

Move the light, not the fiber

S-Series Optical Circuit Switch (OCS) Getting Started Guide



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CALIENT Technologies, Inc.
25 Castilian Drive
Goleta, CA 93117 USA
Phone: +1.805.562.5500
Fax: +1.805.562.1901
www.calient.net

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Table of Contents

1	INTRODUCTION	8
2	UNPACKING THE S-SERIES OCS	9
2.1	Required Personnel.....	9
2.2	Recommended Tools	9
2.3	Unpacking the Switch	9
2.4	Inventory of Contents	10
2.4.1	Missing or Damaged Contents.....	11
2.4.2	Unlocking the S-Series OCS.....	11
3	HARDWARE INSTALLATION.....	12
3.1	Overview	12
3.1.1	General Requirements	12
3.1.2	Required Tools	12
3.1.3	Installing the S-Series OCS in a Rack.....	13
3.2	Power Connections	14
3.2.1	Connecting an External Power Supply.....	15
3.2.1.1	Connecting to an AC Power Module.....	15
3.2.1.2	Connecting to a -48 VDC Power Module	16
3.2.2	Booting Up	17
3.3	Connecting Communication Interfaces	19
3.3.1	Connecting Ethernet.....	19
3.3.2	Default IP Address.....	20
3.3.3	Connecting the Serial Cable	20
3.3.3.1	Serial Port Pinouts.....	20
3.3.3.2	Connection Procedure	21
3.4	Fiber Connections	23
4	MANAGING THE S-SERIES OCS.....	25
4.1	Security Settings.....	25
4.1.1	Configuring Console/SSH Security Settings	25

4.1.2	Configuring Web/TL1 Security Settings	26
4.2	Resetting System Network Defaults	27
4.2.1	Configuring the Network Manually	27
4.2.2	Configuring the Network Using a Configuration File	30
4.2.2.1	Sample Configuration Script	31
4.3	Stopping and Starting Services	36
5	MANAGING THE S-SERIES OCS USING TL1.....	38
5.1	TL1 Agent Connection.....	38
5.1.1	Connecting Using Telnet.....	38
5.1.2	Connecting to TL1 via SSH (Secure Telnet).....	38
5.1.2.1	Requirements.....	38
5.1.2.2	Connecting Using PuTTY	39
5.1.3	Connecting Using the Serial Port	40
6	TROUBLESHOOTING.....	42
6.1	Retrieving the IP Address.....	42

List of Figures

Figure 1	– Shipping Lockdown Baseplate	11
Figure 2	– S-Series OCS Rack Ear.....	13
Figure 3	– S-Series OCS with Rack Ears (Rear View)	14
Figure 4	– C13 Connector.....	15
Figure 5	– S-Series OCS AC Power Module	15
Figure 6	– S-Series OCS -48 VDC Power Module.....	16
Figure 7	– S-Series OCS (Rear View).....	17
Figure 8	– S-Series OCS Center Panel (Close Up)	18
Figure 9	– S-Series OCS Ethernet Interfaces Block Diagram	19
Figure 10	– USB-to-DB9 Cable (L) and RJ45-to-DB9 Adapter Cable (R)	21
Figure 11	– Assembled Serial Cable	21
Figure 12	– S-Series OCS (Front View)	22
Figure 13	– Input and Output Ports on S-Series OCS Fiber Interface	23

Figure 14 – Fiber Direction..... 24

List of Tables

Table 1 – S-Series OCS LED Indicators..... 18

Table 2 – RJ45 Serial Interface Pinout 20

Table 3 – TL1-RAW Mode vs. TL1-TELNET Mode..... 38

Table 4 – Terminal Emulation Settings for the S-Series OCS 41

PREFACE

The *S-Series Optical Circuit Switch (OCS) Getting Started Guide* provides an overview of the basic steps required to unpack, install and configure the S-Series OCS.

AUDIENCE

This guide is written for network operations center personnel and field service personnel tasked with unpacking and setting up an S-Series switch, but are unfamiliar with the proper method for doing so.

1 INTRODUCTION

This document describes how to correctly unpack, install and configure the CALIENT S-Series OCS. Topics covered herein include:

- Unpacking the OCS hardware
- Installing the OCS hardware
- Connecting communication interfaces
- Fiberizing the OCS
- Configuring security settings
- Resetting system network settings
- Stopping and starting services
- Managing the system using TL1



Images of the OCS used in this guide depict switches configured with front power and user interface connections (Figure 12) as well as switches configured with rear power and user interface connections (Figure 7).

Either type of configuration is available to customers, depending on preference; however, the desired configuration *must* be specified by the customer when the switch is ordered. The requested configuration cannot be changed once the order has been processed.

2 UNPACKING THE S-SERIES OCS

This section provides information on how to unpack the S-Series OCS correctly, so that no damage to the switch or bodily injury occurs. Topics covered include:

- Required personnel
- Recommended tools
- Procedure for unpacking the switch

2.1 Required Personnel

The S-Series OCS exceeds the OSHA-recommended, safe-lifting weight for one person. As such, CALIENT recommends *at least two persons* take part any time the switch is lifted or moved.

2.2 Recommended Tools

The following tools are recommended for opening S-Series OCS shipping containers:

- Utility knife
- #1 and #2 Phillips screwdrivers

2.3 Unpacking the Switch

The S-Series OCS is shipped from the factory in a single package consisting of two containers: an inner container and an outer container. For added protection, the S-Series OCS is first packed inside the inner container, which is then packed in the outer container. The dimensions of the outer container are 24.5" W x 27.5" D x 22" H. The shipping weight of the packaged switch is 61 lbs. (27.7 kg).



When unpacking the S-Series OCS, remove and keep the shipping lockdown baseplate (Figure 1), packing materials and containers for future shipment. The switch should only be shipped using the original lockdown baseplate and containers; otherwise, its warranty will be void.



Electro Static Discharge

The S-Series OCS is sensitive to electrostatic discharge (ESD). Be sure to wear either a wrist or ankle ESD grounding strap when handling switch components.

The proper procedure for unpacking the S-Series OCS includes the following steps:

1. Carefully inspect the exterior of each shipping container for any obvious signs of damage that may have occurred during shipping.
2. Cut the band straps wrapped around the container.



Caution Heavy Lifting

Including shipping containers and contents, the S-Series OCS weighs approximately 61 lbs. This weight exceeds the OSHA-recommended, safe-lifting weight for one person. Accordingly, CALIENT recommends *at least two persons* take part any time the switch is lifted or moved. In addition, always make sure the switch is right-side up and level when lifting or handling it.

3. Remove and set aside the accessories box containing the cables, mounting screws and ESD grounding strap.
4. Carefully lift the chassis out of the inner container.
5. Remove its anti-ESD bag from the chassis and keep it for future shipping needs.
6. Compare the contents of the shipment against the packing list. If any items are missing, please contact CALIENT immediately at <http://support.calient.net>.

2.4 Inventory of Contents

The shipment should include the following contents:

- **System Hardware:** The CALIENT S-Series OCS chassis.
- **Cables:** USB-to-DB9 serial cable (1), RJ45-to-DB9 cable and adapter (1), Ethernet cables (2).
- **Documentation and Software:** A single-sheet, two-page (front and back) *S320/160 Optical Circuit Switch Quick Start Guide*.

Comprehensive user documentation for the S-Series OCS—including a *Hardware User Guide*, *Getting Started Guide*, *TL1 Reference Guide*, *Troubleshooting and Alarm Reference Guide* and *Release Notes*—is available online at www.calient.net/library.

Every S-Series OCS ordered from CALIENT is loaded with the most current release of system software available at the time the switch is shipped.

- **Miscellaneous:** Type 12-24 rack-mounting screws (12), slotted screwdriver (1) for terminal strip screws on -48 VDC power modules (Figure 6).

2.4.1 Missing or Damaged Contents

If any items are missing from the shipment or damage is detected, contact CALIENT Service and Support immediately. Returned contents require a Return Material Authorization (RMA), which can be provided by Service and Support personnel.

2.4.2 Unlocking the S-Series OCS

The S-Series OCS is unlocked by removing the shipping lockdown baseplate. Performing this task requires two people. The following procedure describes how to remove the shipping lockdown baseplate (Figure 1):

1. Person 1 presses down firmly on the shipping lockdown baseplate.
2. Person 2 carefully lifts the switch while Person 1 continues pressing down on the baseplate.

As noted in section 2.3, be sure to retain the shipping lockdown baseplate, anti-ESD bag and other materials included in the container for future shipment. The S-Series OCS should only be shipped using the original shipping lockdown baseplate and container.

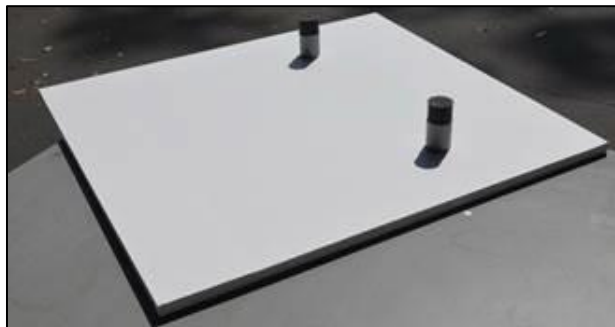


Figure 1 – Shipping Lockdown Baseplate

3 HARDWARE INSTALLATION



Before installing the S-Series OCS for the first time, look online at *library.calient.net* for the latest product installation and configuration guides. In case you are unable to access the Internet, CALIENT includes a copy of the *S320/160 Optical Circuit Switch Quick Start Guide* with every switch it ships.

3.1 Overview

Installing the S-Series OCS includes the following tasks:

- Physically installing the switch in a rack
- Connecting the configuration interfaces of the switch
- Connecting the power interfaces of the switch
- Booting up the switch
- Installing the fiber interfaces of the switch

3.1.1 General Requirements

Before the S-Series OCS is installed, make sure the following requirements are met:

- 7RU of rack space in a 19", 23" or ETSI rack to house the switch
- A mounting shelf for use with two-post racks, or a support bracket set for use with four-post racks
- Power accessible to the switch
- Input and output optical fiber cables with LC-UPC connectors, accessible at the installed switch (i.e., in the rack)
- Computer resources providing VT-100 terminal emulation and a serial interface accessible at the installed switch (i.e., in the rack)

3.1.2 Required Tools

The tools needed to properly install the S-Series OCS are:

- #1 and #2 Phillips screwdrivers

- Wire stripper, crimp tool and pliers
- ESD mats
- Wrist grounding straps
- Anti-ESD examination gloves

3.1.3 Installing the S-Series OCS in a Rack

The S-Series OCS is a 7-RU switch that fits in a 19-inch, 23-inch or ETSI rack. Prior to installation, a pair of installation brackets, or “rack ears” (Figure 2), must be affixed to the S-Series OCS chassis; the proper method for doing this is described in step 1 of the procedure below.



To avoid possible injury to personnel and/or damage to equipment, CALIENT *strongly recommends* that two people install the S-Series OCS in a rack—one person to support the switch and a second person to secure the rack screws. For the same reasons, CALIENT also recommends using a shelf when mounting the S-Series OCS in a rack.

The following procedure describes how to install the S-Series OCS in a rack:

1. Attach the rack ears to the switch—one on each side of the chassis—using the M3 Phillips flathead screws provided with the system. Sixteen (16) M3 screws—eight (8) for each rack ear—are included in the accessories box that comes with the S-Series OCS.

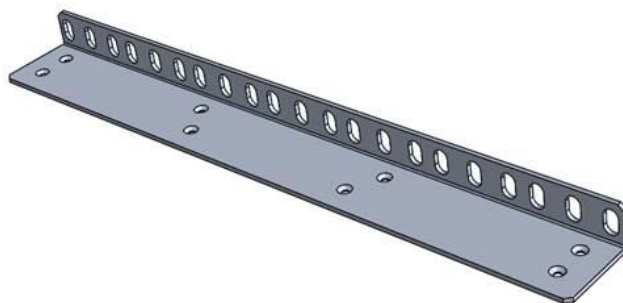


Figure 2 – S-Series OCS Rack Ear

- a. Align the eight (8) countersunk holes in a rack ear with the corresponding holes on the right or left side of the chassis. To prevent incorrect installation, each rack ear is symmetrical and directional—that is, the left rack ear only fits the left side of the chassis, and the right rack ear only fits the right side of the chassis.

- b. Insert an M3 screw through each hole in the rack ear and into the corresponding hole on the chassis.
- c. Tighten each screw with a Phillips screwdriver.
- d. Repeat steps a, b and c on the opposite side of the chassis.

Figure 3 shows the S-Series OCS chassis with the rack ears mounted on it.



Figure 3 – S-Series OCS with Rack Ears (Rear View)

2. Attach a shelf to the rack, one screw hole below the desired location of the switch. This shelf will support the S-Series OCS while it is being secured to the rack.
3. Lift the S-Series OCS onto the shelf.
4. Secure the S-Series OCS to the rack using the mounting screws provided with the switch. There should be 12 screws in the accessories box that came with the switch—6 per rack ear on each side of the switch.

3.2 Power Connections

The S-Series OCS is powered by redundant power source inputs: Power Source A (located in the lower-left corner of the switch) and Power Source B (located in the lower-right corner of the switch). Each input holds a single power module, which can be either AC or -48 VDC, depending on customer preference.

External power is connected to the switch through the power modules: if AC modules are used, power is delivered via an AC power socket (Figure 5); if -48 VDC modules are used, power is delivered via a -48 VDC terminal strip (Figure 6).

For detailed information on both types of module, refer to section 3.3.5 in the *S320 OCS Hardware User Guide*, or contact CALIENT at <http://support.calient.net>.

3.2.1 Connecting an External Power Supply

The procedure for connecting an external power supply to the S-Series OCS varies, depending on which type of power module (AC or -48 VDC) is being connected to.

3.2.1.1 Connecting to an AC Power Module

Connecting an external power supply to an S-Series OCS configured with AC power modules is straightforward, provided the proper cabling is used. Specifically, each cable used to connect external power to the switch must have a C13 connector (Figure 4) on the end that will attach to the AC power module.

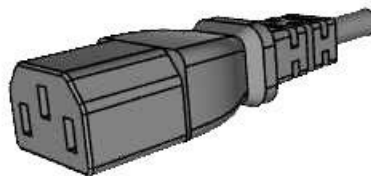


Figure 4 – C13 Connector

The following steps describe how to connect an external power supply to an S-Series OCS configured with AC power modules:

1. Plug the end of the power cable with the C13 (female) connector onto the C14 (male) connector on the AC power module (Figure 5).

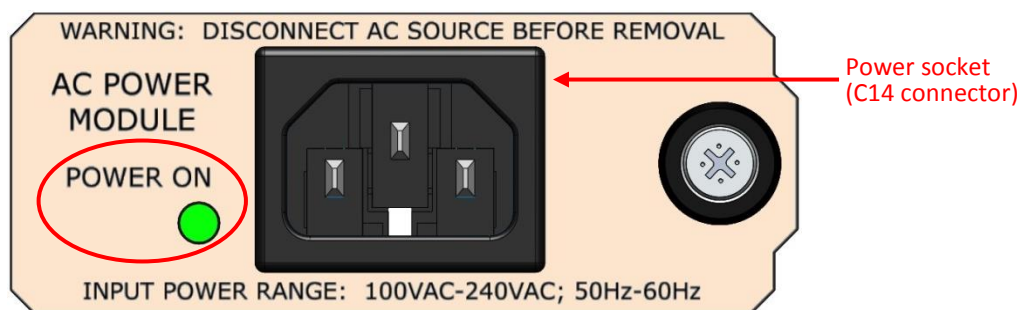


Figure 5 – S-Series OCS AC Power Module

2. Plug the other end of the cable into the power source.
3. Activate the power source for both power modules (primary and backup) to deliver electrical power to the switch.

3.2.1.2 Connecting to a -48 VDC Power Module

Connecting an external power supply to an S-Series OCS configured with -48 VDC power modules (Figure 6) involves more steps than connecting to a switch equipped with AC modules (Figure 5). The following procedure describes how to connect external power to an S-Series OCS configured with -48 VDC power modules:

1. Use wire strippers to strip the insulation from each end of the three (3) wires that comprise the power supply cabling. (CALIENT recommends using 18-gauge wire for this cabling.)
2. Insert one exposed end of each wire into the appropriate input on the cam-over terminal strip located at the center of each power module on the S-Series OCS.

As shown in Figure 6, the black (negative) cabling wire should be inserted in the -48 (VDC) input, the green-yellow (chassis ground) wire should be inserted in the G (Ground) input, and the red (positive) wire should be inserted in the R (Return/+48 VDC) input.

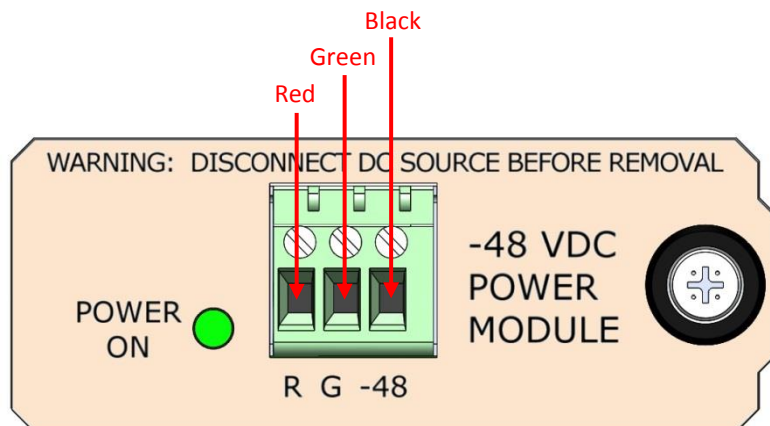


Figure 6 – S-Series OCS -48 VDC Power Module

3. Secure each wire by tightening the screw beside each input with the slotted screwdriver included in the accessories box that comes with the switch.
4. Give each wire a light tug after securing it to ensure that it is firmly attached to the terminal strip.
5. Attach the remaining exposed end of each cabling wire to the appropriate terminal on the power supply.

6. Activate the power source for both power modules (primary and backup) to deliver electrical power to the switch.

 **Caution**

To avoid possible injury to personnel and/or damage to the switch, make sure it is properly grounded *before* powering up the system. CALIENT recommends doing this by stripping one end of insulated copper wire and attaching it to either of the two grounding screws located in the lower-left corner of the rear of the chassis (Figure 7), then attaching the other end of the wire to a grounded circuit.

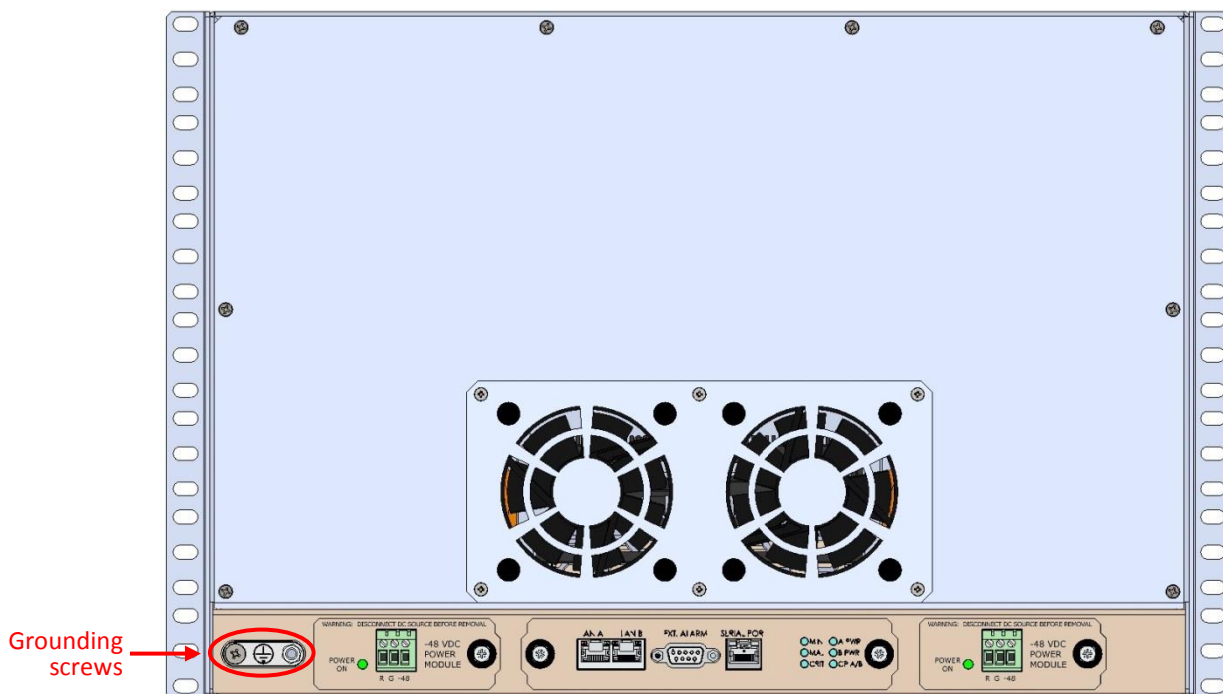


Figure 7 – S-Series OCS (Rear View)

3.2.2 Booting Up

Once the system receives power it will begin its boot process, which will take 3 to 4 minutes. The operational status LED indicators on the center panel of the switch (Figure 8) provide status information, as detailed in Table 1.



Figure 8 – S-Series OCS Center Panel (Close Up)

Table 1 – S-Series OCS LED Indicators

LED	Function	Color	Indication
CRIT, MAJ, MIN	Alarm status	Red	One or more alarms (critical, major or minor) are occurring.
A PWR, B PWR	Power status	Green	The system is receiving power from the indicated power source. Source A is the primary power source; source B is the backup power source.
CP A/B	CP status	Green (A) Amber (B)	The system has passed startup diagnostics and is operating normally. If the LED is green, Control Processor A (active CP) is controlling the system; if the LED is amber, Control Processor B (standby CP) is controlling the system.

If power is applied to the Power Source A input but not the Power Source B input, or vice versa, the S-Series OCS will boot up and function; however, the B-PWR LED will not be illuminated and a major alarm will be communicated to the user via the switch's management interfaces.

Please refer to CALIENT's *OCS Troubleshooting and Alarm Reference Guide* for a detailed description of the system's alarm behavior.

3.3 Connecting Communication Interfaces

This section explains how to connect the communication interfaces of the S-Series OCS.

3.3.1 Connecting Ethernet

The S-Series OCS has two Gigabit Ethernet (GbE) RJ45 connectors—labeled LAN A and LAN B—on the center panel (Figure 8) at the bottom of the switch (Figure 12). These connections enable you to control the system using TL1 via a Telnet session, or using the browser-based graphical user interface (GUI).

Two IP interfaces—eth0 and eth2—map to the switch’s hardware: eth0 maps to the LAN B interface on the center panel, and eth2 maps to the LAN A interface on the center panel.

Figure 9 provides a block diagram that details the IP interface mapping.

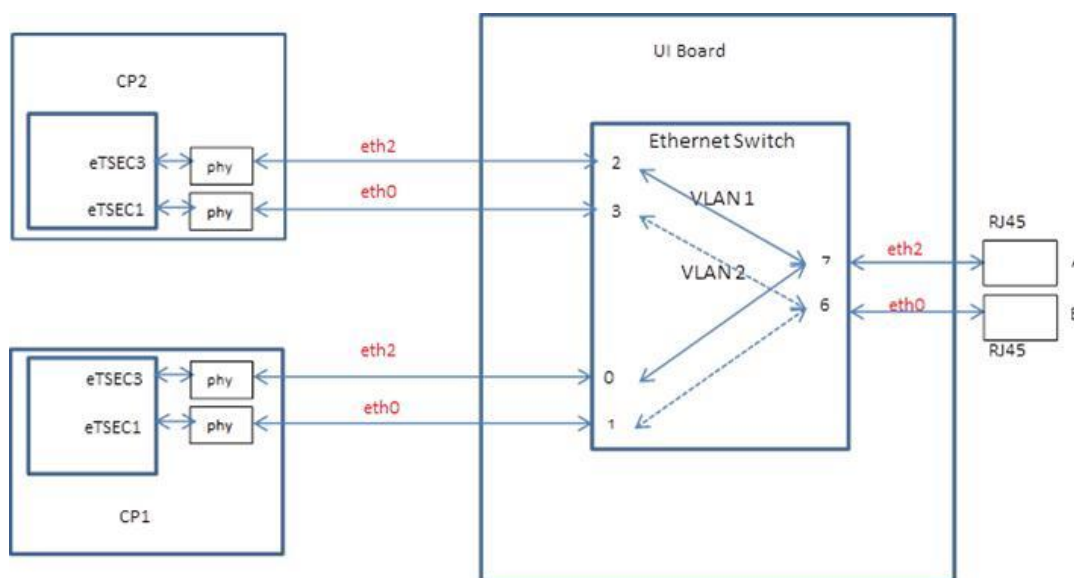


Figure 9 – S-Series OCS Ethernet Interfaces Block Diagram

Note

Make sure to use shielded Ethernet cables, with the shields grounded at both ends, when connecting to the switch’s Ethernet interfaces. The S-Series OCS is approved for installation in a common bonded network (CBN).

3.3.2 Default IP Address

As mentioned in section 3.3.1, the S-Series OCS supports two Ethernet ports (eth0 and eth2). The default IP addresses for these ports are:

- eth0 : 192.168.0.2
- eth2 : Unassigned



Note

The IP address of the eth1 port should not be changed at any time. This interface is used for internal communication between the two control processors; changing the IP address of the eth1 port will negatively affect the system's operation.

3.3.3 Connecting the Serial Cable

A serial cable is used to connect to the serial interface located on the center panel at the bottom of the S-Series OCS chassis. The serial connection enables you to retrieve (or set) the switch's IP address and perform TL1 operations.

3.3.3.1 Serial Port Pinouts

The cabling used to connect to the serial interface on the S-Series OCS uses an RJ45 connector, which requires a combination USB-to-DB9, RJ45-to-DB9 adapter cable (Figure 11). Table 2 lists the pinouts for the RJ45 connector used for the switch's serial interface.

Table 2 – RJ45 Serial Interface Pinout

Pin	Description
2	Transmitted data
3	Received data
5	Ground
7	Clear to send
8	Request to send

3.3.3.2 Connection Procedure

The following procedure describes how to properly connect the combination serial cable provided with the S-Series OCS:

1. Connect the USB-to-DB9 serial cable to the RJ45-to-DB9 adapter cable (Figure 10).

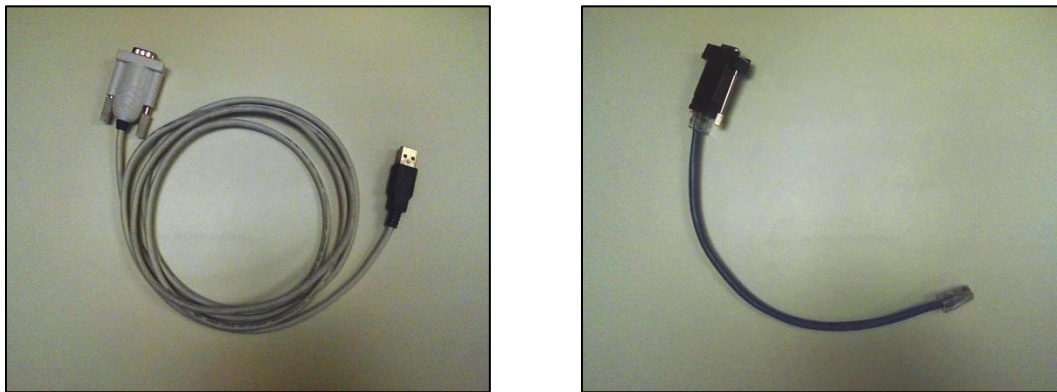


Figure 10 – USB-to-DB9 Cable (L) and RJ45-to-DB9 Adapter Cable (R)

2. Connect the RJ45 end of the assembled serial cable (Figure 11) to the serial connector labeled SERIAL PORT on the center panel (Figure 8) at the bottom of the S-Series OCS chassis (Figure 12).

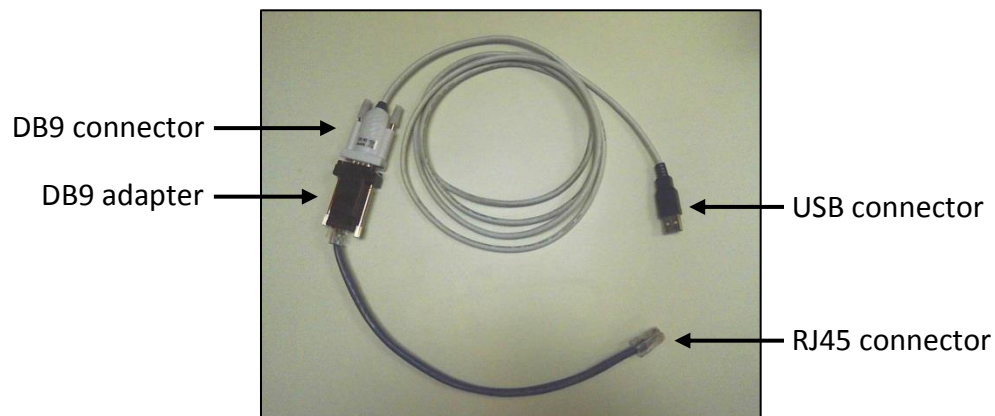


Figure 11 – Assembled Serial Cable

3. Connect the USB end of the assembled cable to the serial connector on the host PC.

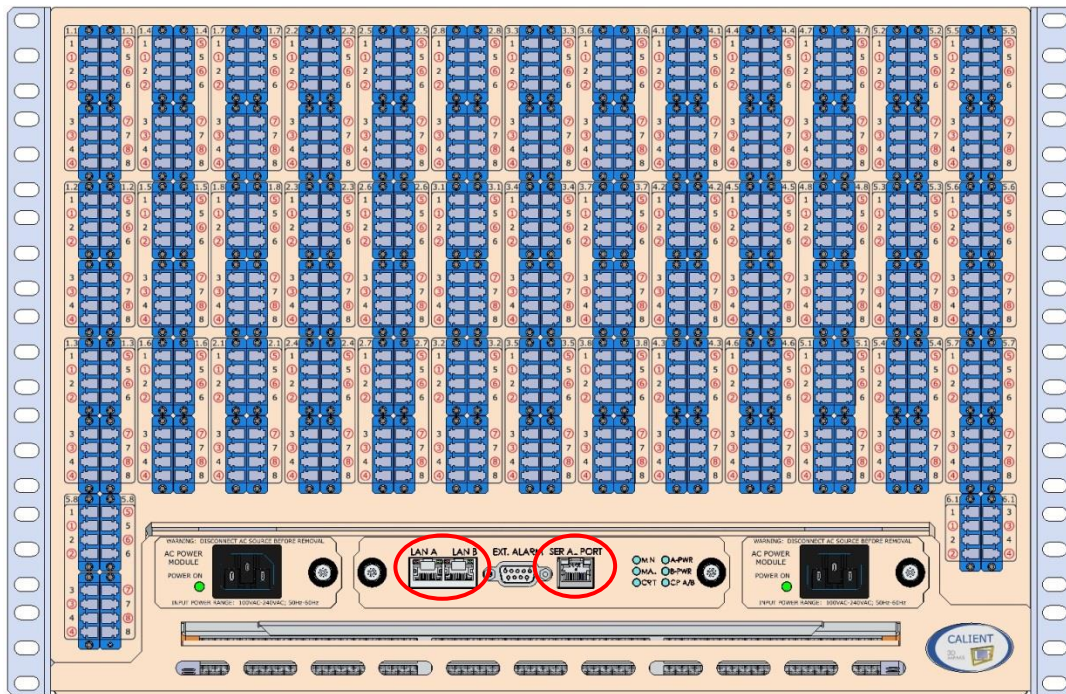


Figure 12 – S-Series OCS (Front View)

Once connected, the assembled serial cable appears as a COM port in the Windows Control Panel Device Manager. If you are unsure which of the COM ports listed in the Device Manager represents the serial cable, unplug the cable while viewing the Device Manager: whichever COM port disappears is the serial cable port. The COM port will reappear in the Device Manager when the cable is reconnected to the switch.

i Note

If a driver for the serial cable is not available, it can be downloaded online at <http://www.ftdichip.com/Drivers/VCP.htm>.

To reset the IP address, refer to section 4.2.

3.4 Fiber Connections

The final task in the installation process involves connecting optical fibers to the S-Series OCS and establishing cross connects. The following procedure describes how to do this:

1. Locate the LC connector at the end of each fiber cable coming from equipment and outside plant fiber.
2. Insert the LC connector into one of the LC-UPC bulkhead adapters on the switch's Fiber Interface (located on the front of the S-Series OCS chassis).

Adapters with *uncircled* port numbers are *inputs*; adapters with *circled* port numbers are *outputs* (Figure 13).



Never look directly at the end of a powered fiber cable. Doing so could cause serious injury to your eyes.

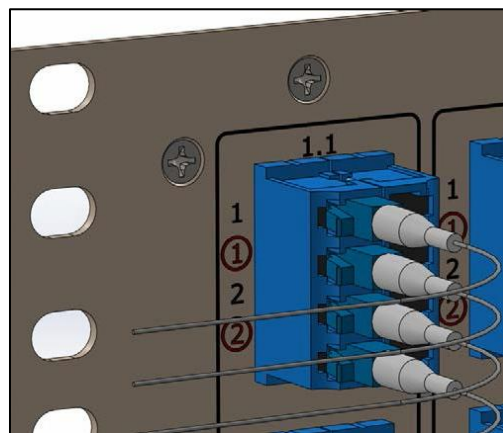


Figure 13 – Input and Output Ports on S-Series OCS Fiber Interface

3. Gently press the LC male connector into LC-UPC bulkhead female connector until it locks in place.

As Figure 14 illustrates, because of the directionality of the switch's monitoring taps, the S-Series OCS operates with light transmitted from the input fiber terminations to the output fiber terminations. Optical transmitters are connected to the inputs, and optical receivers are connected to the outputs.

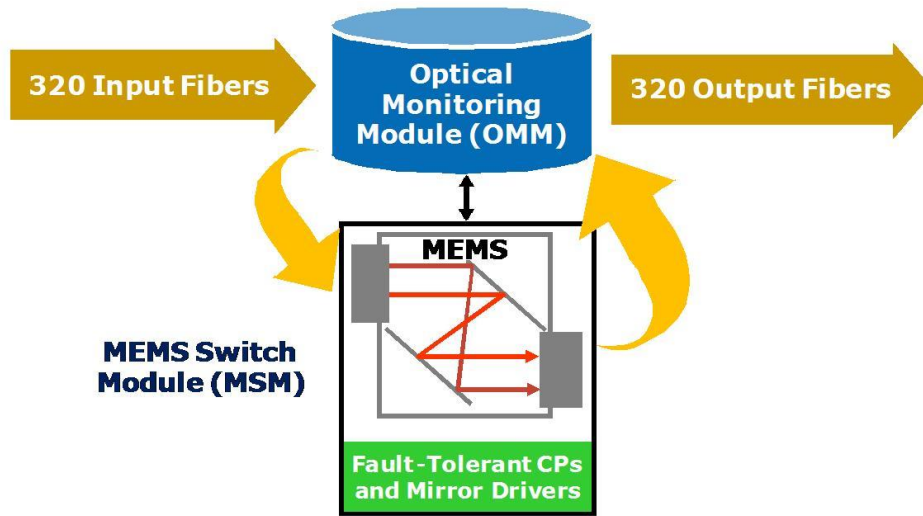


Figure 14 – Fiber Direction

4 MANAGING THE S-SERIES OCS

This section describes how to perform various management operations including configuring security settings, resetting system network defaults (either manually or with a configuration file), and stopping and starting services.

4.1 Security Settings

There are four default methods—console, SSH, Web and TL1—that can be used to access the S-Series OCS. Configuring the security settings for these methods differs, depending on whether system access is via the console/SSH or the Web/TL1.

4.1.1 Configuring Console/SSH Security Settings

The following procedure describes how to log into the S-Series OCS via the console or SSH and modify the security settings:

1. Type the default username `root`. No password is required.
2. The administrator can set the root password at any time with the following command:

```
# passwd  
  
Changing password for root  
  
New password:  
  
Retype password:  
  
Password for root changed by root
```

3. To disable the root password, type the following:

```
# passwd -d root  
  
Password for root changed by root
```

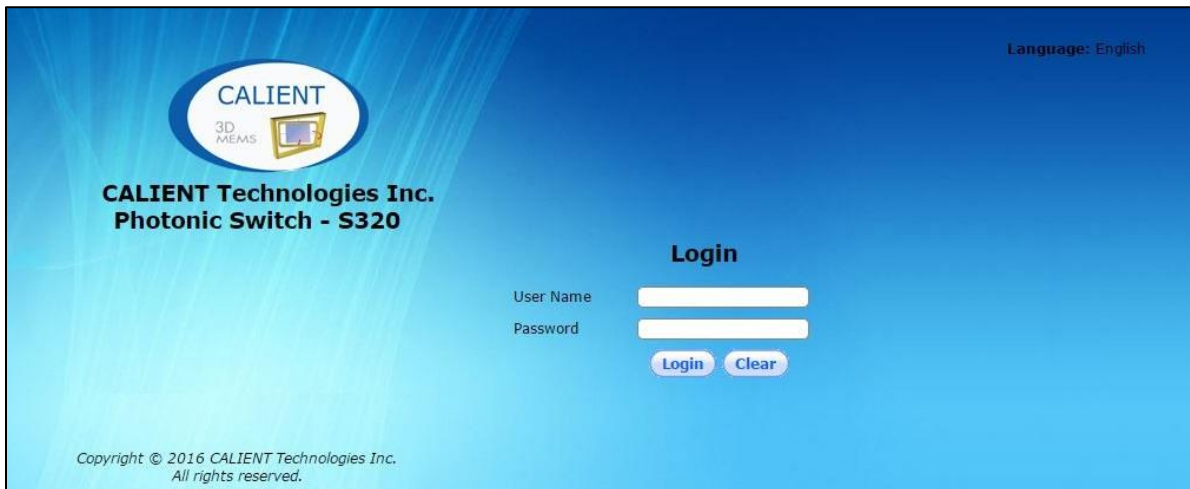


If a new password is set, *make sure to keep a record of it*. If a user-specified password is lost or forgotten, it can only be reset by disrupting existing active connections and traffic. If you do lose or forget your password, contact CALIENT Customer Service at <http://support.calient.net>.

4.1.2 Configuring Web/TL1 Security Settings

The administrator can change the system's default password anytime from the WebGUI. The following procedure describes how to do this:

1. Enter the switch's IP address in your Web browser (i.e., `http://<switchip>`). The switch landing page will appear.



2. Enter the default user name (admin) in the **User Name** field.
3. Enter the default password (pxc***) in the **Password** field.
4. Click the **Login** button to access the switch.
5. Click the **Change Password** button located in the upper-right corner of the Home Page.



The **Change Password** screen will appear.

The screenshot shows the 'Change Password' web interface for a CALIENT S320 device. The page has a blue header with navigation links: Home >> Change Password, Alarms/Events, Status Symbol Key, REST API, Change Password, and Logout. The user is logged in as 'admin' with a session ID of [02-17-2016 17:50:35]. The main content area is titled 'Change Password' and contains a form with the following fields: 'User Name : admin', 'Old Password:', 'New Password:', and 'Confirm New Password:'. Each password field is accompanied by a text input box. At the bottom of the form are 'Save' and 'Reset' buttons. On the left side, there is a sidebar with a navigation menu including 'Node', 'System Info', 'Cross Connects', 'Ports', and 'Ports Group'. Below the menu is a status indicator showing 'Critical : 0', 'Major : 1', and 'Minor : 0'. At the bottom of the page, there is an 'Events' section with a log of system configuration changes.

6. Enter the old password in the **Old Password:** field.
7. Enter the new password in the **New Password:** field.
8. Re-enter the new password in the **Confirm New Password:** field.
9. Click the **Save** button at the bottom of the screen to save the change.

The administrator can also change the default password via TL1 using the `ed-pid` command.

4.2 Resetting System Network Defaults

It may be necessary to change some of the system's network default settings after logging into the S-Series OCS for the first time. System software includes the `gxc-config-network` command, which can be used with the switch's default IP address (192.168.0.2) to access and change the default settings manually. System settings that can be changed include:

- Host name
- Bonding, IP, Netmask and Gateway addresses
- DNS servers
- NTP server
- Time Zone

4.2.1 Configuring the Network Manually

The `gxc-config-network` command enables users to modify system settings (e.g., IP address) on the switch. The following procedure describes how to configure network settings manually:

1. Connect your computing device to the switch via its serial interface (Figure 8) or using PuTTY and the default IP address.
2. Log in to the system as `root`.
3. Execute the `gxc-config-network` command.

The following example shows the typical output that results when the `gxc-config-network` command is run:

```
gxc-config-network
-----
----- GXCP Network Configuration Utility -----
-----
Running in interactive mode. Type 'help' for commands.
gxc-config-network> setup
Bonding, also called Link Aggregation, allows multiple Ethernet interfaces
to be combined into a single logical link. Various modes are available, all
of which provide redundancy; some modes also allow load balancing.
Ethernet bonding? (Type yes to Enable no to Disable) [no] : yes
----- Configuring Hostname -----
Enter system hostname      : sw-714-test
----- Configuring IP Interface 'bond0' -----
IP Address                 : 192.168.102.205
Network Subnet Mask       : 255.255.255.0
Default Gateway Address   : 192.168.102.1
Primary Interface         : ethA
----- Configuring DNS Servers -----
Enter DNS servers one at a time.
When done, enter 0.0.0.0 to stop.
Primary DNS Server        : 4.4.4.4
Secondary DNS Server     : 5.5.5.5
Tertiary DNS Server      : 6.6.6.6
----- Configuring DNS Search Path -----
Press Enter to leave the current path unchanged, or specify
a new search path, with spaces separating each entry.
DNS Search Path : calient.net
----- Configuring Network Time Protocol -----
Enter NTP servers one at a time.  When done, enter a blank value or 0.0.0.0.
```

If your organization or ISP does not have an NTP server, consider using the public NTP servers provided by pool.ntp.org; see <http://www.pool.ntp.org> for more information.

When done, enter a blank entry or 0.0.0.0 to stop.

Primary NTP Server : 192.168.120.13

Secondary NTP Server : 8.8.8.8

Tertiary NTP Server : 9.9.9.9

----- Configuring Time Zone -----

The system can be set to use Coordinated Universal Time (UTC), sometimes called Greenwich Mean Time (GMT), or to a local time zone. Most systems use a local time zone.

Will this system use UTC? [no] :

Please select a geographic location from the following list:

1. Africa
2. Americas
-
10. Pacific Ocean

Enter continent [2] : 2

Please select a country or region from the following list:

1. Antigua & Barbuda
2. Anguilla
3. Argentina
-

Enter country [48] : 48

Please select a time zone from the following list:

1. Alaska Time
2. Alaska Time - Alaska panhandle
3. Alaska Time - Alaska panhandle neck
-
30. Pacific Time

Enter zone [30] : 30

Selected Time Zone: America/Los_Angeles

----- CONFIGURATION SUMMARY -----

Hostname: sw-714-test

IP Interfaces:	Device	IP Address	Network Mask	Default Gateway
bond0	192.168.102.205	255.255.255.0	192.168.102.1	

```
DNS Servers:    4.4.4.4
                5.5.5.5
                6.6.6.6
Search Domains: calient.net
NTP Servers:   192.168.120.13
                8.8.8.8
                9.9.9.9
Time Zone:     America/Los_Angeles
```

```
-----
Is all of the above information correct? [yes] :
-----
```

Please wait while the wizard completes.

Saving configuration...Done.

Restarting network services to apply changes...

Shutting down interface eth0: [OK]

Stopping Switch-ctrl: [OK]

Shutting down loopback interface: [OK]

Bringing up loopback interface: [OK]

Bringing up interface bond0: [OK]

Bringing up interface eth1: [OK]

Starting Switch-ctrl: [OK]

Shutting down ntpd: [OK]

Synchronizing with time server: [OK]

Syncing hardware clock to system time [OK]

Starting ntpd: [OK]

[17:39:27 root@sw-714-test:~]\$

4.2.2 Configuring the Network Using a Configuration File

A configuration file is included with the software that comes loaded on the S-Series OCS.

The following procedure describes how to access and modify the configuration file, then run the network configuration script using the modified file to configure the system:

1. Connect your computing device to the switch via its serial interface (Figure 8) or using PuTTY and the default IP address.
2. Log in to the system as `root`.
3. Go to `/etc`.

4. Modify the configuration file `gxcnetwork.conf` .
5. Save the file.
6. Run the `gxc-config-network` command with the `autoconf` option to apply the specified configuration values:

```
gxc-config-network --autoconf <Path to the Config File>
```

```
gxc-config-network --autoconf /etc/gxcnetwork.conf
```

When run with the `autoconf` option, the `gxc-config-network` script reads all the input values from the configuration file and applies the settings to the system. It will abort the operation if any of the configuration values are not valid.

4.2.2.1 Sample Configuration Script

Following is a sample configuration script with bonding enabled and running `autoconf`:

```
#Config file start
# Comments start with a # in the config file.
HOSTNAME=FactorySwitch
BONDING_ENABLE=yes
bond0_IPADDR=192.168.0.2
bond0_NETMASK=255.255.255.0
bond0_GATEWAY=192.168.0.1
PRIMARY_INTERFACE=ethA
ethB_ENABLED=enabled
ethB_IPADDR=0.0.0.0
ethB_NETMASK=0.0.0.0
ethB_GATEWAY=0.0.0.0
ethA_ENABLED=enabled
ethA_IPADDR=0.0.0.0
ethA_NETMASK=0.0.0.0
ethA_GATEWAY=0.0.0.0
PRIMARY_DNS=0.0.0.0
SECONDARY_DNS=0.0.0.0
TERTIARY_DNS=0.0.0.0
DNS_SEARCH_PATH=Factory.default
PRIMARY_NTP_SERVER=0.0.0.0
SECONDARY_NTP_SERVER=0.0.0.0
TERTIARY_NTP_SERVER=0.0.0.0
```

```
UTC_TIME=no
CONTINENT=2
COUNTRY=48
TIME_ZONE=30
#End of configuration file
[15:16:35 root@TestNetwork:~]$gxc-config-network --autoconf
/etc/gxcnetwork.conf
-----Existing Configuration-----
----- CONFIGURATION SUMMARY -----
Hostname:          TestNetwork
IP Interfaces:    Device      IP Address      Network Mask    Default Gateway
                  bond0      192.168.102.192 255.255.255.0   192.168.102.1
                  ethA      Active Interface
                  ethA      Primary Interface
DNS Servers:      8.8.8.8
Search Domains:   calient.local
NTP Servers:      192.168.120.13
Time Zone:        America/Los_Angeles
-----
Bonding, also called Link Aggregation, allows multiple Ethernet interfaces
to be combined into a single logical link. Various modes are available, all
of which provide redundancy; some modes also allow load balancing.
Ethernet Bonding (Type yes to Enable no to Disable) [yes] : yes
----- Configuring Hostname -----
Enter system hostname          : TestNetwork
----- Configuring IP Interface 'bond0' -----
IP Address                     : 192.168.102.192
Network Subnet Mask            : 255.255.255.0
Default Gateway Address        : 192.168.102.1
Primary Interface              : ethA
----- Configuring DNS Servers -----
Enter DNS servers one at a time.
When done, enter 0.0.0.0 to stop.
Primary DNS Server              : 8.8.8.8
Secondary DNS Server            : 0.0.0.0
----- Configuring DNS Search Path -----
Press Enter to leave the current path unchanged, or specify
```


a new search path, with spaces separating each entry.

DNS Search Path : [calient.local] calient.local

----- Configuring Network Time Protocol -----

Enter NTP servers one at a time. When done, enter a blank value or 0.0.0.0.
If your organization or ISP does not have an NTP server, consider using the
public NTP servers provided by pool.ntp.org; see <http://www.pool.ntp.org>
for more information.

When done, enter a blank entry or 0.0.0.0 to stop.

Primary NTP Server : 192.168.120.13

Secondary NTP Server : 0.0.0.0

----- Configuring Time Zone -----

The system can be set to use Coordinated Universal Time (UTC), sometimes
called Greenwich Mean Time (GMT), or to a local time zone. Most systems
use a local time zone.

Will this system use UTC? [no] : no

Please select a geographic location from the following list:

1. Africa
2. Americas
3. Antarctica
4. Arctic Ocean
5. Asia
6. Atlantic Ocean
7. Australia
8. Europe
9. Indian Ocean
10. Pacific Ocean

Enter continent [2] : 2

Please select a country or region from the following list:

- | | | |
|--------------------------|------------------------|--------------------------|
| 1. Antigua & Barbuda | 19. Dominican Republic | 37. Nicaragua |
| 2. Anguilla | 20. Ecuador | 38. Panama |
| 3. Argentina | 21. Grenada | 39. Peru |
| 4. Aruba | 22. French Guiana | 40. St Pierre & Miquelon |
| 5. Barbados | 23. Greenland | 41. Puerto Rico |
| 6. St Barthelemy | 24. Guadeloupe | 42. Paraguay |
| 7. Bolivia | 25. Guatemala | 43. Suriname |
| 8. Bonaire Sint Eustatiu | 26. Guyana | 44. El Salvador |

- | | | |
|----------------|---------------------------|-------------------------|
| 9. Brazil | 27. Honduras | 45. Sint Maarten |
| 10. Bahamas | 28. Haiti | 46. Turks & Caicos Is |
| 11. Belize | 29. Jamaica | 47. Trinidad & Tobago |
| 12. Canada | 30. St Kitts & Nevis | 48. United States |
| 13. Chile | 31. Cayman Islands | 49. Uruguay |
| 14. Colombia | 32. St Lucia | 50. St Vincent |
| 15. Costa Rica | 33. St Martin (French par | 51. Venezuela |
| 16. Cuba | 34. Martinique | 52. Virgin Islands (UK) |
| 17. Curacao | 35. Montserrat | 53. Virgin Islands (US) |
| 18. Dominica | 36. Mexico | |

Enter country [48] : 48

Please select a time zone from the following list:

1. Alaska Time
2. Alaska Time - Alaska panhandle
3. Alaska Time - Alaska panhandle neck
4. Alaska Time - southeast Alaska panhandle
5. Alaska Time - west Alaska
6. Aleutian Islands
7. Central Time
8. Central Time - Indiana - Perry County
9. Central Time - Indiana - Starke County
10. Central Time - Michigan - Dickinson, Gogebic, Iron & Menominee Counties
11. Central Time - North Dakota - Mercer County
12. Central Time - North Dakota - Morton County (except Mandan area)
13. Central Time - North Dakota - Oliver County
14. Eastern Time
15. Eastern Time - Indiana - Crawford County
16. Eastern Time - Indiana - Daviess, Dubois, Knox & Martin Counties
17. Eastern Time - Indiana - Pike County
18. Eastern Time - Indiana - Pulaski County
19. Eastern Time - Indiana - Switzerland County
20. Eastern Time - Indiana - most locations
21. Eastern Time - Kentucky - Louisville area
22. Eastern Time - Kentucky - Wayne County
23. Eastern Time - Michigan - most locations
24. Hawaii

```
25. Metlakatla Time - Annette Island
26. Mountain Standard Time - Arizona
27. Mountain Time
28. Mountain Time - Navajo
29. Mountain Time - south Idaho & east Oregon
30. Pacific Time
Enter zone [30] : 30
Selected Time Zone:      America/Los_Angeles
-----New Network Configuration-----
----- CONFIGURATION SUMMARY -----
Hostname:      TestNetwork
IP Interfaces: Device      IP Address      Network Mask    Default Gateway
                bond0      192.168.102.192 255.255.255.0   192.168.102.1
                ethA       Active Interface
                ethA       Primary Interface
DNS Servers:   8.8.8.8
Search Domains: calient.local
NTP Servers:   192.168.120.13
Time Zone:     America/Los_Angeles
-----
Is all of the above information correct? [yes] : yes
-----
Please wait while the wizard completes.
Saving configuration...Done.
Restarting network services to apply changes...
Shutting down interface bond0:                [ OK ]
Stopping Switch-ctrl:                          [ OK ]
Shutting down loopback interface:              [ OK ]
Bringing up loopback interface:                [ OK ]
Bringing up interface bond0:                   [ OK ]
Bringing up interface eth1:                    [ OK ]
Starting Switch-ctrl:                          [ OK ]
Shutting down ntpd:                             [ OK ]
Starting ntpd:                                  [ OK ]
[15:19:01 root@TestNetwork:~]$
```



After configuring network settings, services on the switch *must* be stopped and restarted in order for the changes to take effect.

4.3 Stopping and Starting Services

The following procedure describes how to access the stop-start service script in order to activate system changes:

1. Connect your computing device to the serial interface (Figure 8) of the S-Series OCS.
2. Log in to the system as `root`.
3. Enter `Target# gxc-stop` to stop system services.

Following is a sample screen display of the stop utility of the stop-start script, showing the user login, stop command and summary of stopped services:

```
login as: root
root@gxc-S320 OCS:~# gxc-stop

SnmpServices           [STOPPED]
PHPService             [STOPPED]
WebServices            [STOPPED]
TL1Service             [STOPPED]
xConnectProvisioner    [STOPPED]
SwitchMatrix          [STOPPED]
NodeServices           [STOPPED]
Authentication         [STOPPED]
DeviceManager          [STOPPED]
AlarmServices          [STOPPED]
CfgReg                 [STOPPED]
EventServices          [STOPPED]
EventConsumer          [STOPPED]
NamingService          [STOPPED]
DspServices            [STOPPED]
GxcMonitor             [STOPPED]
```

4. Enter Target# `gxc-start` to restart system services.

Following is a sample screen display of the start utility of the stop-start script, showing the start command and summary of started services:

```
root@gxc-S320 OCS:~# gxc-start

DSP, Naming and Event Services           [STARTED]
CfgReg Server, Cfg Writer                 [STARTED]
Alarm Server                             [STARTED]
Device Manager Services                   [STARTED]
Node Provisioner Server                   [STARTED]
Authentication Server                     [STARTED]
Matrix Card , Switch Matrix Server        [STARTED]
Transit Connection Provisioner Server      [STARTED]
TL1 Server                                [STARTED]
Web Services                              [STARTED]
SNMP Services                             [STARTED]

[All Services STARTED]
```

5 MANAGING THE S-SERIES OCS USING TL1

This section describes how to manage the S-Series OCS via the TL1 command line interface using a Telnet or serial port connection.

5.1 TL1 Agent Connection

5.1.1 Connecting Using Telnet

The TL1 Agent supports up to eight (8) simultaneous sessions. To connect via Telnet, specify the node IP address and the port socket that provides the communication path. The default IP address is 192.168.0.2, and the Gateway is 192.168.0.1. Two ports—3082 and 3083—are used, and each port represents a different mode of operation. Both modes are available via SSH. Table 3 describes the differences between the two modes of operation.

Table 3 – TL1-RAW Mode vs. TL1-TELNET Mode

Port Socket	Mode	Description
3082	TL1-RAW	With this mode, the user does not interact with the TL1 Agent and does not receive the <code>agent></code> prompts at the console. When provisioning in bulk, select this mode for executing automated scripts. Online help is not available with this mode.
3083	TL1-TELNET	Typically, this mode is used for individual configuration or provisioning. This mode enables the user to interact with the TL1 Agent through the console, and receive prompts and messages. Online help is available with this mode.

5.1.2 Connecting to TL1 via SSH (Secure Telnet)

CALIENT recommends using an SSH client like PuTTY to connect to TL1 via SSH. PuTTY is a free, open-source SSH and Telnet software application for Windows that can be used to make an SSH connection to your device. You can download free PuTTY software at <http://www.putty.org/>.

5.1.2.1 Requirements

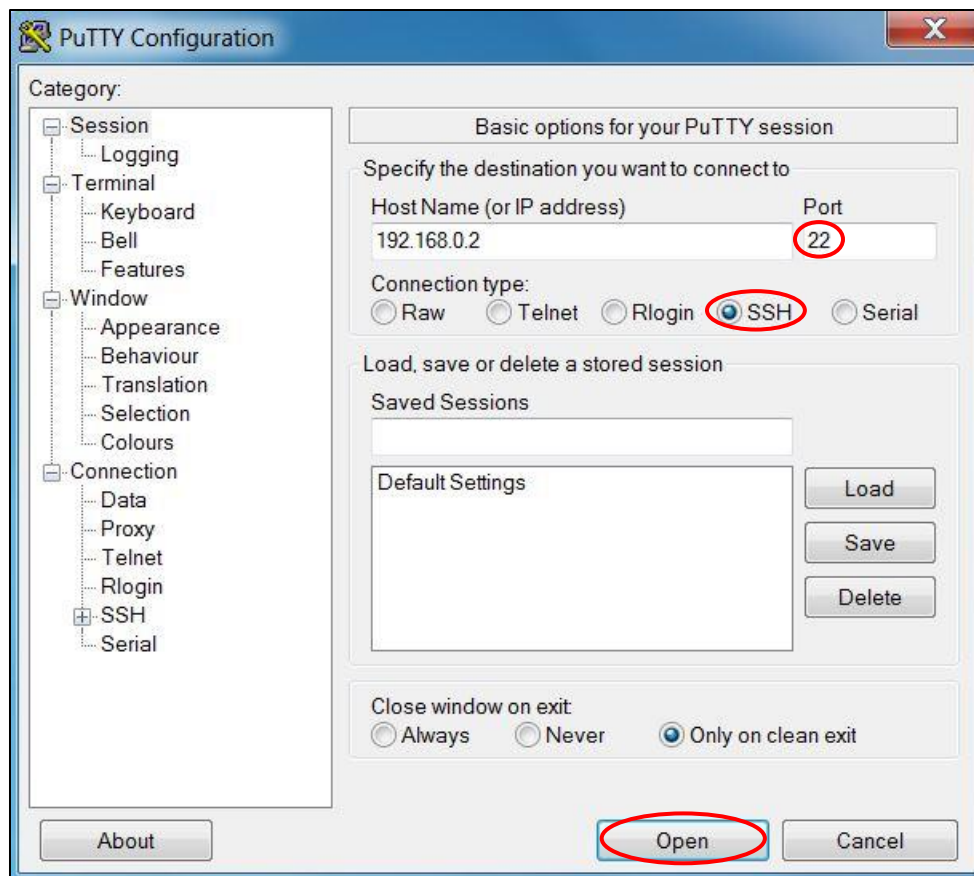
Before you start, you will need the following items:

- Your SSH login credentials
- The IP address of the switch

5.1.2.2 Connecting Using PuTTY

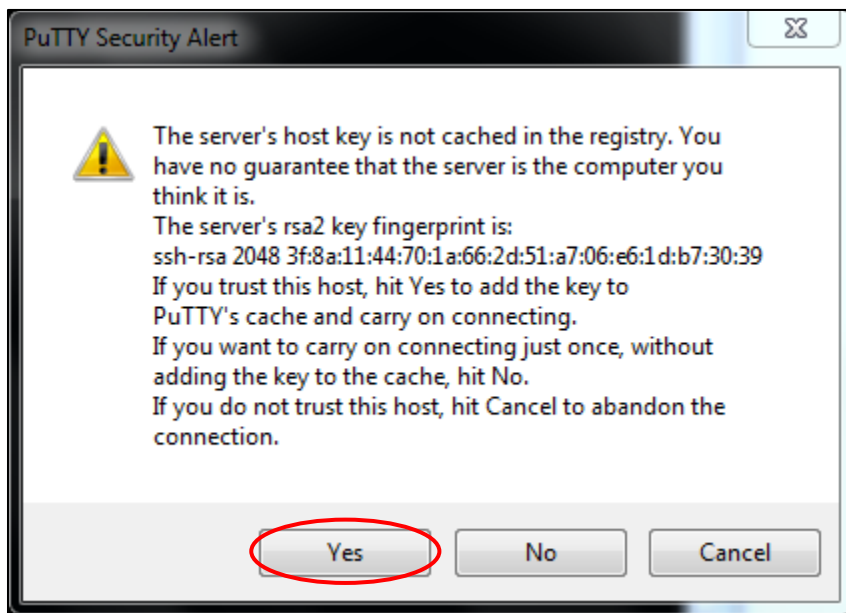
The following procedure describes how to connect to the S-Series OCS using the PuTTY terminal emulation program:

1. Open PuTTY. The PuTTY Configuration window will appear.



2. Specify your connection settings as follows:
 - a. Enter the host name or IP address in the **Host Name (or IP address)** field.
 - b. Enter **22** in the **Port** field and *leave it as the default*.
 - c. Click the **SSH** radio button to select it as the **Connection type** and *leave it as the default*.
3. Click the **Open** button at the bottom of the PuTTY Configuration window to start the SSH session.

If this is your first time connecting to the switch from this computer, the following Security Alert will appear:



4. Click the **Yes** button to accept the connection.

Once the SSH connection is open, you should see a terminal prompt asking for your user name. The SSH login user name for the S-Series OCS is `t11user`.

5. Enter `t11user`.

You are now logged into your switch with SSH and can begin entering commands at the prompt. You should see output like this:

```
agent>
```

6. Enter the TL1 command `act-user` to log in to the switch.

The default TL1 username and password are `admin` and `pxc***`, respectively.

5.1.3 Connecting Using the Serial Port

Unlike the Telnet connection, TL1 service over the serial port is always enabled. To use the serial port on the S-Series OCS, you will need to connect a serial cable to it; section 3.3.3 provides step-by-step instructions on how to do this.

Once connected, you can interact with the TL1 Agent through the console or a PC using a standard terminal emulation program. Table 4 lists the terminal emulation settings for the S-Series OCS.

Table 4 – Terminal Emulation Settings for the S-Series OCS

Item	Value
Data rate	115200 baud
Bits	8
Parity	None
Stop bit	1
Set local echo	Off
Flow control	None
Terminal setting	VT100 or ASCII
Echo	Off
Line wrap	Auto

For more information on using TL1, refer to the *CALIENT OCS TL1 Reference Guide*.

6 TROUBLESHOOTING

This section describes how to retrieve the IP address for the switch if it has been changed from the default or is otherwise unknown.

6.1 Retrieving the IP Address

If for any reason the IP address is unknown, it can be retrieved using the serial interface on the S-Series OCS. The following procedure describes how to do this:

1. Connect a serial cable to the serial port located on the center panel (Figure 8) at the bottom of the switch.
2. Log into the system using the default username `root`.
3. Enter the `gxc-config-network --show` command to determine the IP address of the switch.

Alternatively, the IP address can also be retrieved using the TL1 Agent through the console or a PC and a standard terminal emulation program such as PuTTY. For this method of retrieval, use the terminal emulation settings listed in section 5.1.3 of this document. The default TL1 username and password are:

- Username: `admin`
- Password: `pxc***`

At the TL1 prompt, use the `act-user` command to log in. The following example uses the default username and password:

```
agent>act-user::admin:::pxc***  
  
agent>rtrv-ip
```

Once the IP address is known, the user must configure the client IP network interface to be on the same subnet as the S-Series OCS. After this is done, the user can log into the GUI or telnet to the TL1 Agent using the switch's management interface.