

# OnSite 1052 & 1063 Series **Metro-Optical Transport Access Nodes**

## *Getting Started Guide*



**Important**

This is a Class A device and is not intended for use in a residential environment.

Sales Office: +1 (301) 975-1000  
Technical Support: +1 (301) 975-1007  
E-mail: [support@patton.com](mailto:support@patton.com)  
WWW: [www.patton.com](http://www.patton.com)



Part Number: **07MOS10xx-GS, Rev. B**  
Revised: **October 25, 2010**

**Patton Electronics Company, Inc.**

7622 Rickenbacker Drive  
Gaithersburg, MD 20879 USA

Tel: +1 (301) 975-1000

Fax: +1 (301) 869-9293

Support: +1 (301) 975-1007

Web: [www.patton.com](http://www.patton.com)

E-mail: [support@patton.com](mailto:support@patton.com)

**Copyright © 2010, Patton Electronics Company. All rights reserved.**

The information in this document is subject to change without notice. Patton Electronics assumes no liability for errors that may appear in this document.

The software described in this document is furnished under a license and may be used or copied only in accordance with the terms of such license.

# Summary Table of Contents

- 1 Product Overview..... 14
- 2 Application Overview..... 18
- 3 Installation Overview ..... 23
- 4 System Management Access..... 39
- 5 Contacting Patton for assistance ..... 53
- A Compliance information ..... 56
- B Specifications ..... 58
- C Terms and Acronyms ..... 63

# Table of Contents

<b>Summary Table of Contents .....</b>	<b>3</b>
<b>Table of Contents .....</b>	<b>4</b>
<b>List of Figures .....</b>	<b>7</b>
<b>List of Tables .....</b>	<b>8</b>
<b>About this guide .....</b>	<b>9</b>
Audience.....	9
Structure.....	10
Precautions .....	10
Safety when working with electricity .....	11
Optical Safety .....	12
Fiber-Optic Ports .....	12
Fiber-Optic Safety Precautions .....	12
Typographical conventions used in this document.....	13
General conventions .....	13
Mouse conventions .....	13
<b>1 Product Overview.....</b>	<b>14</b>
Introduction.....	15
OnSite Platforms .....	15
<b>2 Application Overview.....</b>	<b>18</b>
OS1052 Application.....	19
OS1063 Application.....	21
<b>3 Installation Overview .....</b>	<b>23</b>
Introduction .....	24
Unpacking and Inspection.....	24
Site Preparation .....	24
Site Environment .....	25
Planning Your Site.....	25
Site Requirements .....	25
Operating Environment Requirements .....	26
Power Supply Requirements .....	27
Distribution Rack Requirements .....	27
Mechanical Recommendations for the Rack .....	28
Protective Grounding for the Rack and Chassis .....	28
Space Requirements for the Rack .....	28
Securing the Rack .....	28
Tools and Equipment for Installation and Maintenance.....	29
OnSite System Installation .....	29
Mounting the Chassis to an EIA/TIA 19-Inch Rack .....	29

Mounting the Chassis to an ETSI Rack .....	30
Mounting the Chassis on the Wall .....	32
Installing the Chassis Ground Connection .....	33
Connecting Power to the OS-10 System .....	33
Connecting AC Power to the OS-10 System .....	34
Powering On the OS-10 System with AC Power .....	35
Connecting DC Power to the OS-10 System .....	35
Wiring Procedure for DC Input Power .....	35
Checking the OS-10 System Installation .....	38
<b>4 System Management Access.....</b>	<b>39</b>
Introduction .....	40
General Overview .....	40
Ethernet LAN Management Port .....	41
Serial Management Port .....	42
Gaining Access to the System .....	43
Access through the Serial Port .....	43
Access through the Ethernet LAN Management Port .....	44
Web-Based Management Interface .....	45
Launching the GUI Application .....	45
Autonomous Alarm Messages .....	47
Engineering Orderwire (EOW) .....	49
<b>5 Contacting Patton for assistance .....</b>	<b>53</b>
Introduction .....	54
Contact information.....	54
Warranty Service and Returned Merchandise Authorizations (RMAs).....	54
Warranty coverage .....	54
Out-of-warranty service .....	54
Returns for credit .....	54
Return for credit policy .....	55
RMA numbers .....	55
Shipping instructions .....	55
<b>A Compliance information .....</b>	<b>56</b>
Compliance.....	57
EMC .....	57
Low-Voltage Directive (Safety) .....	57
PSTN .....	57
Declaration of Conformity .....	57
Authorized European Representative .....	57
<b>B Specifications .....</b>	<b>58</b>
Model OS1052.....	59
Trunk Interfaces .....	59
Client Interfaces .....	59

Expansion Modules .....	59
Configuration & Port Capacity for 2 Expansion Slots .....	59
Protection .....	59
Bandwidth Connectivity and Provisioning .....	59
Timing & Synchronization .....	59
System Access .....	59
Operations .....	60
Management .....	60
Packet Intelligence .....	60
Dimensions .....	60
Weight .....	60
Cooling .....	60
Mounting .....	60
Power .....	60
Environment .....	60
Model OS1063.....	61
Trunk Interfaces .....	61
Client Interfaces .....	61
Expansion Modules .....	61
Configuration & Port Capacity for 2 Expansion Slots .....	61
Protection .....	61
Bandwidth Connectivity and Provisioning .....	61
Timing & Synchronization .....	61
System Access .....	61
Operations .....	62
Management .....	62
Packet Intelligence .....	62
Dimensions .....	62
Weight .....	62
Cooling .....	62
Mounting .....	62
Power .....	62
Environment .....	62
<b>C Terms and Acronyms .....</b>	<b>63</b>
Abbreviations .....	64

## List of Figures

1	OnSite Model 1052	15
2	OnSite Model 1063	16
3	OS1052 Base System	17
4	OS1063 Base System	17
5	Typical OS1052 application	19
6	OS1052 Map + Modules	20
7	Typical OS1063 application	21
8	OS1063 Map + Modules	22
9	Grounding Terminal Location for the OS-10 System Chassis	28
10	Mounting the OS-10 System Chassis in an EIA/TIA 19-Inch Rack	30
11	Mounting the OS-10 System in an ETSI 300-mm Rack	31
12	Mounting the OS-10 System Chassis on a Wall	32
13	Wiring the OS-10 System for DC Power	36
14	Serial and LAN Management Ports on the Base OS1052 and OS1063 Systems	40
15	Detail of the Management Ports	41
16	Location of Signal Pins on the RJ-45 Plug	41
17	Web-Based Management GUI Frames	46
18	Configuring an SNMP Trap Receiver	47
19	Configuring an Authorized OnSight NMS Server	48
20	Location of EOW port (AUX 1) on OS-10 Series Chassis	49
21	Location of signal pins on the EOW port (AUX 1) RJ-11 connector	50
22	Configuring the Engineering Orderwire (EOW) Function	51

## List of Tables

1	General conventions	13
2	Mouse conventions	13
3	Base System Configuration for OnSite Platforms	16
4	Environmental Conditions for Operating the OS-10 System	26
5	Power Requirements for the OS-10 System	27
6	Ground Wire Specifications	33
7	OS-10 Power Options	33
8	Power Consumption	34
9	DC Wiring Requirements for the OS-10 System Chassis	35
10	Ethernet LAN Management Port Cabling Specifications	41
11	Pin Assignments for the Ethernet LAN Management Port	42
12	Pin Assignments for the RS-232 Serial Management Port	42
13	RS-232 Serial Port Parameters	42
14	VT100 Terminal Emulation Settings	42
15	Web-Based Management GUI Frame Descriptions	46

## About this guide

---

This guide describes how to install a Patton OnSite Series Model 1052 and 1063 Metro-Optical Transport Access Node. For detailed configuration and management instructions, refer to the *OnSite 1052 & 1063 Series Administrator's Reference Guide*, which is located on the CD-ROM that came with your unit and at [www.patton.com](http://www.patton.com).

Installation, maintenance, and removal of a chassis or its components must be done by qualified service personnel only. Qualified service personnel have had appropriate technical training and experience that is necessary to be aware of the hazards to which they are exposed when performing a task and of measures to minimize the danger to themselves and other people.

You should consider the following before unpacking your equipment:

- Install the equipment in a secured, enclosed, and restricted access area, ensuring that only qualified service personnel have access to the equipment.
- Install the equipment only in a temperature and humidity-controlled indoor area that is free of airborne materials that can conduct electricity.
- When you handle equipment that has expansion modules, put on the electrostatic discharge (ESD) wrist strap to reduce the risk of electronic damage to the equipment.

**Note** Leave the ESD strap permanently attached to the chassis or rack so that it is always available when you need to handle ESD-sensitive components.



**Read the following safety information thoroughly before installing your OS-10 system. Failure to follow this safety information can lead to personal injury or damage to the equipment.**

## Audience

---

This guide is intended for the following users:

- Operators
- Installers
- Maintenance technicians

## Structure

---

This guide contains the following chapters and appendices:

- [Chapter 1](#) describes the OnSite Series Metro-Optical Transport Access Nodes
- [Chapter 2](#) describes typical applications for the OS-10 series
- [Chapter 3](#) describes instructions for installing the OS-10
- [Chapter 4](#) describes how to access the OS-10 for configuration and management
- [Chapter 5](#) contains information on contacting Patton technical support for assistance
- [Appendix A](#) lists compliance information
- [Appendix B](#) contains specifications for the OS-10 series
- [Appendix C](#) contains a reference for terms and acronyms found in this guide

For best results, read the contents of this guide *before* you install the OS-10 platforms.

## Precautions

---

Notes and cautions, which have the following meanings, are used throughout this guide to help you become aware of potential problems. *Warnings* relate to personal injury issues, and *Cautions* refer to potential property damage.

**Note** Calls attention to important information.



**The shock hazard symbol and WARNING heading indicate a potential electric shock hazard. Strictly follow the warning instructions to avoid injury caused by electric shock.**



**The alert symbol and WARNING heading indicate a potential safety hazard. Strictly follow the warning instructions to avoid personal injury.**



The shock hazard symbol and CAUTION heading indicate a potential electric shock hazard. Strictly follow the instructions to avoid property damage caused by electric shock.



The alert symbol and CAUTION heading indicate a potential hazard. Strictly follow the instructions to avoid property damage.

## Safety when working with electricity



- Do not open the device when the power cord is connected. For systems without a power switch and without an external power adapter, line voltages are present within the device when the power cord is connected.
- For devices with an external power adapter, the power adapter shall be a listed *Limited Power Source*. The mains outlet that is utilized to power the device shall be within 10 feet (3 meters) of the device, shall be easily accessible, and protected by a circuit breaker in compliance with local regulatory requirements.
- For AC powered devices, ensure that the power cable used meets all applicable standards for the country in which it is to be installed.
- For AC powered devices which have 3 conductor power plugs (L1, L2 & GND or Hot, Neutral & Safety/Protective Ground), the wall outlet (or socket) must have an earth ground.
- For DC powered devices, ensure that the interconnecting cables are rated for proper voltage, current, anticipated temperature, flammability, and mechanical serviceability.
- WAN, LAN & PSTN ports (connections) may have hazardous voltages present regardless of whether the device is powered ON or OFF. PSTN relates to interfaces such as telephone lines, FXS, FXO, DSL, xDSL, T1, E1, ISDN, Voice, etc. These are known as “hazardous network voltages” and to avoid electric shock use caution when working near these ports. When disconnecting cables for these ports, detach the far end connection first.
- Do not work on the device or connect or disconnect cables during periods of lightning activity



This device contains no user serviceable parts. This device can only be repaired by qualified service personnel.



If one has reason to open the chassis or case, then the precautions mentioned above shall be followed. This includes both the warnings relating to disconnection of the input power, and the warnings relating to the disconnection of WAN, LAN & PSTN ports.



This device is NOT intended nor approved for connection to the PSTN. It is intended only for connection to customer premise equipment.



In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.



**Electrostatic Discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures. Do the following to prevent ESD:**

- Always follow ESD prevention procedures when removing and replacing cards.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground.
- To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

## Optical Safety



**Use fiber-optic ports only for telecommunications applications that require optical fiber. Use the ports only with the appropriate connector. When not in use, replace the dust covers. Using these interfaces in ways other than those described in this guide can cause property damage or personal injury.**

### Fiber-Optic Ports

To protect your eyes, never look at the transmit LED or laser through a magnifying device while it is powered on. Never look directly at a fiber port on the chassis or at the ends of fiber cable when they are powered on.

**Note** The OS-10 system uses a CLASS 1 laser device.

### Fiber-Optic Safety Precautions

Follow these safety precautions when working with fiber-optic cables:

- Do not eat, drink or smoke in the work area. If fiber particles are ingested they could cause internal hemorrhaging.
- Wear safety glasses with side shields to avoid getting fiber-optic splinters in your eyes.
- Do not look into the end of a fiber cable until you are sure that there is no light source at the other end. Use a fiber-optic power meter to ensure that the fiber is dark (that is, no power is being carried).
- Ensure that the work area is well ventilated.
- Do not touch your eyes while working with fiber-optic cables.
- Wear disposable aprons to minimize fiber particles on your clothing.
- Dispose of all cut fiber-optic pieces properly.
- Thoroughly clean the work area when the installation is complete.

## Typographical conventions used in this document

This section describes the typographical conventions and terms used in this guide.

### General conventions

The procedures described in this manual use the following text conventions:

Table 1. General conventions

Convention	Meaning
Garamond blue type	Indicates a cross-reference hyperlink that points to a figure, graphic, table, or section heading. Clicking on the hyperlink jumps you to the reference. When you have finished reviewing the reference, click on the <b>Go to Previous View</b> button in the Adobe® Acrobat® Reader toolbar to return to your starting point.
<b>Futura bold type</b>	Indicates the names of menu bar options.
<i>Italicized Futura type</i>	Indicates the names of options on pull-down menus.
Futura type	Indicates the names of fields or windows.
<b>Garamond bold type</b>	Indicates the names of command buttons that execute an action.
< >	Angle brackets indicate function and keyboard keys, such as <b>&lt;Shift&gt;</b> , <b>&lt;Ctrl&gt;</b> , <b>&lt;C&gt;</b> , and so on.
Are you ready?	All system messages and prompts appear in the Courier font as the system would display them.
% dir *.*	Bold Courier font indicates where the operator must type a response or command

### Mouse conventions

The following conventions are used when describing mouse actions:

Table 2. Mouse conventions

Convention	Meaning
Left mouse button	This button refers to the primary or leftmost mouse button (unless you have changed the default configuration).
Right mouse button	This button refers the secondary or rightmost mouse button (unless you have changed the default configuration).
Point	This word means to move the mouse in such a way that the tip of the pointing arrow on the screen ends up resting at the desired location.
Click	Means to quickly press and release the left or right mouse button (as instructed in the procedure). Make sure you do not move the mouse pointer while clicking a mouse button.
Double-click	Means to press and release the same mouse button two times quickly
Drag	This word means to point the arrow and then hold down the left or right mouse button (as instructed in the procedure) as you move the mouse to a new location. When you have moved the mouse pointer to the desired location, you can release the mouse button.

# Chapter 1 **Product Overview**

---

**Chapter contents**

Introduction.....15

OnSite Platforms .....15

## Introduction

The OnSite Series is family of ultra-compact, micro multi-service provisioning platforms (MSPPs). The supports flexible and economic delivery of time division multiplexing (TDM) and Ethernet-based packet data services over synchronous digital hierarchy (SDH) transport networks.

The OS-10 system has two STM-1 ports for connection to the SDH network. The ports operate at 155.520 Mbit/s and can be configured to operate as dual unprotected ports or as a protected pair using Linear 1+1 MSP. The STM-1 ports can also be configured in add-drop multiplexer (ADM) mode for operation in a ring network using SNCP path protection switching.

The OS-10 supports clear-channel mapping of E1/T1 and DS3/E3 signals into SDH payloads, and uses next-generation SDH features, such as generic framing procedure (GFP), virtual concatenation (VCAT), link capacity adjustment scheme (LCAS) and advanced packet intelligence functions for efficient transport of Ethernet-based data services.

The OS-10 has one Ethernet LAN management port and one RS-232 serial port for access to the system management functions. Remote access to OS-10 systems is possible through the use of an inband management channel that uses either a dedicated E1 link over a VC-12 or the SDH data communications channel (DCC).

The OS-10 chassis can be mounted into a standard 19-inch EIA/TIA or a 300-mm ETSI rack. The chassis also supports a wall-mounting option and can also be operated in a stand-alone desktop configuration.

The system uses natural convection cooling (that is, it contains no fans) and supports AC or DC power options.

All cabling, other than AC power, is accessible from the front panel of the chassis. The system also provides activity and status LEDs for all client-signal and SDH network interfaces. The system weighs approximately 5 kg (11 lbs) and has the following dimensions: 44.45 x 438.2 x 293 mm (height x weight x depth).

You can manage and access the OS-10 system through a simple Web-based graphical user interface (GUI) called the OnSight Device Manager (DM) or a scalable network management system (NMS).

### OnSite Platforms

The OS-10 Series has two modular platforms: the OS1052 and OS1063. Table 2 provides a summary of the base system configuration for each platform.



Figure 1. OnSite Model 1052



Figure 2. OnSite Model 1063

Table 3. Base System Configuration for OnSite Platforms

Type	Model OS1052	Model OS1063
<b>SDH Trunks</b>	2 STM-1	2 STM-1
<b>Client Signals</b>	8 E1 or 8 T1	21 E1 or 21 T1
	2 Ethernet	–
<b>Management</b>	Serial RS-232	Serial RS-232
	LAN	LAN
<b>Expansion Slots</b>	2	2

The OS1052 and OS1063 systems have two expansion slots. The expansion slots support the insertion of the following modules for flexible configuration changes and capacity upgrades:

- 21-port E1
- 3-port DS3/E3
- 2-port STM-1 optical and electrical
- 8-port Ethernet 10/100BASE-TX

Figure 3 on page 17 shows the front and back panels of the OS1052 base system without the expansion modules installed. The OS1052 has eight built-in E1 and two built-in Ethernet 10/100BASE-TX interfaces. As a factory-installed option, the OS1052 is also available with eight T1 ports. The OS1052 uses a future bus connector for access to the 8 E1 or T1 ports on the base system.

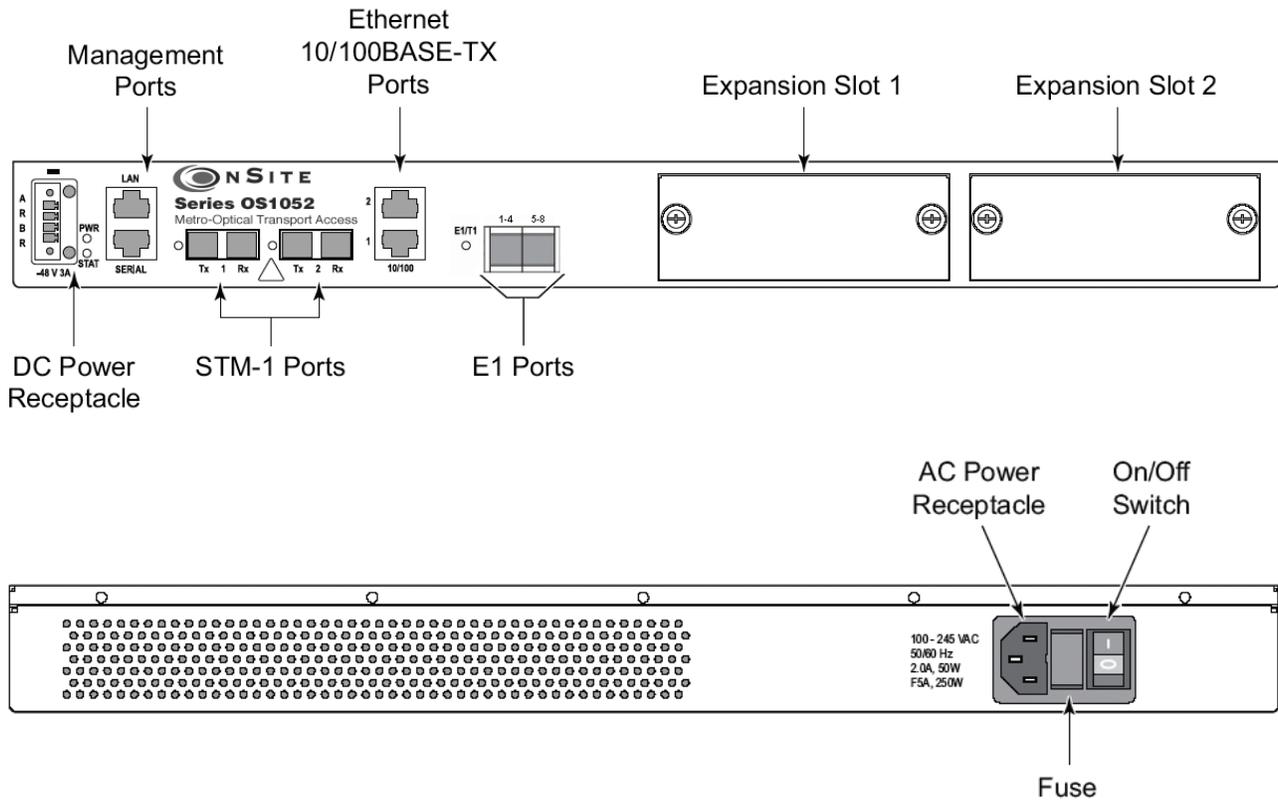


Figure 3. OS1052 Base System

Figure 2 shows the front panel of the OS1063 system. The OS1063 uses a future bus connector for access to the 21 E1 or T1 ports on the base system. When the system is equipped with two 21-port high-density E1 (HD-E1) expansion modules, the OS1063 provides access for up to 63 E1 ports. (See chapter 12 for a description of the future bus connector and the features of the high-density E1 expansion module.) As a factory-installed option, the OS1063 is available with two STM-1 electrical interface (STM-1e) ports on the base system.

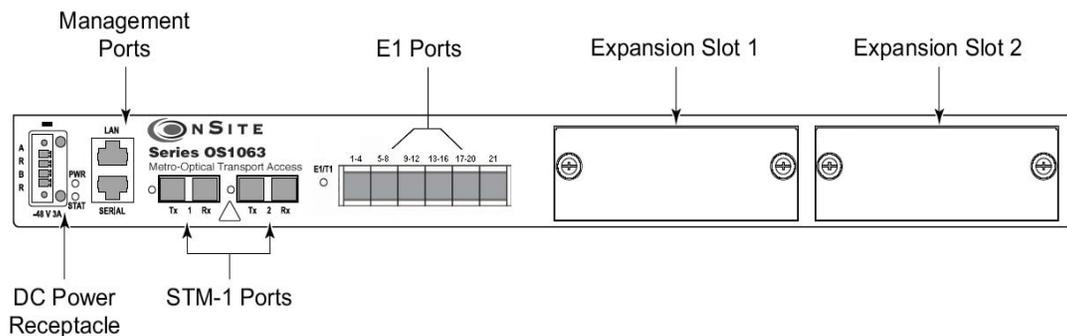


Figure 4. OS1063 Base System

# Chapter 2 **Application Overview**

**Chapter contents**

OS1052 Application.....19  
OS1063 Application.....21

## OS1052 Application

The advanced modular design of the Patton OnSite OS1052 provides unequaled flexibility in its class in terms of service offerings, capacity and functional upgrades.

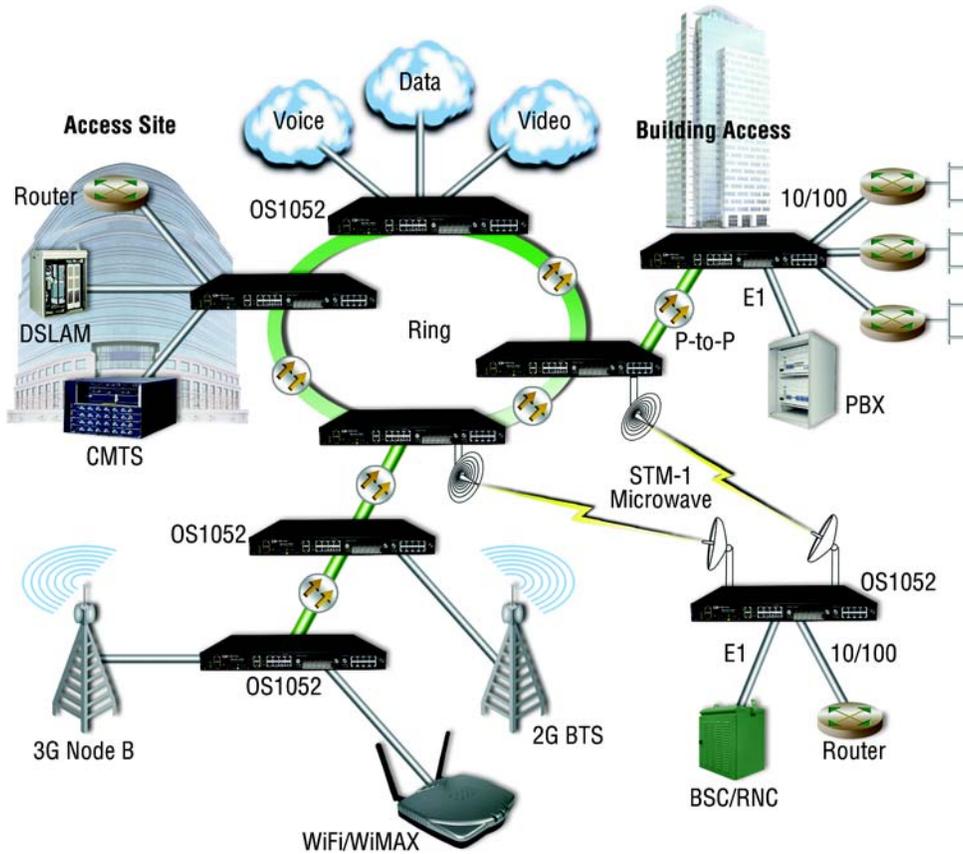


Figure 5. Typical OS1052 application

The base OS1052 system is configured with:

- 2 STM-1
- 8 E1/T1
- 2 Ethernet
- 10/100Base-TX

Two expansion module slots allow increasing system capacity beyond the initial base configuration. Additional ports and features only require simple insertion of one of the many available types of TDM and packet data modules.

In only one RU, the OS1052 supports expansion up to:

- 50 E1 ports
- 18 Ethernet 10/100 ports

The OS1052 incorporates next-generation SDH features such as virtual concatenation (VCAT), link capacity adjustment scheme (LCAS) and generic framing procedure (GFP) for efficient packet data transport. The platform also incorporates Layer 2 features such as VLAN tagging, rate limiting and statistical multiplexing with multi-level QoS control. The OS1052 is easily configured and managed through a simple Web-based GUI interface or the scalable Patton OnSight NMS.

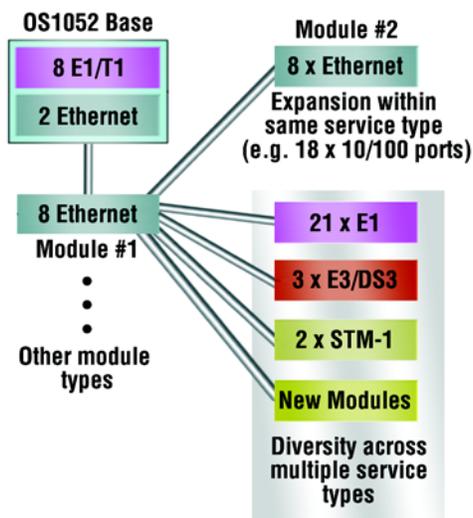


Figure 6. OS1052 Map + Modules

## OS1063 Application

The advanced modular design of the Patton OnSite OS1063 provides unequaled flexibility in its class in terms of service offerings, capacity and functional upgrades.

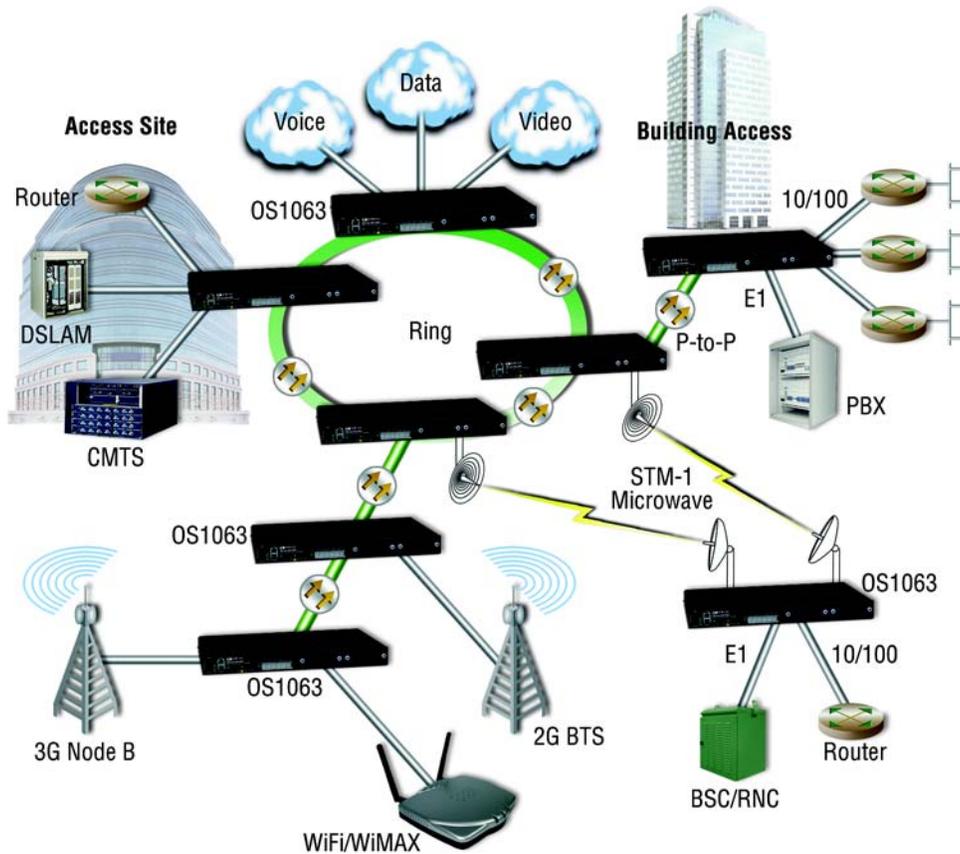


Figure 7. Typical OS1063 application

The base OS1063 system is configured with:

- 2 STM-1
- 21 E1/T1

Two expansion module slots allow increasing system capacity beyond the initial base configuration. Additional ports and features only require simple insertion of one of the many available types of TDM and packet data modules.

In only one RU, the OS1063 supports expansion up to:

- 63 E1 ports
- 16 Ethernet 10/100 ports

The OS1063 incorporates next-generation SDH features such as virtual concatenation (VCAT), link capacity adjustment scheme (LCAS) and generic framing procedure (GFP) for efficient packet data transport. The platform also incorporates Layer 2 features such as VLAN tagging, rate limiting and statistical multiplexing with multi-level QoS control. The OS1063 is easily configured and managed through a simple Web-based GUI interface or the scalable Patton OnSight NMS.

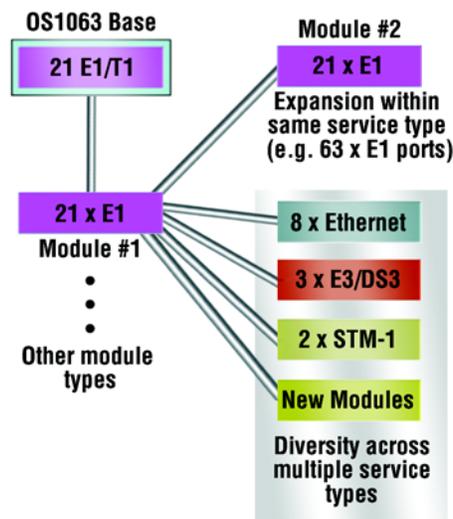


Figure 8. OS1063 Map + Modules

## Chapter 3 **Installation Overview**

### **Chapter contents**

Introduction .....	24
Unpacking and Inspection .....	24
Site Preparation .....	24
Site Environment .....	25
Planning Your Site .....	25
Site Requirements .....	25
Operating Environment Requirements .....	26
Power Supply Requirements .....	27
Distribution Rack Requirements .....	27
Mechanical Recommendations for the Rack .....	28
Protective Grounding for the Rack and Chassis .....	28
Space Requirements for the Rack .....	28
Securing the Rack .....	28
Tools and Equipment for Installation and Maintenance .....	29
OnSite System Installation .....	29
Mounting the Chassis to an EIA/TIA 19-Inch Rack .....	29
Mounting the Chassis to an ETSI Rack .....	30
Mounting the Chassis on the Wall .....	32
Installing the Chassis Ground Connection .....	33
Connecting Power to the OS-10 System .....	33
Connecting AC Power to the OS-10 System .....	34
Powering On the OS-10 System with AC Power .....	35
Connecting DC Power to the OS-10 System .....	35
Wiring Procedure for DC Input Power .....	35
Checking the OS-10 System Installation .....	38

## Introduction

---

This chapter provides the procedures for installing the OnSite OS-10 system.

## Unpacking and Inspection

---

Do not unpack the OS-10 system until you are ready to install it. If the final installation site will not be ready for some time, keep the chassis in its shipping container to prevent accidental damage. When you are ready to install the unit, proceed with unpacking it.

**Note** Do not discard the shipping cartons when you unpack the OS-10 system. Flatten and store them. You will need the containers if you need to move or ship the system. Repacking instructions will be provided in your return material authorization (RMA) paperwork.

To check the contents of the shipping cartons, follow these steps:

1. Check the contents of the shipping container and accessories box or bag against the content list and the packing slip which were included with your unit.
2. Verify that you received all listed equipment, including the following:
  - OS-10 Series documentation (if ordered)
  - Optional equipment that you ordered, such as network interface cables, or special connectors
3. Inspect all items for shipping damage.

**Note** If anything appears to be damaged or you encounter problems installing or configuring your OS-10 Series chassis, contact customer service.

4. Check the expansion modules that may be located in each slot. Ensure that the configuration matches the packing list and that all specified interfaces are included.

## Site Preparation

---

This section describes the requirements your site must meet for safe installation and operation of your OnSite OS-10 Series equipment. Ensure that the site is properly prepared before beginning installation.

The requirements described in this chapter are intended for the personnel responsible for installing and managing the network hardware. A working knowledge of telecommunications and local area network (LAN) operations and a familiarity with communications protocols that are used on interconnected networks are assumed. Installation, maintenance, and removal of a chassis, or its components must be done by qualified service personnel only. Qualified personnel have had appropriate technical training and experience that is necessary to be aware of the hazards to which they are exposed when performing a task and of measures to minimize the danger to themselves and other people. By carefully planning your site, you can maximize the performance of your existing network and ensure that it is ready to migrate to future service and capacity upgrades.

## Site Environment

---

The OS-10 system can be mounted in a rack or on a wall. The location of the chassis and layout of your equipment rack or wiring room are extremely important for proper system operation. Equipment that is too close together, ventilation that is inadequate, and panels that are inaccessible can make system maintenance difficult or cause system malfunctions and possible shutdowns.

The following precautions help you plan an acceptable operating environment for your OS-10 system and avoid environmentally caused equipment failures:

- Ensure that the room in which you operate your system has adequate air circulation. Electrical equipment generates heat. Ambient air temperature might not be able to cool equipment to acceptable operating temperatures without adequate circulation.
- Always follow the proper ESD-prevention procedures described in §3.2 (Electrostatic Discharge Damage) to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Ensure that the chassis cover and all expansion slot covers are secure. The chassis is designed to allow cooling air to flow effectively inside it. An open chassis allows air leaks, which might interrupt the flow of cooling air from internal components.

When planning your site layout and equipment location, remember the following precautions to help avoid equipment failures and reduce the possibility of environmentally caused equipment problems.

**Maximum recommended operating temperature** – The maximum recommended operating temperature for the OS-10 is 50°C (122°F). Determine a suitable operating environment based on this recommendation.

**Elevated operating ambient temperature** – If the unit is installed in a closed or multiunit rack assembly, the operating temperature of the rack environment may be greater than the ambient temperature of the room. Keep this in mind when you install the unit.

**Reduced airflow** – Install the OS-10 system chassis in the rack so that the amount of airflow required for safe operation of the equipment is not compromised.

**Mechanical load** – Mount the OS-10 system chassis in the rack to avoid a potentially hazardous condition due to uneven mechanical loading.

**Circuit overload** – When you connect the OS-10 system chassis to the supply circuit, consider the effect that overloading of the circuits might have on over-current protection and supply wiring.

**Reliable Ground** – Maintain reliable grounding for the OS-10 system and all rack-mounted equipment, giving particular attention to supply circuits.

## Planning Your Site

---

### Site Requirements

To install your OS-10 equipment successfully, you should plan your site carefully. The site planning process has three major areas for consideration to ensure that your physical installation meets the requirements for a safe and successful installation:

- Environmental, safety, and thermal requirements for the OS-10 system
- Power and local building and electrical code requirements

- Distribution rack requirements

The following sections provide further details for each area.

### *Operating Environment Requirements*

You need to verify that your site meets all environmental and safety requirements. During the early planning stages of installing or modifying your network, it is important that you develop a thorough understanding of the regulations that pertain to your location and industry.

**Temperature** – The OS-10 system generates a specified amount of heat as indicated on the data sheet. It is essential that you provide a temperature-controlled environment for both proper performance and safety.

Install the equipment only in a temperature- and humidity-controlled indoor area that is free of airborne materials that can conduct electricity.

The following are some general thermal recommendations for your wiring closet or equipment room:

- Ensure that the ventilation in the area is adequate to maintain a temperature below 50°C (122°F).
- Install a reliable air conditioning and ventilation system.
- Keep the ventilation in the wiring closet running during nonbusiness hours; otherwise, the equipment can overheat.
- Maintain the following ambient operating temperature: 0° to 50° C (32° to 122°F)
- Maintain the following storage temperature: –40° to 70°C (–40° to 158°F)

**Airflow requirements** – To ensure proper airflow through the OS-10 equipment, follow these recommendations when you are installing your chassis:

- Leave 7.62 cm (3 inches) of minimum clearance on both the left and right sides of the chassis.
- Leave a half-rack unit (RU) of minimum clearance above and below the chassis for proper airflow.

**Note** The OS-10 is a convection-cooled system, and adherence to these clearance requirements is required for proper operation of the system.

**Humidity** – Keep the operating humidity between 5 and 95 percent relative humidity (noncondensing).

Table 4 summarizes the acceptable operational conditions for the OS-10 system.

Table 4. Environmental Conditions for Operating the OS-10 System

	Environment	Minimum	Maximum
<b>Temperature</b>	Ambient operating	5°C	+40°C
	Short-term (96 hours)	0°C	+50°C
<b>Humidity</b>	Short-term (96 hours)	5%	80%
	Short-term (96 hours)	5%	95%
<b>Altitude</b>	Ambient operating	–60 m	1800 m

### Power Supply Requirements

To operate your OS-10 equipment safely, follow these requirements:

- Ensure that your power supply meets the site power requirements of the equipment to be installed.
- Check the power at your site to ensure that you are receiving “clean” power (free of spikes and noise). Install a power conditioner, if necessary.
- Ensure that DC connections are made by an on-site electrician.
- When connecting power to installed equipment, avoid connecting through an extension cord or a power strip.

Table 5 summarizes the power requirements for the OS-10 system chassis.

Table 5. Power Requirements for the OS-10 System

Power Source	Nominal Input Voltage	Nominal Input Current	Tolerance Limits
AC	110 or 220 VAC	1.0 A at 50 to 60 Hz	100 to 245 VAC
DC	-48 VDC	2.0 A	-36 to -72 VDC

**Note** If your system is shipped with the AC power option, use an AC power cable appropriate for your country. Check your local electrical codes and regulatory agencies for power cable requirements.

**Note** The system uses a universal AC power supply with an autoselection function for operation with either 110 V (60 Hz) or 220 V (50 Hz).

### Distribution Rack Requirements

The OS-10 can be installed in either a 19-inch EIA/TIA or ETSI 300-mm rack.

**Note** The 19-inch EIA/TIA rack should comply with the specification in EIA-310-D.

**Note** The ETSI 300-mm rack should comply with the specification in ETSI EN 300 119-3 V2.1.0 (2004-05).

### **Mechanical Recommendations for the Rack**

The following information will help you plan your equipment rack configuration:

- Use a rack made of steel or aluminum.
- Install equipment in the lower half of the rack first to avoid making the rack top heavy.
- The rack should be able to support the full weight of the final installed chassis.
- Enclosed racks must have adequate ventilation. Ensure that the rack is not overly congested because each unit generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the cooling holes. If the chassis is installed on slides, check the position of the chassis when it is seated all the way into the rack.
- In an enclosed rack with a ventilation fan in the top, excessive heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack. In addition, ensure that you provide adequate ventilation for equipment at the bottom of the rack.
- Baffles can help isolate exhaust air from intake air, which also helps draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack, which can be found by experimenting with different arrangements.

### **Protective Grounding for the Rack and Chassis**

Use a rack grounding kit and a ground conductor that is carried back to earth or another suitable building ground. The OS-10 chassis is designed with mounting brackets that provide solid metal-to-metal connection to the rack. If you do not use equipment racks, you can attach a wiring terminal directly to the chassis at the position indicated for appropriate grounding. [Figure 9](#) shows the location of the grounding terminal location for the OS-10 chassis.

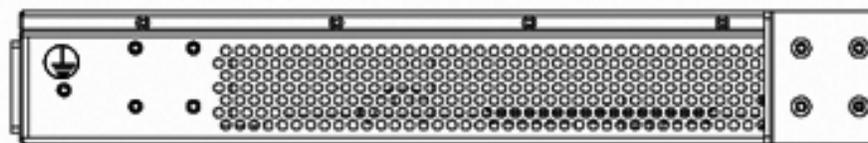


Figure 9. Grounding Terminal Location for the OS-10 System Chassis

**Note** Because building codes vary worldwide, OnSite Systems strongly recommends that you consult an electrical contractor to ensure that proper equipment grounding is in place for your specific installation.

### **Space Requirements for the Rack**

Provide enough space in front of and behind the OS-10 system chassis so that you can service it easily. Typically, allow a minimum of 122 cm (48 inches) in front of the rack and 61 cm (24 inches) behind the rack.

### **Securing the Rack**

The rack should be attached to the equipment room floor with 9.5-mm (3/8-inch) lag screws or equivalent hardware. The floor under the rack should be level within 5 mm (3/16 inch). Use a floor-leveling cement compound if necessary or bolt the racks to the floor.

## Tools and Equipment for Installation and Maintenance

---

You need the following tools and equipment to install or upgrade the OS-10 system and its components:

- ESD-preventive cord and wrist strap (when working with modular components or expansion cards)
- Number 1 or number 2 Phillips screwdriver
- Mounting brackets (provided); two are required for rack mounting or for wall mounting
- 8 screws (provided) to secure the L mounting brackets to the OS-10 system chassis (four screws for each bracket)
- A minimum of four 12-24 x 3/4-inch screws (not provided) to secure the OS-10 system chassis to the rack
- Suitable screws and wall anchors to install an OS-10 system on a wall
- Cable ties, if required, for organizing cables

In addition, depending on the type of modules you plan to use, you might need the following equipment to connect the OS-10 system to an external network:

- Cables for connection to the fiber-optic and client signal ports (depending on configuration)
- Ethernet hub or PC with a network interface card for connection to Ethernet LAN ports
- Console terminal (an ASCII terminal or a PC running terminal emulation software) configured for 9,600 baud, 8 data bits, no parity, and 1 stop bit

## OnSite System Installation

---

**Note** Read the information in this section thoroughly and completely before you attempt to install or remove an OS-10 Series system chassis.



**Only trained and qualified personnel should be allowed to install, replace, or service this equipment.**

### Mounting the Chassis to an EIA/TIA 19-Inch Rack

To install the OS-10 system chassis in an EIA/TIA 19-inch rack, see [Figure 10](#) and follow these steps:

1. Install the two L mounting brackets in the orientation shown in [Figure 10](#). Insert and fully tighten the screws to secure the brackets to the chassis (four screws for each bracket).

**Note** For this rack configuration, the L mounting bracket holes are flush with the front panel of the OS-10 system, as shown in [Figure 4](#).

2. Position the chassis in the rack and align the mounting holes in the L bracket with the mounting holes in the equipment rack.

**Note** The mounting-hole pitch for the 19-inch rack has the following repetitive pattern: 5/8" - 5/8" - 1/2".

**Note** Take care to load the rack so that it is not top heavy.

**Note** Do not cover vents that would restrict airflow. Leave a minimum of a half-rack space above and below the OS-10 system for adequate ventilation.

3. Secure the chassis using four 12-24 x 3/4-inch screws (two screws for each side) through the elongated holes in the L bracket nearest to the chassis and to the threaded holes in the mounting post. Use a suitable screwdriver for this task.
4. Tighten any loose captive installation screws on the expansion slot front panel covers.

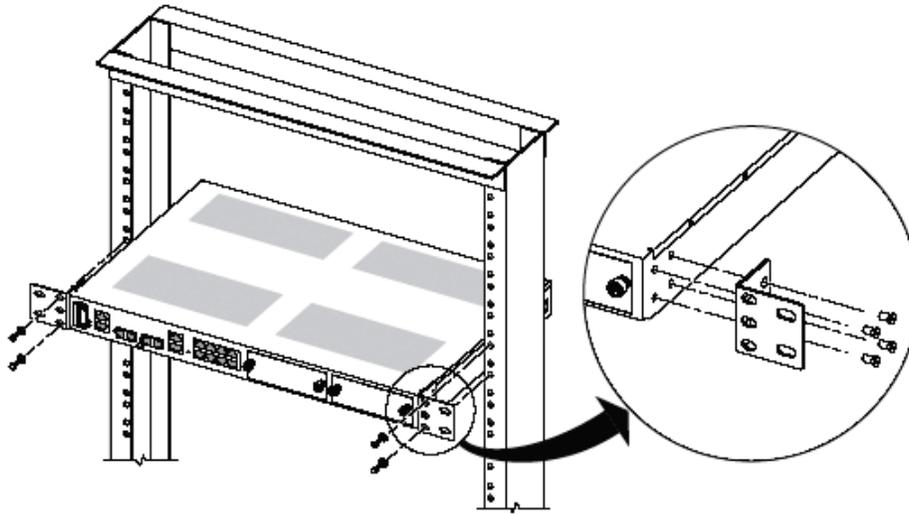


Figure 10. Mounting the OS-10 System Chassis in an EIA/TIA 19-Inch Rack

### Mounting the Chassis to an ETSI Rack

To install the OS-10 system chassis in an ETSI 300-mm rack, see [Figure 11](#) and follow these steps:

1. Install the two L mounting brackets in the orientation shown in [Figure 11](#). Insert and fully tighten the screws to secure the brackets to the chassis (four screws for each bracket). Use a suitable screwdriver for this task.

**Note** For this rack configuration, the L mounting bracket holes are positioned 50 mm back from the front panel of the OS-10 system, as shown in [Figure 11](#).

2. Position the chassis in the rack and align the mounting holes in the L bracket with the mounting holes in the equipment rack.

**Note** The mounting-hole pitch for the ETSI 300 mm rack is 25 mm.

**Note** Take care to load the rack so that it is not top heavy.

**Note** Do not cover vents that would restrict airflow. Leave a minimum of a half-rack space above and below the OS-10 system for adequate ventilation.

3. Secure the chassis using four 12-24 x 3/4-inch screws (two screws for each side) through the elongated holes in the L bracket nearest to the chassis and to the threaded holes in the mounting post. Use a suitable screwdriver for this task.
4. Tighten any loose captive installation screws on the expansion slot front panel covers.

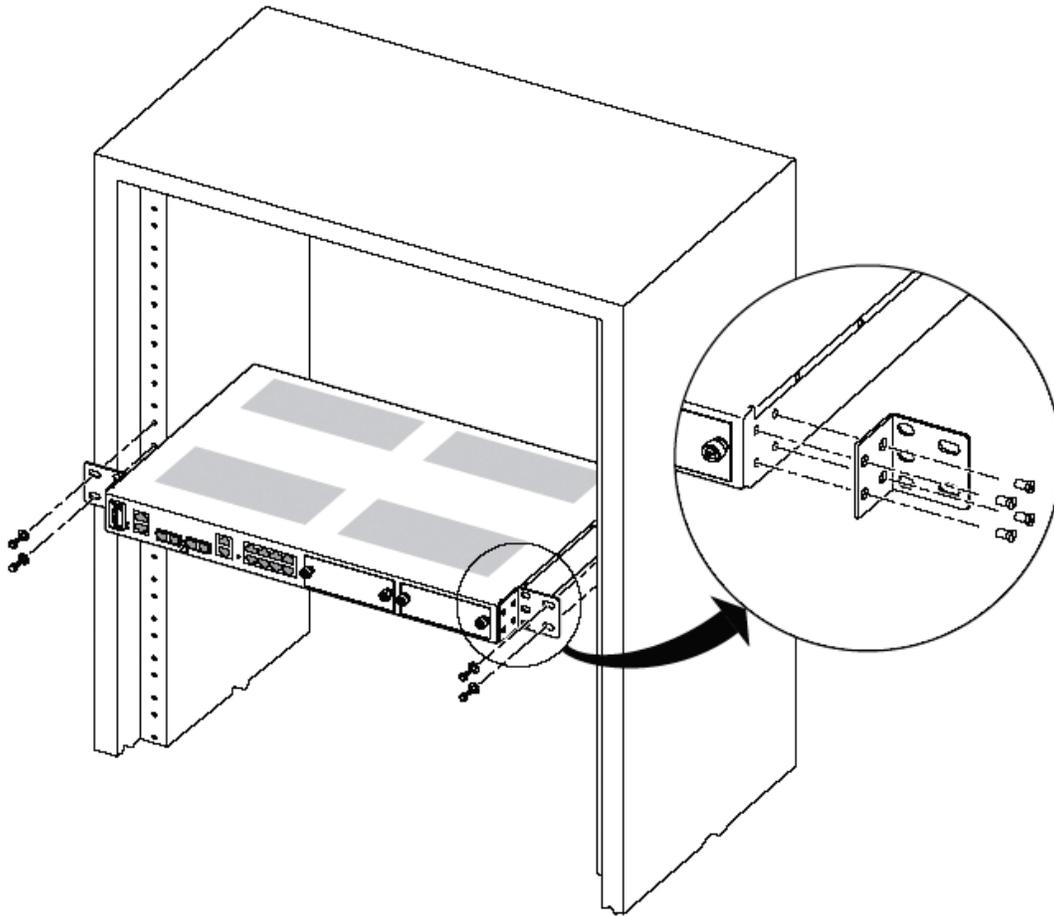


Figure 11. Mounting the OS-10 System in an ETSI 300-mm Rack

## Mounting the Chassis on the Wall

**Note** When choosing a wall-mounting location, consider the cable limitations and the wall structure. Use the four L brackets provided for rack mounting to mount the chassis on a wall. The brackets provide the most stable installation for the chassis.

1. Install the two L mounting brackets in the orientation shown in [Figure 12](#). Insert and fully tighten the screws to secure the brackets to the chassis (four screws for each bracket). Use a suitable screwdriver for this task.

**Note** For this rack configuration, the L mounting bracket holes are flush with the bottom panel of the OS-10 system chassis.

2. Position the chassis against the wall using wall mount option 1 or option 2, as shown in [Figure 12](#).
3. Secure the chassis to the wall using four 12-24 x 3/4-inch screws (two screws for each side) through the elongated holes in the L bracket nearest to the chassis. Use a suitable screwdriver for this task.
4. Tighten any loose captive installation screws on the expansion slot front panel covers.

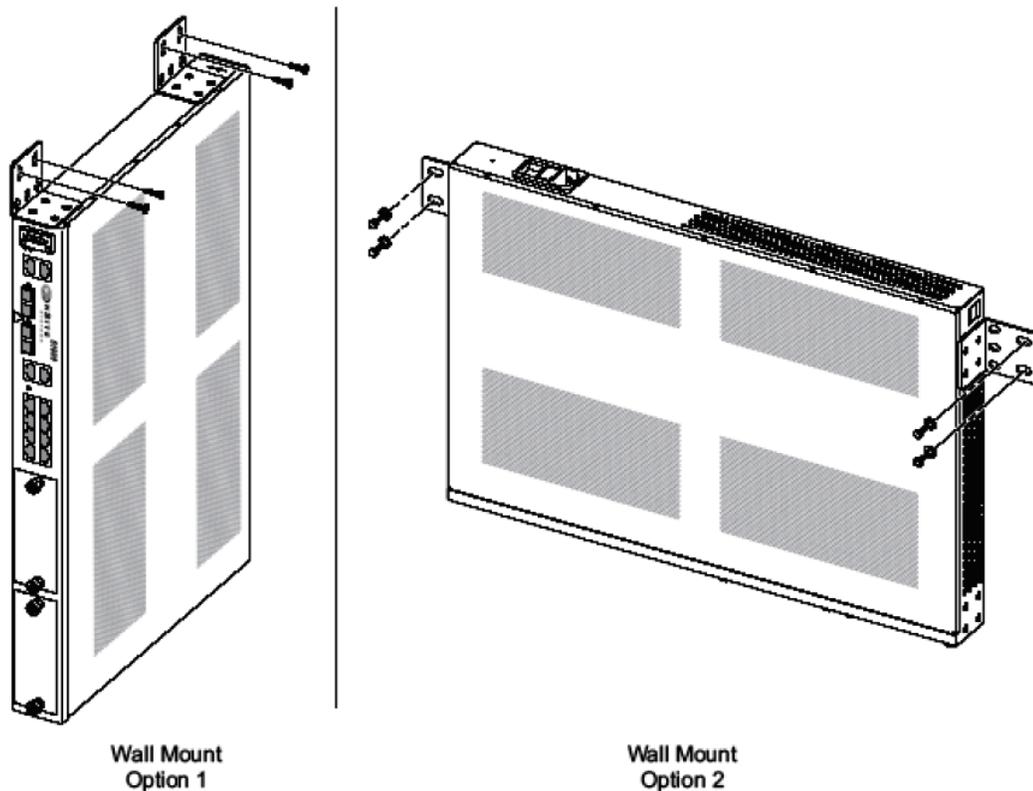


Figure 12. Mounting the OS-10 System Chassis on a Wall

### Installing the Chassis Ground Connection

The OS-10 system chassis requires a reliable earth ground connection. You must connect the chassis to a reliable earth ground. The ground wire must be installed in accordance with local electrical safety standards.

Table 6. Ground Wire Specifications

Grounding Standard	Wire
EN/IEC 60950	AWG 18 (1 mm <sup>2</sup> ) or larger wire and an appropriate user-supplied ring terminal
NEBS	AWG 6 (13 mm <sup>2</sup> ) wire and the ground lug provided in the accessory kit
NEC (National Electric Code)	AWG 14 (2 mm <sup>2</sup> ) or larger wire and an appropriate user-supplied ring terminal

To connect the OS-10 system chassis to a reliable earth ground, follow these steps:

1. Strip one end of the ground wire to the length required for the ground lug or terminal.

**Note** For the NEBS ground lug, the length is approximately 0.75 inches (20 mm)

**Note** For a user-provided ring terminal—as required

2. Crimp the ground wire to the ground lug or ring terminal, using a crimp tool of the appropriate size.
3. Attach the ground lug or ring terminal to the chassis grounding terminal location shown in Figure 3.
4. Connect the other end of the ground wire to a suitable grounding point at your site.

After installation and proper grounding of the OS-10 chassis, you can connect the following:

- Power wiring
- Cables for the fiber-optic interface and Category 5 cables for E1 and Ethernet client signal interfaces
- Category 5 cables for the Ethernet LAN and SERIAL management ports

### Connecting Power to the OS-10 System

The system supports AC and DC power options, as listed in Table 7. These options are factory installed.

Table 7. OS-10 Power Options

Power Options	Nominal Input	Tolerance Limit	Feature
AC	110 VAC at 50 Hz and 220 VAC at 60 Hz	100 to 245 VAC	Auto-switching AC to DC power converter
DC	-48VDC	-36 to -72 VAC	Auto-switching AC to DC power converter

**Note** Both AC and DC options provide short-circuit and over-voltage protection.

**Note** The DC option provides reverse input polarity protection.

**Note** The DC-to-DC converter has dual power inputs (A and B power). The system continues to operate normally if either the A or B power input fails.

The system uses natural convection for heat dissipation (that is, it does not use fans). The absence of fans increases system reliability and eliminates periodic maintenance visits for fan filter replacement. Table 8 provides the maximum power consumption figures for the OS-10 system under normal operating conditions.

Table 8. Power Consumption

System Configuration	Maximum Power (W)
Base system	40
Base system with a single expansion module	50
Base system with dual expansion modules	60

This section explains how to connect the AC or DC power to the OS-10 system chassis.



**Read the installation instructions before connecting the system to the power source.**



**Do not work on the system or connect or disconnect cables during periods of lightning activity.**

The installation must comply with all required electrical codes applicable at the installation site.

#### Connecting AC Power to the OS-10 System

If your OS-10 system uses AC power, connect it to a 15 A at 120 VAC (or 10 A at 240 VAC) circuit with over-current protection.

**Note** The input voltage tolerance limits for AC power are 100 to 245 VAC.



- AC-connected units must have a permanent ground connection in addition to the power cable ground wire. NEBS-compliant grounding satisfies this requirement.
- This product relies on the installation of the building for short-circuit (over-current) protection. Ensure that the protective device is rated not greater than: 15A at 120 VAC (or 10 A at 240 VAC).
- The AC power supply for the OS-10 system has Double Pole/Neutral Fusing.

### Powering On the OS-10 System with AC Power

To power on the OS-10 system using AC power, follow these steps:

1. Connect the AC power cable to the OS-10 system and then to the wall outlet.
2. Turn the power switch on the back panel of the OS-10 system to the ON position.

**Note** The green PWR (power) LED on the front panel is lit when the system receives power from the AC source.



After turning off the AC power switch, wait for at least 3 seconds before turning it back to the on position.

### Connecting DC Power to the OS-10 System

If your OS-10 system has a DC-input power supply terminal block on the front panel, follow the directions in this section for proper wiring.



**This product relies on the installation of the building for short-circuit (over-current) protection. Ensure that the protective device is rated not greater than 15 A at 60 VDC.**

Table 9 summarizes the wiring requirements for the OS-10 system chassis with a DC-input power supply.

**Note** For installations compliant with the National Electric Code, an AWG 14 (2.0 mm<sup>2</sup>) wire is required for DC input and safety ground wire.

Table 9. DC Wiring Requirements for the OS-10 System Chassis

DC Nominal Input	DC Input Wire Size	Safety Ground Wire Size	Over-Current Protection
-48 VDC at 2.0 A	AWG 18 (1.0 mm <sup>2</sup> )	AWG 14 (2.0 mm <sup>2</sup> )	15 A

**Note** The input voltage tolerance limits for nominal -48 VDC power supplies is -36 to -72 VDC.

### Wiring Procedure for DC Input Power

To connect DC power to the OS-10 system, see [Figure 13](#) and follow these steps:



- Connect the DC input wires to the OS-10 system with the following wiring sequence.
- [Figure 13](#) shows the terminal block for the DC power supply on the OS-10 system. Wire the DC power supply as shown.

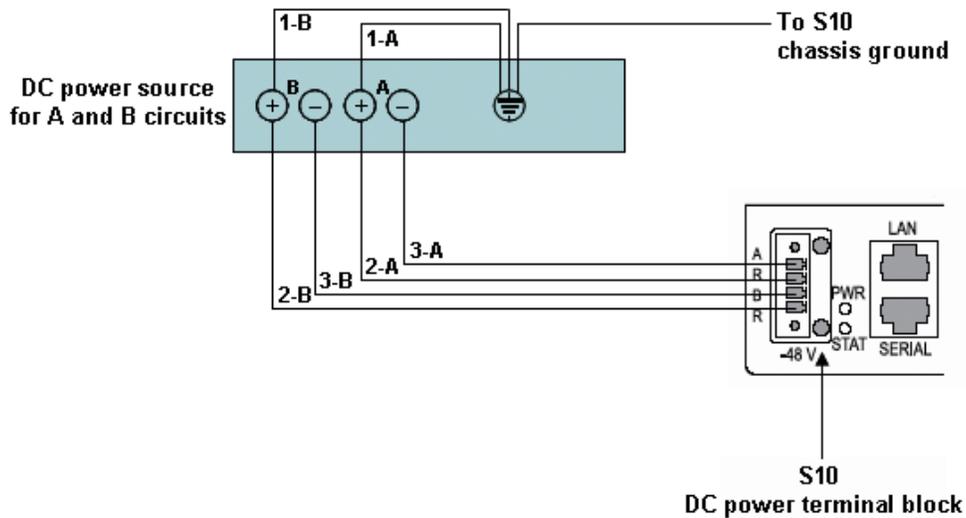


Figure 13. Wiring the OS-10 System for DC Power

1. Choose an available circuit from a DC power source and identify both the positive and negative leads for this circuit.

**Note** The DC power source may be a DC circuit breaker or an AC-to-DC power rectifier.



•Do not touch the circuit with your hands or with any other instrument until you make sure that there is no power present on the circuit.  
 •Make sure that power is removed from the DC circuit that will supply power to the OS-10 system before performing any of the following procedures.

2. Remove power from this circuit.

**Note** To ensure that power is removed from the DC circuit, locate the circuit breaker for the DC circuit, switch the circuit breaker to the OFF position, and tape the circuit-breaker switch in the OFF position.

3. Strip the DC input wires that will connect the circuit to the DC power terminal block on the OS-10 system to the appropriate length.
4. Connect the positive lead of this circuit to ground. See wiring 1-A in Figure 13.

**Note** As an option, you may choose another common grounding point other than the one shown in Figure 13. The choice depends on the grounding practice for your particular location. Figure 13 shows the grounding point colocated with the DC circuit for “A” power.



The ground wire should always be connected first and disconnected last.

5. Connect the positive lead of the circuit to the return direction for “A” power on the OS-10 system terminal block. See wiring 2-A in Figure 7.

**Note** The terminal block indicates the return direction for “A” power by the letter R. This lead is second from the top on the OS-10 system terminal block.

**Note** Step 4 and Step 5 results in the grounding of the return direction for “A” power on the OS-10 system terminal block.

6. Connect the negative lead of the circuit to the “A” power input lead on the OS-10 system terminal block. See wiring 3-A on figure 13 on page 36.

**Note** The terminal block indicates the “A” power lead by the letter A. This lead is first from the top on the OS-10 system terminal block.

Continue with the following steps if a second circuit is available for the provision of redundant “A” and “B” DC power inputs on the system. Otherwise, go directly to Step 10 to complete this task.

7. Connect the positive lead of this circuit to ground. See wiring 1-B on figure 13 on page 36.

**Note** As an option, you may choose another common grounding point other than the oneshown in Figure 13. The choice depends on the grounding practice for your particular location. Figure 13 shows the grounding point colocated with the DC circuit for “B” power.



The ground wire should always be connected first and disconnected last.

8. Connect the positive lead of the circuit to the return direction for “B” power on the OS-10 Series system terminal block. See wiring 2-B on Figure 13.

**Note** The terminal block indicates the return direction for “B” power by the letter R. This lead is fourth from the top on the OS-10 system terminal block.

**Note** Step 7 and Step 8 result in the grounding of the return direction for “B” power on the OS-10 system terminal block.

9. Connect the negative lead of the circuit to the “B” power input lead on the OS-10 system terminal block. See wiring 3-B on [figure 13](#) on page 36.

**Note** The terminal block indicates the “B” power lead by the letter B. This lead is third from the top on the OS-10 system terminal block.



Do not over torque the terminal block captive thumbscrew or terminal block contact screws.

10. Secure the wires using cable ties or similar appropriate cable tie-downs.
11. Turn on power to the DC circuit.

**Note** The green PWR (power) LED on the front panel is lit when the system receives power from the DC source.

### **Checking the OS-10 System Installation**

When you first apply power to the system, the STAT (status) LED shows a solid amber light. This light indicates that the system is booting. The STAT LED turns to a solid green light when the system completes the boot process and is ready for operation.

# Chapter 4 **System Management Access**

## **Chapter contents**

- Introduction .....40
- General Overview .....40
- Ethernet LAN Management Port .....41
- Serial Management Port .....42
- Gaining Access to the System .....43
  - Access through the Serial Port .....43
  - Access through the Ethernet LAN Management Port .....44
- Web-Based Management Interface .....45
  - Launching the GUI Application .....45
- Autonomous Alarm Messages .....47
- Engineering Orderwire (EOW) .....49

## Introduction

This chapter provides the procedures for configuring and monitoring the local serial and LAN management (LM) ports, and the inband management channel (IMC) for remote management communications. The chapter also provides the procedures for configuring and using the Orderwire communications port (if the AUX port is factory-installed).

## General Overview

The base OnSite OS-10 system provides two management ports from which you can access the system management functions. One of the management ports is an Ethernet LAN (10/100BASE-TX) port. The other is an RS-232 SERIAL port.

Figure 14 shows the location of the two management ports on the base OS1052 and OS1063 systems.

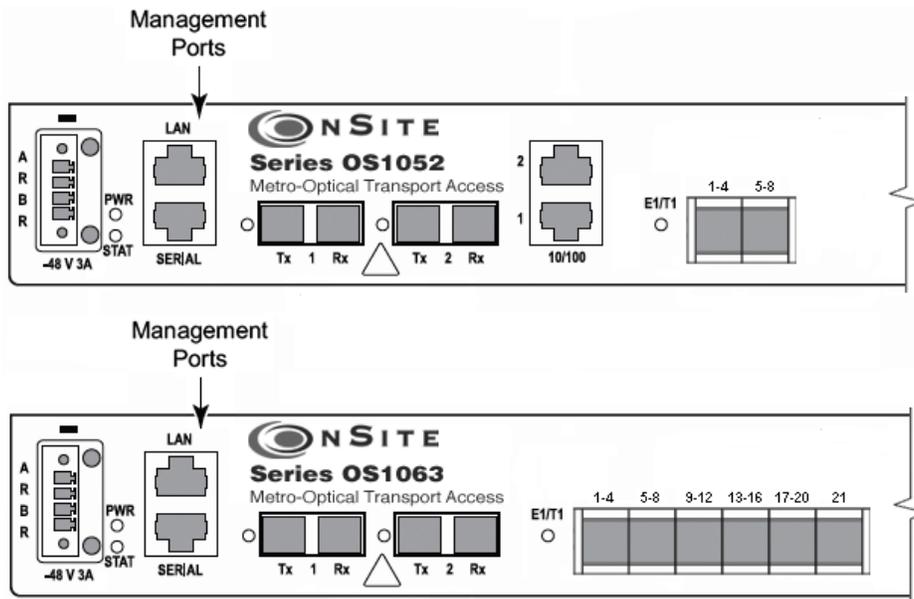


Figure 14. Serial and LAN Management Ports on the Base OS1052 and OS1063 Systems

Figure 15 provides a close-up view of the two management ports. The figure includes the location of the RJ-45 connector pins for both ports.

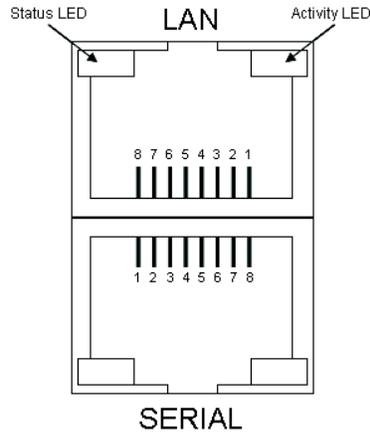


Figure 15. Detail of the Management Ports

Figure 16 shows the location of the signal pins on the RJ-45 plug.

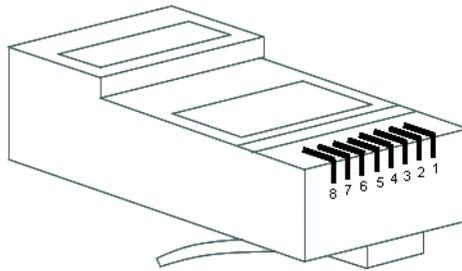


Figure 16. Location of Signal Pins on the RJ-45 Plug

## Ethernet LAN Management Port

The Ethernet LAN management port complies with the following standards:

- IEEE 802.3u (PHY)
- IEEE 802.3 (MAC)
- IEEE 802.3x (flow control)

The port supports autonegotiation, which is always enabled.

Table 10 provides the cabling specifications for the Ethernet LAN management port.

Table 10. Ethernet LAN Management Port Cabling Specifications

Cable	Specification
Connector	RJ-45
Type	Category 5
Reach	100 m

Table 11 provides the pin assignments for the RJ-45 connector.

Table 11. Pin Assignments for the Ethernet LAN Management Port

Signal Name	Description	RJ-45 Pin
RXN	Receive tip	3
RXP	Receive ring	6
TXN	Transmit tip	1
TXP	Transmit ring	2

## Serial Management Port

The physical connector for the RS-232 SERIAL management port is an RJ-45 connector. Table 12 provides the pin assignments for the RJ-45 connector.

**Note** A connector adapter is supplied with the system to allow the connection of the RS-232 signal to a PC with a DB-9 connector.

Table 12. Pin Assignments for the RS-232 Serial Management Port

Signal Name	Description	RJ-45 Pin
RS232_TXD output	Transmit data	6
RS232_RXD input	Receive data	3
GND	Ground	4 and 5

Table 13 lists the serial port parameters:

Table 13. RS-232 Serial Port Parameters

Parameter	Property
Baud rate	9,600 to 38,400 (asynchronous)
Data	8 bits
Parity	None
Stop	1 bit

Table 14 lists the required VT100 terminal emulation settings for the PC that connects to the serial port.

Table 14. VT100 Terminal Emulation Settings

Parameter	Setting
Port	COM1
Baud rate	9,600
Data	8 bits
Parity	None
Stop	1 bit
Flow control	None

## Gaining Access to the System

---

There are two ways of gaining access to the system management functions. One way is through the SERIAL port and the command line interface (CLI). The other way is through the Ethernet LAN port and the web browser interface. The following sections describe the procedures for each of the access methods.

### Access through the Serial Port

To gain management access to the system for the first time through the SERIAL port, follow these steps:

1. Connect a PC to the SERIAL management port.

**Note** Use the DB-9-to-RJ-45 adapter cable supplied with the system.

2. Launch the VT100 terminal emulation program on the PC.

**Note** Configure the terminal in accordance with the settings in Table 14.

3. Press the Enter key on the PC to obtain a login prompt from the system.

4. Log in to the system using the Super user ID and password.

**Note** Only the Super user is able to perform the following task.

**Note** The user ID for the Super user is super (all lowercase letters).

**Note** The factory-assigned default password for the Super user is super (all lowercase letters).

After successful completion of the login, the system responds with the CLI (command-line interface) prompt.

**Note** The CLI command prompt for the system is OnSite >

5. Type the following CLI command to configure the IP address for the Ethernet LAN management port, and then press the Enter key:

```
config mgmt-enet ip-address aaa.bbb.ccc.ddd
```

**Note** aaa.bbb.ccc.ddd is the standard dotted-decimal notation.

6. Type the following CLI command to configure the net mask for the Ethernet LAN management port, and then press the Enter key:

```
config mgmt-enet ip-netmask aaa.bbb.ccc.ddd
```

7. Type the following CLI command to configure the default gateway for the Ethernet LAN management port, and then press the Enter key:

```
config mgmt-enet default-gateway aaa.bbb.ccc.ddd
```

**Note** By default, the IP address is set to 192.168.2.100, the net mask is set to 255.255.255.0, and the default gateway is set to 192.168.2.1

8. Type the following CLI command to save the IP settings (address, net mask, and default gateway) for the Ethernet LAN management port to the system configuration file, and then press the Enter key:

```
save config
```

**Note** Saving the configuration is important to prevent the loss of the IP configuration data if a system reset or reboot occurs.



Changing the IP address, net mask, and default gateway settings for the Ethernet LAN management port could result in the loss-of-management connectivity to the system, if the connection is currently through that port.

At this point, the system responds with Configuration Saved to indicate that the IP settings have been saved to the system. The system is now ready for operation using the Web-based management interface.

**Note** You may also have access to the system through Telnet. This access requires prior configuration of the IP address of the Ethernet LAN management port through the RS-232 SERIAL port, as indicated in the preceding steps.

**Note** The system terminates the management session for any user when the session remains inactive for 30 seconds. This termination applies to management sessions through the SERIAL port or through Telnet. The login prompt appears when the system terminates a previously active session through the SERIAL port.

### **Access through the Ethernet LAN Management Port**

To gain management access to the system for the first time through the Ethernet LAN management (LM) port, follow these steps:

1. Connect a PC to the Ethernet LAN management port using the RJ-45 connector.

**Note** You may connect the PC to the system from a remote location using an IP LAN or WAN that connects to the Ethernet LAN management port.

2. Configure the PC using the factory default settings for the Ethernet LAN management port.

**Note** By default, the IP address is set to 192.168.2.100, the net mask is set to 255.255.255.0, and the default gateway is set to 192.168.2.1

3. Launch the Web browser of your choice, and type the default IP address of the system in the Address field of the browser.
4. Log in to the system using the super, admin, or monitor user ID and password.

**Note** The factory-assigned default password for the Super user is super (all lowercase letters).

See “[Web-Based Management Interface](#)” on page 45 for a description of the Web-based management interface features. Once you gain access to the system through the Ethernet LAN port, you may change the IP settings for the port for secure access in the future.

5. Refer to the *OnSite Series Administrator's Reference Guide*, located on the CD that came with your unit and online at [www.patton.com](http://www.patton.com) for instructions on how to change the IP settings for the Ethernet LAN port.



Save the system configuration to prevent the loss of the new IP settings if a system reboot occurs.

Refer to the *OnSite Series Administrator's Reference Guide*, located on the CD that came with your unit and online at [www.patton.com](http://www.patton.com) for instructions.

**Note** Once the changes take place, you will lose connectivity to the system, but you can regain access immediately by typing the new IP address of the system in the Address field of the browser.

## Web-Based Management Interface

---

The system provides a simple but powerful Web-based management interface to configure and monitor the OnSite OS-10 system. This graphical user interface (GUI) is called the OnSight Device Manager (DM) and is accessible through a Web browser using Hypertext Transfer Protocol (HTTP).

**Note** The system supports the following Web browsers: Microsoft Internet Explorer 6+, Netscape 7+, Mozilla 1.7+, and Mozilla Firefox 1.0+ on Windows, Solaris, and Linux platforms.

The OnSight DM allows you to have full access to the system management functions. These functions include the ability to set up or change all configurable items on the system and the ability to create and delete connections between the client ports and SDH network interface. The interface also allows you to monitor and display current active alarms, performance monitoring parameters, and alarm and event logs.

### Launching the GUI Application

To launch the Web-based management interface, follow these steps:

**Note** This procedure requires prior configuration of the IP address of the Ethernet LAN management port through the RS-232 SERIAL port or LAN port, as indicated in §6.4.

1. Connect the PC to the Ethernet LAN management port using the RJ-45 connector.

**Note** You may connect the PC to the system from a remote location using an IP LAN or WAN that connects to the Ethernet LAN management port.

2. Launch the Web browser of your choice, and type the IP address of the system in the Address field of the browser.
3. Log in to the system using the **super**, **admin**, or **monitor** user ID and password.

After successful completion of the login, the browser displays the OnSight DM splash screen from which you can select the language of your choice (English or Chinese, currently). After language selection, the browser displays the **System Information** page. The OnSight DM screen is divided into three frames, as shown in Figure 17. Table 15 provides a description of each frame.

You may now start to configure and operate the system using the GUI interface.

**Note** For proper display of the GUI interface, you must set your browser to allow “pop-up” windows.

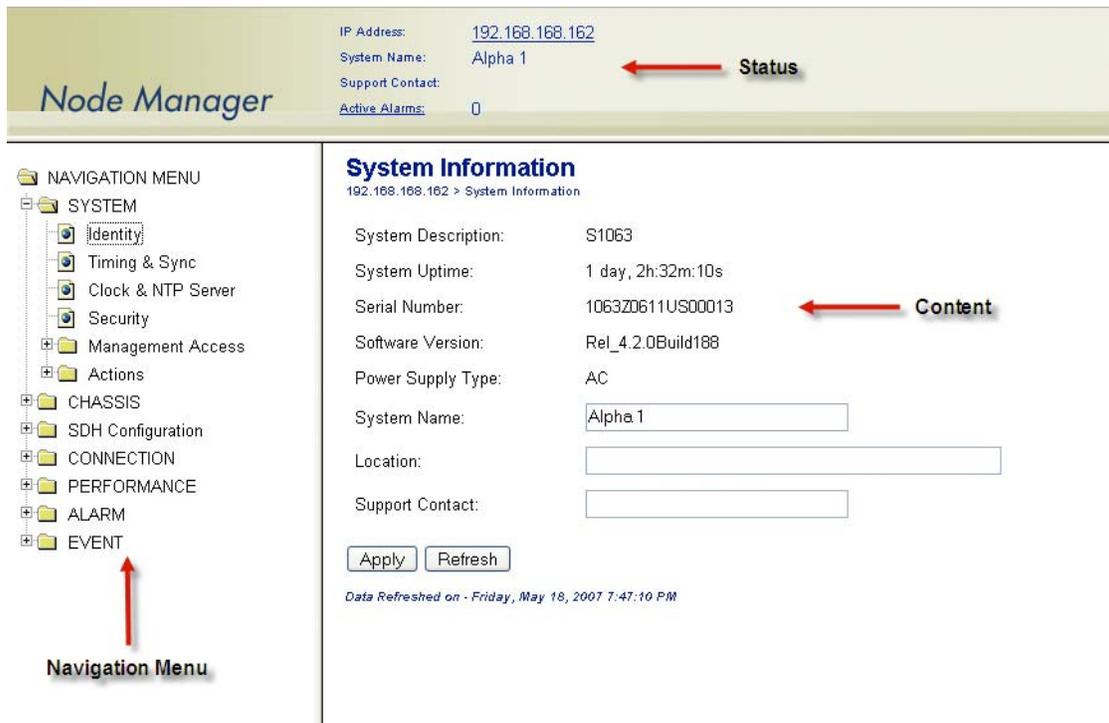


Figure 17. Web-Based Management GUI Frames

Table 15. Web-Based Management GUI Frame Descriptions

GUI Frames	Provides...
Status (top frame)	An overview of the system identity, including the system name and IP address, and the support contact information and status of active alarms.
Navigation (bottom left frame)	The main categories and subdivisions of system functions.
Content (bottom right frame)	The main area for information display and configuration.

## Autonomous Alarm Messages

You can configure the system to generate autonomous alarm messages that can be received and displayed by an SNMP-based network management system (NMS).

By default, the system does not generate SNMP traps. To allow the generation of SNMP traps, you must first configure the IP address of the NMS host device or devices to which you wish to direct the traps.

To configure the system as an SNMP trap sender for an SNMP trap receiver, see Figure 12 and follow these steps:

1. Select the **SYSTEM** folder from the navigation menu.
2. From the expanded **SYSTEM** folder, select **Management Access**.
3. From the expanded **Management Access** folder, select **Trap Receiver**.
4. On the **SNMP Trap Receivers** page, click on **Add**.
5. In the **Add New Trap Receiver** page, type the **Trap Receiver Address** and **Community String**.

**Note** The community string controls access between a client (the OS-10 system) and a server (the NMS host).

6. Set the **Version** to configure the system to send SNMP V1 or V2 traps.
7. Type the **Source Agent Address** of the SNMP agent.

**Note** The OS-10 generates SNMP traps that contain the IP address of the source agent. By default, the system uses the address of the Ethernet LAN management port as the source agent address. However, you may use another address (for example, the inband management channel address) according to the routing settings for the system.

8. Click on **Close** to close the window.

At this point, the **Trap Receivers** page displays the settings for the new receiver.



Figure 18. Configuring an SNMP Trap Receiver

To remove an existing SNMP trap receiver, follow these steps:

1. Select a trap receiver on the **SNMP Trap Receivers** page.
2. Click on **Delete** to remove the trap receiver.

At this point, the system removes the trap receiver, and it is no longer displayed in the table.

In addition to supporting the generation of traps to an SNMP-based NMS, the system also sends autonomous messages to all connected OnSight NMSs. The OnSight NMS provides centralized management and control of OS-10 systems in point-to-point, linear, and ring ADM subnetworks.

To display the OnSight NMS servers authorized to manage the OS-10 system, see [Figure 19](#) and follow these steps:

1. Select the **SYSTEM** folder from the navigation menu.
2. From the expanded **SYSTEM** folder, select **Management Access**.
3. From the expanded **Management Access** folder, select **NMS**.

On the **Authorized NMS Servers** page, the table displays the IP addresses of the OnSight NMS servers authorized for management connectivity to the system.

To add an OnSight NMS server to the list of authorized servers, see [Figure 19](#) and follow these steps:

1. On the **Authorized NMS Servers** page, click on **Add**.
2. In the **Add Authorized NMS Server** window, type the **NMS IP Address** and click on **Apply**.
3. Click on **Close** to close the window.



Figure 19. Configuring an Authorized OnSight NMS Server

## Engineering Orderwire (EOW)

If the system is equipped with the factory-installed AUX (auxiliary) board, you can use AUX port 1 (AUX 1) for voice communications between two or more interconnected OnSite OS-10 Series systems.

Figure 20 shows the location of EOW port (AUX 1) on the system. The port is located on the right side of the chassis, at the back.

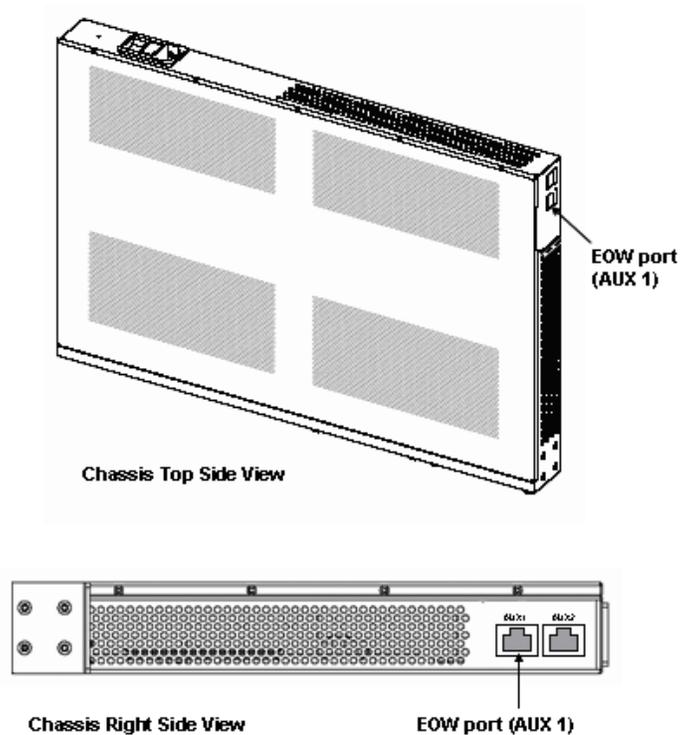


Figure 20. Location of EOW port (AUX 1) on OS-10 Series Chassis

The EOW port supports a 2-wire analog interface (tip and ring) with a nominal impedance of 900-ohm and A-law PCM voice encoding. The system carries the PCM-encoded 64 kbit/s voice channel in either the E1 or E2 byte of the STM-1 section overhead (SOH).

As a Foreign eXchange Station (FXS) interface, the EOW port supports the following functions:

- Dial tone
- Battery current
- Ring voltage

The system uses an RJ-11 connector for the EOW port (AUX 1) but only two pins are used for the 2-wire connection: pin 2 (tip) and pin 3 (ring), as shown in Figure 21.

**Note** The “tip” is the ground side and the “ring” is the battery side of the 2-wire telephone circuit.



**To prevent electrical shock, never touch uninsulated wires or terminals when the phone line is plugged into the RJ-11 connector of the EOW port (AUX 1).**

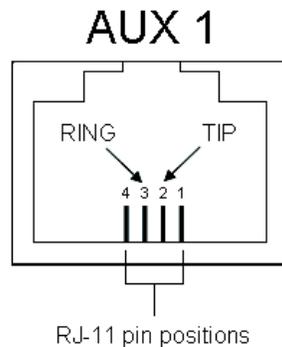


Figure 21. Location of signal pins on the EOW port (AUX 1) RJ-11 connector

The EOW port supports dual-tone multifrequency (DTMF) signaling to identify EOW stations within an OnSite OS-10 subnetwork. Each EOW station is identified with a programmable 3-digit station ID number.

To configure the engineering orderwire (EOW) function, see Figure 16 and follow these steps:

1. Select the **SYSTEM** folder from the navigation menu.
2. From the expanded **SYSTEM** folder, select **Management Access**.
3. From the expanded **Management Access** folder, select **Orderwire**.

**Note** If you see that the physical connector for the AUX 1 port is present but the **Orderwire** selection does not appear on the folder, check first that the system is operating using Release 4.3 or above.

4. On the **Orderwire** page, check that the **AUX Board** shows **Installed** and that the **Operational Status** is in-service (**IS**).

**Note** If the AUX Board shows **Not Installed** or the **Operational Status** is out-of-service (**OOS**), and you see that the physical connector for the AUX1 port is present, contact your local systems engineer or regional OnSite support center for additional technical information.

5. On the **Orderwire** page, set the **Station ID** for the system.

**Note** The Station ID needs to be a unique 3-digit number for each EOW station within an OnSite subnetwork. The available range of station ID numbers is 001 to 255.

**Note** In addition to supporting selective calling of EOW stations using the station ID, the EOW also supports a party-line function that allows calling and communicating with all EOW stations at once (party-line function) by dialing \*000.

- Set the **Channel Byte** to E2 (express orderwire byte) if there are SDH regenerators present between the STM-1 ports connecting two OnSite OS-10 nodes supporting the EOW function; otherwise, leave the default setting as E1 (local orderwire byte).
- Set **Termination** to **Termination Point** if the EOW station is an OS-10 node in terminal mux configuration in a point-to-point link or at the end of a linear ADM chain. For OS-10 nodes in ADM configuration, leave the default setting as **Intermediate Point**.

**Note** For OS-10 nodes in a ring network, one of the nodes must be set to **Termination Point** while the rest of the nodes are set to **Intermediate Point**. This arrangement is necessary to prevent an audio feedback loop. Normally, the OS-10 node serving as the master timing node for the ring is set to **Termination Point**.

- Click on **Apply** to complete the configuration of the EOW port.



Figure 22. Configuring the Engineering Orderwire (EOW) Function

After the EOW port is configured for operation, you can connect a regular 2-wire touchtone telephone set to the RJ-11 connector of the port. To establish a voice call with another EOW station on the same OnSite OS-10 subnetwork, take the phone “off-hook”, wait for dial tone, and then dial star (\*) followed by the Station ID number. For example, to call Station ID number 123, dial \*123.

**Note** To use the EOW function, all OS-10 nodes in the subnetwork must be equipped with the factory-installed AUX board option. The nodes must also be configured with a unique station ID number for each node.

At this point, the called station begins to ring if another telephone set is connected to the EOW port of that station.

**Note** To call and communicate with all EOW stations at once (party-line function), dial \*000.

To complete the call, simply place the telephone set in the on-hook position, like a regular analog phone.

# Chapter 5 **Contacting Patton for assistance**

## **Chapter contents**

- Introduction..... 54
- Contact information..... 54
- Warranty Service and Returned Merchandise Authorizations (RMAs)..... 54
  - Warranty coverage ..... 54
    - Out-of-warranty service ..... 54
    - Returns for credit ..... 54
    - Return for credit policy ..... 55
  - RMA numbers ..... 55
  - Shipping instructions ..... 55

## Introduction

---

This chapter contains the following information:

- “Contact information”—describes how to contact Patton technical support for assistance.
- “Warranty Service and Returned Merchandise Authorizations (RMAs)” —contains information about the RAS warranty and obtaining a return merchandise authorization (RMA).

## Contact information

---

Patton Electronics offers a wide array of free technical services. If you have questions about any of our other products we recommend you begin your search for answers by using our technical knowledge base. Here, we have gathered together many of the more commonly asked questions and compiled them into a searchable database to help you quickly solve your problems.

- Online support—available at [www.patton.com](http://www.patton.com).
- E-mail support—e-mail sent to [support@patton.com](mailto:support@patton.com) will be answered within 1 business day
- Telephone support—standard telephone support is available Monday through Friday, from 8:00 A.M. to 5:00 P.M. EST (8:00 to 17:00 UTC-5), Monday through Friday by calling +1 (301) 975-1007

## Warranty Service and Returned Merchandise Authorizations (RMAs)

---

Patton Electronics is an ISO-9001 certified manufacturer and our products are carefully tested before shipment. All of our products are backed by a comprehensive warranty program.

**Note** If you purchased your equipment from a Patton Electronics reseller, ask your reseller how you should proceed with warranty service. It is often more convenient for you to work with your local reseller to obtain a replacement. Patton services our products no matter how you acquired them.

### Warranty coverage

Our products are under warranty to be free from defects, and we will, at our option, repair or replace the product should it fail within one year from the first date of shipment. Our warranty is limited to defects in workmanship or materials, and does not cover customer damage, lightning or power surge damage, abuse, or unauthorized modification.

### *Out-of-warranty service*

Patton services what we sell, no matter how you acquired it, including malfunctioning products that are no longer under warranty. Our products have a flat fee for repairs. Units damaged by lightning or elephants may require replacement.

### *Returns for credit*

Customer satisfaction is important to us, therefore any product may be returned with authorization within 30 days from the shipment date for a full credit of the purchase price. If you have ordered the wrong equipment or you are dissatisfied in any way, please contact us to request an RMA number to accept your return. Patton is not responsible for equipment returned without a Return Authorization.

### *Return for credit policy*

- Less than 30 days: No Charge. Your credit will be issued upon receipt and inspection of the equipment.
- 30 to 120 days: We will add a 20% restocking charge (crediting your account with 80% of the purchase price).
- Over 120 days: Products will be accepted for repairs only.

### **RMA numbers**

RMA numbers are required for all product returns. You can obtain an RMA by doing one of the following:

- Completing a request on the RMA Request page in the *Support* section at [www.patton.com](http://www.patton.com)
- By calling +1 (301) 975-1000 and speaking to a Technical Support Engineer
- By sending an e-mail to [returns@patton.com](mailto:returns@patton.com)

All returned units must have the RMA number clearly visible on the outside of the shipping container. Please use the original packing material that the device came in or pack the unit securely to avoid damage during shipping.

### *Shipping instructions*

The RMA number should be clearly visible on the address label. Our shipping address is as follows:

**Patton Electronics Company**

RMA#: xxxx

7622 Rickenbacker Dr.

Gaithersburg, MD 20879-4773 USA

Patton will ship the equipment back to you in the same manner you ship it to us. Patton will pay the return shipping costs.

# Appendix A **Compliance information**

## **Chapter contents**

- Compliance .....57
  - EMC .....57
  - Low-Voltage Directive (Safety) .....57
  - PSTN .....57
- Declaration of Conformity .....57
- Authorized European Representative .....57

## Compliance

---

### **EMC**

- EN 55022 Class A
- EN55024

### **Low-Voltage Directive (Safety)**

- IEC/EN60950-1

### **PSTN**

- This device is not intended nor approved for connection to the PSTN.

## Declaration of Conformity

---

Patton Electronics, Inc declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2004/108/EC relating to electromagnetic compatibility and Directive 2006/95/EC relating to electrical equipment designed for use within certain voltage limits. The Declaration of Conformity may be obtained from Patton Electronics, Inc at [www.patton.com/certifications](http://www.patton.com/certifications).

The safety advice in the documentation accompanying this device shall be obeyed. The conformity to the above directive is indicated by CE mark on the device.

## Authorized European Representative

---

D R M Green

European Compliance Services Limited.

Avalon House, Marcham Road

Abingdon,

Oxon OX14 1UD, UK

## Appendix B **Specifications**

### **Chapter contents**

Model OS1052.....	59
Trunk Interfaces .....	59
Client Interfaces .....	59
Expansion Modules .....	59
Configuration & Port Capacity for 2 Expansion Slots .....	59
Protection .....	59
Bandwidth Connectivity and Provisioning .....	59
Timing & Synchronization .....	59
System Access .....	59
Operations .....	60
Management .....	60
Packet Intelligence .....	60
Dimensions .....	60
Weight .....	60
Cooling .....	60
Mounting .....	60
Power .....	60
Environment .....	60
Model OS1063.....	61
Trunk Interfaces .....	61
Client Interfaces .....	61
Expansion Modules .....	61
Configuration & Port Capacity for 2 Expansion Slots .....	61
Protection .....	61
Bandwidth Connectivity and Provisioning .....	61
Timing & Synchronization .....	61
System Access .....	61
Operations .....	62
Management .....	62
Packet Intelligence .....	62
Dimensions .....	62
Weight .....	62
Cooling .....	62
Mounting .....	62
Power .....	62
Environment .....	62

## Model OS1052

---

### **Trunk Interfaces**

STM-1: G.707, G.783

Optics: G.957 S-1.1, L-1.1 and L-1.2 options

### **Client Interfaces**

E1: G.703, 75-ohm and 120-ohm options

T1: G.703, 100-ohm

Ethernet 10/100Base-TX: 802.3u

### **Expansion Modules**

SDH: STM-1 optical (2 ports) • STM-1 electrical (2 ports)

PDH: E1 (21 ports) • E3/DS3 (3 ports)

Packet Data: 10/100Base-TX (8 ports)

### **Configuration & Port Capacity for 2 Expansion Slots**

STM-1: Base: 2 • Max: 6

E1: Base: 8 • Max: 50

E3/DS3: Base: – • Max: 6

10/100Base-TX: Base: 2 • Max: 18

### **Protection**

Linear MSP 1+1 • SNCP/I and SNCP/N

### **Bandwidth Connectivity and Provisioning**

Connectivity: VC-12, VC-3 levels

One-way, two-way, drop-and-continue and multicast connections

VCAT: VC-12-Xv and VC-3-Xv

LCAS: G.7042

Packet encapsulation: GFP-F (G.7041)

### **Timing & Synchronization**

Internal: Stratum 3 clock

Line timing: STM-1 and E1/T1

External timing: Dual Sync In/Out ports at 2 or 1.5 Mbps/MHz

SSM support: G.781

### **System Access**

Serial RS-232 and Ethernet LAN management ports

IP over DCCr and DCCm options

IP over E1 signal mapped into selected VC-12 channel

DCC transparency (any subset of DCC rows)

Telnet

### **Operations**

Local and remote software download and upgrade (FTP/TFTP)  
Loopbacks: facility and terminal  
ALS (automatic laser shutdown): G.958  
Alarm Contacts (optional)  
Orderwire: 2-wire interface using E1 or E2 byte (optional)

### **Management**

Web-based GUI management interface  
XML  
SNMP v1/v2

### **Packet Intelligence**

Ethernet MAC: 802.3  
VLAN: 802.1Q and Q-in-Q  
Service provider VLAN (SP-VLAN) using S-Tag: 802.1ad  
Tagging operations: C-Tag and S-Tag add/strip  
Flow Control: 802.3x  
Rate Limiting: Sustained and peak rates with 64 kbit/s granularity for ports and VLANs  
QoS: 4 levels with strict priority, WFQ and WRED support

### **Dimensions**

1.75H x 17.25W x 11.54D in.  
(44.45H x 438.2W x 293D mm)  
1RU

### **Weight**

11 lbs (5 kg)

### **Cooling**

Natural convection cooling (no fans)

### **Mounting**

19-inch EIA/TIA or ETSI 300 mm racks, or desktop and wall-mounting options

### **Power**

AC input: 100 to 245 V at 50 to 60 Hz  
DC input: -36 to -72 V (-48V nominal), dual inputs  
Consumption: 60 W maximum

### **Environment**

Temperature: 0 to +50°C (+32 to +122°F)  
Humidity: 5 to 95%, non-condensing

## Model OS1063

---

### **Trunk Interfaces**

STM-1: G.707, G.783

Optics: G.957 S-1.1, L-1.1 and L-1.2 options

### **Client Interfaces**

E1: G.703, 75-ohm and 120-ohm options

T1: G.703, 100-ohm

Ethernet 10/100Base-TX: 802.3u

### **Expansion Modules**

SDH: STM-1 optical (2 ports) • STM-1 electrical (2 ports)

PDH: E1 (21 ports) • E3/DS3 (3 ports)

Packet Data: 10/100Base-TX (8 ports)

### **Configuration & Port Capacity for 2 Expansion Slots**

STM-1: Base: 2 • Max: 6

E1: Base: 21 • Max: 63

E3/DS3: Base: – • Max: 6

10/100Base-TX: Base: – • Max: 18

### **Protection**

Linear MSP 1+1 • SNCP/I and SNCP/N

### **Bandwidth Connectivity and Provisioning**

Connectivity: VC-12, VC-3 levels

One-way, two-way, drop-and-continue and multicast connections

VCAT: VC-12-Xv and VC-3-Xv

LCAS: G.7042

Packet encapsulation: GFP-F (G.7041)

### **Timing & Synchronization**

Internal: Stratum 3 clock

Line timing: STM-1 and E1/T1

External timing: Dual Sync In/Out ports at 2 or 1.5 Mbps/MHz

SSM support: G.781

### **System Access**

Serial RS-232 and Ethernet LAN management ports

IP over DCCr and DCCm options

IP over E1 signal mapped into selected VC-12 channel

DCC transparency (any subset of DCC rows)

Telnet

### **Operations**

Local and remote software download and upgrade (FTP/TFTP)  
Loopbacks: facility and terminal  
ALS (automatic laser shutdown): G.958  
Alarm Contacts (optional)  
Orderwire: 2-wire interface using E1 or E2 byte (optional)

### **Management**

Web-based GUI management interface  
XML  
SNMP v1/v2

### **Packet Intelligence**

Ethernet MAC: 802.3  
VLAN: 802.1Q and Q-in-Q  
Service provider VLAN (SP-VLAN) using S-Tag: 802.1ad  
Tagging operations: C-Tag and S-Tag add/strip  
Flow Control: 802.3x  
Rate Limiting: Sustained and peak rates with 64 kbit/s granularity for ports and VLANs  
QoS: 4 levels with strict priority, WFQ and WRED support

### **Dimensions**

1.75H x 17.25W x 11.54D in.  
(44.45H x 438.2W x 293D mm)  
1RU

### **Weight**

11 lbs (5 kg)

### **Cooling**

Natural convection cooling (no fans)

### **Mounting**

19-inch EIA/TIA or ETSI 300 mm racks, or desktop and wall-mounting options

### **Power**

AC input: 100 to 245 V at 50 to 60 Hz  
DC input: -36 to -72 V (-48V nominal), dual inputs  
Consumption: 60 W maximum

### **Environment**

Temperature: 0 to +50°C (+32 to +122°F)  
Humidity: 5 to 95%, non-condensing

# Appendix C **Terms and Acronyms**

---

## **Chapter contents**

Abbreviations .....	64
---------------------	----

## Abbreviations

Abbreviation	Meaning
<b>A</b>	
AIS	Alarm Indication Signal
AMI	Alternate Mark Inversion
AU	Administrative Unit
AUX	Auxiliary (port)
<b>B</b>	
BIP	Bit Interleaved Parity
BBE	Background Block Error
BER	Bit Error Rate
BPV	Bipolar Violation
B3ZS	Bipolar with 3-zero Substitution
B8ZS	Bipolar with 8-zero Substitution
<b>C</b>	
cHEC	core Header Error Check
CLI	Command Line Interface
CSU/DSU	Channel Service Unit/Data Service Unit
C-Tag	Customer-assigned tag (for example, VLAN tag)
<b>D</b>	
DNU	Do Not Use (for synchronization)
<b>E</b>	
E1	European digital signal hierarchy level 1
EB	Errored Block
EDC	Error Detection Code
EIA	Electronics Industries Alliance
EOW	Engineering Orderwire
ES	Errored Second
ETSI	European Telecommunications Standards Institute
EXM	Extension Header Mismatch
EXZ	Excessive Zeros
<b>G</b>	
GFP	Generic Framing Procedure
<b>H</b>	
HDB3	High-Density Bipolar with 3-zero Substitution
HP	High-order Path
HTTP	Hyper Text Transfer Protocol
<b>I</b>	
IP	Internet Protocol

Abbreviation	Meaning
<b>L</b>	
LCAS	Link Capacity Adjustment Scheme
LFD	Loss of Frame Delineation
LOF	Loss of Frame
LOP	Loss of Pointer
LP	Low-order Path
<b>M</b>	
MS	Multiplex Section
<b>N</b>	
NEBS	Network Equipment Building System
NEC	National Electric Code
<b>P</b>	
PBX	Private Branch Exchange
PC	Personal Computer
PDH	Plesiochronous Digital Hierarchy
PJC	Pointer Justification Count
PM	Performance Monitoring
POST	Power-On Self-Test
ppm	parts per million
PRC	Primary Reference Clock
PRI	Primary Rate Interface
PSC	Protection Switching Count
PSD	Protection Switching Duration
<b>R</b>	
RS	Regenerator Section
RSOH	Regenerator Section Overhead
RU	Rack Unit (1.75 inches)
<b>S</b>	
SD	Signal Degrade
SDH	Synchronous Digital Hierarchy
SEC	Secondary source (also Synchronous Equipment Clock)
SES	Severely Errored Second
SF	Signal Failure
SNMP	Simple Network Management Protocol
SOH	Section Overhead
SSM	Synchronization Status Messaging
SSU	Synchronization Supply Unit
S-Tag	Service provider tag
STM-1	Synchronous Transport Module level 1

Abbreviation	Meaning
<b>T</b>	
TDM	Time Division Multiplexing
TIA	Telecommunications Industry Association
TIM	Trace Identifier Mismatch
TNV	Telecommunications Network Voltage
TP	Termination Point
TU	Tributary Unit
TUG	Tributary Unit Group
<b>U</b>	
UAS	Unavailable Seconds