i> .....	16
<i>Connecting PowerShell TCL to the PSA2400 (RackPack PSA) Instrument</i> .....	17
<i>Inventory the PSA Chassis</i> .....	17
<b>UPDATING FIRMWARE TO THE POWERSYNC INSTRUMENT .....</b>	<b>18</b>
UPDATING CHASSIS CONTROLLER FIRMWARE.....	18
UPDATING TEST PORT FIRMWARE.....	19
<i>Step 1: Storing the Firmware File</i> .....	19
<i>Step 2: Upgrading the Test Ports</i> .....	19
PROGRAMMING AND INTERACTIVELY CONTROLLING THE PSA INSTRUMENT .....	20

## About this guide

### Purpose

This manual describes first-time PowerSync Analyzer and PowerSync Programmable Load installation and setup. It also includes instructions for firmware upgrades to the PowerSync instrument.

### Audience

This manual is designed for Engineers and Technicians who are familiar with PC's and/or Linux Workstations and have a working knowledge of networking equipment.

### Content

#### About the PowerSync Analyzer

This section introduces the user to the PowerSync Analyzer family of products

#### Installation and setup

This section describes the initial installation and setup of the PowerSync instrument and associated software.

#### Upgrading Instrument Firmware

This section describes processes for upgrading firmware to the PowerSync chassis and test blades.

### Conventions

This guide uses the following typographical conventions:

**Bold** lettering is used to indicate menu selections and CLI (command line interface) typed commands, as well as for general emphasis for important items.

*Italics* is used to indicated command options and for notes to the user

Menu/submenu selections are indicated with “greater than” (>) symbols. For instance, **File > Save** refers to the Save submenu selection under the file menu.

### Related Information

In addition to this manual, the user may refer to Sifos Technologies’ “**PowerSync Analyzer Technical Reference Manual**”, which is provided both in paper form and on the CD shipped with the PowerSync Analyzer.

### Technical Support

To obtain technical support, please contact our technical support team using either of the following methods:

By email: [support@sifos.com](mailto:support@sifos.com)

By mail: Sifos Technologies, Inc.  
Attn: Technical Support  
1061 East St.  
Tewksbury, MA 01876

Additionally, Application Notes and Product Notices may be found at our web site:

<http://www.sifos.com>

## About the PowerSync Family of Instruments

### Introduction

The IEEE 802.3af standard and emerging 802.3at revision describe a method for powering remote devices and systems using PoE (Power over Ethernet). Prior to this standard, PoE was implemented using proprietary methods, which inhibited growth and interoperability. The 802.3 PoE standard specifies various features and responses which must be adhered to in order to comply with the standard and hence guarantee interoperability with other 802.3 PoE devices and systems. This forms the stepping stone to widespread, robust, PoE deployment.

The standard describes PSE's (Power Sourcing Equipment) and PD's (Powered Devices). Examples of each would be a PoE enabled Ethernet Switch (PSE) connected to a Wireless Access Point (PD). The PD would derive power from the PSE, eliminating the need for a local power supply.

### PowerSync Analyzer Description

The PowerSync Analyzer is a system that is used to test and characterize PSE's. The PowerSync Analyzer is not just a "PD Emulator"; it is also a test instrument that can be used to evaluate PSE's and characterize parameters that are specified in the 802.3 PoE standard. Furthermore, it is capable of stress-testing, and performing tests beyond the scope of the 802.3 PoE standard. The PowerSync Analyzer's flexibility makes it an ideal choice for both the Manufacturing floor and for engineering lab use.

There are three versions of PowerSync Analyzers available;

- The PSA-100 Compact, a small and portable entry-level PSA with 2 PSE test ports.
- The PSA-1200 Analyzer, a rack-mountable desktop chassis with slots for up to 12 PSEAF-2 test cards. Each PSEAF-2 provides 2 isolated test ports, allowing the PSA-1200 to test up to 24 PoE ports simultaneously
- The PSA-2400 RackPack consisting of two PSA-2400 chassis with 24 PSE test ports each, bound into a single entity by software, for a total of 48 Test Ports. The PSA-2400 chassis' are rack mountable.

### PowerSync Programmable Load Description

The PowerSync Programmable Load offers a subset of the capabilities of the PSA-1200 Analyzer at lower per-port cost. It can scale to 24 Test Ports in a rack-mountable chassis and offers flexible PD Emulation and simple PoE line measurements with software automation capabilities in common with the PowerSync Analyzer. It is fully upgradeable to the PSA-1200 through the acquisition of special software keys from Sifos Technologies.

### PowerSync Analyzer & PL Control

All PowerSync instruments include an Ethernet (LAN) interface for routine control. Additionally, a 9-pin serial port is provided exclusively for IP address configuration and firmware upgrades. The PowerSync Analyzer also includes an external trigger port to enable synchronization of measurements and load transient events across PSA chassis'.

The PowerSync Analyzer is controlled via an external PC or Linux Workstation running Sifos Technologies' PowerSync Interactive, an interactive graphical user interface, and/or with PowerShell Wish/PowerShell TCL, an interactive command line and automation script development environment incorporating the TCL/TK scripting language.

Users, and particularly programmers working with the PowerSync Analyzer or PowerSync Programmable Load are **strongly advised** to read the **PowerSync Technical Reference Manual** included with the product in order to become familiar with all of the features of the PowerSync instrument so that it will provide the maximum benefit to their testing applications.

## Physical and Environmental Specifications

### PHYSICAL

#### PSA-100

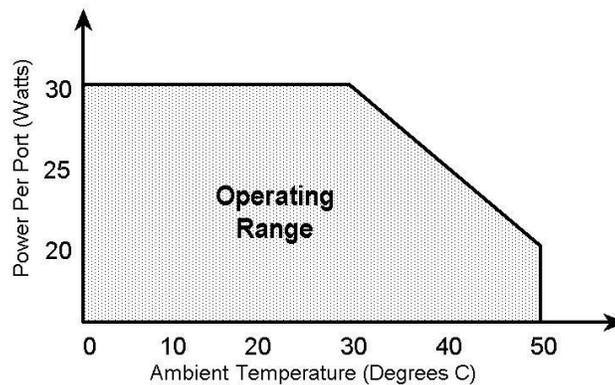
Width:	4.2 "
Height:	1.65"
Depth:	9.15" (Including Rear-Panel Connectors)
Weight:	1.4 lbs.
Power:	5V, 700mA Max. (100VAC – 240VAC, 50-60Hz Wall Plug-in Adaptor Supplied)

#### PSA-1200, PSA2400

Width:	19 "
Height:	5.25" (3 Rack-Unit)
Depth:	12"
Weight:	17.25 lbs. (Fully Populated)
Power:	100VAC – 240VAC, 50-60Hz, 600mA Max.

### ENVIRONMENTAL

Operating Temperature: 50°C at 20W Max per Port, linearly de-rated from 30°C at 30W per port (see Graph)  
 Note: 30W is the heat dissipation rating, not the power loading capability of each PSA Test Port.



Storage Temperature: -20°C to 85°C  
 Operating Humidity: 5% to 95% RH, Non-Condensing.

## Certifications

---

<b>Emissions:</b>	FCC Part 15, Class A Meets EN55022, VCCI, AS/NZS 3548
<b>Safety:</b>	CSA Listed (CSA22.2 No. 61010) Meets EN61010-1
European Commission:	Low Voltage Directive (73/23/EEC) Electromagnetic Compatibility Directive (89/336/EEC) CE Marking Directive (93/68/EEC)

### **FCC Statement:**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

# Installation and Setup Procedures

## PC Requirements

IBM Compatible PC running Windows NT™, Windows 2000™, Windows XP™, Windows Vista™ or Windows 7™. PowerSync software is also available for SUSE, RedHat (Fedora), and Debian Linux Workstations. 400MHz Pentium or higher recommended. Minimum 10MB Drive space and 128MB RAM required for PSA Software.

SVGA Color Monitor, Mouse, CD Rom Drive, an RS232 serial port, and one or more 10BaseT or 10/100BaseT Ethernet Ports and appropriate cabling are required.

For the PSA-100 and PSA-1200 models, a direct connection between the PC and the PSA is possible with an Ethernet Cross-over cable.

TCL/TK Version 8.4.5 or later (NOTE: TCL 8.4 versions only; TCL 8.5 or later is not supported). TCL/TK is provided as part of the Microsoft Windows installer package.

## Network Connectivity

As is typical of most LAN controlled instruments, the PowerSync Analyzer and PowerSync Programmable Load utilize **fixed IP Addresses** and therefore should only be used on a private LAN network. PC's and workstations that will control the PowerSync instrument should have capability to reside on this private LAN using either a fixed IP Address or a carefully administered address provisioning method that protects against address conflicts with instruments utilizing fixed IP addresses.

PC's and workstations may host a second network connection via a separate LAN interface to a building or enterprise network. In the event that a second LAN interface is utilized for wide area networking purposes, it is recommended that the two LAN interfaces be kept completely separate with no route paths between them.

The network connection between host computer and PowerSync Analyzer should not introduce significant delay or latency. Round trip connection latency should not exceed 5msec and it is recommended that connections provide less than 1msec latency.

See applicable PC and operating system literature when configuring multiple LAN interfaces.

## Package Contents

The PSA-100 Compact PowerSync Analyzer is shipped with the following items:

- PSA dual test port desktop unit
- Software and documentation provided on a CD
- AC wall-mount power supply
- CAT5 Ethernet cable, straight-through (beige)
- CAT5 Ethernet cable, crossover (green)
- RS232 Straight-through cable with DB9M to DB9F connections.

The PSA-1200 PowerSync Analyzer and PowerSync Programmable Load are shipped with the following items:

- PSA chassis with installed controller card, one or more SIF-4002 test cards, and blank faceplates to cover any unused slots
- Software and documentation provided on a CD
- AC power cord
- CAT5 Ethernet cable, straight-through (beige)
- CAT5 Ethernet cable, crossover (green)
- RS232 Straight-through cable with DB9M to DB9F connections.

The PSA-2400 RackPack PowerSync Analyzer package is shipped with the following items:

- Two PSA chassis with 24 PSE test ports per chassis
- Software and documentation provided on a CD
- AC power cord
- Two CAT5 Ethernet cables, straight-through (beige)
- RS232 Straight-through cable with DB9M to DB9F connections.

## **Safety Precautions**

TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE THE COVER OF THE PSA. NO USER SERVICEABLE PARTS ARE INSIDE. SERVICE SHOULD BE REFERRED TO QUALIFIED PERSONNEL.

THE PSA SHOULD BE POWERED DOWN AND DISCONNECTED FROM AC LINE VOLTAGES WHEN ANY OF THE CARD SLOTS ARE UNPOPULATED OR UNCOVERED BY A BLANK FACEPLATE, AND WHEN INSTALLING OR REMOVING CARDS OR FACEPLATES.

THE PSA-1200-BASED PSEAF-2 CARDS MAY EXCEED SAFE HANDLING TEMPERATURES WHEN OPERATING UNDER HEAVY CURRENT LOADS. CARDS SHOULD ALWAYS BE ALLOWED TO COOL BEFORE REMOVAL FROM THE CHASSIS.

THE PSA IS FOR CONNECTION ONLY TO THE INTERNAL BUILDING ETHERNET NETWORK. IT IS NOT FOR CONNECTION TO THE TELECOMMUNICATIONS NETWORK.

THE PSA SHOULD BE POWERED VIA THE SUPPLIED AC POWER CORD, WHICH INCLUDES AN EARTHING CONDUCTOR. THE GROUND TERMINAL OF THE PLUG SHOULD NOT BE MODIFIED, SINCE THIS COULD RESULT IN A PRODUCT THAT IS NOT PROPERLY EARTHED. WHEN PLACING THE EQUIPMENT IN ITS FINAL CONFIGURATION, THE EQUIPMENT SHOULD BE PLACED SUCH THAT IT IS EASY TO ACCESS THE POWER CORD; THIS WILL ALLOW THE CORD TO BE PULLED OUT OF THE UNIT IN THE EVENT THAT IT IS NECESSARY TO REMOVE POWER.

THERE ARE VENTILATION HOLES ON THE TOP AND BOTTOM COVERS, AND FAN VENT HOLES ON THE BACK OF THE PSA-1200 AND PSA-2400 RACK-MOUNT CHASSIS, AND ON THE SIDES AND TOP OF THE PSA-100. THESE SHOULD NOT BE BLOCKED OR OTHERWISE OBSTRUCTED.



**WARNING: THE PSA-100 SHOULD ONLY BE OPERATED WITH THE POWER SUPPLY THAT WAS PROVIDED WITH THAT PRODUCT.**

## Hardware Installation

This section describes the PowerSync Analyzer hardware installation.

### ***PSEAF-2 Card Installation***

The card slots for the PSEAF-2 cards are numbered from 1-12 (left to right) in the software. Cards should generally be installed from left to right, however this is *not* a strict requirement for proper operation of the instrument under software control.

**Note: The PSEAF-2 card installation is not applicable to the PSA-100 and PSA-2400.**

### ***PSA-1200, PSA-2400 Mounting Considerations***

The PSA-1200 and PSA-2400 may be operated either as a stand-alone instrument or in a rack-mount configuration.

The top and bottom air vents and back-panel fans on the PSA provide required cooling for the PSEAF-2 cards. When rack mounting the PSA, a 1U (1.7") spacing must be maintained above and below the PSA, without front-side obstructions. Vent plates will be available from Sifos that can be installed in the empty slots.

**NOTE: OBSTRUCTION OF THE TOP OR BOTTOM VENTS OR THE FANS COULD DAMAGE THE HARDWARE UNDER HEAVY CURRENT LOADS, AND WILL VOID THE WARRANTY.**

### ***Powering Up the PowerSync Analyzer***

Connect the supplied AC cord to the back of the PSA-1200, PSA-PL, or PSA-2400, and then to a properly grounded AC source (see "Safety Precautions"). Turn on the switch on the back of the PSA. The Test Ports should all flash their LED's for about 2 seconds, and the PSA controller should then flash its LED indicators briefly.

The PSA-100 should be powered via the supplied Wall-plug-in supply. The user may optionally power the instrument with the supplied USB-Port adapter cable, however since individual USB ports may or may not meet the standard USB power specification, operation is not guaranteed, and should be verified prior to any critical test situations.

### ***IP Address Set-Up***

The PSA is shipped from the factory with an IP Address of **192.168.221.105**. Under typical situations, the user may wish to change this to an address that matches the user's local network settings.

**The PowerSync instrument's serial port is available exclusively for IP Address set-up and PSA Controller firmware updates. Under normal use it should be left disconnected.**

The serial port should be connected to a PC running HyperTerminal or an equivalent data terminal emulator using the supplied DB9 cable.

The HyperTerminal set-up is as follows:

Start HyperTerminal,  
Select a connection name when prompted

In the connection prompt, enter the following:  
*Connect Using*> **direct to com#**

Where # = 1,2,3 or 4, depending upon the PC port being used.

In the Port Settings Prompt, select the following parameters:

```
Bits per second >    9600
Data bits >         8
Parity >            None
Stop bits >         1
Flow Control >     Hardware
```

With HyperTerminal set up and running as described above, hit the **ENTER** key on the Keyboard. The following menu will appear:

```
PowerSync Analyzer
Firmware Version #.##
MAC Address:  00204A#####

IP Address: 192.168.221.105
Mask:       255.255.255.0
Gateway:    192.168.1.1

1.  Set IP Address
2.  Firmware Upgrade (Controller)
3.  Enable PSA

(PSA DISABLED) >
```

Type **1** and press **ENTER**. Follow the command prompts to set up the IP address. Pay careful attention in the following example to see how this is done, particularly the assigned **IP Mask\*** method.

```
> 1
Use DHCP ? (Y/N) > N
Enter IP Address (xxx.xxx.xxx.xxx) > 10.10.10.114
Confirm? (Y/N) y

Enter Number of Mask Bits (01 - 30) > 24
255.255.255.0
Confirm? (Y/N) y

Enter Gateway Address (xxx.xxx.xxx.xxx) >
10.10.10.1
Confirm? (Y/N) y

Please Wait... Done
```

There is approximately a 10-second delay before “Done” is displayed, and then the main menu appears again: **Type “3” to Enable the PSA. Then disconnect the serial port and close the terminal emulation software.**

**NOTE!** The PSA LAN interface **will not operate** if the serial port to the PSA is open and the command menu is visible by virtue of pressing the **ENTER** key.

If you are setting up more than one PSA, as in the case of the **PSA-2400 RackPack**, each PSA chassis must have a unique IP Address.

The PSA IP Address may also be changed to another address on the *same subnet* using the PowerShell command **psa\_setipaddress**. This method does not require a serial port connection. See the PowerShell chapter of the Technical Reference Manual for more information on this command.

\* Note that the **Mask** is entered as the number of **unmasked MSB's** of a binary Mask Address.

### **DHCP Address Option**

PSA's with controller firmware version 1.53 or newer may prompt to "Use DHCP?" when updating the PSA address. If DHCP is selected, the PSA will attempt to acquire an address from a network DHCP server. Generally, this configuration is **not advised** for test laboratory environments where most instruments operate with hard-coded addresses. Knowledge of the PSA address is critical in order to connect and control the PSA from PSA Interactive or PowerShell, so if DHCP is utilized, the assigned address must be known and must be stable over the course of instrument usage. (Note: The PSA console menu will display an acquired address if the address is successfully acquired and the menu is re-opened.)

### **Connect the Ethernet Port**

The Ethernet Port on the PSA can be connected to a 10/100/1000BaseT Ethernet Switch or Hub:  
**Connections to a Hub or Switch require the standard CAT5 UTP cable.**

If you are installing a PSA-100 or PSA-1200, you have the option of making a direct connection to a PC:  
**Direct Connections to a PC require the CAT5 Ethernet crossover cable.**

The PC must be on the same subnet as the instrument in order to communicate with it. When the CAT5 cable is connected and the PC and PSA are powered up, one of the LED's located on the RJ-45 should be either on or blinking.

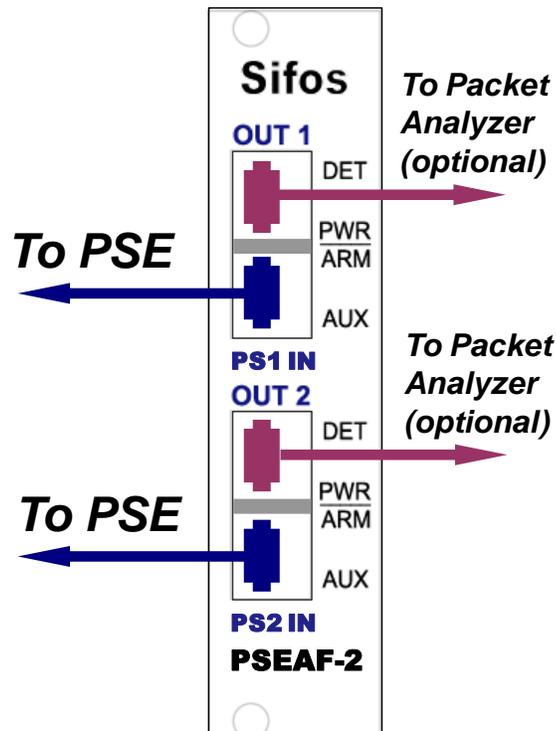
**NOTE!** *The PSA-2400 RackPack PSA requires that the two PSA chassis' be installed on the same sub-net and powered on for the Software to operate them.*

### Connecting Power Sourcing Equipment (PSE's)

After installing the PowerSync Analyzer chassis, you can connect the Power Sourcing Equipment (PSE) to the PSE Test Ports in the chassis.

Each PSEAF-2 test card (or equivalently, each **slot** on the PSA-100 or PSA-2400) has two pairs of RJ-45 connectors. The top pair is labeled OUT 1 and PS1 IN. The bottom pair is labeled OUT 2 and PS2 IN. Each pair acts as an independent test port. In some tests you use both ports in the pair; in other tests you use only one of the ports of the pair.

The PS1 IN and PS2 IN ports connect to the ports of an 802.3af PSE device. Use of the OUT 1 and OUT 2 ports is optional.



### Test Port LED Indicators

There are four LEDs on each test port: DET, PWR, ARM, and AUX. The LEDs are described below. The LEDs toggle on and off at power-up and flash during the firmware upgrade process.

**DET** - The DET LED is lit when the test port is in Detect Mode. Detect mode is present when the port is connected (port connect), and the detection resistance is between 19k Ohm and 26k Ohm. When this LED is lit, it's an indication that the passive load is set up to allow a successful detection by a PSE, assuming that the ALT-A/ALT-B and MDI/MDI-X settings in the correct state.

**PWR** - The PWR LED is lit when the PSE voltage at the input port exceeds 33 Volts. If a measurement is active, this LED may be delayed until completion of the measurement.

**ARM** - The ARM LED is lit when the test port is armed and waiting for either an internal or external trigger. This LED is shut off when the trigger occurs. (Note: *This LED is not utilized by PSA-PL.*)

**AUX** - The AUX LED is lit during communications between the controller and the test port. It is also available for possible user control in future software releases.

All four of the above LED's toggle on and off at power-up, and flash during the firmware upgrade process.

**Controller LED Indicators**

The controller has two LED's on the RJ-45 Ethernet connector, and, in the case of the PSA-1200, PSA-2400, and PSA-PL, three LED's labeled PWR, ETH, and COM. These are described below.

**RJ-45 Upper/Right LED** - The upper LED is a bi-color LED, which indicates whether the Ethernet connection is 10BaseT or 100BaseTx. An Amber color indicates 10BaseT, and Green indicates 100BaseTx. If the LED is not lit, then a proper connection is not present.

**RJ-45 Lower/Left LED** - The lower LED indicates that there is activity on the link. Half-duplex activity is indicated with a momentary Amber color, and Full-Duplex activity is indicated with green.

**ETH LED** - The Ethernet LED is lit whenever there is a communication with the controller. This can represent either; a direct communication between the host PC and controller, or communications between the controller and a test port.

**COM LED** - The COM LED is lit momentarily during RS232 communications.

Both of the above LED's are lit momentarily during power-up, and flash during upload procedures.

**PWR LED** - The PWR LED is lit whenever the instrument is powered on.

## Software Installation & Initial Connection

### Install the CD-based Software onto Microsoft Windows

1. Put the PowerSync CD in the drive.
2. Open the CD in Windows Explorer, and then run the file named **Sifos\_PSA\_Installer\_#\_#\_###.exe**, where #\_#\_### is the version number of the software. After a moment the installation wizard appears. *(Note: The PSA Software installer will automatically open from PSA Version 3.1 and later CD's.)*
3. Click **Next**. If Tcl/Tk version 8.4.5 or later is not installed, a dialog box will appear, asking if you want to install Tcl/Tk version 8.4.5. This version of Tcl/Tk or later is required. If this dialog box does not appear, skip step 4 and go to step 5.
4. If Tcl/Tk version 8.4.5 or later is already installed, click **No** and go to the step 5. If you need this version of Tcl/Tk installed, click **Yes** and follow the instructions on the screen to install Tcl/Tk. When the Tcl/Tk installation is complete, the installation wizard appears again. **Note:** *Some products that install Tcl may not install Tk. The installer will check for the installation of Tk as well as Tcl.*
5. The PSA Installer may also prompt to install an editor program **AnyEdit** for PowerShell. This program is recommended for those that plan to do test script development for PowerShell since it knows all PowerShell command and global variable names and will provide many other productivity features of a textual program editor for TCL.
6. Follow the instructions on the screen to complete installation of the PSA software.

### Install the CD-based Software onto Linux Workstation

PowerSync Software requires TCL/TK 8.4.5 (or later) to operate. TCL/TK should be installed on the Linux Workstation separate from PowerSync Software. TCL/TK for Linux and Unix is available from the ActiveState website, and usually available through Linux distribution specific package managers. TCL/TK must be installed such that the user has Execute permissions to the TCL “/bin” directory so that the commands “tclsh8.4” and “wish8.4” will open the respective TCL consoles.

1. Put the PowerSync CD in the drive.
2. Establish read-write permissions for the **/usr/local/** directory path
3. Copy the files **psa\_installer.sh** and **Sifos\_PSA\_Archive\_#\_#\_###.tar** (where #\_#\_### is the PSA version number) from the directory **/Linux Installation Files** to the user's **<HOME>/bin/** directory path.
4. Open a terminal and execute the shell command “**sh psa\_install.sh**”.
5. Read-write permissions to the **/usr/local/** directory path may be removed following execution of the installer script.
6. Desktop icons, or application links, may be set up to **PowerShell TCL**, **PowerShell WISH**, and **PSA Interactive**. The corresponding shell scripts for each of these applications will be found in the **<HOME>/bin/** directory path after execution of the installer script.

Refer to the **PSA\_Linux-Unix\_Install\_README** document on the CD under the path **/Linux Installation Files** for more information regarding the Linux installation process.

Terminal commands to launch PowerSync Software will be:

Program	Shell Command
PowerShell TCL	PowerShell_TCL.sh
PowerShell WISH	PowerShell_WISH.sh
PSA Interactive PL	PSA_Interactive.sh

**Connecting PSA Interactive or PowerShell Wish to the PSA1200, PSA100, or PSA-PL Instrument**

PSA Software must initially learn the IP address of each PowerSync instrument on the local network. The assumed address of a PowerSync Analyzer or PL after the software is installed is **192.168.221.105**.

If this is *not* the address configured in the PSA and if PowerShell TCL has *not* yet been used to connect to the PSA, the following procedure will “train” all PSA Software as to where the PSA is located on the LAN.

1. Connect the PSA chassis on the local network and turn it on.
2. Open PSA Interactive or PowerShell Wish.
3. Enter the new PSA address in the Chassis Selection dialog entry field. Then press **Add Chassis**.
4. Assuming the new address is accepted and added to the selection list, **Select** the new address and press **Connect**.

If the new address was *not* accepted, be sure PSA is connected on LAN and subnet visible to host computer and that PSA is turned on. Also be sure the IP address of the PSA was properly entered before pressing the Add Chassis button.

PSA Software is now able to communicate with the PSA instrument. There is no need to perform a similar operation using PowerShell Tcl.

**Connecting PowerShell Tcl to the PSA1200, PSA100, or PSA-PL Instrument**

PSA Software must initially learn the IP address of each PowerSync instrument on the local network. The assumed address of the PowerSync Analyzer or PL after the software is installed is **192.168.221.105**.

If this is *not* the address configured in the PSA and if PSA Interactive and PowerShell Wish has *not* yet been used to connect to the PSA, the following procedure will “train” PSA Software as to where the PSA is located on the LAN.

1. Connect the PSA chassis on the local network and turn it on.
2. Open PowerShell TCL and respond “N” or “NO” at the initial user connection prompt
3. Enter the new PSA chassis IP address at the prompt and press [Enter].

If the new address was *not* accepted, be sure PSA is connected on LAN and subnet visible to host computer and that PSA is turned on. Also be sure the IP address of the PSA was properly entered before pressing the Add Chassis button.

PSA Software is now able to communicate with the PSA instrument. There is no need to perform a similar operation to add the PSA address unless the PSA address is altered in the PowerSync Analyzer or PL.

**Connecting PSA Interactive or PowerShell Wish to the PSA2400 (RackPack PSA) Instrument**

PSA Software must initially learn the IP address of each PowerSync instrument on the local network. In order for PSA software to work with the RackPack PSA (PSA2400), it must learn the address of **BOTH** PSA chassis’ before controlling either one. This is a one-time operation.

This one-time procedure can also be done using PSA Interactive, PowerShell Wish, or PowerShell Tcl. When using PSA Interactive or PowerShell Wish, the procedure is as follows:

1. Set up each RackPack PSA chassis to a unique IP address
2. Connect and power up both chassis’ on the local network
3. Open PowerShell WISH or PSA Interactive
4. In the PSA Connection window, enter the IP address of the *first* RackPack PSA chassis and press **Add Chassis**
5. In the Selection List, **Select** the newly added address (Note: Status will report “PSA-2400 Init...”) and a message box will appear instructing the user to enter the second PSA2400 address

6. In the PSA Connection window, enter the IP address of the *second* RackPack PSA chassis and press **Add Chassis**
7. In the Selection List, **Select** the newly added address
8. Press **Connect**

PowerShell Wish or PSA Interactive will then open up connected to the *second* of the two PSA's entered during the procedure. At this point, any PSA application will have ready access to the PSA2400 RackPack system.

### Connecting PowerShell TCL to the PSA2400 (RackPack PSA) Instrument

PSA Software must initially learn the IP address of *each* PowerSync chassis on the local network. In order for PSA software to work with the RackPack PSA (PSA2400), it **must** learn the address of **BOTH** PSA chassis' before controlling either one.

This one-time procedure is easily done using PowerShell TCL. The procedure is as follows:

1. Set up each RackPack PSA chassis to a unique IP address
2. Connect and power up both chassis' on the local network
3. Open PowerShell Tcl and enter "N" or "NO" to the initial address prompt
4. Enter the IP address of either PSA2400 chassis
5. Upon prompt for SECOND PSA2400 address, enter the IP address of the other PSA2400 chassis

PowerShell TCL will then open with an active connection to the first PSA address entered. At this point, any PSA application will have ready access to the PSA2400 RackPack system.

### Inventory the PSA Chassis

Once connected to any PSA Chassis, PowerShell may be used to quickly inventory the types of test resources and the associated firmware versions of the PowerSync instrument. To see this inventory:

1. Open PowerShell TCL or PowerShell WISH.
2. Execute the command **psa\_config -d**

This will provide a full inventory of instrument resources as show in the example below.

```
PSA-1,1>psa_config -d
Slot,Port          Type Version
-----
0,0 Standard_PSA_Ctlr 1.67
1,1 Dual_PSE_Test_3 1.59
1,2 Dual_PSE_Test_3 1.59
2,1 Dual_PSE_Test_3 1.59
2,2 Dual_PSE_Test_3 1.59
3,1 Dual_PSE_Test_3 1.59
3,2 Dual_PSE_Test_3 1.59
4,1 Dual_PSE_Test_3 1.59
4,2 Dual_PSE_Test_3 1.59
5,1 Dual_PSE_Test_3 1.59
5,2 Dual_PSE_Test_3 1.59
6,1 Dual_PSE_Test_3 1.59
6,2 Dual_PSE_Test_3 1.59
7,1 Empty
7,2 Empty
8,1 Empty
8,2 Empty
9,1 Empty
9,2 Empty
10,1 Empty
10,2 Empty
11,1 Empty
11,2 Empty
12,1 Empty
12,2 Empty
PSA-1,1>
```

## Updating Firmware to the PowerSync Instrument

Occasionally, Sifos Technologies will make available firmware updates for the PowerSync Analyzer or PowerSync Programmable Load. These updates may be applied by the instrument owner at their site by adhering to the following directions.

There are two firmware entities for the PowerSync instrument:

- Chassis Firmware
- Test Blade Firmware

There is a separate copy of Test Blade firmware for each Test Port (2 per Dual-PSE Test Blade) in the PSA Chassis.

## Updating Chassis Controller Firmware

Chassis controller firmware must be updated via the Serial Port to the PSA chassis. The firmware file for the chassis controller is typically named as follows:

**SIF-CTL\_1\_67.HEX**

Where 1 and 67 are version numbers and the string “CTL” indicates this is for the chassis controller.

To update the chassis controller firmware:

1. Turn on the power to the PSA chassis.
2. Connect the supplied DB9 cable to the PSA serial port and to a PC that has the Windows HyperTerminal program.
3. Start HyperTerminal. This is usually on the Windows Start menu under **Programs > Accessories > Communications**.
4. When prompted, type a name for the connection you are about to make, and click **OK**.
5. Select the COM port you are using in the **Connect using** box, and click **OK**.
6. Select the following port settings:

**Bits per second** – 9600  
**Data bits** – 8  
**Parity** – None  
**Stop bits** – 1  
**Flow Control** – Hardware

**NOTE!** Hardware flow control is required for a firmware upload to work correctly.

**NOTE!** If the current Chassis Controller Firmware is **1.21 or earlier**, or if for any reason the **PSA is unable to communicate on the serial interface**, execute steps 7-through-9. Otherwise Select Menu item #2 “Firmware Upgrade”, and proceed to **step 10**.

7. Click **OK** to establish the connection with the PSA chassis.
8. With HyperTerminal running and the PSA connected, turn off power to the PSA.
9. Turn the PSA on, and within 1 to 2 seconds, enter the pound symbol (#) at the keyboard. The PSA should respond with a greater-than prompt (>) in the HyperTerminal window. If this prompt does not appear, repeat steps 8 and 9. **Once the “>” prompt appears, do not enter any more characters at the keyboard.**
10. In HyperTerminal, click **Transfer > Send Text File**.... A Windows Explorer screen will appear.
11. Find and select the firmware upgrade file. You might have to select **All Files (\*.\*)** in the Files of Type box to see the firmware upgrade file.

12. Click Open. The file should begin to load. A series of dots (.....) will be written to the screen indicating that the upload is in progress. At the conclusion of the upload, the word **PASS** should be written to the screen indicating a successful upload. If the word **FAIL** appears, or if **PASS** does not appear, repeat the previous procedures.
13. When the download finishes, *cycle power* to the PSA chassis.
14. Hit **ENTER** in HyperTerminal, Select menu item 1, and re-enter the IP Address (see **IP Address Setup** above). After the command completes, close HyperTerminal and *cycle power* to the PSA again.

## Updating Test Port Firmware

The firmware file for a PSA Test Port is typically named as follows:

**SIF-TST\_1\_59.HEX**

Where 1 and 59 are version numbers and the string “TST” indicates this is for the a Test Port on a Test Blade.

The procedure for firmware upgrade installation for the Test Ports is a two-step process. **Step 1** stores the firmware upgrade file in non-volatile memory in the PSA controller. **Step 2** upgrades the firmware on the test ports.

Once the test port firmware file is stored in the PSA controller, it remains in non-volatile memory until it is overwritten.

### Step 1: Storing the Firmware File

In this step you transfer the firmware file to non-volatile memory on the PSA chassis.

1. Open PowerShell WISH or TCL.
2. At the command line, type **psa\_download** followed by the full path and file name of the upgrade file, and then press **Enter**. For example:

**psa\_download c:/SIF\_TST\_\*\_\*\*.HEX**

where the upgrade file **SIF\_TST\_\*\_\*\*.HEX** is in the Root directory of drive **c:** in this case. (\*\_\*\* refers to the version number of the current Firmware.)

**NOTE!** You must use the forward slash (/) for path separators, as shown in the example above.

3. When prompted to load the file, type **YES** and press Enter.
4. Wait until the firmware file is transferred to the PSA chassis – PowerShell will report “DOWNLOAD COMPLETE”. Then *cycle power* to the PSA chassis.

**NOTE!** Firmware download to the PSA will take approximately **30 seconds** to complete. If for any reason it completes much faster than this, then the download failed and should be re-attempted after cycling power to the PSA chassis.

### Step 2: Upgrading the Test Ports

In this step you use the previously downloaded firmware file (*see Step 1*) to upgrade the test ports. This may be done either to a *single* selected test port or to *all test ports* in the chassis.

1. Open PowerShell WISH or TCL.
2. At the command line, type **psa\_update\_port** followed by a single port ID (e.g. **1,1**) or the multi-port argument **allports** to upgrade, and press **Enter**. Examples:

**psa\_update\_port 1,2**  
(This upgrades slot 1, port 2)

**psa\_update\_port allports**

(This upgrades all available test ports in the chassis.)

5. When prompted for confirmation, type **YES** and press **ENTER**. The LED's on the test ports being upgraded will flash during this process. Wait for the upgrade process to finish, then *cycle power* to the PSA chassis.

**NOTE!** Firmware upgrade to the Test Ports will take approximately 30 seconds per Test Port. Do not interfere with the operation of PowerShell or the PSA Chassis during this period of time.

## **Programming and Interactively Controlling the PSA Instrument**

See the PowerSync Analyzer or PowerSync PL **Technical Reference Manual**.