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Alcatel-Lucent 1850

Transport Service Switch (TSS-5) | Release 7.2

Installation and System Turn-Up Guide

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About this document

Purpose

This document provides the information and procedures necessary to install, self-test and turn up the Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) system.

Reason for reissue

This document, the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Installation and System Turn-Up Guide*, Issue 2, is issued to support Release 7.2.2.

Intended audience

This installation manual provides information and procedures necessary to install, self-test, and turn up the Alcatel-Lucent 1850 TSS-5 system.

This manual is not a service or operations manual. Refer to *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Provisioning Guide,* 365-372-401R7.2 for any activities involving circuit turn-up or regular maintenance, and *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Maintenance and Trouble-Clearing Guide,* 365-372-402R7.2 for trouble analysis.

How to use this document

This manual is divided into four parts each containing several chapters. The first part explains the installation sequence at a high level. It is useful to the trained installer or job planner. The other parts provide instructional steps for personnel needing additional detail or background information Refer to the Table of Contents to locate specific information by chapter.

Federal Communications Commission (FCC) Part 15 Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency

energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's expense.

Conventions used

The following typographical conventions are used in this guide:

Appearance	Description
emphasis	Text that is emphasized
document titles	Titles of books or other documents
file or directory names	The names of files or directories
Graphical user interface text	Text that is displayed in a graphical user interface
Keyboard keys	The name of a key on the keyboard
`system input`	Text that the user types or selects as input to a system
`system output`	Text that a system displays or prints
`variable`	A value or command-line parameter that the user provides
`[ ]`	Text or a value that is optional
`{value 1|value 2}` `{variable 1|variable 2}`	A choice of values or variables from which one value or variable is used

Related documentation

The following documents provide additional information about the Alcatel-Lucent 1850 TSS-5:

Table 1 Alcatel-Lucent 1850 TSS-5 documentation set

Document Number	Comcode	Document Title
365-372-400R7.2	109757724	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Product Information and Planning Guide*
365-372-401R7.2	109757732	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Provisioning Guide*
365-372-402R7.2	109757740	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Maintenance and Trouble-Clearing Guide*

Document Number	Comcode	Document Title
N/A	109758300	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes* (CD-ROM)
N/A	109758292	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes (PDF)*
365-372-404R7.2	109757765	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) TL1 Command Guide for MSPP*
365-372-405R7.2	109757773	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Command Line Interface Guide*
365-372-406R7.2	109757781	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) CLI User Provisioning Guide*
365-372-407R7.2	109757799	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) TL1 Command Guide for T-MPLS*
N/A	109758318	Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Release 7.2.X Customer Documentation (CD-ROM)
365-372-330	N/A	*WaveStar® CIT User Guide*
Alcatel-Lucent 1850 TSS-5 Drawings		
ED8C956-10	N/A	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Release 7.2 Engineering and Ordering Information*
ED8C956-20	N/A	*Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Release 7.2 Interconnect Circuit Information*

Online Customer Support (OLCS)

The following hyperlink can be used to access the Online Customer Support (OLCS) web site for Technical support information, order documentation, and software ordering.

https://support.alcatel-lucent.com/portal/olcsHome.do

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Safety information

For your safety, this document contains safety statements. Safety statements are given at points where risks of damage to personnel, equipment, and operation may exist. Failure to follow the directions in a safety statement may result in serious consequences.

How to comment

To comment on this document, go to the Online Comment Form (http://www.lucent-info.com/comments/) (http://infodoc.alcatel-lucent.com/comments) or email your comments to the Comments Hotline (comments@alcatel-lucent.com).

Packaging collection and recovery requirements

Countries, states, localities, or other jurisdictions may require that systems be established for the return and/or collection of packaging waste from the consumer, or other end user, or from the waste stream. Additionally, reuse, recovery, and/or recycling targets for the return and/or collection of the packaging waste may be established. For more information regarding collection and recovery of packaging and packaging waste within specific jurisdictions, contact the Alcatel-Lucent Environment, Health and Safety organization.

Recycling/take-back/disposal of product and batteries

Electronic products and batteries bearing or referencing the symbols shown below shall be collected and treated at the end of their useful life, in compliance with applicable European Union and other local legislation. They shall not be disposed of as part of unsorted municipal waste. Due to materials that may be contained in the product and batteries, such as heavy metals, the environment and human health may be negatively impacted as a result of inappropriate disposal.

Note 1: For electronic products put on the market in the European Union, a solid bar under the crossed-out wheeled bin indicates that the product was put on the market after 13 August 2005.



Note 2: For batteries put on the market in the European Union, a chemical symbol Hg (mercury), Cd (cadmium), or Pb (lead), or a combination of those symbols, beneath the cross-out wheeled bin indicates that the battery contains the corresponding heavy metals.



Moreover, in compliance with legal requirements and contractual agreements, where applicable, Alcatel-Lucent will offer to provide for the collection and treatment of Alcatel-Lucent products bearing the logo at the end of their useful life, or products displaced by Alcatel-Lucent equipment offers.

For information regarding take-back of equipment by Alcatel-Lucent, or for more information regarding the requirements for recycling/disposal of a product, please contact your Alcatel-Lucent account manager. Visit the Alcatel-Lucent Take-Back (http://www.alcatel-lucent.com/product_takeback) web page, or contact Alcatel-Lucent Takeback Support (takeback@alcatel-lucent.com). For technical information on product treatment, consult the Alcatel-Lucent Recycling Information (http://www.alcatel-lucent.com/product_recycling) web page.

1 Safety

Overview

Purpose

This chapter provides important laser safety instructions and precautions for the Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) high-capacity shelf.

Contents

This chapter provides information on the following topics:

Laser safety	1-2
Laser product classification	1-4
Electrostatic discharge ESD considerations	1-6
Optical specifications	1-10

Laser safety

System design

The Alcatel-Lucent system complies with FDA/CDRH 21 CFR 1040.10 and 1040.11 as a Class I and with IEC 60825-1 as a Class 1 Optical Fiber Telecommunication laser product. The system has been designed to ensure that the operating personnel is not endangered by laser radiation during normal system operation. The safety measures specified in the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) regulations and the international standards IEC-60825 or DIN/EN 60825 are met. Please also refer to "Laser product classification" (p. 1-4).

Potential sources of danger

Beware of the following potential sources of danger which will remain despite all safety measures taken:

- Laser radiation can cause damage to the skin and eyes.
- Laser radiation from optical transmission systems is in a wavelength range that is invisible to the human eye.

Laser warning labels

The laser warning labels indicate either only the laser class or both the laser class and the maximum output power of laser radiation. The following figure shows different types of laser warning labels and their characteristics.



Laser warning symbol



This laser warning label is affixed on the outside of the front cover



This warning label is affixed to the inside of the subrack.

Laser safety instructions

Observe the following instructions to avoid exposing yourself and others to risk.

- Read the relevant descriptions in the manuals before taking equipment into operation or carrying out any installation and maintenance work on the optical port units, and follow the instructions. Ignoring the instructions can result in exposure to dangerous radiation.
- Do not view directly into the laser beam with optical instruments such as a fiber microscope, because viewing of laser emission in excess of Class 1 limits significantly increases the risk of eye damage.
- Never look into the end of an exposed fiber or an open connector as long as the optical source is still switched on.
- Ensure that the optical source is switched off before disconnecting optical fiber connectors.
- In the event of doubt, check that the optical source is switched off by measuring with an optical power meter.

Laser product classification

Standards compliance

The product complies with both IEC standards and the Food and Drug Administration's Center for Devices and Radiological Health (FDA/ CDRH) regulations.

FDA/CDRH regulations

Laser products are classified in accordance with the FDA/CDRH - 21 CFR 1010 and 1040. The classification scheme is based on the ability of the laser emission to cause injury to eye or skin during normal operating conditions.

In the United States, lasers and laser systems in the infrared wavelength range (greater than 700 nm) are assigned to one of the following classes:

- Class I,
- Class IIIb, or
- Class IV.

Laser classification is dependent upon operating wavelength, output power and fiber modefield diameter (core diameter).

IEC requirements

The International Electro-Technical Commission (IEC) establishes standards for the electrical and electronic industries. IEC-60825 has been established for the worldwide safety of laser products.

According to the IEC classification, lasers and laser systems in the infrared wavelength range (greater than 700 nm) are assigned to one of the following classes:

- Class 1,
- Class 3A,
- Class 3B, or
- Class 4.

There are some major differences between the FDA/CDRH regulations and IEC:

1. The Accessible Emission Limits (AEL) are different.
2. Class 3A applies to all wavelengths.
3. Class 3B requires strict engineering controls.
4. Classification is under single fault conditions.

Laser classes

The maximum output power of laser radiation depends on the type of laser diode used. The international standards IEC-60825 or DIN/EN 60825 define the maximum output power of laser radiation for each laser class in accordance with the wavelength.

Table 1-1 Laser classes

Laser class	Wavelength	Maximum Output Power of Laser Radiation
1	1310 nm	8.85 mW
	1550 nm	10 mW
3A	1310 nm	24 mW
	1550 nm	50 mW
3B	1310 nm	0.5 W
	1550 nm	0.5 W

Hazard level assignment

Hazard level refers to the potential hazard from laser emission at any location in an end-to-end optical fiber communication system that may be accessible during service or in the event of a failure. The assignment of hazard level uses the AELs for the classes.

Hazard levels for optical transmission equipment are assigned in either of the following two ways:

- Actual output power from the connector or fiber cut.
- If automatic power reduction is used, output power at the connector or fiber cut at one second after automatic power reduction takes place provided that maximum output and restart conditions are met.

Classification of optical telecommunication equipment

Optical telecommunication equipment is generally classified as IEC Class 1 or FDA/CDRH Class I, because under normal operating conditions, the transmitter ports terminate on optical fiber connectors. These are covered by a front panel to ensure protection against emissions from any energized, unterminated transmitter. The circuit packs themselves, however, may be IEC Class 1 or 3A or FDA/CDRH Class I or IIIb.

Electrostatic discharge ESD considerations

ESD precautions



CAUTION

ESD hazard

Industry experience has shown that all integrated circuit packs can be damaged by static electricity that builds up on work surfaces and personnel. The static charges are produced by various charging effects of movement and contact with other objects. Dry air allows greater static charges to accumulate. Higher potentials are measured in areas with low relative humidity, but potentials high enough to cause damage can occur anywhere.

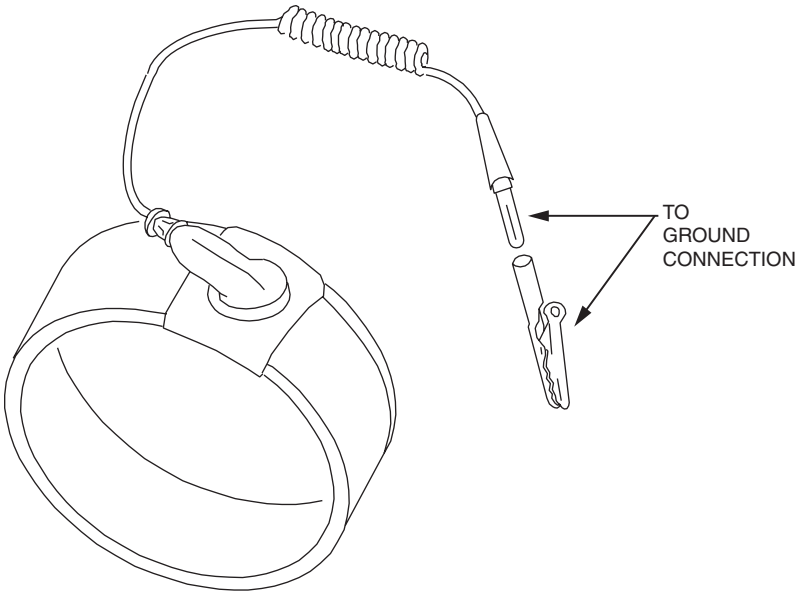
In order to prevent damage by electrostatic discharge the following precautions should be observed when handling circuit packs:

- Assume all circuit packs contain solid state electronic components that can be damaged by ESD.
- When handling circuit packs (storing, inserting, removing, etc.) or when working on the backplane, always wear a grounded wrist strap such as the one shown in Figure 1-1, “Static control wrist strap” (p. 1-7) or wear a heel strap and stand on a grounded, static dissipating floor mat. If a static dissipating floor mat is used, be sure that it is clean to ensure a good discharge path.
- Handle all circuit packs by the faceplate or latch and by the top and bottom outermost edges. Never touch the components, conductors, or connector pins.
- Observe warning labels on bags and cartons. Whenever possible, do not remove circuit packs from antistatic packaging until ready to insert them into slots.
- If possible, open all circuit packs at a static safe work position, using properly grounded wrist straps and static dissipating table mats. If a static dissipating floor mat is used, be sure that it is clean to ensure a good discharge path.
- Always store and transport circuit packs in static safe packaging. Shielding is not required unless specified.
- Keep all static generating materials such as food wrappers, plastics, and styrofoam containers away from all circuit packs. Upon removal from bay, immediately put circuit packs into static safe packages.
- Whenever possible, maintain relative humidity above 20 percent.

To reduce the possibility of ESD damage, assemblies are equipped with grounding jacks to enable personnel to ground themselves using wrist straps [Figure 1-1, “Static control wrist strap” (p. 1-7)] while handling circuit packs or working on an assembly. The jacks

for connection of wrist straps are located at the lower right-hand corner of each assembly and are labeled. When grounding jacks are not provided, an alligator clip adapter enables connection to bay frame ground.

Figure 1-1 Static control wrist strap



IMPORTANT SAFETY INSTRUCTIONS

READ AND UNDERSTAND ALL INSTRUCTIONS

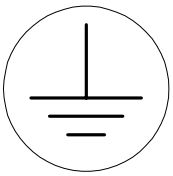


The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying this product.

When installing, operating, or maintaining this equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Read and understand all instructions
2. Follow all warnings and instructions marked on this product.
3. This product should be only operated from the type of power sources indicated on the marking label.
4. Connect this product only to the type of power sources recommended by Alcatel-Lucent. For information on the powering instructions, consult the Installation Manual.
5. This equipment is suitable for mounting on a concrete or other noncombustible surface only.
6. For information on proper mounting instructions, consult the Installation Manual.
7. Install only equipment identified in the Installation Manual. Use of other equipment may result in improper connection of circuitry leading to fire or injury to persons.
8. All metallic telecommunication interfaces should not leave the building premises unless connected to telecommunication devices providing primary and secondary protection, as applicable.
9. Do not use this product near water, for example, in a wet basement.
10. Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.
11. Use caution when installing or modifying telecommunications lines.
12. Never install telecommunications wiring during a lightning storm.
13. Never install telecommunications connections in wet locations.
14. Never touch uninsulated telecommunications wires or terminals unless the telecommunications line has been disconnected at the network interface.
15. Never touch uninsulated wiring or terminals carrying direct current or ringing current, or leave this wiring exposed. Protect and tape uninsulated wiring and terminals to avoid risk of fire, electric shock, and injury to service personnel.
16. Never push objects of any kind into this product through slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquids of any kind on the product.

17. Slots and openings in the unit are provided for ventilation, to protect it from overheating, and these openings must not be blocked or covered. This product should not be placed in a built-in installation unless proper ventilation is provided.
18. To reduce the risk of an electrical shock, do not disassemble this product. Service should be performed by trained personnel only. Opening or removing covers and/or circuit boards may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electrical shock when the unit is subsequently used.
19. Some of the Alcatel-Lucent 1850 TSS-5 hardware modules contain FDA/CDRH Class I/IEC Class 1 single-mode laser products that are enclosed lightwave transmission systems. Under normal operating conditions, lightwave transmission systems are completely enclosed; nonetheless, the following precautions must be observed because of the potential for eye damage:
    - Do not disconnect any lightwave cable or splice and stare into the optical connectors terminating the cables.
    - Lightwave/lightguide operations should not be performed by a technician who has not satisfactorily completed an approved training course.
    - Do not use optical instruments such as an eye loupe to view a fiber or unterminated connector.
    - More information about laser safety can be found in the Installation Manual.
20. For a unit intended to be powered from –48 V dc voltage sources, read and understand the following:
    - To be powered only by Safety Extra Low Voltage (SELV) -48 V dc Sources.
    - Disconnect up to Two (2) power supply connections when removing power from the system.
    - This equipment must be provided with a readily accessible disconnect device as part of the building installation.
    - Ensure that there is no exposed wire when the input power cables are connected to the unit.
    - Installation must include an independent frame ground drop to building ground. Refer to User's Manual.



This symbol is marked on the product, adjacent to the ground (earth) area for the connection of the ground (earth) conductor.

Optical specifications

Overview

Table 1-2 details the short, intermediate, and long reach SFPs that support the OC-3/STM1 connections for the VLNC50, VLNC52, and VLNC64 circuit packs. Table 1-3 details the intermediate and long reach SFPs that support the OC-12/STM4 connections on the VLNC50 and VLNC52 only.

Table 1-2 OC-3/STM-1 optical PTM specifications VLNC50/52 and VLNC64

Plugin Type	Wavelength (nm)	Output Power Range (dBm)	Input Power Range (dBm)	Connector Type	Target Distance
SR-1	1310	-8 to -15	-8 to -23	LC	2 km
IR-1	1310	-8 to -15	-8 to -28	LC	15 km
LR-1	1310	0 to -5	-10 to -34	LC	40 km
CWDM	1471 to 1611	-1 to +5	-9 to -28	LC	96 km

Table 1-3 OC-12/STM-4 optical PTM specifications VLNC50 and VLNC52

Plugin Type	Wavelength (nm)	Output Power Range (dBm)	Input Power Range (dBm)	Connector Type	Target Distance
IR-1	1310	-8 to -15	-8 to -28	LC	15 km
LR-1	1310	-3 to +2	-8 to -28	LC	40 km
LR-1	1550	-3 to +2	-8 to -28	LC	80 km
CWDM	1471 to 1611	-1 to +5	-9 to -28	LC	96 km

Table 1-4 OC-48/STM-16 optical PTM specifications VLNC55

Optics	Circuit Pack PTM	Allowable Receiver Range (dBm)
OC48/STM16 CWDM-LR	OM2488wavelengths 1471,1491,1511,1531 ,1571,1591,1611 nm	-9.0 to -28.0

Table 1-5 Ethernet PTM specification

Plugin Type	Supported Circuit Pack(s)	Wavelength (nm)	Maximum Output Power (dBm)	Maximum Input Power (dBm)	Connector Type	Target Distance
100BASE-LX	VLNC33 VLNC35 VLNC40 VLNC42 VLNC42B VLNC60 VLNC61 VLNC62 VLNC64	1260 -1360	-8 to -15.0	-14 to -25.0	LC	10 km
1000BASE-ZX	VLNC50 VLNC52 VLNC55	1500 to 1580	0 to +5.0	0 to -22.5	LC	80 km
BASE-T-C1 electrical (not OSP)	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	Provisionable 100 to 1000 Mbps	NA	NA	RJ-45	100 meters

Plugin Type	Supported Circuit Pack(s)	Wavelength (nm)	Maximum Output Power (dBm)	Maximum Input Power (dBm)	Connector Type	Target Distance
GE-1X2XFC-LX-I1 (1000BASE-LX, 1Gbps	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1270 to 1355	-3 to -11.0	-3 to -19.0	LC	10 km
GE-1X2XFC-SX-I1 (1000BASE-SX, 1 Gbps)	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	770 to 860	0 to -9.5	0 to -17.0	LC	275m with 62.5 µm fiber 550m with 50 µm fiber
SGEC47EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1471	-1 to +5.0	-9 to -29.0	LC	96 km

Plugin Type	Supported Circuit Pack(s)	Wavelength (nm)	Maximum Output Power (dBm)	Maximum Input Power (dBm)	Connector Type	Target Distance
SGEC49EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1491	-1 to +5.0	-9 to -29.0	LC	96 km
SGEC51EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1511	-1 to +5.0	-9 to -29.0	LC	96 km
SGEC53EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1531	-1 to +5.0	-9 to -29.0	LC	96 km

Plugin Type	Supported Circuit Pack(s)	Wavelength (nm)	Maximum Output Power (dBm)	Maximum Input Power (dBm)	Connector Type	Target Distance
SGEC55EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1551	-1 to +5.0	-9 to -29.0	LC	96 km
SGEC57EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1571	-1 to +5.0	-9 to -29.0	LC	96 km
SGEC59EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1591	-1 to +5.0	-9 to -29.0	LC	96 km

Plugin Type	Supported Circuit Pack(s)	Wavelength (nm)	Maximum Output Power (dBm)	Maximum Input Power (dBm)	Connector Type	Target Distance
SGEC61EL	VLNC40 VLNC42 VLNC42B VLNC50 VLNC52 VLNC55 VLNC60 VLNC61 VLNC62 VLNC64	1611	-1 to +5.0	-9 to -29.0	LC	96 km

Part I: Physical and power installation

Overview

Purpose

Part I of this document covers the physical installation of the Alcatel-Lucent 1850 Transport Service Switch (TSS-5) (Alcatel-Lucent 1850 TSS-5) rack mount shelf; the running and terminating of power cables, miscellaneous cables, and fibers. The installation and downloading of circuit packs.

Contents

This part of the document contains the following chapters:

Physical installation	Chapter 2

Tools, test equipment, and accessories

This section lists the tools, test equipment and accessories needed to perform all the procedures in this installation manual.

Important! The first three entries below are bracket kits for the different type of mounting options. Only one kit is needed per Alcatel-Lucent 1850 TSS-5 shelf depending on either the bayframe, ETSI, or if the shelf needs to be wall mounted.

Listed below are the required tools, test equipment and accessories.

Quantity	Description	Comments
1 set	Brackets for rack-mount Alcatel-Lucent 1850 TSS-5	The Alcatel-Lucent 1850 TSS-5 shelf mounts in a 19” or 23” wide bay, adjustable brackets are included. For standard 23” bays, see ED8C500-50, ED8C501-50, ED8C502-50, ED8C504-50 and ED8C509-50 For seismic 23” bays, see ED8C800-50, ED8C800-70, ED8C808-50 and 847138351 (ED8C801-50,51).

Quantity	Description	Comments
1 set	Brackets for wall mount kit Alcatel-Lucent 1850 TSS-5 (849108873)	The Alcatel-Lucent 1850 TSS-5 shelf mounts on a wall using brackets
1 set	Brackets for an ETSI frame kit (849109236)	The Alcatel-Lucent 1850 TSS-5 shelf also mounts in a standard ETSI frame.
1	75 ohm timing input assembly	The Alcatel-Lucent 1850 TSS-5 shelf will support a 120 ohm to 75 input timing assembly
1	75 ohm timing output assembly	The Alcatel-Lucent 1850 TSS-5 shelf will support a 75 ohm to 120 ohm output assembly
1	new (optional) cover	The Alcatel-Lucent 1850 TSS-5 also supports a new optional front cover Comcode 849101357 designed for cable stress relief
1	Heat Baffle (848862181) with 19” or 23” brackets	The Alcatel-Lucent 1850 TSS-5 can be stacked on top of each other without using a heat baffle due to its integrated fan unit. Only use a heat baffle above or below the shelf if other equipment generates heat towards the Alcatel-Lucent 1850 TSS-5 shelf.
	Screwdriver(s)	A screwdriver(s) with the appropriate head(s) is (are) required for securing the mounting screws, repositioning the mounting brackets, and installing the interfacing cables.
1	RJ-45 Crimping tool	The crimping tool is required for terminating DS1/E1 blunt-cut cables to a RJ-45 connector.
1	Wire-wrap gun R-4496A	The wire-wrap gun is required for terminating DS1/E1 cable and must be able to accommodate 26-gauge wire.
1	ESD wrist strap R-4987C	A wrist strap must be worn when handling circuit packs. Use the electrostatic discharge (ESD) jack provided on the shelf.
1	Torque wrench (R-5952)	A torque wrench (50-250 IN-LBS) is used when tightening the Alcatel-Lucent 1850 TSS-5 shelf to the frame. It is also used when reattaching the mounting brackets to the Alcatel-Lucent 1850 TSS-5 shelf.
1	Torque screwdriver	A torque screwdriver is used to attach the -48or +24Volt wiring to the terminal block.

Quantity	Description	Comments
1	Mini BNC install/remove tool	A tool for removing or connecting mini bnc connectors to the VLIU panel. Comcode 409079993 (Pt. No. RT-4L Trompeter)
1	Metric & inch series tool set - R-6001	Because some optical networking products (also know as transport) may have some metric fasteners, please ensure that the proper metric tools are available.
1	Multimeter (optional) ITE-6379C	The voltmeter must be capable of measuring DC voltage in the 0 to 80 volt range. The use of the voltmeter is optional since the shelf will alarm or shut down if the proper voltage is not supplied.
1	Ohmmeter ITE-6379C	An ohmmeter is required to verify that the Alcatel-Lucent 1850 TSS-5 is properly grounded.
1	DS1 error rate test set ITE-7113	A DS1 error rate test set is required for testing of DS1 cabling. A T-BERD 209 or equivalent is recommended.
1	E1 error rate test set	A E1 Error Rate Test set is required for E1 testing.
2	LC-type optical fiber Jumper ITE-7169 (109462168)	Two optical fiber jumpers with LC type connectors are required to optically loop the Alcatel-Lucent 1850 TSS-5 shelf for test purposes.
1	Noyes OFS 300-200X optical fiber scope ITE-7129	This equipment may not be necessary at all locations. It is to be used when the ports need to be verified for cleanliness. If care is exercised when cleaning fibers, the optical fiber scope may not be needed.
1	2.5 mm universal adapter cap ITE-7129 D1	For use with the Noyes OFS 300-200X optical fiber scope.
1	1.25 mm universal adapter cap ITE-7129 D2	
1	Noyes VFS-1 ITE-7187 video fiber scope[1]	This equipment may not be necessary at all locations. It is to be used when the ports need to be verified for cleanliness. If care is exercised when cleaning fibers, the video scope may not be needed.
1	Individual presaturated alcohol wipes ITE-7136	99% pure isopropyl alcohol
1	CLETOP cleaning cassette ITE-7137	Type A Reel

Quantity	Description	Comments
1	Luminex stick port cleaners ITE-7134 & ITE-7135	1.25 mm and 2.5 mm sizes
1	Luminex cloth R-6033	5.5” x 5.5”

Table 1-1 Part I installation checklist

Section and Chapter	Procedure	Required	Completed	
			Yes	No
Chapter 2, “Physical installation”	“Inspection” (p. 2-4)	Yes		
	“Alcatel-Lucent 1850 TSS-5 rack-mount shelf installation” (p. 2-5)	Yes		
	“Alcatel-Lucent 1850 TSS-5 Wall-Mount shelf installation” (p. 2-12)	Yes		
	“Front cover” (p. 2-19)			
	“Power cable installation” (p. 2-21)	Yes		
	“Powering” (p. 2-24)	Yes		
Chapter 3, “Cable and fiber installation”	“DS1/E1 cable installation” (p. 3-3)	Optional		
	“DS3/E3 cable Installation” (p. 3-11)	Optional		
	“Ethernet cable installation” (p. 3-14)			
	“Office alarm cable installation” (p. 3-24)			
	“Miscellaneous (environmental) discrete telemetry cable installation” (p. 3-28)	Optional		
	“Timing cable installation” (p. 3-31)	Optional		
	“E1 timing interface converters” (p. 3-33)	Optional		
	“10/100/1G cable installation” (p. 3-38)	Optional		
	“RS-232 cable assembly” (p. 3-41)	Optional		
	“LAN cable installation” (p. 3-44)	Optional		

Section and Chapter	Procedure	Required	Completed	
			Yes	No
Chapter 4, "Circuit pack installation"	"VLNC2 (SYSCTL) installation" (p. 4-3)	No		
	"VLNC50 main1 or main2 installation" (p. 4-4)	No		
	"VLNC52 main1 or main2 installation" (p. 4-4)	No		
	"VLNC55 main1 or main2 installation" (p. 4-5)	No		
	"VLNC60 main1 or main2 installation" (p. 4-6)	No		
	"VLNC61 main1 or main2 installation" (p. 4-6)	No		
	"VLNC62 main1 or main2 installation" (p. 4-7)	No		
	"VLNC64 main1 or main 2 installation" (p. 4-8)	No		
	"VLNC35 fn-c installation" (p. 4-9)	No		
	"VLNC40 main 2 installation only" (p. 4-10)	No		
	"VLNC42 main 2 installation only" (p. 4-10)	No		
	"VLNC42B main 2 installation only" (p. 4-11)	No		
	"199SC apparatus blank installation" (p. 4-12)			
	"199MN apparatus blank installation" (p. 4-12)			
	"Install optical PTMs" (p. 4-14)			
	"Install ethernet PTMs" (p. 4-15)			

2 Physical installation

Overview

Purpose

This section provides installation mounting and powering instructions for the Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) high-capacity shelf. Note that this document uses the term “shelf” as the combination of chassis, backplane and I/O plug-in circuit pack (VLIU1, VLIU2, VLIU3 or VLIU10).

Mounting options for the rack-mount unit are:

1. Rear-mount with front access
2. Front-mount with front access

WARNING

The intra-building port(s) of the equipment or subassembly is suitable for connection to intrabuilding or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

Contents

This chapter provides information on the following

Planning	2-3
Inspection	2-4
Alcatel-Lucent 1850 TSS-5 rack-mount shelf installation	2-5
Alcatel-Lucent 1850 TSS-5 Wall-Mount shelf installation	2-12
Front cover	2-19

Power description	2-20
Power cable installation	2-21
Powering	2-24

Planning

Description

This section provides information about the following:

- Tools, test equipment and accessories
- Mounting options
- Cabling checklist

Mounting options

The rack-mount mounting brackets for the Alcatel-Lucent 1850 TSS-5 are adjustable and designed to allow for mounting in the following:

- 19-inch bay-frames (EIA and Telco)
- Standard 23-inch wide network bay-frames

  The recommended network bay-frames are the ED-8C500-50, ED-8C501-50, ED-8C502-50, ED-8C504-50 and the ED-8C509-50.
- 23-inch seismic network bay-frame

  The ED-8C800-50, ED-8C800-70, ED-8C808-50, ED-8C801-50 and ED-8C801-51 seismic network bay-frames are designed for use in all earthquake zones, and in general, do not require top support at the 7-foot level. These frames meet Pacific Bell Equipment Framework Standard PBS-000-102PT.
- 23-inch wide EIA-Type bay frames.
- Up to 15 Alcatel-Lucent 1850 TSS-5 network elements can be mounted into one 7-foot frame with 2 inches remaining for a power distribution unit not specified.
- For mounting in ETSI type frames, there is a separate orderable bracket kit available. See “Tools, test equipment, and accessories” (p. 1-1) for comcode.

Inspection

Description

Perform the following procedure before installing the Alcatel-Lucent 1850 TSS-5 shelf and cables.

Procedure

Proceed as follows:

1 Inspect the shelf for visible damage including bent or touching backplane pins.

If any backplane pins are damaged, refer to Appendix D, "Backplane pin replacement" for instructions on repairing the damaged pin(s).

2 Each rack-mount Alcatel-Lucent 1850 TSS-5 shelf comes with a box containing the brackets and the following items

Table 2-1 Shelf equipment packaging

Quantity	Description
4	Screws for mounting the brackets to the shelf
4	Screws for mounting the shelf to the bay frame
1	Safety Instruction Sheet

Verify that the box is available and contains the items listed above.

3 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. 1-4).

Alcatel-Lucent 1850 TSS-5 rack-mount shelf installation

Introduction

This section provides instructions for mounting the Alcatel-Lucent 1850 TSS-5 rack-mount in the supported bay-frame sizes using the appropriate bracket.

Installation notes:

1. The shelf will tolerate temperatures in a range of -40°C to +65°C. The heat from the Alcatel-Lucent 1850 TSS-5 rack-mount shelf is dissipated by horizontal air flow provided by integrated fans within the shelf.
2. The Alcatel-Lucent 1850 TSS-5 rack-mount is 17.4" (441 mm) wide, 4.9" (125 mm) high, and 11.8" (300 mm) deep.
3. Alcatel-Lucent 1850 TSS-5 rack-mount has an integrated fan unit, and is stackable.
4. The maximum weight of the Alcatel-Lucent 1850 TSS-5 rack-mount shelf, fully equipped, is 6.8kg (15 lbs).

Procedure

Proceed as follows:

4 Position the rack-mount Alcatel-Lucent 1850 TSS-5 shelf on a stable work surface.

5 Is the VLIU installed in the Alcatel-Lucent 1850 TSS-5 shelf?

IF...	Then...
Yes	Skip to Step 12
No	Continue with Step 6

Table 2-2 VLIU interface panel descriptions

Circuit Pack	Aparatus Code	Comcode	Release	Description
Interface Unit	VLIU1	109645614	R3.0	Required for basic shelf operation. Does not support VLNC52, VLNC55, or VLNC61; supports equipment protection on the VLNC50 only.

Circuit Pack	Aparatus Code	Comcode	Release	Description
Interface Unit	VLIU2	109659136	R5.0	Required for the higher density VLNC52, VLNC55, and VLNC61 circuit packs when used in conjunction with the VLNC40.
Interface Unit	VLIU3	109705152	R6.0	Required front access paddleboard to support ToD and high density >8DS1/E1 interfaces when equipped with VLNC62 and VLNC42B.
Interface Unit	VLIU10	109657247	R5.0	Required for equipment protection for the VLNC52 and VLNC55. Unprotected VLNC6X circuit packs. Cannot be used with the VLNC40.

6 Refer to Table 2-2 above for the VLIU interface panel descriptions

7 If the VLIU interface panel was shipped separate from the shelf, it must be inserted into the top of the shelf.

8 Locate the VLIU interface panel and remove from packaging.

9 With the faceplate latch levers of the VLIU in an open position (45^{o} angle) as seen in Figure 2-1, “VLIU faceplate latches” (p. 2-7) seat the VLIU interface panel into the slot, aligning the left and right PWB edges with the card guides. Slide the VLIU into place by applying steady pressure to the faceplate and latch assemblies until latch levers engage the pins of the shelf.

10 Secure the VLIU interface panel in the shelf by pushing both left and right latch levers simultaneously rotating toward the sides of the shelf until VLIU interface panel is fully seated. See Figure 2-2, “Fully seated VLIU interface panel” (p. 2-7).

Figure 2-1 VLIU faceplate latches



Figure 2-2 Fully seated VLIU interface panel



11 Using a phillip head screwdriver, tighten the captive screws on the left and right sides of the VLIU interface panel. See Figure 2-3, “VLIU captive screws” (p. 2-8)

Figure 2-3 VLIU captive screws



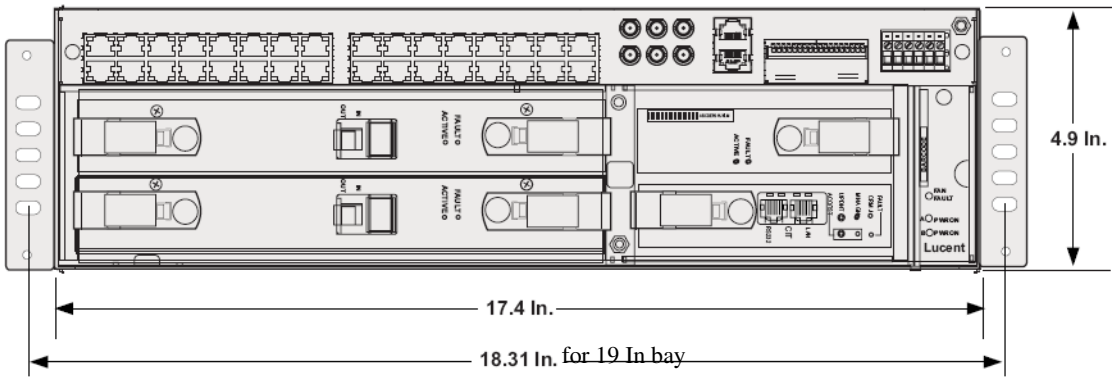
12 Once the VLIU interface panel is in place, attach the mounting brackets.

13 Determine the mounting configuration for the rack-mount Alcatel-Lucent 1850 TSS-5 shelf:

- Type of bay frame (23-inch, 19-inch wide or ETSI)
- Mounting position (front or rear)
- Position in bay (bottom to top)

The Alcatel-Lucent 1850 TSS-5 shelf mounting brackets can be rotated to fit both the 19-inch and 23-inch bay frames. See Figure 2-5, “Mounting bracket position for 19-inch frame” (p. 2-9) for 19-inch bracket position

Figure 2-4 Alcatel-Lucent 1850 TSS-5 rack-mount shelf



14 Attach the mounting brackets to the shelf using the supplied flat head screws: see Figure 2-5, “Mounting bracket position for 19-inch frame” (p. 2-9) if attaching to a 19-inch bay frame and Figure 2-6, “Mounting bracket position for 23-inch frame” (p. 2-9) if

attaching the shelf to a 23-inch bay frame, and Figure 2-7, “Mounting bracket position for ETSI frame” (p. 2-10) if attaching to an ETSI bay frame.

Figure 2-5 Mounting bracket position for 19-inch frame

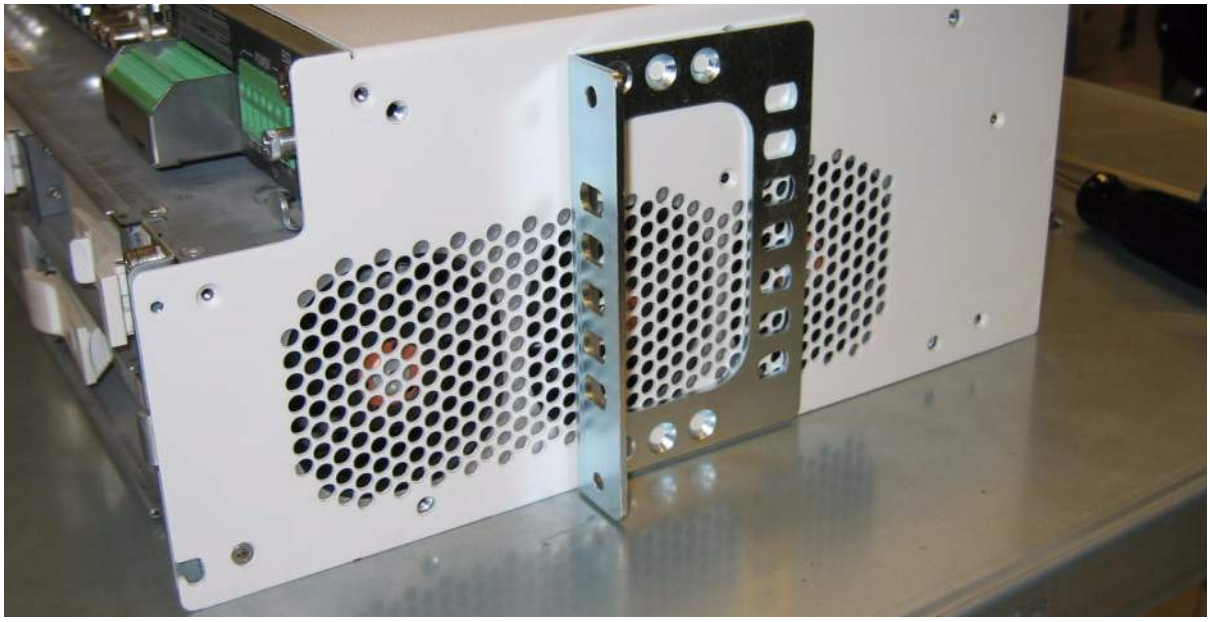
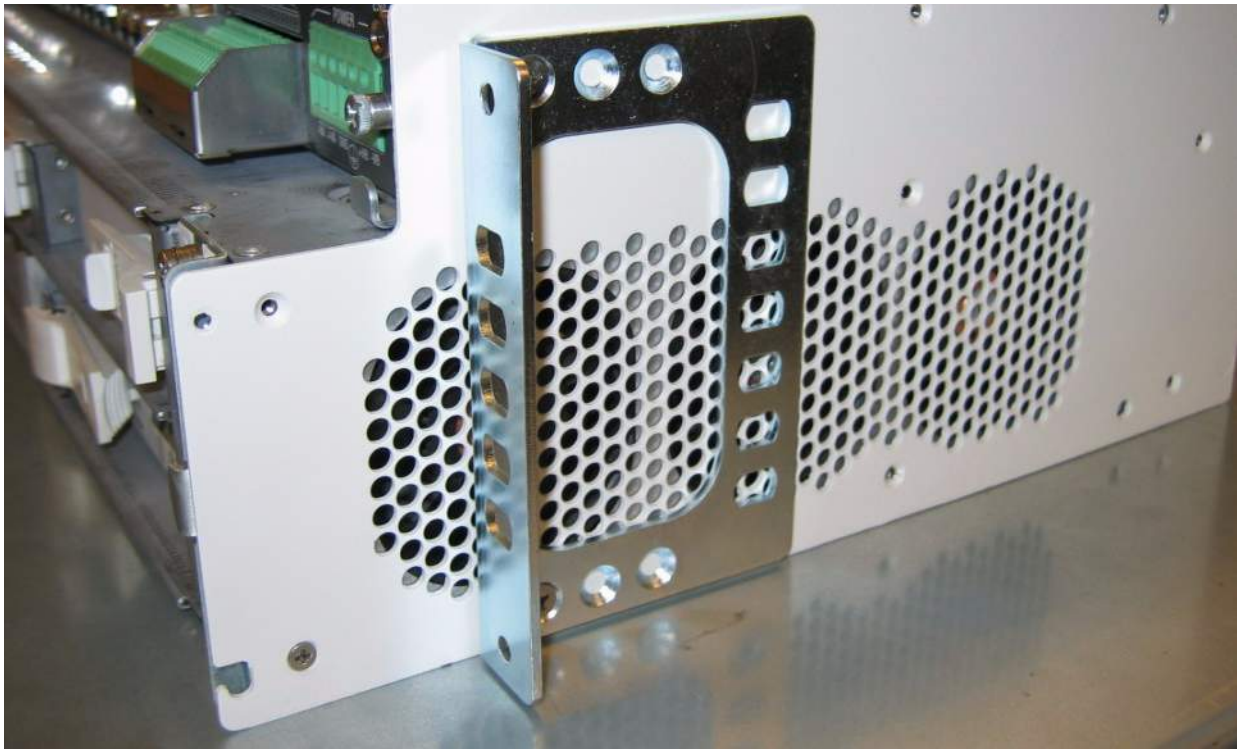


Figure 2-6 Mounting bracket position for 23-inch frame



Figure 2-7 Mounting bracket position for ETSI frame



15 Determine the position that the rack-mount Alcatel-Lucent 1850 TSS-5 shelf will be mounted. Start at the bottom of the bay and add shelves from bottom to top.

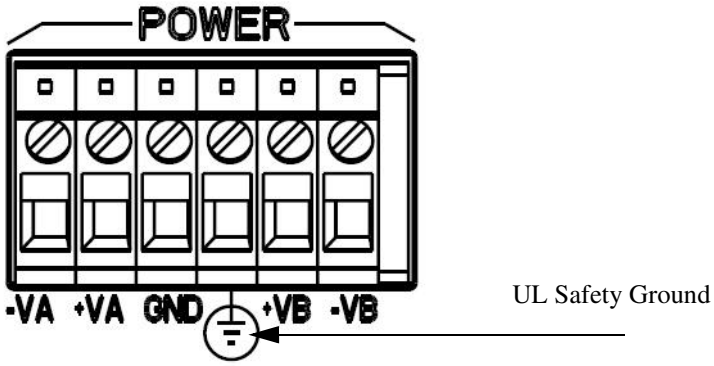
Note: There are no heat baffles needed betweenAlcatel-Lucent 1850 TSS-5 shelves. Only use heat baffles (848862181) above and below when stacking Alcatel-Lucent 1850 TSS-5 shelves with other vendors equipment in the same bay.

16 Position the rack-mount Alcatel-Lucent 1850 TSS-5 shelf in the frame and secure the shelf to the frame using the thread-forming screws, included with the shelf.

17 Attach grounding wire between the UL safety ground screw located in the middle of the power terminal block and appropriate safety ground. See Figure 2-8, “Power terminal block” (p. 2-11).

Note: Grounding wire must be of the same gauge as the cables used to power the shelf (12 AWG).

Figure 2-8 Power terminal block



18 Verify with an ohmmeter that the Alcatel-Lucent 1850 TSS-5 shelf is grounded properly. Measure between the Alcatel-Lucent 1850 TSS-5 shelf safety ground screw and the appropriate frame ground.

Requirement: The ohmmeter reads less than 1 ohm.

19 Verify with an ohmmeter that the ESD jack on the front of the shelf is grounded properly. Measure between the ESD jack stud and the appropriate frame ground.

Requirement: The ohmmeter reads less than 1 ohm.

20 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

Alcatel-Lucent 1850 TSS-5 Wall-Mount shelf installation

Introduction

This section provides instructions for mounting the Alcatel-Lucent 1850 TSS-5 Wall-Mount using the appropriate bracket.

Installation Notes:

1. The shelf will tolerate temperatures in a range of -40°C to +65°C. The heat from the Alcatel-Lucent 1850 TSS-5 Wall-Mount shelf is dissipated by horizontal air flow provided by integrated fans within the shelf.
2. The Alcatel-Lucent 1850 TSS-5 Wall-Mount is 17.4" (441 mm) wide, 4.9" (125 mm) high, and 11.8" (300 mm) deep.
3. Alcatel-Lucent 1850 TSS-5 Wall-Mount has an integrated fan unit, and is stackable.
4. The maximum weight of the Alcatel-Lucent 1850 TSS-5 Wall-Mount shelf, fully equipped, is 6.8kg (15 lbs).

Procedure

Proceed as follows:

1 Position the Wall-Mount Alcatel-Lucent 1850 TSS-5 shelf on a stable work surface.

2 Is the VLIU installed in the Alcatel-Lucent 1850 TSS-5 shelf?

IF...	Then...
Yes	Skip to Step 12
No	Continue with Step 6

Table 2-3 VLIU interface panel descriptions

Circuit Pack	Aparatus Code	Comcode	Release	Description
Interface Unit	VLIU1	109645614	R3.0	Required for basic shelf operation. Does not support VLNC52, VLNC55, or VLNC61; supports equipment protection on the VLNC50 only.

Circuit Pack	Aparatus Code	Comcode	Release	Description
Interface Unit	VLIU2	109659136	R5.0	Required for the higher density VLNC52, VLNC55, and VLNC61 circuit packs when used in conjunction with the VLNC40.
Interface Unit	VLIU3	109705152	R6.0	Required front access paddleboard to support ToD and high density >8DS1/E1 interfaces. when equipped with VLNC62 and VLNC42B.
Interface Unit	VLIU10	109657247	R5.0	Required for equipment protection for the VLNC52 and VLNC55. Unprotected VLNC6X circuit packs. Cannot be used with the VLNC40.

3 Refer to Table 2-2 above for the VLIU interface panel descriptions

4 If the VLIU interface panel was shipped separate from the shelf, it must be inserted into the top of the shelf.

5 Locate the VLIU interface panel and remove from packaging.

6 With the faceplate latch levers of the VLIU in an open position (45° angle) as seen in Figure 2-1, “VLIU faceplate latches” (p. 2-7) seat the VLIU interface panel into the slot, aligning the left and right PWB edges with the card guides. Slide the VLIU into place by applying steady pressure to the faceplate and latch assemblies until latch levers engage the pins of the shelf.

7 Secure the VLIU interface panel in the shelf by pushing both left and right latch levers simultaneously rotating toward the sides of the shelf until VLIU interface panel is fully seated. See Figure 2-2, “Fully seated VLIU interface panel” (p. 2-7).

8 Using a phillip head screwdriver, tighten the captive screws on the left and right sides of the VLIU interface panel. See Figure 2-3, “VLIU captive screws” (p. 2-8)

9 Once the VLIU interface panel is in place, determine the Wall-Mount location for the Alcatel-Lucent 1850 TSS-5 shelf.

10 Locate the Wall-Mount hardware that was shipped with the Alcatel-Lucent 1850 TSS-5 shelf.

11 The wall mounting bracket kit will contain the following hardware See Figure 2-9, “Wall-Mount bracket kit” (p. 2-15)..

Quantity	Description
4	Screws for mounting the brackets to the shelf
4	Wood Screws for mounting the shelf to the wall
1	Safety Instruction Sheet

Figure 2-9 Wall-Mount bracket kit



12 With one bracket in hand, mark the location using a marker or pencil to stencil the hole to be drilled. See Figure 2-10, “Wall Mount bracket marking position” (p. 2-16)

Figure 2-10 Wall Mount bracket marking position



13 Drill the first hole using a 1/8" drill bit to start the wood screw.

14 Attach the wood screw to the first hole drilled and then place the bracket with the flange side protruding out from the bottom. Refer to Figure 2-10, “Wall Mount bracket marking position” (p. 2-16).

15 Level the bracket before marking the drill hole position for the second hole.

16 Drill the second hole using a 1/8" drill bit to start the wood screw.

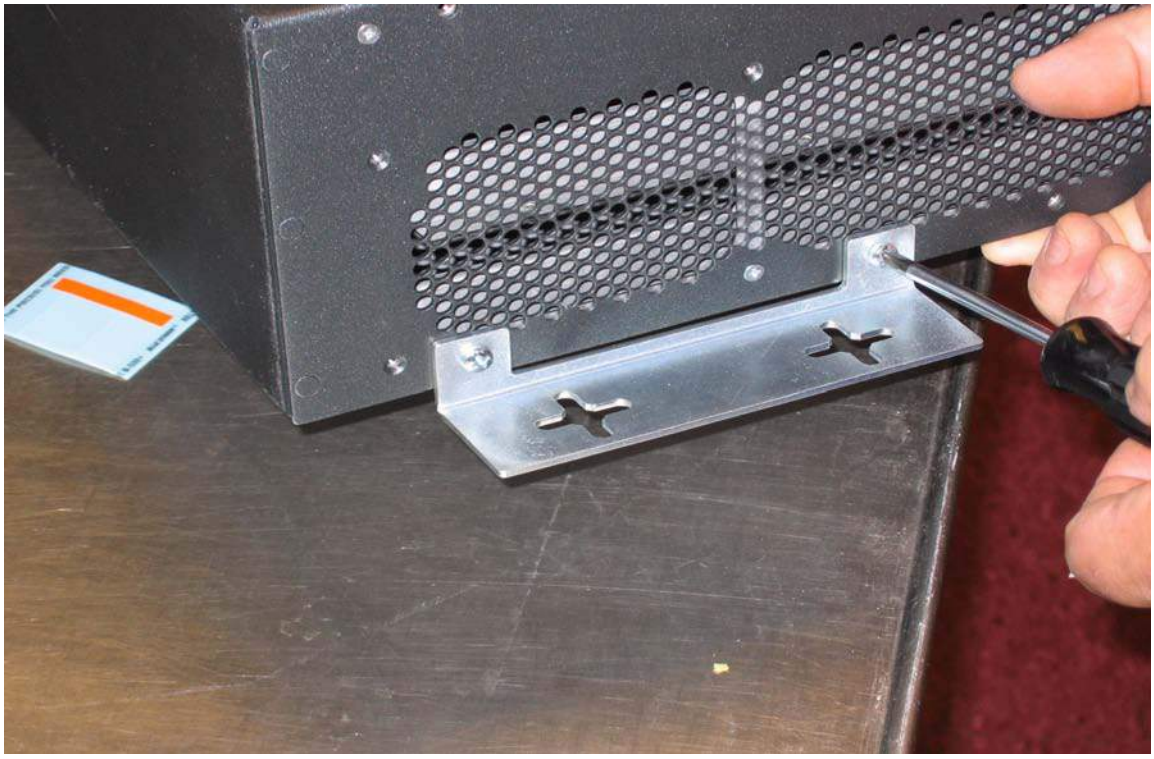
17 Attach the second wood screw to the bracket.

18 Do not tighten the wood screws at this time.

19 Remove the bracket from the wall so that it can be attached to the chassis.

20 Attach both brackets to the chassis using the flat Philips screws provided. See Figure 2-11, “Attach brackets to chassis” (p. 2-17).

Figure 2-11 Attach brackets to chassis



Note: There is only one position for the brackets to be mounted to the chassis.

21 Once the brackets are attached to the chassis, mount the chassis to the wood screws.

22 The recommended shelf mounting position for proper air flow is shown in Figure 2-12, “Mounting position for wall-mount shelf” (p. 2-18)

Figure 2-12 Mounting position for wall-mount shelf



23 21.Drill the bottom two holes using the 1/8" drill bit.

24 22.Tighten down all 4 wood screws.

25 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

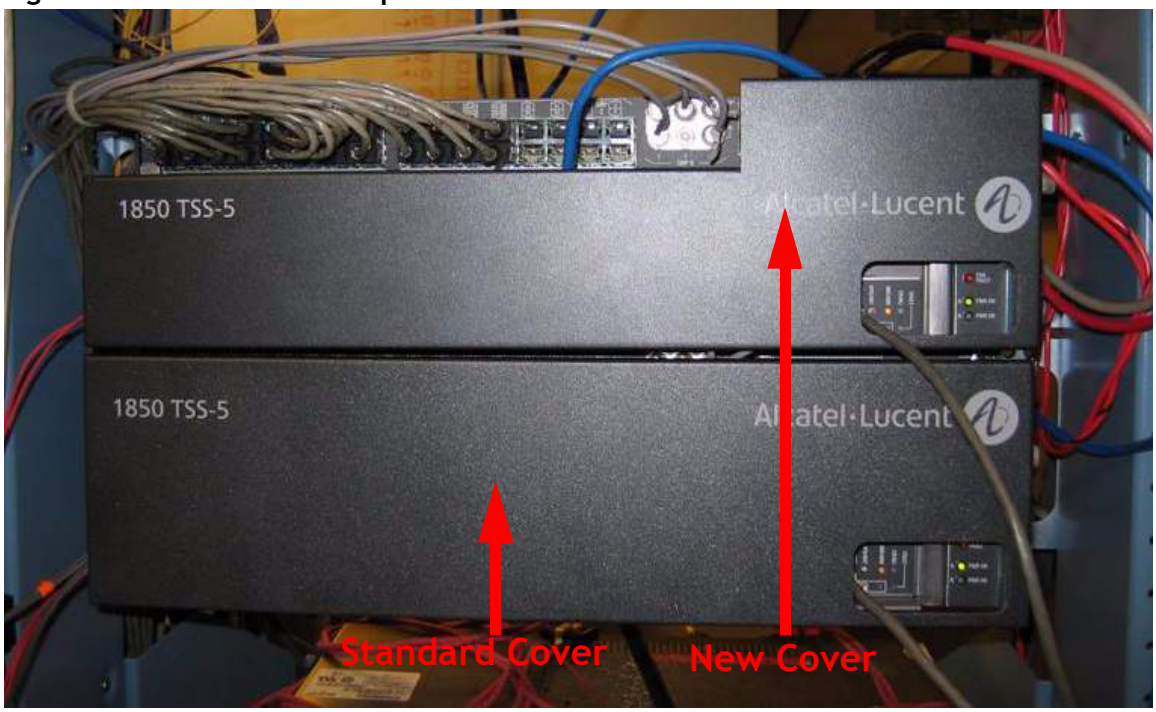
END OF STEPS

Front cover

Overview

The Alcatel-Lucent 1850 TSS-5 shelf comes with either of the following shelf covers. The standard cover and a new cable stress release cover. See Figure 2-13, "Front Cover Options" (p. 2-19). Once installation is completed and all cables are routed attach the front cover to the shelf. This section should be performed on all shelf installations.

Figure 2-13 Front Cover Options



1 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. 1-4).

END OF STEPS

Power description

Overview

This section should be performed on all shelf installations.

Tools, test equipment and accessories

Listed below are the tools, test equipment and accessories necessary to perform the procedures in this section.

Quantity	Required	Description	Comments
	Y	Screwdriver(s)	A screwdriver(s) with the appropriate head(s) is (are) required for securing the mounting screws, repositioning the mounting brackets, and installing the interfacing cables.
1	Y	ESD wrist strap	A wrist strap must be worn when handling circuit packs. Use the electrostatic discharge (ESD) jack provided on the shelf.
1	Y	Multimeter	The voltmeter must be capable of measuring DC voltage in the 0 to 60 volt range. The use of the voltmeter is optional since the shelf will alarm or shut down if the proper voltage is not supplied.

Power cable installation

Description

This section provides instructions on installing the power cabling for the Alcatel-Lucent 1850 TSS-5 shelf.

Each power feeder (A and B) requires a single power feed from the battery distribution fuse board (BDFB), or the battery distribution circuit breaker bay (BDCBB) to the Alcatel-Lucent 1850 TSS-5 shelf.

If the Alcatel-Lucent 1850 TSS-5 is powered through only one power feed, the system will report a minor alarm. To suppress the alarm, use two jumpers, one jumper between the -VA and -VB and the second jumper between +VA and +VB. The gauge of both jumpers should be the same as the gauge being brought in from either the Battery Plant (#12AWG to #20AWG).

Table 2-4, "Power cable assembly" (p. 2-21) and Table 2-5, "Power cable color coding for -48V connection" (p. 2-22)list the available power cable assembly and power connections, respectively

Table 2-4 Power cable assembly

Description	Cable Assembly #	Cable Length (feet)
DC Power cable 12 AWG 4 conductors from power block to DC power source, both ends un-terminated.	848946687	30

Procedure

Proceed as follows:

1 Verify the power source is off.

2 Connect the A and B power cables to the A and B connector pins of the terminal block located on the top right. Use a torque screwdriver set to 0.5 nm (4.4 lb-in) to tighten. See Figure 2-8, "Power terminal block" (p. 2-11).

Note: Power cables must be between 12 AWG and 20 AWG and have an **9-mm** wire strip length for connection to the terminal block. Use the guide located on the shelf labeling for accurate lengths.

12AWG wire allows for the greatest distance between a power source(BDFB) and the Alcatel-Lucent 1850 TSS-5 shelf.

Table 2-5 Power cable color coding for -48V connection

	Color Coding	Connection
BAT A	Red	-VA
	Red/Black	+VA
BAT B	Blue	-VB
	Blue/Black	+VB

Note: For 48Vgrounding when using -48V, add a 16 AWG strap between +VA and GND and +VB and GND. The dc terminal block can accommodate wire sizes from 12 to 20 AWG, however, if jumpering between positions, for grounding, the maximum wire size that allows 2-wires into same hole is 16AWG.

Table 2-6 Power cable color coding for +24V connection

	Color Coding	Connection
BAT A	Red	+VA
	Red/Black	-VA
BAT B	Blue	+VB
	Blue/Black	-VB

Note: For 24V grounding when using +24V add a 16 AWG strap between -VA and GND and -VB and GND. The dc terminal block can accommodate wire sizes from 12 to 20 AWG, however, if jumpering between positions, for grounding, the maximum wire size that allows 2-wires into same hole is 16 AWG.

3 Route the power cables toward the power source (e.g., BDCBB, BDFB etc.)

Note: The Alcatel-Lucent 1850 TSS-5 is powered by either +24V DC or -48 V DC.



NOTICE

If using BBCBB or BDFB, verify that the BDCBB breakers are off or that the BDFB fuses are not installed.

4 Splice feeders from the BDCBB or BDFB to the Alcatel-Lucent 1850 TSS-5 power cables. Refer to Table 2-5, "Power cable color coding for -48V connection" (p. 2-22) and Table 2-6, "Power cable color coding for +24V connection" (p. 2-22).

Note: Four wires are spliced to the power cables:

1. -VA
2. +VA
3. -VB
4. +VB

5 Label the feeders at the power source as follows:

1. -VA
2. +VA
3. -VB
4. +VB

Note: Each -48V or +24V feed should be fused for 8 amperes.

6 Leave the power supply mechanism disconnected at the power source until you are ready to perform the procedures in Chapter 4, "Circuit pack installation" of this manual.

Note: The BDFB requires the removal of fuses to inhibit power flow.

7 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. 1-4).

END OF STEPS

Powering

Overview

The following table lists the requirements for the Alcatel-Lucent 1850 TSS-5 shelf.

Table 2-7 Alcatel-Lucent 1850 TSS-5 shelf power supply requirements

Item	Description
Voltage range, all components	-40.0V to -57.0 VDC +20.0V to +28.0 VDC
Power feeders	A and B (-48 VDC or +24 VDC)
Circuit breakers (one per feeder) or fuse (one per feeder)	Two 8A fuses for either -48 VDC or +24 VDC are required

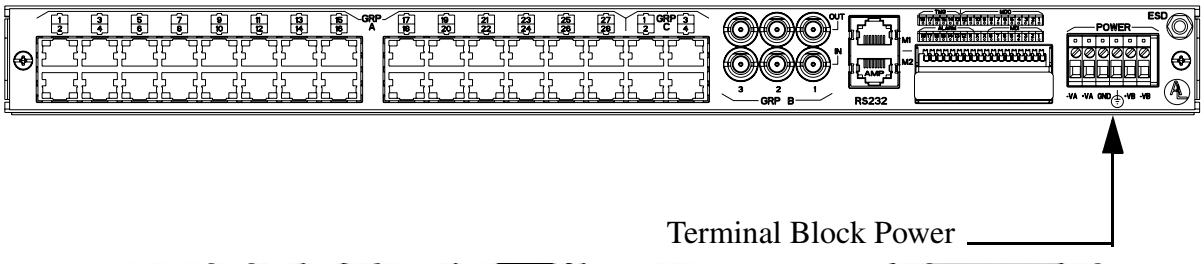
Procedure

Proceed as follows:

1 Verify that the Alcatel-Lucent 1850 TSS-5 shelf is properly grounded by measuring the resistance between the return signal on the power terminal block and frame ground.

2 The resistance between frame ground and the return should be less than 1 ohm.

Figure 2-14 Power connections on rack-mount Alcatel-Lucent 1850 TSS-5 VLIU plug-in circuit pack



3 Connect the fuses at the BDFB, or turn on the breakers at that BDCBB.

4 At the Alcatel-Lucent 1850 TSS-5 power terminal block if power is -48 VDC, use a voltmeter and measure the voltage on the power cable between -VA and +VA. Then measure the voltage between -VB and +VB.

Requirement: The voltage MUST be between -40.0 VDC and -57.0 V DC.

Important! In case of DC power equipment, measure the DC power on the screwdriver above the wires, with a thin and isolated point, to avoid short-circuits. You can see below on the DC power terminal block that –V and +V are side by side.



5 At the Alcatel-Lucent 1850 TSS-5 power cable connector, if power is +24 VDC, use a voltmeter and measure the voltage on the power cable between +VA and -VA. Then measure the voltage between +VB and -VB.

Requirement: The voltage MUST be between +20.0 VDC and +28.0 VDC.

6 Verify that the PWR-A and PWR-B LEDs are lighted.

7 Inhibit the power flow to the “B” power feed of the Alcatel-Lucent 1850 TSS-5 shelf by either:

- Disconnecting the corresponding fuse at the BDFB
- Turning off the corresponding breaker at that BDCBB.

8 Verify that only the PWR-A LED on the Alcatel-Lucent 1850 TSS-5 shelf is lit with only the “A” feed powered.

9 Restart the power flow to the “B” power feed of the Alcatel-Lucent 1850 TSS-5 shelf by either:

- Connecting the corresponding fuse at the BDFB.
- Turning on the corresponding breaker at that BDCBB.

10 Inhibit the power flow to the “A” power feed of the Alcatel-Lucent 1850 TSS-5 shelf by either:

- Disconnecting the corresponding fuse at the BDFB.
- Turning off the corresponding breaker at that BDCBB.

11 Verify the PWR-B LED on the Alcatel-Lucent 1850 TSS-5 shelf is lit with only the “B” feed powered.

12 Restart the power flow to the “A” power feed of the Alcatel-Lucent 1850 TSS-5 shelf by either:

- Connecting the corresponding fuse at the BDFB.
- Turning on the corresponding breaker at that BDCBB.

13 Verify that the PWR-A and PWR-B LEDs are lit with both "A" and "B" power feeds powered.

14 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

Part II: Stand-alone installation tests

Overview

Purpose

Part II covers downloading software to the Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) and then installation of circuit packs. This section also covers installation and operational tests.

Contents

This part of the document contains the following chapters:

Cable and fiber installation	3
Circuit pack installation	4
Stand-alone node set-up	5

Installation checklist

Table 2-1 Part II installation checklist

Section and Chapter	Procedure	Required	Completed	
			Yes	No
Chapter 5, “Stand-alone node set-up”	“Circuit pack compatibility” (p. 5-2)	No		
	“Circuit pack installation” (p. 5-5)	Yes		
	“Software installation” (p. 5-12)	Yes		
	“Use of WaveStar® CIT software” (p. 5-13)	Yes		
Chapter 6, “Stand-alone installation testing”	“Setting VLNC50/52/55 DS1 LBO values” (p. 6-2)	Yes		

Section and Chapter	Procedure	Required	Completed	
			Yes	No
	"Setting VLNC60/61/62 LBO settings (optional)" (p. 6-4)	Yes		
	"Clearing alarms" (p. 6-8)	Yes		
	"DS1 testing procedure" (p. 6-10)			
	"E1 testing procedure" (p. 6-13)			
	"DS3/E3 testing procedure" (p. 6-17)			
	"VLNC33 and VLNC35 standalone test" (p. 6-21)			
	"VLNC40/VLNC42/VLNC42B standalone test" (p. 6-22)			
	"VLNC60/61/62 standalone test" (p. 6-28)			
	"VLNC64 standalone test" (p. 6-31)			
	"LED test" (p. 6-34)			
	"Office alarm test" (p. 6-35)			
	"Miscellaneous (environmental) discrete telemetry test" (p. 6-38)			
	"Final operations" (p. 6-41)	Yes		

Tools, test equipment and accessories

Listed below are the required tools, test equipment and accessories.

Quantity	Required	Description	Comments
1	Y	Personal Computer (PC)	See ""PC minimum requirements for WaveStar® CIT installation" (p. 2-4)" below.

Quantity	Required	Description	Comments
1	Y	CIT Interface Cable (848748869)	8-ft. long RJ45 to 9-pin D-sub serial cable.
		LAN 10BASE-T (Crossover)	Allows for direct connection between the PC LAN card and the CTL LAN slot. See Table 3-21, "Ethernet / LAN crossover cable" (p. 3-44) for Comcode information.
		LAN 10BASE-T (StraightThrough)	Allows for connection between the PC NIC card and a HUB. See Table 3-22, "LAN cross-over cable connections" (p. 3-44) for Comcode information.
1	Y	ESD wrist strap	A wrist strap must be worn when handling circuit packs. Use the electrostatic discharge (ESD) jack provided on the shelf.
1	Y	Software CD-ROM	Verify latest software version is being used.
1	N	Customer Release Notes (CRN)	Verify latest issue of the CRN is being used, for the software that is used.
1	Y	DS1/E1 and DS3/E3 Error Rate Test Set	A DS1/E1 and DS3/E3 error rate test set is required for testing of DS1/E1 and DS3/E3 cabling.
2	Y	DS1/E1 patch cords	DS1/E1 patch cords to test the DS1/E1 ports. If connecting directly to the VLIU that end must be RJ-45
2	Y	DS3/E3 Mini BNC to standard BNC	Allows testing of the DS3/E3 ports on the VLIU panel.
2	Y	LC to LC Optical Fiber Jumpers (108918269)	Optical fiber jumpers with LC-type connectors are required to optically loop the Alcatel-Lucent 1850 TSS-5 shelf for test purposes. 2 fibers are needed for the main card.
1	Y	LC-Type LBOs 5dB (108279381) 10dB (108279431) 15dB (108279480) 20dB (108279530)	Two of each type may be necessary to loop the VLNC50/VLNC64 optical port's IN to OUT depending on the optical PTM reach.

Quantity	Required	Description	Comments
1	Y	CLETOP Cleaning Cassette Type A Reel (901375154)	See "Fiber cleaning" (p. A-1)

PC and cable requirements for WaveStar® CIT

This section lists the required and optional equipment needed to run the WaveStar® CIT software with the Alcatel-Lucent 1850 TSS-5.

Quantity	Required	Description	Comments
1	Y	Personal computer (PC)	See "PC minimum requirements for WaveStar® CIT installation" (p. 2-4) below.
1	Y	CIT interface cable (848748869)	8-ft. long RJ45 to 9-pin D-sub serial cable.
1	Y	LAN 10BASE-T (Crossover)	Allows for direct connection between the PC LAN card and either the VLNC40 MGMT LAN Port, or the VLNC60 LAN or the CTL LAN slot. See Table , "LAN cable installation" (p. 3-44) for Comcode information.
		LAN 10BASE-T (straight through)	Allows for connection between the PC NIC card and a HUB. See Table 3-23, "LAN straight-through cable connections" (p. 3-45) for Comcode information.

PC minimum requirements for WaveStar® CIT installation

- Windows 2000 or Windows XP Operating Systems
- 256 MByte of RAM (minimum), 512 MByte recommended
- 139 MByte Virtual Memory (minimum), 267 MByte recommended.
- SVGA monitor set to 800x600 resolution or greater, with 256 colors (1024x768, 16 million colors recommended)
- 650 MByte memory available on hard drive (minimum), 750 MByte Recommended (for all graphical packages).
- CD-ROM drive
- 10/100 BaseT LAN interface (network interface card, NIC)

- Pentium II, 266-MHz Processor (minimum), Pentium IV, 1 GHz recommended.

  Important! Minimum requirements are sufficient to run one System GUI view the recommended requirements may run multiple (up to 4) System GUI views, unless otherwise noted. Recommended requirements are intended to be used as a general guideline to optimize WaveStar® CIT performance. As the CIT is used with multiple NE connections and multiple NE types, the processor type and speed as well as the memory size will all factor in to CIT performance.

3 Cable and fiber installation

Overview

Purpose

This chapter provides installation and cabling instructions for the Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) high-capacity shelf.

Contents

This chapter provides information on the following topics

DS1/E1 cable installation	3-3
DS3/E3 cable Installation	3-11
Ethernet cable installation	3-14
Office alarm cable installation	3-24
Miscellaneous (environmental) discrete telemetry cable installation	3-28
Timing cable installation	3-31
E1 timing interface converters	3-33
OC-3/STM-1 OC-12/STM-4 and OC-48/STM-16 main optical fiber cable installation	3-36
10/100/1G cable installation	3-38
RS-232 cable assembly	3-41
LAN cable installation	3-44
Final operations	3-46

Cabling checklist

This section briefly describes cabling information, including the number of particular cables required. For information regarding available cable lengths and ordering comcodes, refer to the tables in this chapter. All connections are made to the VLIU, also known as the I/O plug-in circuit pack for the Alcatel-Lucent 1850 TSS-5.

"Cable requirements and options" (p. 3-2) lists available cables along with the required number (if any).

Table 3-1 Cable requirements and options

Cable Assembly Description	Required	See Note
Power	Yes	*1*
DS1/E1	Optional	2
DS3/E3	Optional	3
Office Alarms	Optional	4
LAN cable	Yes	5
Miscellaneous Discrete	Optional	
Sync cable	Optional	

Notes:

1. One cable assembly supports both the -48VDC or +24VDC (A and B) main power feeders. A cable assembly kit is available (12 AWG, 4 conductors 30'). Wires are stripped and connected directly to the terminal block on the VLIU. Voltage range is -40 to -57 VDC at 2.5A or +20 to +28 VDC at 5.0A. Each power feed needs to have an external 8.0A fuse.
2. One "Single DS1/E1 Cable Assembly" is required for each DS1/E1 supported by the main pack. Each DS1/E1 Cable Assembly supports either 1 or 2 pair of 26-gauge shielded cable RJ45/un-terminated or RJ45 to RJ45 cables. One cable is for both input and output signals.
3. Two DS3/E3 Mini-BNC cables are needed for each DS3/E3 circuit. Populate in pairs (1 receive and 1 transmit), as required for up to a total of 6 mini-BNC cables per Alcatel-Lucent 1850 TSS-5 shelf. Lengths from 25' to 250'.
4. When cabling the Alcatel-Lucent 1850 TSS-5 for office alarm applications, one office alarm cable assembly is required for each Alcatel-Lucent 1850 TSS-5 shelf.
5. When accessing the shelf through the LAN (OSI/TCP-IP) connection, either a LAN cross-over cable or a LAN straight-through cable is required to access the shelf. The cross-over cable should be used when connecting directly between the shelf from a PC LAN card. The straight-through cable should be used when connecting the shelf to a hub.

DS1/E1 cable installation

Description

This section describes how to connect the DS1/E1 transmission cables to the A function group of the shelf. There are three different types of VLIU paddle boards as well as different DS1/E1 main circuit pack cards supporting different quantities of DS1/E1s. These paddle boards in conjunction with these main-cards support either protected or unprotected DS1/E1 configurations. For Release 5.1, the VLNC50 supports 8 DS1/E1s, the VLNC52 supports 28 DS1s and 21 E1s. The VLNC55 supports 28 DS1s and 21 E1s. The VLNC60 supports 8 DS1/E1s and the VLNC61 supports 16 DS1/E1s.

The cables are connectorized (RJ-45 Type) at the Alcatel-Lucent 1850 TSS-5 end and may need to be wire-wrapped at the DSX end if equipped with a blunt connection end. If applicable, route the cables out of the bay and connect the cables to a DSX panel.

Table 3-2, “DS1/E1 cable assemblies” (p. 3-3) and Table 3-3, “Single harness DS1/E1 for VLIU1 VLIU3 and VLIU10 applications” (p. 3-5) lists the available DS1/E1 cable assemblies and DS1/E1 connections, respectively.

Table 3-2 DS1/E1 cable assemblies

Description	Cable Length (feet)	Orderable Code
Single DS1/E1 Cable, 26-gauge, RJ45-RJ45	8	109468124
	20	109142398
	50	109142406
	100	109142414
	150	109142422
	250	109142430
	350	109142448
	550	109142455

Description	Cable Length (feet)	Orderable Code
Single DS1/E1 Cable, 26-gauge, RJ45 blunt-cut (un-terminated)	8	109468132
	20	109142323
	50	109142331
	100	109142349
	150	109142356
	250	109142364
	350	109142372
	550	109142380
DS1/E1 #1-16 cable harness, RJ45-RJ45	20	109147942
	50	109147959
	100	109147967
	150	109147975
	250	109147983
	350	109147991
	550	109148007
Bundle of 16 DS1/E1 cables, 26 gauge, RJ45 blunt-cut (un-terminated)	20	109308437
	50	109308445
	100	109308452
	150	109308460
	250	109308478
	350	109308486
	550	109308494

Description	Cable Length (feet)	Orderable Code
Dual DS1 cable, halogen free, RJ45 to un-terminated one shielded RJ45 plug, no boot 24GA solid shielded halogen free cable other end, no connector The new cable codes do not replace any of the existing codes. These cables are for customers using the TSS-5, equipped with VLIU2 I/O panel for cases where they need to access the max I/O of a VLNC52 (28DS1/E1 and the VLNC40 (20 FE ports) at same time.	20	849090451
	50	849090469
	100	849090477
	150	849090485
	250	849090493
	350	849090501
	550	849090519

Table 3-3 Single harness DS1/E1 for VLIU1 VLIU3 and VLIU10 applications

Pin	Tip/Ring Designation	Direction	Color
1	Ring	Out	BL-W
2	Tip	Out	W-BL
4	Ring	In	O-W
5	Tip	In	W-O

Note: This harness can be used on the VLIU2 but will only provide 16 DS1/E1s.

Table 3-4 Dual harness DS1/E1 for VLIU2 applications

Pin	Tip/Ring Designation	Direction	Color
1	Ring*	Out	W-Green
2	Tip*	Out	Green
4	Ring*	In	Blue
5	Tip*	In	W-Blue
3	Ring**	Out	W-Orange
6	Tip**	Out	Orange
7	Ring**	In	W-Brown
8	Tip**	In	Brown

Legend:

* Indicates the primary pin pairing directions for ports 1 to 16

**Indicates the secondary pin pairing directions for ports 17 to 28.

Procedure

Proceed as follows:

Important! The Alcatel-Lucent 1850 TSS-5 VLIU1 only terminates 8 DS1/E1 connections. If a bundle of 16 DS1/E1 cable assemblies is ordered, use this harness for terminating two Alcatel-Lucent 1850 TSS-5 shelves.

Important! The Alcatel-Lucent 1850 TSS-5 VLIU3 paddle board only terminates 8 DS1/E1 connections. It uses the Single harness cable assembly for terminating these 8 DS1/E1s. Use Table 3-3, “Single harness DS1/E1 for VLIU1 VLIU3 and VLIU10 applications” (p. 3-5)andFigure 3-2, “VLIU3 DS1/E1 access panel cable connections” (p. 3-8) as a guide for proper DS1/E1 terminations.

Important! The Alcatel-Lucent 1850 TSS-5 VLIU2 terminates 28 DS1 or 21 E1 connections. Use the Dual harness cable assembly for terminating 28 DS1/E1 on the VLIU2 paddle board only.

Important! The Alcatel-Lucent 1850 TSS-5 VLIU10 terminates 28 protected DS1 or 21 E1 connections. Use the single harness cable assembly to terminate the VLIU10 paddle boards. Use Table 3-3, “Single harness DS1/E1 for VLIU1 VLIU3 and VLIU10 applications” (p. 3-5)and Figure 3-6, “VLIU10 paddle board” (p. 3-9) as a guide for proper DS1/E1 terminations.

Note: To terminate 28 DS1s on a VLIU2 paddle board, 12 Dual harness cables (24 DS1s) and 4 single harness cables should be used. Use Figure 3-4, "VLIU2 DS1 RJ-45 port assignments" (p. 3-9) as a visual guide. For terminating 21 E1s, 5 Dual harness cables and 11 single harness cables should be used. Use Figure 3-5, "VLIU2 E1 RJ-45 port assignments" (p. 3-9) as visual guide.

1 Refer to the engineering job specification. Obtain the DS1/E1 cables per Table 3-2, "DS1/E1 cable assemblies" (p. 3-3). Label the cables, indicating bay and shelf, and direction (IN or OUT of the bay) at each end. See Table 3-3, "Single harness DS1/E1 for VLIU1 VLIU3 and VLIU10 applications" (p. 3-5) or Table 3-4, "Dual harness DS1/E1 for VLIU2 applications" (p. 3-6)for associated color coding.

Note: Blunt-end cables that are to be wire wrapped will need to be labeled IN or OUT. Cable ends terminated using a RJ-45 connector will not need to be labeled using the IN and OUT designation because both are supported by the connector.

2 Connect the RJ-45 end of a single cable to the respective RJ-45 Receptacle on the access panel on the front of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf as shown in Figure 3-1, "VLIU1 DS1/E1 access panel cable connectors" (p. 3-8), Figure 3-2, "VLIU3 DS1/E1 access panel cable connections" (p. 3-8), Figure 3-3, "RJ-45 pin out for VLIU2 dual cable harness" (p. 3-8) and Figure 3-4, "VLIU2 DS1 RJ-45 port assignments" (p. 3-9),Figure 3-5, "VLIU2 E1 RJ-45 port assignments" (p. 3-9) and Figure 3-6, "VLIU10 paddle board" (p. 3-9)

3 If necessary attach a 3" tie bar to the front of the Alcatel-Lucent 1850 TSS-5 shelf above the circuit packs slots and just above the top of the VLIU. This will allow the front cover to close.

4 Route the cables **toward the left** along the tie bar and into the bay cable rack. See Figure 3-8, "DS1/E1 cable routing for VLIU 1 Paddle board" (p. 3-10).

Figure 3-1 VLIU1 DS1/E1 access panel cable connectors

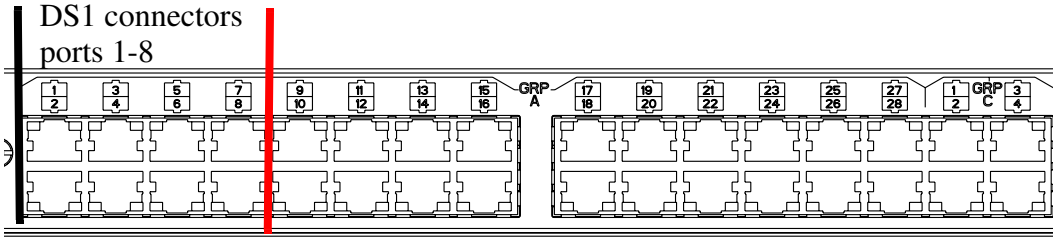


Figure 3-2 VLIU3 DS1/E1 access panel cable connections

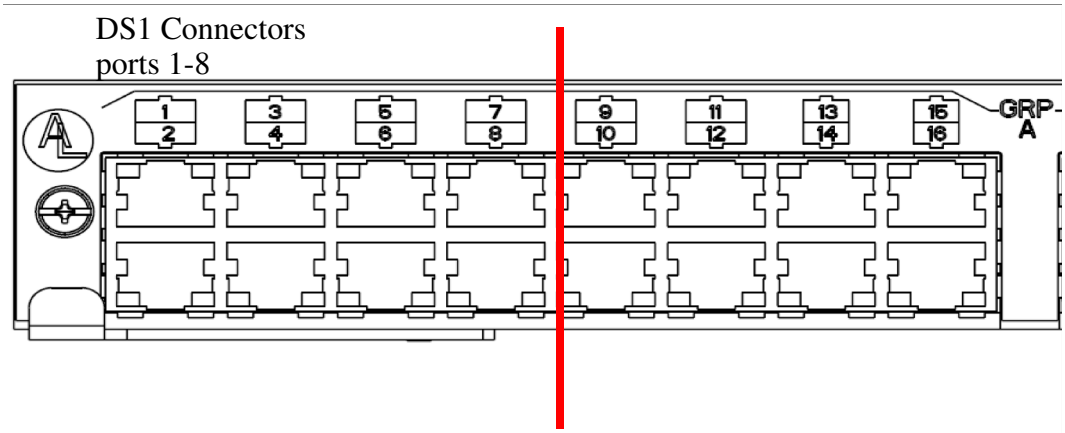


Figure 3-3 RJ-45 pin out for VLIU2 dual cable harness

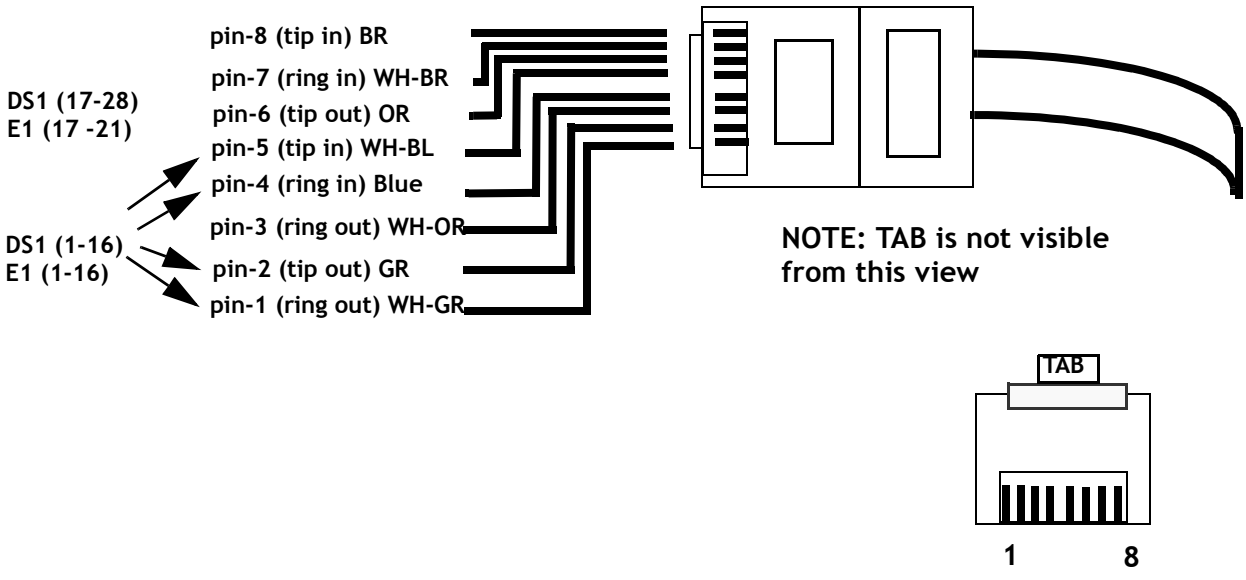


Figure 3-4 VLIU2 DS1 RJ-45 port assignments

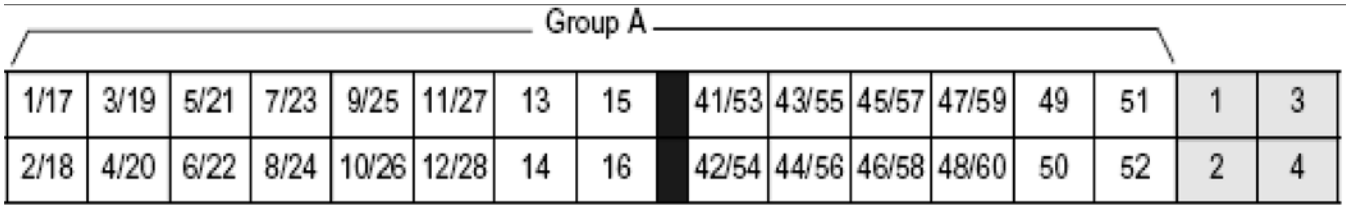


Figure 3-5 VLIU2 E1 RJ-45 port assignments

a-1 a-17	a-3 a-19	a-5 a-21	a-7	a-9	a-11	a-13	a-15
a-2 a-18	a-4 a-20	a-6	a-8	a-10	a-12	a-14	a-16

Note: For E1 applications, only the first five RJ-45 ports (a-1 to a-5) use the dual port scheme because there are only 21 ports.

Figure 3-6 VLIU10 paddle board

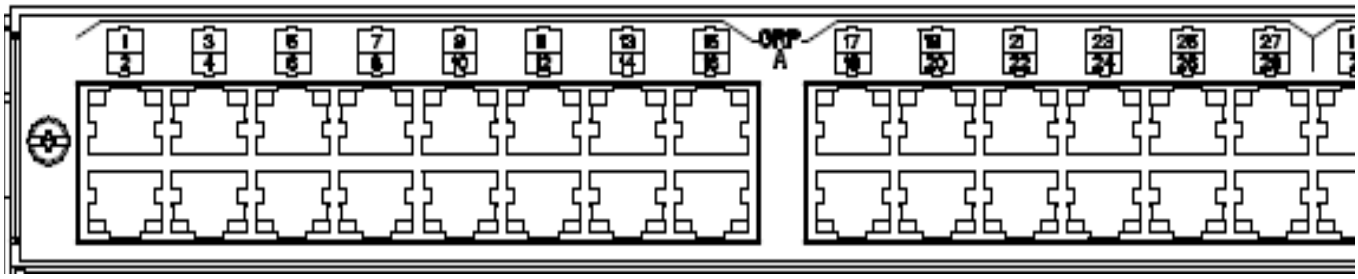


Figure 3-7 VLIU3 Paddle board Ethernet and Time of Day RJ-45 assignments

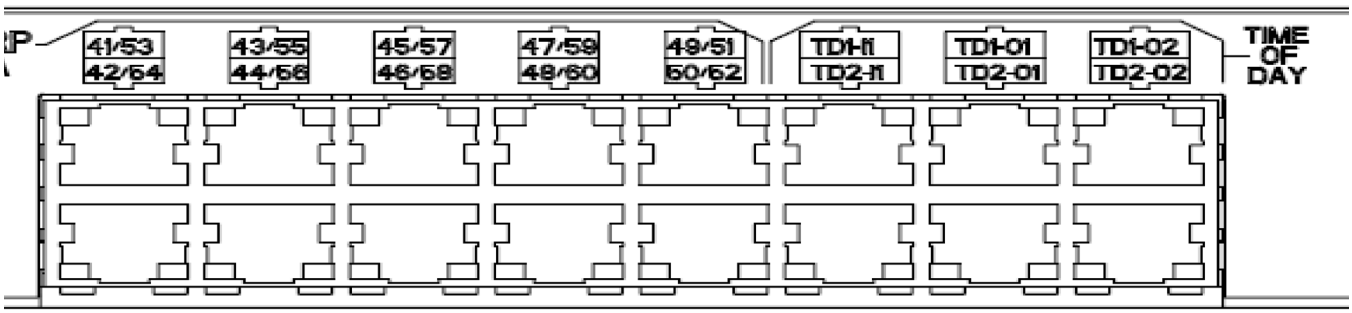
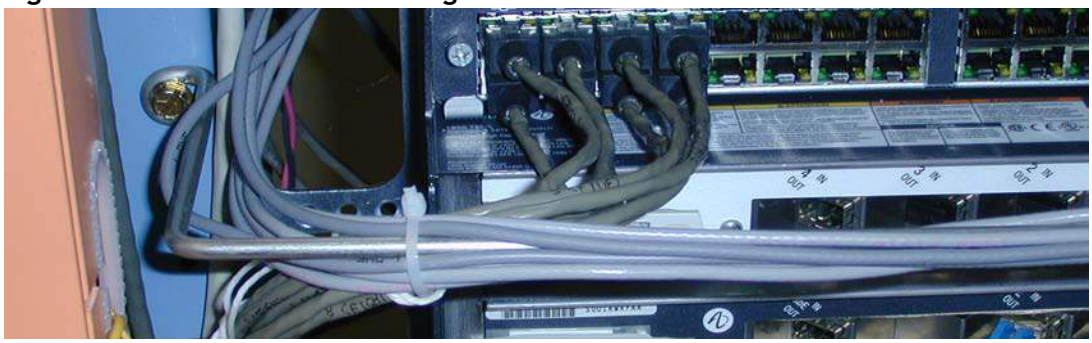


Figure 3-8 DS1/E1 cable routing for VLIU 1 Paddle board



5 Are you terminating the DS1/E1 cables on a DSX?

IF...	Then...
Yes	Go on to Step 6
No	Skip to Step 9

6 Remove slack and cut the DS1/E1 cables to the desired length at the DSX.

7 Referring to Table 3-3, “Single harness DS1/E1 for VLIU1 VLIU3 and VLIU10 applications” (p. 3-5), carefully observe color codes and wire-wrap the cables at the DSX.

8 Referring to Table 3-4, “Dual harness DS1/E1 for VLIU2 applications” (p. 3-6) carefully observe color codes and wire-wrap the cables at the DSX.

9 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

DS3/E3 cable Installation

Description

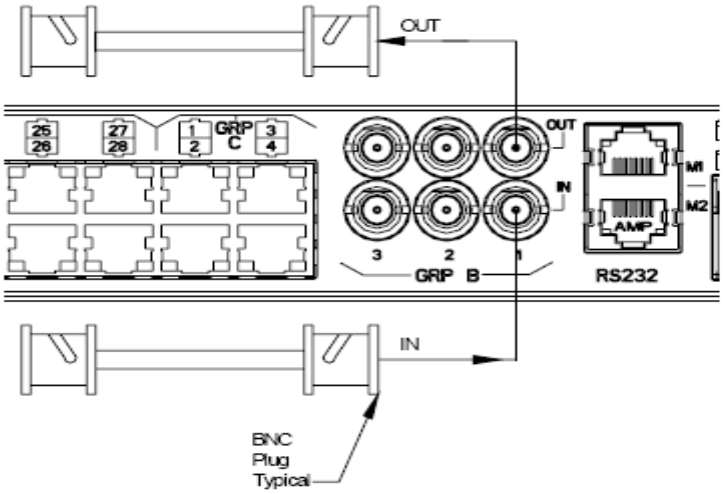
This section describes how to connect the DS3/E3 transmission cables to the B function group of the shelf. If applicable, route the cables out the bay and connect to the DSX panel.

The cables are connectorized with BNCs at each end. A mini BNC connects to the access panel, one cable each for Input and Output direction. The B function group supports up to 3 DS3/E3s.

Table 3-5 DS3/E3 cable assemblies

Description	Cable Length (Feet)	Orderable Code
Mini-BNC DS3/E3 Cable One 735A coaxial cable per code with one Mini-BNC to one standard BNC plug. Order two codes per DS3/E3, one for input, the other for output. Related Tools / Kits: 409079993 - Mini-BNC plug RT-4L installer tool (Trompeter) 406575969 - standard BNC plug RT1L installer tool 409064078 - TK2-20 Mini-BNC jack repair kit, includes RT4L mini-BNC installer tool	25	109508325
	50	109508333
	75	109508341
	100	109508358
	125	109508366
	150	109508374
	175	109508382
	200	109508390
	250	109508408

Figure 3-9 DS3/E3 access panel connectors



Procedure

Proceed as follows:

1 Refer to engineering job specification. Obtain the DS3/E3 cables per Table 3-5, “DS3/E3 cable assemblies” (p. 3-11). Label the cables, indicating bay and shelf and direction (IN or OUT of the bay) at each end.

2 Connect the BNCs at each end. Mini BNCs connect to the DS3/E3 Access Panel. Refer to Table 3-9, “DS3/E3 access panel connectors” (p. 3-12) for correct placement, IN or OUT, DS3/E3 1,2 or 3.

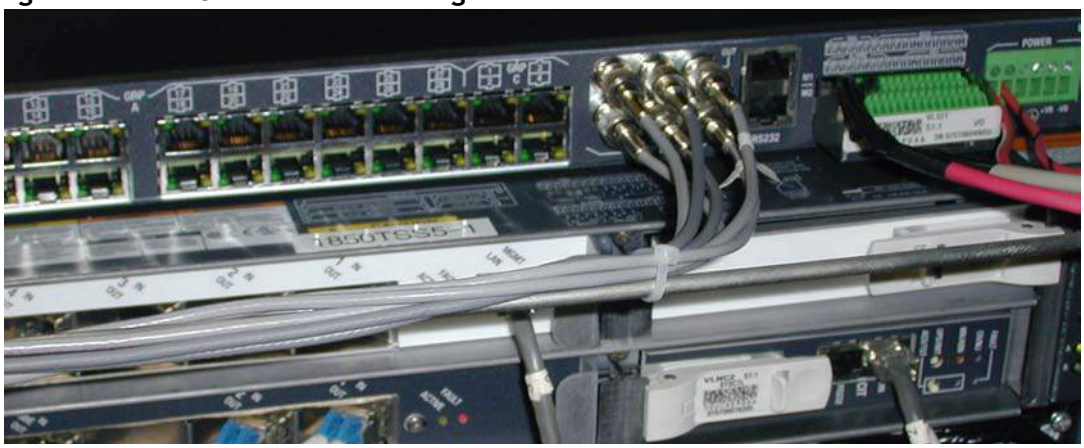
3 If necessary attach a 3” tie bar to the front of the Alcatel-Lucent 1850 TSS-5 shelf above the circuit pack slots and just above the top of the VLIU in use. This will allow the front cover to close.

4 Are you terminating the DS3/E3 cables on a DSX?

IF...	Then...
Yes	Go on to Step 5
No	Skip to Step 8

5 Route the cables **toward the left** along the tie bar and into the bay cable rack. See Figure 3-10, “DS3/E3 cable routing” (p. 3-13).

Figure 3-10 DS3/E3 cable routing



6 Route the cables along the cable rack and into the terminating bay.

7 The standard BNC end of the coaxial cable will connect to the DSX.

8 Wiggle both ends of the coaxial cable to ensure a good connection.

9 Check off appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

Ethernet cable installation

Overview

This section describes how to route the Fast Ethernet (10/100BaseT) cables from the rack-mount Alcatel-Lucent 1850 TSS-5 shelf to the 10/100BaseT terminating equipment.

Note: Ports 9 - 28 on the VLIU1 and VLIU3 panels are used for 10/100BaseT cables.

Note: Ports 41 - 60 on the VLIU2 panel are used for 10/100BaseT cables.

Note: For the VLNC35 electrical 10/100/BaseT cables, use Function Group “C” ports 1 - 4 on all VLIU paddle boards.

Procedure VLIU1

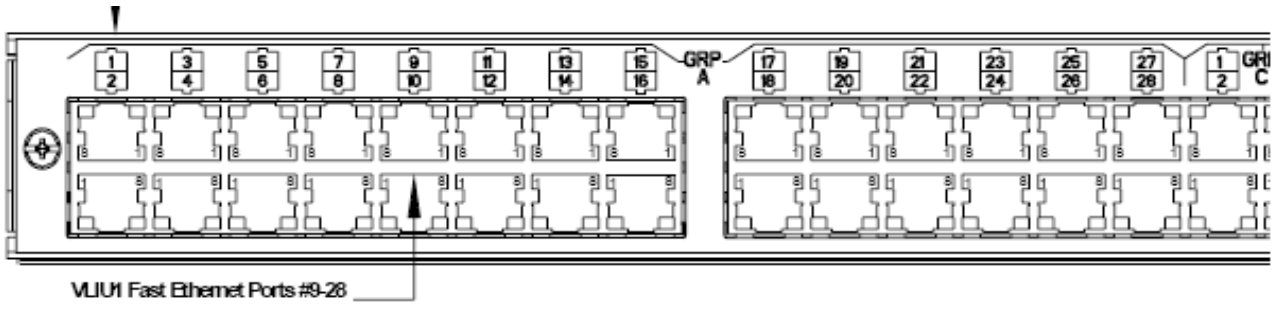
1 Refer to Figure 3-11, “VLIU1 10/100BaseT port assignments” (p. 3-14) when performing this procedure with a VLIU1 panel.

2 Obtain the 10/100BaseT cables per Table 3-6, “10/100 pin assignment for VLIU1 applications” (p. 3-15).

3 Connect one end of the cable to the respective RJ-45 connector on the access panel on the front of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf.

4 Route the cabling along the rack-mount Alcatel-Lucent 1850 TSS-5 shelf and out to the 10/100BaseT terminating equipment. Refer to Figure 3-22, “Optical fiber routing” (p. 3-37).

Figure 3-11 VLIU1 10/100BaseT port assignments



5 Label the cables, indicating bay (if required), shelf, pack and position (9 through 28).

6 Label the cables indicating bay (if required) shelf, pack and position (FN C 1- 4) if using the VLNC35 electrical ports.

7 Connect the cables onto their respective positions at the 10/100BaseT terminating equipment.

8 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. 1-4).

Table 3-6 10/100 pin assignment for VLIU1 applications

Pin	Wire Designation	Direction	Color
1	TFEP*	Out	White-Green
2	TFEN*	Out	Green
3	RFEP*	In	White-Orange
6	RFEN*	In	Blue

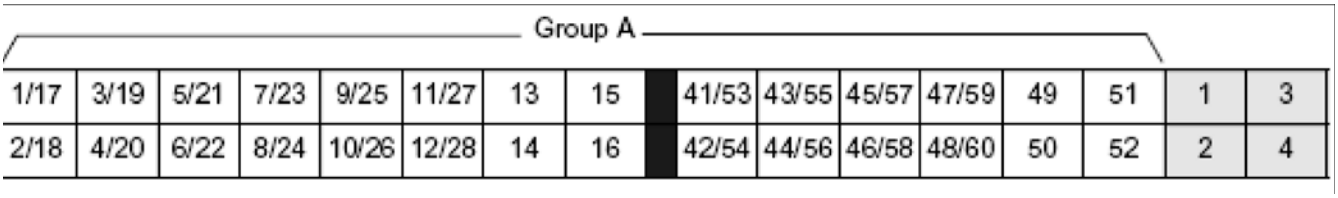
Procedure VLIU2

Refer to Figure 3-13, "VLIU2 10/100BaseT port assignments" (p. 3-17) and Table 3-7, "Dual harness 10/100 pin assignment for VLIU2 applications" (p. 3-17) when performing this procedure with a VLIU2 panel.

9 Obtain the 10/100BaseT cables per Table 3-9, "Ethernet 10/100BaseT straight through cable" (p. 3-22).

10 Connect one end of the cable to the respective RJ-45 connector on the access panel on the front of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf.

Figure 3-12 VLIU2 10/100 BaseT port assignments



11 Route the cabling along the rack-mount Alcatel-Lucent 1850 TSS-5 shelf and out to the 10/100BaseT terminating equipment. Refer to Figure 3-23, “VLIU 10/100BaseT cable routing” (p. 3-39)

12 Label the cables, indicating bay (if required), shelf, pack and position (41 through 60).

13 Label the cables indicating bay (if required) shelf pack and position (FN C 1- 4) if using the VLNC35 electrical ports.

14 Connect the cables onto their respective positions at the 10/100BaseT terminating equipment.

15 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

Figure 3-13 VLIU2 10/100BaseT port assignments

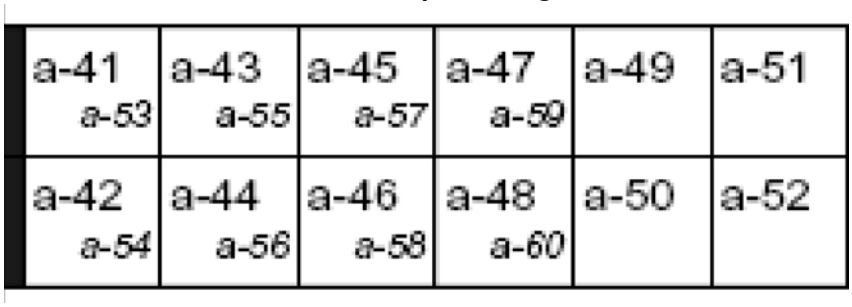


Table 3-7 Dual harness 10/100 pin assignment for VLIU2 applications

Pin	Wire Designation	Direction	Color
1	TFEP*	Out	White-Green
2	TFEN*	Out	Green
3	RFEP*	In	White-Orange
6	RFEN*	In	Blue
4	TFEP**	Out	White-Blue
5	TFEN**	Out	Orange
7	RFEP**	In	White-Brown
8	RFEN**	In	Brown

Legend:

* Indicates the primary pin pairing directions for ports 41 to 52.

**Indicates the secondary pin pairing directions for ports 53 to 60.

Procedure VLIU3

Refer to Figure 3-7, “VLIU3 Paddle board Ethernet and Time of Day RJ-45 assignments” (p. 3-9) and Table 3-8, “Dual harness 10/100 pin assignment for VLIU2 and VLIU3 applications” (p. 3-20) when performing this procedure with a VLIU3 panel.

16 Obtain the 10/100BaseT cables per Table 3-9, “Ethernet 10/100BaseT straight through cable” (p. 3-22).

17 Connect one end of the cable to the respective RJ-45 connector on the access panel on the front of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf.

18 Route the cabling along the rack-mount Alcatel-Lucent 1850 TSS-5 shelf and out to the 10/100BaseT terminating equipment. Refer to Figure 3-23, “VLIU 10/100BaseT cable routing” (p. 3-39)

19 Label the cables, indicating bay (if required), shelf, pack and position (41 through 60).

20 Label the cables for Time Of Day. See Figure 3-15, “TOD RJ-45 pins assignments for TOD1 and TOD2 inputs” (p. 3-19),Figure 3-16, “TOD RJ-45 pins assignments for TOD1 and TOD2 output1” (p. 3-20) and Figure 3-17, “TOD RJ-45 pins assignments for TOD1 and TOD2 output2” (p. 3-20).

21 Connect the cables onto their respective positions at the 10/100BaseT terminating equipment. See Figure 3-14, “VLIU3 TOD port assignments” (p. 3-19).

22 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

Figure 3-14 VLIU3 TOD port assignments

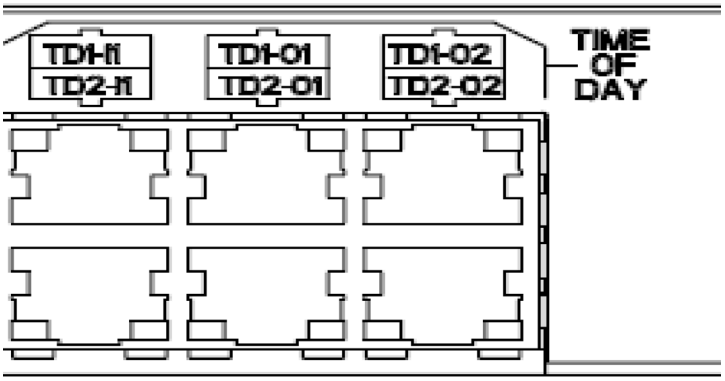


Figure 3-15 TOD RJ-45 pins assignments for TOD1 and TOD2 inputs

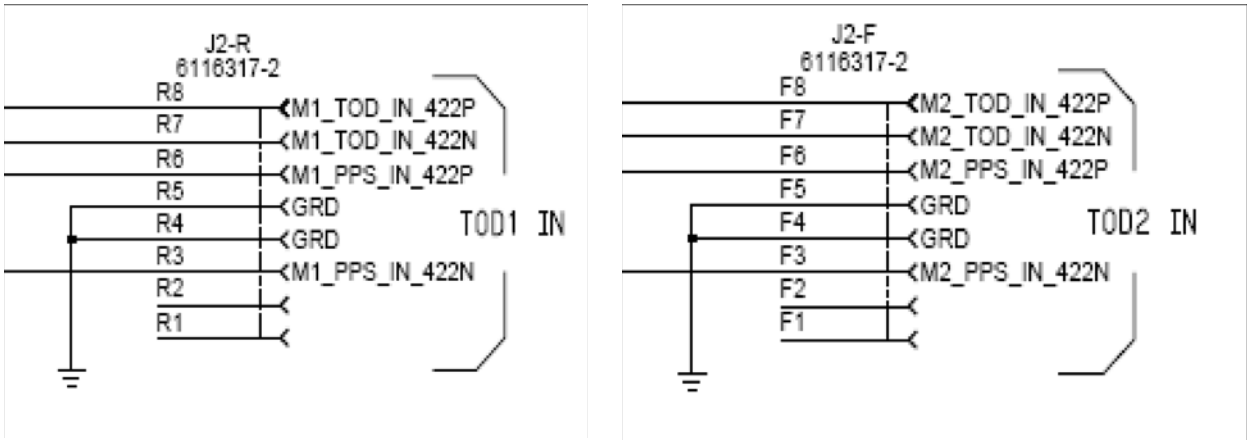


Figure 3-16 TOD RJ-45 pins assignments for TOD1 and TOD2 output1

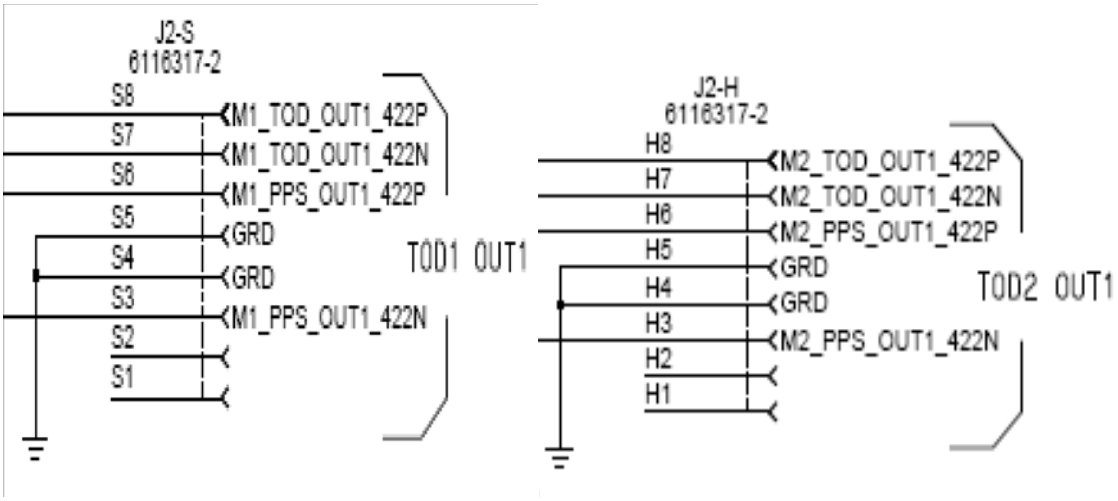


Figure 3-17 TOD RJ-45 pins assignments for TOD1 and TOD2 output2

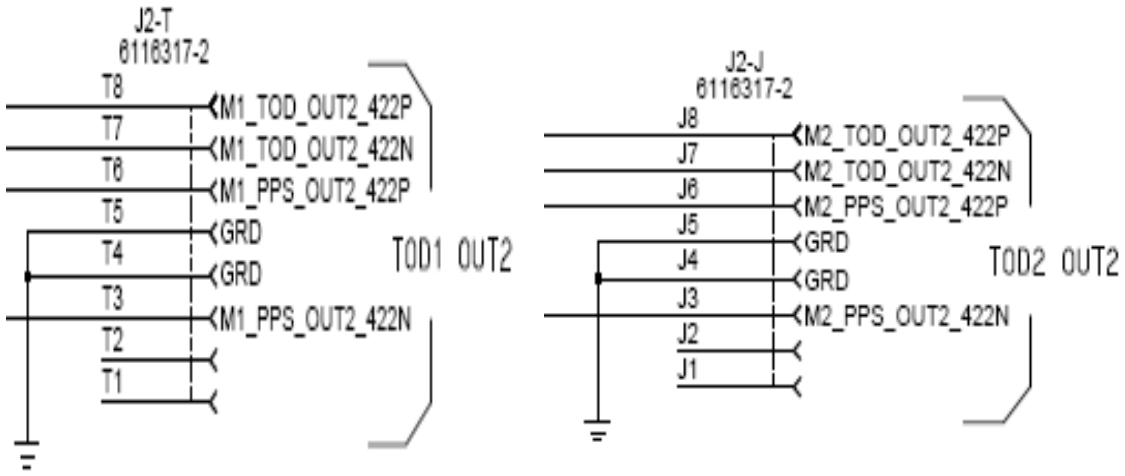


Table 3-8 Dual harness 10/100 pin assignment for VLIU2 and VLIU3 applications

Pin	Wire Designation	Direction	Color
1	TFEP*	Out	White-Green
2	TFEN*	Out	Green
3	RFEP*	In	White-Orange
6	RFEN*	In	Blue
4	TFEP**	Out	White-Blue
5	TFEN**	Out	Orange
7	RFEP**	In	White-Brown

Pin	Wire Designation	Direction	Color
8	RFEN**	In	Brown

Legend:

* Indicates the primary pin pairing directions for ports 41 to 52.

**Indicates the secondary pin pairing directions for ports 53 to 60.

Table 3-9 Ethernet 10/100BaseT straight through cable

Description	Comcode	Cable Length (feet)	Alcatel-Lucent 1850 TSS-5 Connections
LAN Straight-through cable Shielded RJ45 — RJ45 CAT5E	849010483	5	VLNC40/VLNC42 circuit pack ports 9- 28 and VLIU2 ports 49 - 52
	849010491	10	
	849010509	15	
	849010517	20	
	849010525	25	
	849010533	30	
	849010541	40	
	849010558	50	
	849010566	60	
	849010574	70	
	849010582	80	
	849010590	90	
	849010608	100	
	849010616	110	
	849010624	120	
	849010632	130	
	849010640	140	
	849010657	150	
	849010665	160	
	849010673	180	
	849010681	200	
	849010699	220	
	849010707	240	
	849010715	260	
	849010723	280	
	849010731	300	

Description	Comcode	Cable Length (feet)	Alcatel-Lucent 1850 TSS-5 Connections
Gigabit Ethernet / LAN straight through cable one shielded RJ45 plug, no boot 24GA solid shielded 4 pair CAT5E enhanced halogen free cable other end, no connector	849090527	10	VLNC40/VLNC42 circuit pack ports 41- 60
	849090535	25	
	849090543	50	
	849090550	100	
	849090568	150	
	849090576	200	
	849090584	300	

END OF STEPS

Office alarm cable installation

Description

Office alarms are the common method used in a central office for maintenance personnel to quickly isolate a failure. Perform this procedure if connection to the office alarm system is required.

Note: The steady state current for office alarm connections must not exceed 1.0 amp at 60 volts or 1.8 amps at 30 volts. The maximum transient currents (20 msec duration) during initial contact closure must not exceed 9 amps at 30 volts.

If transient voltages or currents are above these limits, transient noise-suppressing devices such as diodes or contact protection networks must be used to keep within the voltage and current limits. If these protection devices are not sufficient, an external buffer relay MUST be provided.

In all cases, and as a matter of good practice, suppression devices such as diodes or contact protection networks must be provided across any external relay coil being driven by the Alcatel-Lucent 1850 TSS-5 to limit transient voltages and currents.

Office alarm cable assemblies are listed in Table 3-10, “MDI/MDO/alarm cable assemblies” (p. 3-24) and Office alarm connection are listed in Table 3-11, “Office alarm connections” (p. 3-24).

Table 3-10 MDI/MDO/alarm cable assemblies

Description	Cable Assembly #	Cable Length (feet)	Access Panel Connections
MDI/MDO Alarm Cable, 26 AWG, 8 conductors, both ends are unterminated	848946653	30	ALARM

Table 3-11 Office alarm connections

Pin#	Color	Name
11	BL	CR/MJ Audible +
12	BL/W	CR/MJ Audible -
13	O	CR/MJ Visual +
14	O/W	CR/MJ Visual -
15	G	MN/ABN Audible +
16	G/W	MN/ABN Audible -

Pin#	Color	Name
17	BR	MN/ABN Visual +
18	BR/W	MN/ABN Visual -
Note: The SYSCTL circuit pack reports office alarms. All are NO (normally open) contacts. When an alarm is enabled, they become closed.		

Procedure

Proceed as follows:

1 Obtain the office alarm cable per Table 3-10, “MDI/MDO/alarm cable assemblies” (p. 3-24). Connect the office alarm cables to pins 11-18 of the TMG/MDI/MDO/ALARM terminal block located on the VLIU. See Figure 3-18, “VLIU MDI/MDO/alarm terminal block” (p. 3-26) and Figure 3-19, “VLIU MDI/MDO/alarm terminal block shelf view” (p. 3-26) for details.

Note: The recommended wire strip length for cables being connected to the alarm block is **8 mm.** Use the guide located on the shelf labeling for accurate lengths.

Figure 3-18 VLIU MDI/MDO/alarm terminal block

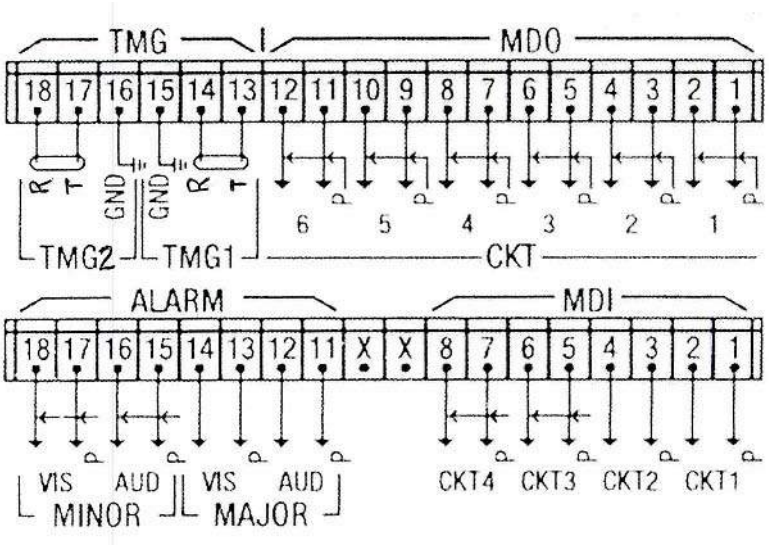


Figure 3-19 VLIU MDI/MDO/alarm terminal block shelf view



2 Route the office alarm cable to the right of the shelf up the bay troff to the office alarm panel. Secure to a tie bar for strain relief.

Note: Miscellaneous discrete connections and alarm connections may be dressed together in a single bundle.

3 Inspect the office alarm panel and add a contact protection network (if required).

4 Cut the office alarm cable to the desired length.

5 Wire-wrap the loose end of the office alarm cable to the alarm panel, making connections as listed in Table 3-11, "Office alarm connections" (p. 3-24).

6 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. 1-4).

END OF STEPS

Miscellaneous (environmental) discrete telemetry cable installation

Description

The miscellaneous (environmental) discrete telemetry access allows the maintenance center to control and monitor equipment collocated with the Alcatel-Lucent 1850 TSS-5.

The environmental control feature enables the maintenance center to remotely initiate up to four contact closures at the remote terminal (RT) for equipment operation such as pumps, generators, etc.

The environmental alarm status indications allow up to 4 miscellaneous user-settable alarm status indications (SI) at the remote terminal for transmission toward the central office (ckts 1-4)

Miscellaneous (environmental) discrete telemetry cable assemblies and connections are listed in Table 3-12, “MDI/MDO cable assemblies” (p. 3-28) and Table 3-13, “Miscellaneous (environmental) discrete (MDI/MDO) connections” (p. 3-29), respectively.

MDO - ckt1-ckt4 (pin positions 1-8) are NO (normally open) contacts. When enabled, they become closed. They are connected to the SYSCTL only.

MDO - ckt5 (pin positions 9 and 10) is a NC (normally closed) contact. Unused in this release.

MDO - ckt6 (pin position 11 and 12) is a NC (normally closed) contact. It monitors M2 (VLNC40) only. Will activate the alarm for any service affecting condition on this pack.

MDI - ckt1-ckt4 (pin positions 1-8) are enabled by an external closure (short circuit) between the circuit pairs e.g. 1-2 or 3-4 etc. connected to the SYCTL only.

Table 3-12 MDI/MDO cable assemblies

Description	Cable Assembly #	Cable Length (feet)	Access Panel Connections
MDI/MDO Alarm Cable, 26 AWG, 8 conductors, both ends are unterminated	848946653	30	MDI/MDO
Note: MDO requires 12 conductors, therefore, two cable assemblies are required. MDI requires one cable.			

Table 3-13 Miscellaneous (environmental) discrete (MDI/MDO) connections

Pin #	Color	Designation
MDI/O PIN1	BL	TLMI/O #1 +
MDI/O PIN2	BL/W	TLMI/O #1 -
MDI/O PIN3	O	TLMI/O #2 +
MDI/O PIN4	O/W	TLMI/O #2 -
MDI/O PIN5	G	TLMI/O #3 +
MDI/O PIN6	G/W	TLMI/O #3 -
MDI/O PIN7	BR	TLMI/O #4 +
MDI/O PIN8	BR/W	TLMI/O #4 -
MDO PIN9	CABLE 2, BL	MDO #1 +
MDO PIN10	CABLE 2, BL/W	MDO #1 -
MDO PIN11	CABLE 2, O	MDO #2 +
MDO PIN12	CABLE 2, O/W	MDO #2 -

Procedure

This procedure is performed for Alcatel-Lucent 1850 TSS-5 shelves requiring miscellaneous (environmental) discrete telemetry.

1 Connect the miscellaneous discrete telemetry cables to the MDI and MDO terminal blocks on VLIU of the Alcatel-Lucent 1850 TSS-5 shelf, refer to Figure 3-18, “VLIU MDI/MDO/alarm terminal block” (p. 3-26) and Figure 3-19, “VLIU MDI/MDO/alarm terminal block shelf view” (p. 3-26).

2 Route the miscellaneous (environmental) discretes cables towards the right of the shelf to the telemetry. Secure to a tie bar for strain relief.

Note: Miscellaneous discrete connections and alarm connections may be dressed together in a single bundle.

3 Cut the miscellaneous (environmental) discrete telemetry cable to the desired length at the telemetry panel.

4 Wire-wrap the loose end of the miscellaneous (environmental) discrete telemetry cable to the wire-wrap terminal strip, making connections per Table 3-13, “Miscellaneous (environmental) discrete (MDI/MDO) connections” (p. 3-29).

5 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

Timing cable installation

Description

If either Main circuit pack slot is populated with a VLNC60, VLNC61, or VLNC64, a BITS input timing reference can be used.

If either Main is populated with a VLNC50 or VLNC52 only sync output is available. In this case only, the shield ground should be made at the VLIU pin 15 for main1 and pin 16 for main2.

Shielded, differential pair cabling must be used for timing functionality. Refer to Table 3-14 "Timing cables" for appropriate lengths.

Note: Shield ground is always connected at the output. For the VLNC60 and VLNC64 this ground should be made at the office BITS clock.

Table 3-14 Timing cables

Description	Comcode	Cable Length in feet
Timing TMG cable, both ends un-terminated 22 AWG shielded twisted pair, PVC jacket per ATT-TP-76418	849090592	25
	849090600	50
	849090618	100
	849090626	250

Procedure

This procedure is performed for Alcatel-Lucent 1850 TSS-5 shelves requiring either input timing or sync out. Refer to the following table for cable types Supported in Release 7.2 timing cable assemblies

1 Connect the timing cable to the TMG 1 and TMG 2 if needed to the terminal block on VLIU of the Alcatel-Lucent 1850 TSS-5 shelf refer to "TMG cable assembly" (p. 3-31) for pin designations.

Table 3-15 TMG cable assembly

TMG 1 Pin Designation Main 1	TMG 2 Pin Designation Main 2
Tip - 13	Tip - 17
Ring - 14	Ring- 18

TMG 1 Pin Designation Main 1	TMG 2 Pin Designation Main 2
GND - 15	GND- 16

2 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

E1 timing interface converters

Description

The Alcatel-Lucent 1850 TSS-5 provides physical connections for timing inputs and outputs. The functionality of each depends upon the circuit pack installed into the shelf and the provisioning of the pack. Currently, the physical timing connections are multi-wire connections. Customers have requested a 75 ohm BNC interface for E1 timing. An interface converter provides the physical and impedance transformation to accommodate a 75 ohm E1 interface for both input and output timing signals. It is not expected that both input timing converters and output timing converters would be deployed in a single shelf. If either Main circuit pack slot is populated with a VLNC60, VLNC61, or VLNC64, a BITS input timing reference can be used.

Note: The VLNC60, VLNC61, and VLNC64 support input timing only.

Note: E1 2MHz clocks for the VLNC5x packs is not supported at this time.

Procedure

This procedure is performed for Alcatel-Lucent 1850 TSS-5 shelves requiring input timing 75ohm to 120ohm cable assemblies. Each cable assembly can be installed on either side of the Alcatel-Lucent 1850 TSS-5 shelf. The 1850 TSS-5 shelf accepts two twisted pair timing inputs: one for each main slot - Main1 [M1] and Main 2 [M2]. The twisted pair interface is three-wire 100 ohm or 120 ohm with tip, ring and ground. The physical receptacle is a spring-loaded terminal block on the VLIU. See [fig 1 Detail A] for a representative figure. The interface converter allows a 75 ohm BNC cable to connect E1 timing signals to the shelf.

1 Mount the converter to either side of the Alcatel-Lucent 1850 TSS-5 shelf using the screw provided with the cable assembly. See "Right side E1 input converter mounting position" (p. 3-34) and "Left side E1 input timing cable mounting position" (p. 3-35) below.

2 Connect the E1 converter input timing cable to the TMG 1 and TMG 2 if needed to the terminal block on VLIU of the Alcatel-Lucent 1850 TSS-5 shelf refer to "TMG cable assembly" (p. 3-34) for pin designations.

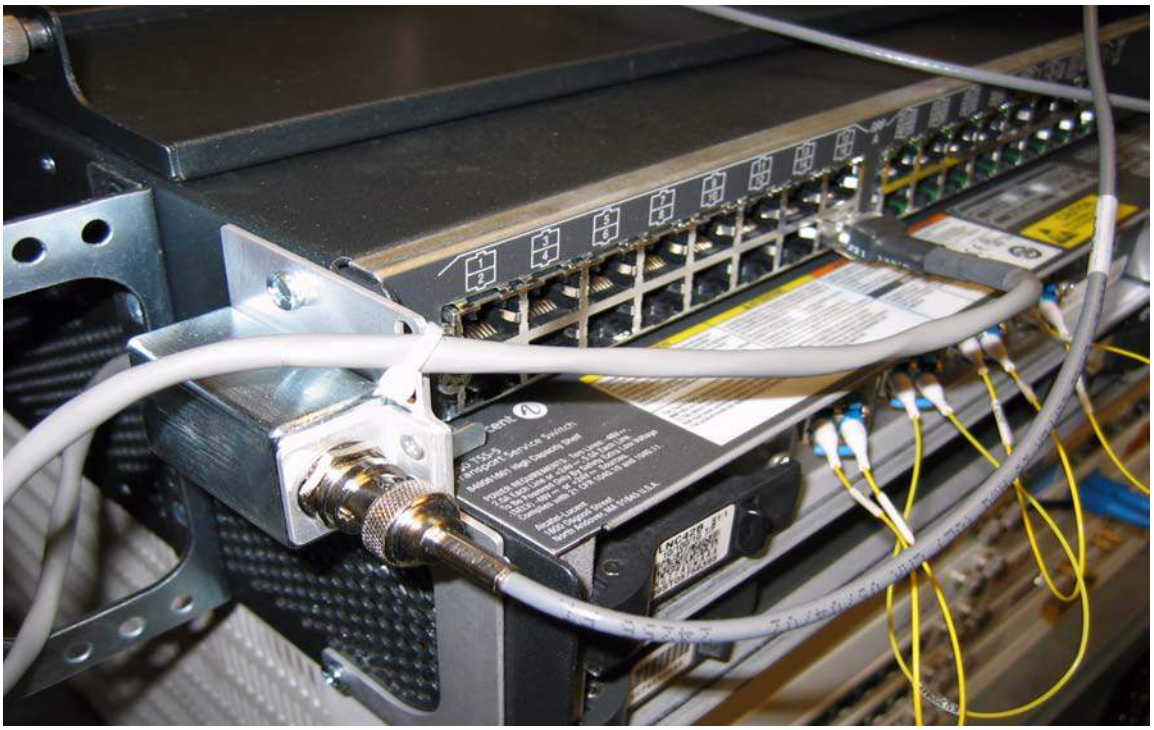
Table 3-16 TMG cable assembly

TMG 1 Pin Designation Main 1	TMG 2 Pin Designation Main 2
Tip - 13	Tip - 17
Ring - 14	Ring- 18
GND - 15	GND- 16

Figure 3-20 Right side E1 input converter mounting position



Figure 3-21 Left side E1 input timing cable mounting position



3 Attach the E1 input timing to the 75-ohm BNC cable mounted on the shelf.

4 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

OC-3/STM-1 OC-12/STM-4 and OC-48/STM-16 main optical fiber cable installation

Description

This section describes how to route the optical fiber cables from the interconnecting equipment (for example, an LGX® optical fiber distributing frame) to the VLNC50 PTMs, VLNC52 PTMs, or the VLNC55 PTMs located in either Main1 or Main2 or the VLNC64 located in either Main1 or Main2 of the rack-mount Alcatel-Lucent 1850 TSS-5. This procedure does not cover routing optical fiber cable between sites.

The optical fiber cables are connected to the Alcatel-Lucent 1850 TSS-5 after the VLNC50, VLNC52,VLNC55, or VLNC64 circuit pack are installed. The Alcatel-Lucent 1850 TSS-5 requires single-mode fiber for the PTMs of the VLNC50, VLNC52, and VLNC55 circuit packs. Refer to *ED8C956-10 Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Engineering and Ordering Information* for recommended fibers.

Note: Ensure only ANGLED LC connectors appear at IN ports of optical circuit packs. The “ANGLED” is referring to the rotating boot on the connector and not the connector. APC or Angled Polished Connectors are not supported on the Alcatel-Lucent 1850 TSS-5.

Note: The optical fiber cable is fragile and must be protected. The fibers should be placed in a protective tube or channel, such as PVC tubing, or *PANDUIT* cable channel, when running the cable from the Alcatel-Lucent 1850 TSS-5 to the cable rack. The fibers should be placed in the cable rack in a protective channel with nothing on top of them. Cable ties should NOT be used with the optical fiber cables.



WARNING

Laser hazard

Unterminated optical connectors may emit laser radiation. Do not view an unterminated optical connector with optical instruments. Avoid direct exposure of the eyes to the beam.

Note: Prior to connecting the optical fiber cables, the fibers should be examined to ensure that they are clean. See Appendix A, “Fiber cleaning” for recommended cleaning procedures.

Procedure

Proceed as follows:

1 TheAlcatel-Lucent 1850 TSS-5 requires 42 degree angled rotating boot LC fibers to allow the front cover to close. Align the angled fiber to the left of the shelf guiding each fiber pair between main circuit pack slots. See Figure 3-22, “Optical fiber routing” (p. 3-37).

2 Route the optical fiber cables from the interconnecting equipment through the fiber management module and into the left side of the rack-mount Alcatel-Lucent 1850 TSS-5. Protective covers must be left on cables.

Figure 3-22 Optical fiber routing



3 Optical fiber routing - Place the optical fiber cables in a protective tube or channel once it has cleared the Alcatel-Lucent 1850 TSS-5 shelf.

4 Label the optical fiber cables, indicating bay, shelf, pack, and direction (IN or OUT). See Appendix E, “Fiber labeling” for more details. The fibers will be inserted into the equipment later, once the circuit packs are installed.

5 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

10/100/1G cable installation

Description

This section describes how to route both the optical fiber cables and the 10/100BaseT RJ-45 cables from the Alcatel-Lucent 1850 TSS-5 shelf to the interconnecting equipment (for example, a *LGX*® optical fiber distributing frame). Optical fibers to the 1 GbE PTM port on the VLNC50 /52/55 circuit pack, the 2 GbE/FE SFP ports on the VLNC60/61 circuit pack, the 3 GbE/FE/OC3 ports on the VLNC64, and the 4 GbE/FE SFP based ports on the Ethernet Aggregator M2 VLNC40 circuit pack are run along the circuit pack. Single-mode fiber or multimode fiber may be used depending on the specific PTM used on the all four circuit packs. Refer to *ED8C956-10 Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Engineering and Ordering Information* for recommended fibers and associated PTMs.

The optical fiber cables will be connected to the optical ports after the circuit packs are installed.

Note: The optical fiber cable is fragile and must be protected. The fibers should be placed in a protective tube or channel, such as PVC tubing, or *PANDUIT* cable channel, when running the cable from the Alcatel-Lucent 1850 TSS-5 to the cable rack. The fibers should be placed in the cable rack in a protective channel with nothing on top of them. Cable ties should NOT be used with the optical fiber cables.



WARNING

Laser hazard

Unterminated optical connectors may emit laser radiation. Do not view an unterminated optical connector with optical instruments.



WARNING

Laser hazard

Invisible laser radiation when unterminated. Avoid direct exposure of the eyes to the beam.

Note: Prior to connecting the optical fiber cables, the fibers should be examined to ensure that they are clean. See Appendix A, “Fiber cleaning” for recommended cleaning procedures.

Procedure

Figure 3-23 VLIU 10/100BaseT cable routing



1 Label the optical fiber cables, indicating bay, shelf, main circuit pack, and direction (IN or OUT).

2 Route optical fiber cables from the interconnecting equipment up to where the optical ports will be on the VLNC50/52/55 and VLNC64 circuit pack and the M2 VLNC40/42 circuit packs and VLNC33 and VLNC35 if applicable. See Figure 3-22, “Optical fiber routing” (p. 3-37). Optical fibers are fragile **do not** attach optical fibers to the tie bar depicted in the figure.

3 Optical fiber connections between the VLNC40/42 port 4 and either the VLNC50/52/55 GbE main packs or VLNC6x packs is no longer necessary. These connections can now be made through the backplane using CLI and TL1 commands between packs.

4 Place the optical fiber cables in a protective tube or channel.

5 Route the 10/100BaseT RJ-45 cables to the left along the tie bar if installed. See Figure 3-23, “VLIU 10/100BaseT cable routing” (p. 3-39). terminate these cables on the appropriate equipment.

6 Route any Gigabit Ethernet fibers in a protective tube or channel.

END OF STEPS

RS-232 cable assembly

Description

This section describes how to wire a RJ-45 connector to a DB-9 D-Type connector for serial connection to the shelf. Two RJ45 connectors (M1, M2) on the VLIU provide RS-232 connections to the main slots. One of these can be used to establish a serial connection to a VLNC40/VLNC42 in M2 slot. The other can be used to access the VLNC60/VLNC61/VLNC64 through a serial connection to the RS-232 port on the VLIU on either main. The VLNC2 circuit card has its own RS-232 port.

CIT cable assemblies and the length options are listed in Table 3-17, "Serial CIT cable assembly" (p. 3-41). CIT cable connections are listed in Table 3-18, "Standard CIT cable connection" (p. 3-41) and Table 3-19, "RJ-45 to DB-9 connector connections" (p. 3-42).

Table 3-17 Serial CIT cable assembly

Description	Cable Assembly #	Cable Length	Alcatel-Lucent 1850 TSS-5 Connections
RS-232 CIT Cable	848748869	8 feet	CIT/RS-232 jack on system controller (VLNC2)

Table 3-18 Standard CIT cable connection

Connection	RJ45 Connector		Color	9-Pin D-Type Connector	
	Pin#	Designation		Pin#	Designation
CIT cable	1	FRS232N	W - O	6	DCE ready
	3	FDTR	W - BL	4	DTE ready
	4	Ground	W - G	5	Ground
	5	FTXD	O	2	Receive data
	6	FRXD	G	3	Transmit data

Notes:

1. The connection and the colors shown above are for a standard cable. If you use a RJ-45 to DB-9 connector with a standard straight-through 10BASE-T LAN cable then refer to Table 3-19, "RJ-45 to DB-9 connector connections" (p. 3-42).

Table 3-19 RJ-45 to DB-9 connector connections

From RJ-45 Connector		To DB-9 Pin D-Type Connector
Pin#	**Color**	**Pin#**
1	Blue	6
3	Black	4
4	Red	5
5	Green	2
6	Yellow	3

Notes:

1. The connection and the colors shown above are for RJ-45 to DB-9 connector.
2. This connector should be used with a standard straight-through 10/100 BASE-T LAN cable.

Procedure

Establish RS-232 communications to any RS-232 port on the shelf. Proceed as follows:

1 Connect the RJ-45 end of the CIT cable to the RS-232 jack on either the VLNC2 or VLIU.

2 Connect the 9-pin D-type connector to the serial port on the PC.

Note: New PCs may not have a serial connection. A USB to RJ-45 adapter may be needed to make this connection.

3 Using a terminal emulator, establish communication to the port. Refer to Table 3-20, “RS-232 default settings” (p. 3-43).

Table 3-20 RS-232 default settings

Parameter	Value
Baud rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow control	Disabled
Terminal	VT 100 emulation

END OF STEPS

LAN cable installation

Description

This section describes how to connect the LAN/TCP-IP cable to the Alcatel-Lucent 1850 TSS-5 shelf and to the VLNC40/VLNC42/VLNC60/VLNC61/VLNC64 circuit packs if installed. Perform this procedure if this cabling is required. Use this procedure to connect PC and establish a local CLI session with the VLNC40/VLNC42/VLNC60/VLNC61/VLNC64 circuit pack using the **MGMT LAN** port on the faceplate of the circuit pack.

The LAN/TCP-IP interface cable is available in two configurations (cross-over and straight-through) and is connected to the front of the VLNC2, VLNC40, VLNC42, VLNC60, VLNC61, or VLNC64 circuit packs. The following tables provide additional information:

- Table 3-9, “Ethernet 10/100BaseT straight through cable” (p. 3-22)
- Table 3-21, “Ethernet / LAN crossover cable” (p. 3-44)

Table 3-21 Ethernet / LAN crossover cable

Description	Cable Assembly #	Cable Length (feet)
Ethernet / LAN Cross-over (Cable to PC / CIT) RJ45 plug to RJ45 plug to connect CTL LAN interface directly to a PC’s LAN card.	109321810	10
	848605028	50
	848605036	100
	848605051	150
	848605069	200
	848605077	300

Table 3-22 LAN cross-over cable connections

SYSCTL Connection	Alcatel-Lucent 1850 TSS-5	Pin Design.	Color	PC Ethernet	Pin Design.
LAN	1	TX+	BL - W	3	RCV+
	2	TX-	W - BL	6	RCV-
	3	RCV+	O - W	1	TX+
	6	RCV-	W - O	2	TX-

Table 3-23 LAN straight-through cable connections

SYSCTL Connection	Alcatel-Lucent 1850 TSS-5	Design	Color	to HUB	Pin Design
LAN	1	TX+	BL - W	1	TX+
	2	TX-	W - BL	2	TX-
	3	RCV+	O - W	3	RCV+
	6	RCV-	W - O	6	RCV-

Procedure

Proceed as follows:

1 Connect the cable to the LAN (RJ-45) jack on the SYSCTL VLNC2, or VLNC40/42 MGMT LAN, or the VLNC60/61 MGMT LAN, or the VLNC64 MGMT LAN circuit pack.

Note: If connecting directly to a PC, use a LAN cross-over cable assembly (see Table 3-22, “LAN cross-over cable connections” (p. 3-44)).

Note: If connecting to a hub, use a LAN straight-through cable assembly (see Table 3-23, “LAN straight-through cable connections” (p. 3-45)).

Are you using...	Then...
Cross-over LAN cable	Route the cable to the desired PC LAN Network Interface card
Straight-through LAN cable	Route the cable to the desired hub port location

2 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

Final operations

Description

Final check on equipment and cable installation.

Procedure

Proceed as follows:

1 Verify that all the cables are properly dressed/connected.

2 Verify that all cables are properly labeled.

3 Verify that designations where cables were wire-wrapped are properly labeled.

4 Verify that all the fibers are properly dressed/connected.

5 Verify that all fibers are properly labeled. See Appendix E, “Fiber labeling”.

6 Verify that designations where fibers were terminated are properly labeled.

7 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. 1-4).

END OF STEPS

4 Circuit pack installation

Overview

Purpose

This chapter provides the procedures for initial seating of circuit packs in the shelf.

Contents

This chapter provides information on the following topics:

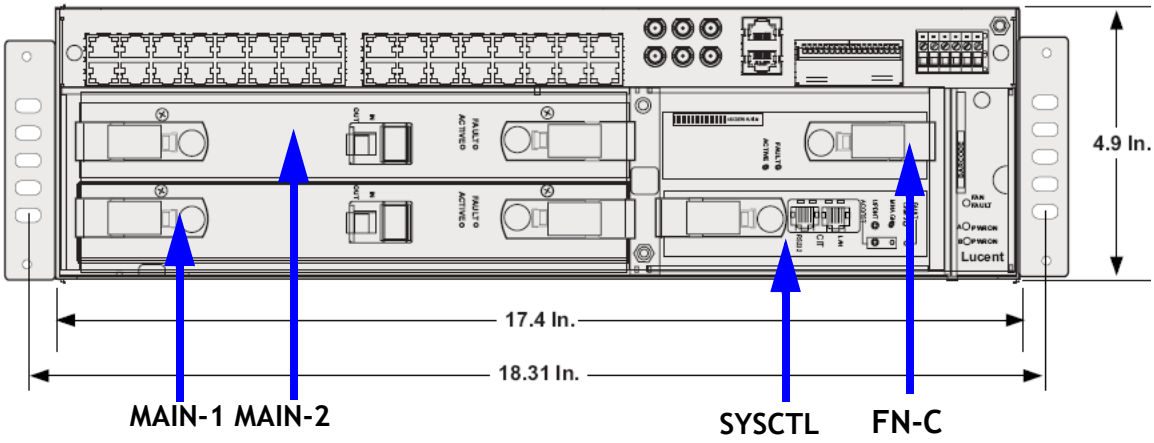
Initial circuit pack installation	4-3
Install PTM (pluggable transmission modules)	4-13

Tools, test equipment and accessories

Listed below are the required tools, test equipment and accessories.

Quantity	Required	Description	Comments
1	Y	ESD wrist strap	A wrist strap must be worn when handling circuit packs. Use the electrostatic discharge (ESD) jack provided on the shelf.

Figure 4-1 Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view



Initial circuit pack installation

Description

This section provides instructions for installing, but NOT fully seating, circuit packs into the Alcatel-Lucent 1850 Transport Service Switch (TSS-5) (Alcatel-Lucent 1850 TSS-5) shelf. After circuit packs have been unpacked, they may be placed in their respective slots in the Alcatel-Lucent 1850 TSS-5 shelf but NOT FULLY ENGAGED IN THE BACKPLANE CONNECTOR. Use Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2) as a guide for correct slot insertion. The circuit packs will be fully installed (seated) in 5, "Circuit pack compatibility" (p. 5-2).

Important! 199MN apparatus blanks are required in an unequipped main slot to provide proper air flow for cooling.

Important! 199SC apparatus blank is required in an unequipped CTL slot and Function Group C slot to provide proper air flow for cooling.



CAUTION

ESD hazard

To protect against damage due to electrostatic discharge, a properly grounded ESD wrist strap must be worn when handling equipment.

VLNC2 (SYSCTL) installation

Follow this procedure to install the VLNC2 (SYSCTL) circuit pack into the Alcatel-Lucent 1850 TSS-5 shelf.

Note: If the CTL slot is to be unequipped, a 199SC apparatus blank is required to allow proper air flow. Refer to "199SC apparatus blank installation" (p. 4-12).

1 Remove the SYSCTL circuit pack from the packing material.

2 Identify the lower right-hand slot on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2).

3 Holding the SYSCTL upright in your hand, turn the circuit pack 90 degrees to the right and place the SYSCTL circuit pack into the lower right-hand slot on the Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC50 main1 or main2 installation

Follow this procedure to install the VLNC50 OC-3/STM-1/OC12/STM-4/1GbE circuit pack in the Alcatel-Lucent 1850 TSS-5 shelf.

1 Remove the VLNC50 circuit pack from the packing material.

2 Identify the large, lower left hand slot on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2).

3 Holding the Main VLNC50 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the Main OLIU circuit pack into slot 1 or 2 on the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: The VLNC50 can occupy both Main slots if equipped with any VLIU Interface board. If Main 2 slot is to be equipped, repeat steps 1 to 3 otherwise install a 199MN apparatus blank to provide proper air flow for cooling. Refer to 199MN apparatus blank installation (p. 4-12).

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC52 main1 or main2 installation

Follow this procedure to install the OC-3/STM-1 & OC-12/STM-4 HS w/ 28 DS1/E1, 3DS3/E3, & 1 GigE (pluggable optics ready) circuit pack in the Alcatel-Lucent 1850 TSS-5 shelf.

1 Remove the VLNC52 circuit pack from the packing material.

2 Identify the large, lower left hand slot on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, “Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view” (p. 4-2).

3 Holding the VLNC52 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the Main OLIU circuit pack into the large, lower slot on the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: The VLNC52 can occupy both main slots if equipped with a VLIU10 Interface board. If Main 2 slot is to be equipped, repeat Steps 1 to 3 noting the upper slot; otherwise, install a 199MN apparatus blank to provide proper air flow for cooling. Refer to 199MN apparatus blank installation (p. 4-12).

4 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. I-4).

END OF STEPS

VLNC55 main1 or main2 installation

Follow this procedure to install the OC-3/STM-1, OC-12/STM-4 and OC-48/STM16 HS w/ 28 DS1/E1, 3DS3/E3, & 1 GigE (pluggable optics ready) circuit pack in the Alcatel-Lucent 1850 TSS-5 shelf.

1 Remove the VLNC55 circuit pack from the packing material.

2 Identify the large, lower left hand slot on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, “Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view” (p. 4-2).

3 Holding the VLNC55 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the Main OLIU circuit pack into the large, lower slot on the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: The VLNC55 can occupy both main slots if equipped with a VLIU10 Interface board. If Main 2 slot is to be equipped, repeat Steps 1 to 3 noting the upper slot; otherwise, install a 199MN apparatus blank to provide proper air flow for cooling. Refer to 199MN apparatus blank installation (p. 4-12).

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC60 main1 or main2 installation

Follow this procedure to install the VLNC60 2GbE/FE circuit pack in the Alcatel-Lucent 1850 TSS-5 shelf.

Note: The VLNC60 can occupy either Main1 or Main2 but not both slots at the same time.

1 Remove the VLNC60 circuit pack from the packing material.

2 Identify either Main 1 or Main 2 on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2).

3 Holding the VLNC60 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the Main OLIU circuit pack into either Main 1 or Main 2 but not in both slots on the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: The VLNC60 can occupy both Main slots if equipped with a VLIU10. If Main 2 slot is to be equipped, repeat steps 1 to 3 otherwise install a 199MN apparatus blank to provide proper air flow for cooling. Refer to "199MN apparatus blank installation" (p. 4-12).

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC61 main1 or main2 installation

Follow this procedure to install the VLNC61 double density 10/100 T circuit pack in the Alcatel-Lucent 1850 TSS-5 shelf.

Note: The VLNC61 can occupy either Main1 or Main2 but not both slots at the same time.

1 Remove the VLNC61 circuit pack from the packing material.

2 Identify either Main 1 or Main 2 on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, “Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view” (p. 4-2).

3 Holding the VLNC61 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the main OLIU circuit pack into either main 1 or main 2 on the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

4 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. I-4).

END OF STEPS

VLNC62 main1 or main2 installation

Follow this procedure to install the VLNC62 double density 10/100 T circuit pack in the Alcatel-Lucent 1850 TSS-5 shelf.

Note: The VLNC62 can occupy either Main1 or Main2 but not both slots at the same time.

1 Remove the VLNC62 circuit pack from the packing material.

2 Identify either Main 1 or Main 2 on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, “Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view” (p. 4-2).

3 Holding the VLNC62 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the main OLIU circuit pack into either main 1 or main 2 on the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC64 main1 or main 2 installation

Follow this procedure to install the VLNC64 mini-hub circuit pack in the Alcatel-Lucent 1850 TSS-5 shelf.

1 Remove the VLNC64 circuit pack from the packing material.

2 Identify either main 1 or main 2 on the Alcatel-Lucent 1850 TSS-5 shelf. See Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2).

3 Holding the VLNC64 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the main OLIU circuit pack into either main 1 or main 2 on the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: The VLNC64 can occupy both main slots if equipped with any VLIU. If Main 2 slot is to be equipped, repeat Steps 1 to 3 otherwise install a 199MN apparatus blank to provide proper air flow for cooling. Refer to "199MN apparatus blank installation" (p. 4-12).

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC33 fn-c installation

Follow this procedure if you are installing a VLNC33 100BASE-X Fast Ethernet Private Line circuit pack.

1 Remove the VLNC33 circuit pack from the packing material.

2 Identify the unequipped fn-c slot on the upper right-hand side of the shelf, above the SYCTL slot. Refer to Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2) for details.

3 Holding the VLNC33 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the circuit pack into the fn-c slot of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

Note: If the FN-C slot is to remain unequipped, install a 199SC apparatus blank to provide proper air flow for cooling. Refer to "199SC apparatus blank installation" (p. 4-12).

END OF STEPS

VLNC35 fn-c installation

Follow this procedure if you are installing a VLNC35 10/100/ BASE-T or 100BASE-X Fast Ethernet Private Line circuit pack.

1 Remove the VLNC35 circuit pack from the packing material.

2 Identify the unequipped fn-c slot on the upper right-hand side of the shelf, above the SYCTL slot. Refer to Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2) for details.

3 Holding the VLNC35 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the circuit pack into the fn-c slot of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

Note: If the FN-C slot is to remain unequipped, install a 199SC apparatus blank to provide proper air flow for cooling. Refer to "199SC apparatus blank installation" (p. 4-12).

END OF STEPS

VLNC40 main 2 installation only

Follow this procedure if you are installing a VLNC40 10/100/1G T/F ethernet aggregator circuit pack.

1 Remove the VLNC40 circuit pack from the packing material.

2 Identify the unequipped main 2 slot on the upper left-hand side of the shelf, above Main 1 slot. Refer to Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2) for details.

3 Holding the VLNC40 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the circuit pack into the main 2 slot of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: If the Main 2 slot is to remain unequipped, install a 199MN apparatus blank to provide proper air flow for cooling. Refer to "199MN apparatus blank installation" (p. 4-12).

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC42 main 2 installation only

Follow this procedure if you are installing a VLNC42 10/100/1G T/F ethernet aggregator circuit pack.

1 Remove the VLNC42 circuit pack from the packing material.

2 Identify the unequipped main 2 slot on the upper left-hand side of the shelf, above Main 1 slot. Refer to Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2) for details.

3 Holding the VLNC42 circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the circuit pack into the main 2 slot of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: If the Main 2 slot is to remain unequipped, install a 199MN apparatus blank to provide proper air flow for cooling. Refer to "199MN apparatus blank installation" (p. 4-12).

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

VLNC42B main 2 installation only

Follow this procedure if you are installing a VLNC42B 10/100/1G T/F ethernet aggregator circuit pack.

1 Remove the VLNC42B circuit pack from the packing material.

2 Identify the unequipped main 2 slot on the upper left-hand side of the shelf, above Main 1 slot. Refer to Figure 4-1, "Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view" (p. 4-2) for details.

3 Holding the VLNC42B circuit pack upright in your hand, turn the circuit pack 90 degrees to the right and place the circuit pack into the main 2 slot of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf. Do **NOT** engage the circuit pack in the backplane connector.

Note: If the Main 2 slot is to remain unequipped, install a 199MN apparatus blank to provide proper air flow for cooling. Refer to "199MN apparatus blank installation" (p. 4-12).

4 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

199SC apparatus blank installation

Follow this procedure to install a 199SC apparatus blank in function group C or an empty SYSCTL slot in the Alcatel-Lucent 1850 TSS-5 shelf.

Note: For Release 4.1, function group C does not have a designated circuit pack; therefore, a 199SC apparatus blank is required.

1 Identify the unequipped function group C slot on the upper right-hand side.

2 Remove the 199SC apparatus blank from the packing material.

3 Place the 199SC apparatus blank into the unequipped C slot in the shelf. Do **NOT** engage the blank pack in the backplane connector.

4 Identify the unequipped SYSCTL slot on the lower right-hand side.

5 Remove the 199SC apparatus blank from the packing material.

6 Place the 199SC apparatus blank into the unequipped C slot in the shelf. Do **NOT** engage the blank pack in the backplane connector.

7 Check off the appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

199MN apparatus blank installation

Follow this procedure to install 199MN apparatus blank into the rack-mount Alcatel-Lucent 1850 TSS-5 shelf.

Important! If not installing a circuit pack in either main 1 or main 2, an 199MN apparatus blank is required.

1 Identify the unequipped main slot on the left side of the rack-mount Alcatel-Lucent 1850 TSS-5 shelf.

2 Remove the 199MN apparatus blank from the packing material.

3 Place the 199MN apparatus blank into the unequipped main slot on the shelf. Do **NOT** engage the blank pack in the backplane connector.

4 Check off the appropriate box in Table 1-1, “Part I installation checklist” (p. I-4).

END OF STEPS

Install PTM (pluggable transmission modules)

This section contains the instructions for the installation of the PTM modules.

Install optical PTMs

This section contains the instructions to install optical PTMs in the VLNC50, VLNC52, VLNC55, and VLNC64 circuit packs

1 Refer to the engineering job specification. Identify the proper circuit pack type (VLNC50, VLNC52, VLNC55 or VLNC64) and the port socket being equipped with the optical pluggable transmission module (PTM). Verify the PTM for the VLNC50/VLNC52/VLNC55 optical rate and reach matches the rate and reach of the PTM. Verify the PTM for the VLNC64 (matches the rate and reach of the PTM. See Appendix B, "PTM installation".

Note: Pluggable optics modules are shipped with a dust plug installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust plug be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable optics modules should not be necessary.

2 Check the ports for cleanliness and clean the pluggable optics module if necessary. See Appendix A, "Fiber cleaning".

Note: Never mechanically clean the receive (RX) port. Air blows should be used on the receive (RX) port. The receive port contains a lens for focusing a wide input. The lens is more easily scratched than cleaned.

3 Insert the pluggable optics modules in the required socket of the circuit pack faceplates, then wiggle the optics module to verify that it is locked in the socket. See Appendix B, "PTM installation". Verify that all unused sockets are equipped with dust plugs.

4 Repeat Step 1 through Step 3 if more optical modules need to be installed.

5 Check off appropriate box in Table 1-1, "Part I installation checklist" (p. I-4).

END OF STEPS

Install ethernet PTMs

This section contains the instructions to install Ethernet PTMs in the VLNC50. VLNC52, VLNC55, VLNC60, VLNC61, VLNC62,VLNC64,VLNC40, VLNC42,VLNC42B, VLNC33, and VLNC35 circuit packs. All of the circuit packs for the Alcatel-Lucent 1850 TSS-5 support one or more Ethernet PTMs. The VLNC40/VLNC42/VLNC42B can accept up to four PTMs supporting FE/GbE Ethernet connections, depending upon the PTM installed. The VLNC50/52/55 circuit pack can accept one GbE PTM. The VLNC60, VLNC61, VLNC62, and VLNC64 circuit packs can accept two FE/GbE PTMs and the VLNC33 and VLNC35 can accept two optical FE PTMs. When authorized Alcatel-Lucent PTMs are installed, they are automatically detected.

1 Refer to the engineering job specification. Identify the proper circuit pack type (VLNC50, VLNC52, VLNC55, VLNC60, VLNC61, VLNC62,VLNC64, VLNC40, VLNC42, VLNC42B, VLNC33, or VLNC35) and the port socket being equipped with the pluggable transmission module (PTM). Verify the PTM for the VLNC50/VLNC52/VLNC55 Ethernet rate (GbE) matches the rate of the PTM. Verify the PTM for the VLNC60, VLNC61,VLNC62, and VLNC64 Ethernet rate (FE/GbE) matches the rate of the PTM. See Appendix B, “PTM installation”.

Note: Pluggable optics modules are shipped with a dust plug installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust plug be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable optics modules should not be necessary.

2 Check the ports for cleanliness and clean the pluggable optics module if necessary. See Appendix A, “Fiber cleaning”.

Note: Never mechanically clean the receive (RX) port. Air blows only should be used on the receive (RX) port. The receive port contains a lens for focusing a wide input. The lens is more easily scratched than cleaned.

3 Insert the pluggable ethernet modules in the required socket of the circuit pack faceplates, then wiggle the optics module to verify that it is locked in the socket. See Appendix B, “PTM installation”. Verify that all unused sockets are equipped with dust plugs.

4 Repeat Step 1 through Step 3 if more ethernet modules need to be installed.

5 Check off appropriate box in Table 1-1, “Part I installation checklist” (p. I-4).

END OF STEPS

5 Stand-alone node set-up

Overview

Purpose

This section provides instructions for installing circuit packs and downloading software.

Contents

This chapter provides information on the following topics:

Circuit pack compatibility	5-2
Circuit pack installation	5-4
Software installation	5-11
Use of WaveStar® CIT software	5-12

Safety instructions

Note: All precautions should be observed when handling fiber.



WARNING

Laser hazard

Unterminated optical connectors may emit laser radiation. Do not view beam with optical instruments.



CAUTION

Service disruption hazard

The operational tests in this section are run only in an out-of-service mode of operation. Office alarms will normally be connected only during the office alarm test to prevent constant alarms throughout this section.

Circuit pack compatibility

Overview

"Main slot VLIU compatibility" (p. 5-2) lists all the circuit packs that are compatible with the installed VLIU and their respective shelf locations (slots).

Table 5-1 Main slot VLIU compatibility

Supported Circuit Packs Configurations		Compatible VLIU Interface Units			
Main 1	**Main 2**	**VLIU1**	**VLIU 2**	**VLIU3**	**VLIU 10**
VLNC50	Not Equipped	X	X	Not Compatible	X
Not Equipped	VLNC50 **1**	X	Not Compatible	Not Compatible	X
VLNC50	VLNC50 **1**	X	Not Compatible	Not Compatible	X
VLNC52	Not Equipped	Not Compatible	X	Not Compatible	X
Not Equipped	VLNC52 **1**	Not Compatible	Not Compatible	Not Compatible	X
VLNC52	VLNC52 **1**	Not Compatible	Not Compatible	Not Compatible	X
VLNC55	Not Equipped	Not Compatible	X	Not Compatible	X
Not Equipped	VLNC55	Not Compatible	Not Compatible	Not Compatible	
VLNC55	VLNC55	Not Compatible	Not Compatible	Not Compatible	
VLNC60/62	Not Equipped	X	X	X	X
Not Equipped	VLNC60/62	X	Not Compatible	Not Compatible	X
VLNC61	Not Equipped	Not Compatible	X	X	X
Not Equipped	VLNC61	Not Compatible	Not Compatible	Not Compatible	X
VLNC61	VLNC61	Not Compatible	Not Compatible	Not Compatible	Not Compatible

Supported Circuit Packs Configurations		Compatible VLIU Interface Units			
Not Equipped	VLNC40/42/42B	X	X	X	Not Compatible
VLNC40/42/42B	Not Equipped	Not Compatible	Not Compatible	Not Compatible	Not Compatible
VLNC50	VLNC40/42/42B	X	X	Not Compatible	Not Compatible
VLNC52	VLNC40/42/42B	Not Compatible	X	Not Compatible	Not Compatible
VLNC55	VLNC40/42/42B	Not Compatible		Not Compatible	Not Compatible
VLNC60/62	VLNC40/42/42B	X	X	X	Not Compatible
VLNC61	VLNC40/42/42B	Not Compatible	X	X	Not Compatible
VLNC64	VLNC40/40/42B	X	X	X	Not Compatible
VLNC64	Not Equipped	X	X	X	X
Not Equipped	VLNC64	X	X	X	X
VLNC64	Any Circuit pack **2**	X	X	X	X
Any Circuit pack **2**	VLNC64	X	X	X	X
VLNC64 **3**	VLNC64 **3**	X	X	X	X

Note:

1. The circuit pack Slot Protection State parameter must be provisioned Protected. If a VLNC50/52/55 circuit pack is inserted in Main 2 and the circuit pack Slot Protection State parameter is Unprotected, the system reports an unexpected CP type alarm. To change the circuit pack Slot Protection State parameter refer to the Alcatel-Lucent 1850 Transport Service Switch (TSS-5) User Provisioning Guide.
2. Any circuit pack that is otherwise allowed in this slot is allowed next to the VLNC64 circuit pack.
3. The VLNC64s in Main 1 and Main 2 operate separately and do not form an equipment-protected pair.
4. The “X” implies that the supported circuit pack will work with that VLIU
5. The VLNC35 is supported on all VLIU paddle boards except the VLIU3.
6. The VLNC33 is supported only when Main 2 is equipped with the VLNC42B circuit pack.

Control slot

The control slot is reserved for the VLNC2 System Controller (SYSCTL) circuit pack. The VNC40/VLNC42/VLNC42B/VLNC60/VNC61/VLNC62/VLNC64 circuit packs do not require a SYSCTL circuit pack in the shelf. However, if a VLNC50, VLNC52, and VLNC55 circuit pack is installed, the control slot must be equipped with a SYSCTL VLNC2 circuit pack.

Function group C slot

The “C” function slot is designed to house an Ethernet circuit pack (VLNC35) and is mapped directly to the four F. GRP “C” RJ-45 connectors.

If the “C” function slot is equipped with a VLNC33 circuit pack, Main 2 must be a VLNC42B circuit pack.

When not being used, this slot equipped with a 199SC apparatus blank.

Fan unit

The Alcatel-Lucent 1850 TSS-5 shelf contains an integral fan unit. Due to their horizontal orientation, a fan unit is required to dissipate heat across the circuit packs. Blank circuit pack In order to meet radiated emission requirements per GR-1089, any unused slot in the Alcatel-Lucent 1850 TSS-5 shelf must be equipped with an appropriate apparatus blank. Available circuit packs

Circuit pack installation

Description

This section provides instructions and the recommended order for installing (fully-seating) the circuit packs in the Alcatel-Lucent 1850 TSS-5 shelf.

Locations for circuit packs are shown in Figure 4-1, “Rack-mount Alcatel-Lucent 1850 TSS-5 shelf front view” (p. 4-2).



CAUTION

ESD hazard

When installing the circuit packs, be careful to insert them straight to avoid damaging the backplane pins.

A properly grounded ESD wrist strap MUST be worn when handling circuit packs.

When a circuit pack is installed, its FAULT LED will light for several seconds then extinguish.

Circuit pack installation procedure

Proceed as follows

1 Insert the VLNC2 circuit pack into the “SYCTL” slot of the shelf. If software has not been loaded, refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes*“New Installation chapter and load the VLNC2 card.

2 If applicable, fully insert the VLNC50 circuit pack into Main 1 or Main 2.

Note: The VLNC50 can occupy either Main slot when equipped with a VLIU 1 or VLIU10 I/O board. It must occupy Main1 when using a VLIU2 I/O board. Refer to Table 5-1, “Main slot VLIU compatibility” (p. 5-2) for further clarification if necessary.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 2 minutes then goes off, indicating successful installation.

3 If applicable, fully insert the VLNC52 circuit pack into Main 1 or Main 2.

Note: The VLNC52 can occupy both Main slots when equipped with a VLIU10 I/O board. Refer to Table 5-1, “Main slot VLIU compatibility” (p. 5-2) for appropriate slot configurations for the VLNC52.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 2 minutes then goes off, indicating successful installation.

4 If applicable, fully insert the VLNC55 circuit pack into Main 1 or Main 2.

Note: The VLNC55 can occupy both Main slots when equipped with a VLIU10 I/O board. Refer to Table 5-1, “Main slot VLIU compatibility” (p. 5-2) for appropriate slot configurations for the VLNC55.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 2 minutes then goes off, indicating successful installation.

5 If applicable, fully insert the VLNC60 circuit pack into either Main 1 or Main 2. Refer to Table 5-1, “Main slot VLIU compatibility” (p. 5-2) for appropriate slot configurations for the VLNC60.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 30 seconds then goes off, indicating successful installation.

6 If applicable, fully insert the VLNC61 circuit pack into either Main 1 or Main 2. Refer to Table 5-1, "Main slot VLIU compatibility" (p. 5-2) for appropriate slot configurations for the VLNC61.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 30 seconds then goes off, indicating successful installation.

7 If applicable, fully insert the VLNC62 circuit pack into either Main 1 or Main 2. Refer to Table 5-1, "Main slot VLIU compatibility" (p. 5-2) for appropriate slot configurations for the VLNC62.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 30 seconds then goes off, indicating successful installation.

8 If applicable, fully insert the VLNC64 circuit pack into either Main 1 or Main 2. Refer to Table 5-1, "Main slot VLIU compatibility" (p. 5-2) for appropriate slot configurations for the VLNC64.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 30 seconds then goes off, indicating successful installation.

9 If either Main slot is to remain unequipped, unlatch and fully seat the 199MN apparatus blank in the empty slot.

10 If the shelf is to operate in SDH mode, (default SONET) for the VLNC2, VLNC50/52/55 set the shelf mode to SDH. **Configuration -> Equipment -> 1850TSS-5** select **Interface Standard** SDH.

Result: The shelf will reset upon execution of the command.

11 If the shelf is to operate in SDH mode, for the VLNC60, VLNC61,VLNC62, and VLNV64 set the interface mode to E1 using the CLI manual command **(ALU SWITCHING) (Config)# interface-mode e1**

12 If applicable set the signal rate for the PTM being used. Right click on port 1 and select.

13 **Configuration -> port -> signal type** and select **OC-3**/STM-1, OC-12/STM-4 or OC-48/STM16 from the menu.

14 If applicable connect OUT to IN of the first PTM of the VLNC50/52/55 in Main1 of the Alcatel-Lucent 1850 TSS-5 shelf using an optical fiber jumper cable. Refer to Appendix A, “Fiber cleaning” for proper fiber cleaning instructions. Attenuate according to Table 5-2, “PTM for OC-n/STM-n lines” (p. 5-10).

Connect OUT to IN of the second PTM of the VLNC50/52/55 in Main1 of the Alcatel-Lucent 1850 TSS-5 shelf using an optical fiber jumper cable. Attenuate according to Table 5-2, “PTM for OC-n/STM-n lines” (p. 5-10).

After a few minutes the flashing FAULT LEDs extinguish on the VLNC50/52/55 circuit pack. The FAULT and the CR/MJ LEDs light on the SYSCTL due to DCC alarms created by optically looping the OLIUs. These SYSCTL LEDs remain lit until the DCC is disabled in the section labeled “Clearing alarms” (p. 6-8) of Chapter 6, “Stand-alone installation testing”.

15 f applicable connect OUT to IN of the first PTM of the VLNC50/52/55 in Main 2 of the Alcatel-Lucent 1850 TSS-5 shelf using an optical fiber jumper cable. Refer to Appendix A, “Fiber cleaning” for proper fiber cleaning instructions. Attenuate according to Table 5-2, “PTM for OC-n/STM-n lines” (p. 5-10).

Connect OUT to IN of the second PTM of the VLNC50/52/55 in Main 2 of the Alcatel-Lucent 1850 TSS-5 shelf using an optical fiber jumper cable. Attenuate according to Table 5-2, “PTM for OC-n/STM-n lines” (p. 5-10).

After a few minutes the flashing FAULT LEDs extinguish on the VLNC50/52/55 circuit pack. The FAULT and the CR/MJ LEDs light on the SYSCTL due to DCC alarms created by optically looping the OLIUs. These SYSCTL LEDs remain lit until the DCC is disabled in the section labeled "Clearing alarms" (p. 6-8) of Chapter 6, "Stand-alone installation testing".

16 If applicable, fully insert the VLNC40/42/42B circuit pack into Main 2 only. Refer to Table 5-1, "Main slot VLIU compatibility" (p. 5-2) for appropriate slot configurations for the VLNC42.

Important! The VLNC40/42/42B must occupy "Main 2"only of the Alcatel-Lucent 1850 TSS-5 shelf.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 1 minute then goes off and the Active LED goes to green indicating successful installation. If After the Active LED goes green, and if:

1. the Fault LED is OFF, it is a successful boot.
2. the Fault LED is blinking, this should not be considered a fault until the pack is configured. This could indicate a transmission fault that could be due to configuration.
3. the Fault LED is solid, the pack has a hardware fault and did not come up correctly.

17 If applicable, fully insert the VLNC35 or VLNC33 circuit pack into function slot "C" only.

Note: The VLNC35 must occupy function slot "C" of the Alcatel-Lucent 1850 TSS-5 shelf.

Note: The VLNC33 must occupy function slot "C" and Main 2 is equipped with a VLNC42B of the Alcatel-Lucent 1850 TSS-5 shelf.

Note: Unlatch the circuit pack and using a gentle steady pressure on both ends of the circuit pack, slide the circuit pack into the slot until it is fully seated. Then close the faceplate latch.

Result: The circuit pack FAULT LED lights for approximately 30 seconds then goes off, indicating successful installation.

18 If function slot “C” is to remain unequipped, unlatch and fully seat the 199SC apparatus blank in the empty slot.

19 If there are any FAULT or flashing LEDs on the VLNC50,VLNC52, and VLNC55 circuit packs other than the SYSCTL, press the UPD/INIT pushbutton on the SYSCTL circuit pack. Use the CLI manual for retrieving and clearing alarms on VLNC40/VLNC42/VLNC42B/VLNC60/VLNC62/VLNC64.

Result: The operation of the UPD/INIT push-button on the SYSCTL circuit pack will update the system and should clear any flashing or FAULT LEDs on the VLNC50 VLNC52, and VLNC55 circuit pack.

Note: There will still be solid FAULT and CR/MJ LEDs on the SYSCTL at this time. These alarms will be cleared in “Clearing alarms” (p. 6-8) of Chapter 6, “Stand-alone installation testing”.

20 If FAULT LEDs remain lit on the VLNC50, VLNC52, and VLNC55 circuit pack log into shelf and retrieve alarms using the **RTRV-ALM** command and refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Maintenance and Trouble-Clearing Guide,*365-372-402R7.2 for procedures to clear the alarm.

21 Any other alarms will be cleared later on in “Clearing alarms” (p. 6-8) of Chapter 6, “Stand-alone installation testing”.

22 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

Table 5-2 PTM for OC-n/STM-n lines

Optics	Circuit Pack PTM	Allowable Receiver Range (dBm)
Long Reach Optics	OM155 1.3LR1	-10.0 to -34.0
	OM622 1.3LR1	-8.0 to -28.0
	OM622 1.5LR1	-8.0 to -28.0
Intermediate Reach (IR) Optics	OM155 1.3IR1	-8.0 to -28.0
	OM622 1.3IR1	-8.0 to -28.0
Short Reach (SR) Optics	OM155 1.3SR1	-8.0 to -23.0

Optics	Circuit Pack PTM	Allowable Receiver Range (dBm)
OC3/STM1 CWDM-LR	OM155 wavelengths 1471,1491,1511,1531 ,1551,1571,1591,& 1611	-9.0 to -28.0
OC12/STM4 CWDM-LR	OM622 wavelengths 1471,1491,1511,1531 ,1551,1571,1591,& 1611nm	-9.0 to -28.0
OC48/STM16 CWDM-LR	OM2488wavelengths 1471,1491,1511,1531 ,1571,1591,1611 nm	-9.0 to -28.0

END OF STEPS

Software installation

Description

Installation of the (Alcatel-Lucent 1850 TSS-5) software and WaveStar® CIT Graphical User Interface (GUI) software is covered in detail in the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes*, which is provided with the software CD. On this CD, is software for the VLNC2, VLNC50, VLNC52, VLNC55, VLNC33, VLNC35, and the following CLI (Command Line Interface) packs VLNC40, VLNC42,VLNC42B, VLNC60, VLNC61,VLNC62, and the VLNC64.

Installing the WaveStar® CIT software and the TFTP software from this CD to the PC is necessary for software loading of the VLNC2, VLNC33, VLNC35, VLNC50, VLNC52, VLNC55, VLNC40, VLNC42, VLNC42B, VLNC60, VLNC61, VLNC62,and VLNC64 circuit packs. Follow the procedure "Install software on the PC" section of the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes*.

Any provisioning other than the software download, to the VLNC40, VLNC42,VLNC60, VLNC61, and VLNC64 will be done through the use of the CLI and its associated documentation. To install the Network Element software on the VLNC2, VLNC33, VLNC35, VLNC50, VLNC52, VLNC55, VLNC40,VLNC42,VLNC42B,VLNC60, VLNC61, VLNC62,VLNC64, and CIT, please follow the procedures in the "**Install NE software on a new Network Element**" section of the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes*

Important! When the software installation is completed for all applicable packs check off the appropriate box in Table 2-1, "Part II installation checklist" (p. II-1).

Software installation

Software installation is accomplished by performing the "**Install NE software on a new Network Element**" section in the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes* which is shipped with the software CD. Software download requires an *MS-DOS* compatible personal computer (PC), and either a CIT interface cable for connecting the PC to the RS-232 connector on the faceplate of the VLNC2 circuit pack or a LAN cross-over or straight cable for connecting the PC's network card to the LAN connector on the faceplate of the VLNC2 (preferred).

Software installation for the CLI circuit packs VLNC40, VLNC42, VLNC42B,VLNC60, VLNC61.VLNC62,VLNC64 is accomplished by either using the RS-232 connector designated M1 or M2 for Main1 and Main2 on the VLIU I/O board or connecting a staight or cross over cable directly to the LAN port of the card and using the TFTP server to download the pack. Refer to "**Install NE software on a new Network Element**" section of the CRN for complete details

Use of WaveStar® CIT software

Description

Complete the following steps to login to the Alcatel-Lucent 1850 TSS-5 via WaveStar® CIT. It is assumed that the CIT software has been installed on the PC and the NE software has been downloaded to the Alcatel-Lucent 1850 TSS-5 shelf per the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes*. See "Software installation" (p. 5-12).

Login procedure

Proceed as follows:

1

If using...	Make Connection between...
RS-232 cable	RS-232 port of the SYSCTL and DB-9 connector on the PC
Cross-over cable	LAN port of the SYSCTL and NIC card on the PC
Straight-through cable	Port on the hub or router and NIC card on the PC
Notes: 1. It is assumed connection has already been made between the LAN port of the SYSCTL and a port on the hub or router.	

2 Start the WaveStar® CIT software on the PC by double-clicking on the WaveStar® icon that was created during the installation procedure.

The following windows appears:

Figure 5-1 WaveStar® CIT banner

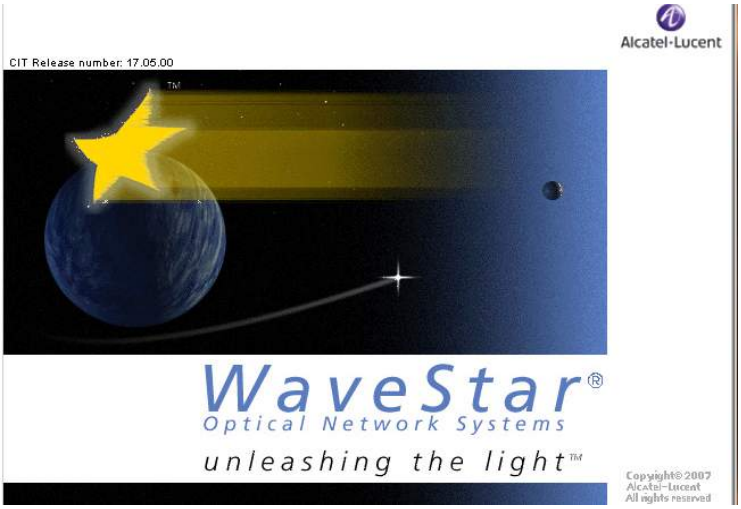
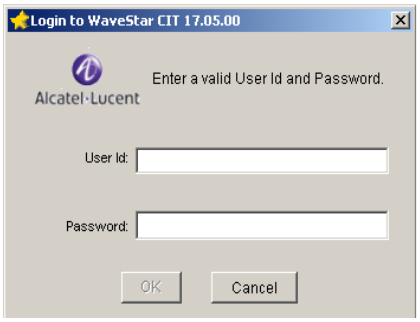


Figure 5-2 WaveStar® CIT login prompt



3 Enter the following in the Login window if CIT login was enabled during installation:

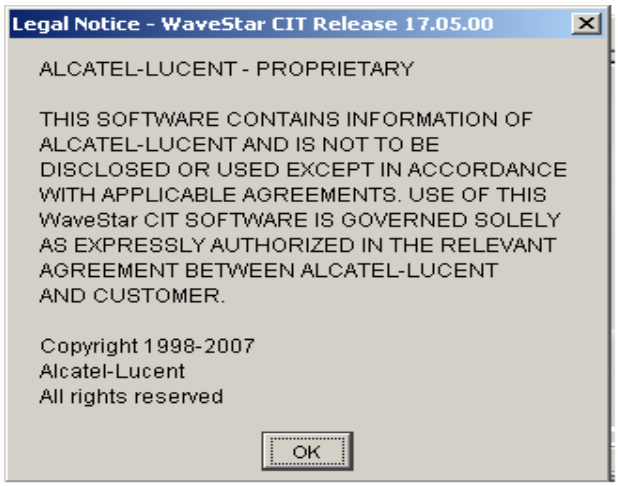
User ID: LUC01
Password: LUC+01

Note: User ID and password are case sensitive.

The above User ID and Password are the default, if they have been changed, use the current User ID and Password.

4 Click **OK** to connect. The following window will appear:

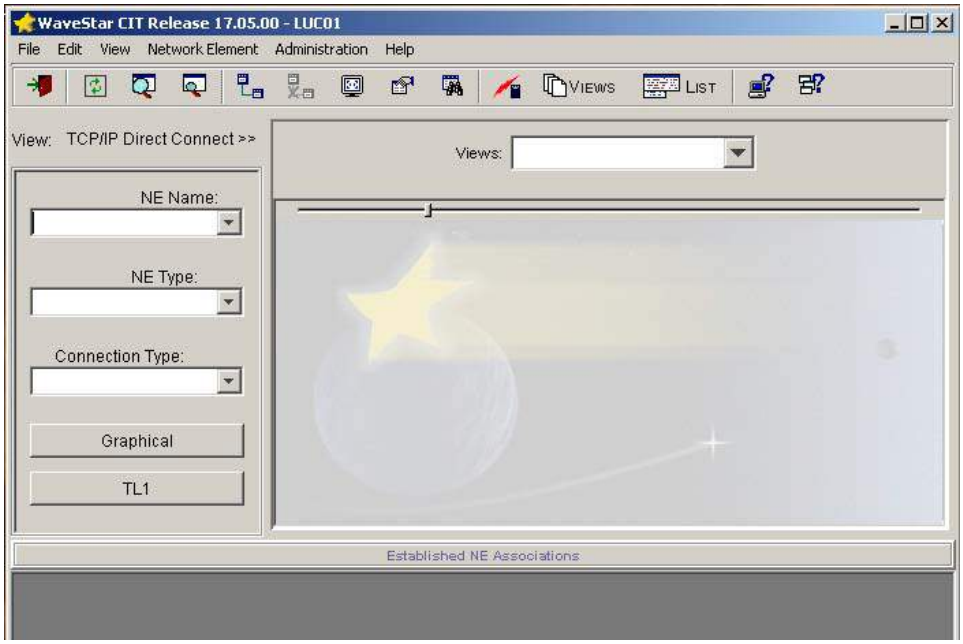
Figure 5-3 WaveStar® CIT legal notice



5 After reading the Legal Notice, click OK.

6 The following is displayed:

Figure 5-4 WaveStar® CIT network view



7 Under **NE Name**, enter **ALU-TSS-5**.

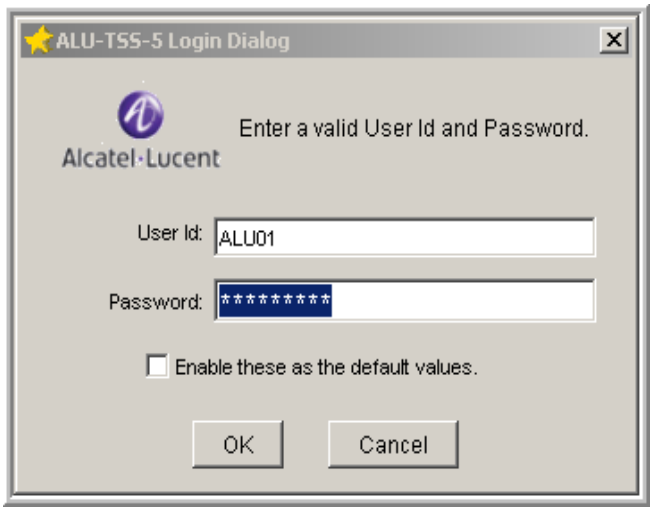
Note: **ALU-TSS-5** is the default TID.

8 Under **NE Type** click on the drop-down menu arrow and choose **1850TSS-5** from the drop-down list.

9 Under Connection Type, click on the drop down menu arrow and select **Serial** if physically connected to the **RS232** port or **OSI** if physically connected to the **LAN** port of the system controller.

10 Click on the **Graphical** button. The following screen will appear.

Figure 5-5 Shelf Login



11 Enter valid User ID and Password. Enter **ALU01** (case sensitive) for user ID and **1850TSS-5** (case sensitive) for the password.

12 A graphical representation of the Alcatel-Lucent 1850 TSS-5 shelf will open.

13 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

Part III: Network turn-up and testing

Overview

This section starts the process of integrating the Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) into the customer's network. The section provides the procedures to connect inter-office fibers and verify DCC communications and path switching.

Contents

This part of the document contains the following chapters:

Stand-alone installation testing	6
Connecting adjacent network elements	7

Installation checklist

Table 5-1 Part III installation checklist

Section and Chapter	Procedure	Required	Completed	
			Yes	No
Chapter 7, "Connecting adjacent network elements"	"Fiber installation" (p. 7-2)	Yes		
	"OC-3/STM-1/OC-12/STM-4/OC-48/STM-16 optical transmission test" (p. 7-7)	Yes		
	"Automatic protection switching test" (p. 7-8)	Yes		
	"Manual switching tests" (p. 7-10)	Yes		
	"Final operations" (p. 7-12)	Yes		

6 Stand-alone installation testing

Overview

Purpose

The purpose of this section is to verify proper cabling installation for DS1s/E1s, DS3/E3s, and 10/100M ports by performing stand-alone verification tests. This applies to any equipped pack that the Alcatel-Lucent 1850 Transport Service Switch (TSS-5) (Alcatel-Lucent 1850 TSS-5) shelf supports.

For end-to-end turn-up and testing procedures, refer to the *Alcatel-Lucent 1850 Transport Service Switch 5 (TSS-5) User Provisioning Guide,* 365-372-401R7.2.

Contents

This chapter provides information on the following topics:

LBO software settings	6-2
Clearing alarms	6-8
Local equipment and cross-connect tests	6-10
LED test	6-35
Office alarm test	6-36
Miscellaneous (environmental) discrete telemetry test	6-39
Final operations	6-42

LBO software settings

Description

This section provides instructions for setting the software Line Build Out (LBO) for DS1 and DS3 cabling and requires that the SYSCTL and VLNC50, VLNC52, and VLNC55,or VLNC60, VLNC61, VLNC62,or VLNC64 are installed and that software has been downloaded.

Setting VLNC50/52/55 DS1 LBO values

Follow this procedure to set the LBOs for DS1 interfaces.

Note: LBO values are not needed for E1 interfaces.

1 Is a VLNC50, VLNC52, or VLNC55 installed?

IF...	Then...
Yes	Continue with to Step 2.
No	Skip to "Setting VLNC60/61/62 LBO settings (optional)" (p. 6-4).

2 Log into the Alcatel-Lucent 1850 TSS-5 shelf using the CIT software as described in Chapter 5, "Use of WaveStar® CIT software".

3 Refer to the following table of cable lengths and LBO values. Determine the LBO value corresponding to the DS1 cables installed.

Table 6-1 DS1 LBO values for the VLNC50/52/55, VLNC60, VLNC61, and VLNC62

VLNC50/52/55 LBO Value	Distance (Feet)	VLNC60/61 LBO Short Haul Values (Feet)	Long Haul Values in dB
	Cable Type 1161A		
20	0 - 133 (default)	0 - 110 (default)	0
40	133 - 267	110 - 220	7.5
60	267 - 420	220 - 330	15
80	420 - 533	330 - 440	22.5
100	533 - 655	440 - 550	

VLNC50/52/55 LBO Value	Distance (Feet) Cable Type 1161A	VLNC60/61 LBO Short Haul Values (Feet)	Long Haul Values in dB
		550 - 660	

4 To provision LBO values, right-click on the graphical representation of the DS1 ports on the VLNC50/52/55 circuit packs. Notice that there are either eight or twenty-eight squares representing the DS1 ports for the VLNC50, VLNC52, VLNC55, respectively. One group of four ports represent ports a-1-1 to a-1-4 on the far right. The second group represents ports a-2-1 to a-2-4 the third group to the seventh group represents port a-3-1 to a-7-4 for the VLNC52 only. Move the cursor over the ports to differentiate which are which.

5 Right-click on a group of 4 ports to the right.

Result: a-1-1 to a-1-4 ports should be selected.

6 Right-click on port a-1-1.

7 Right-click and select **Configure port.**

8 Select the appropriate LBO value for the cable lengths i.e., **Line Build Out =20, (0,133)**

9 At the bottom of the screen, choose **all ports this pack.**

10 Select **Close**.

Result: The LBO values will be set appropriately for your cable lengths on all ports.

11 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

Setting VLNC60/61/62 LBO settings (optional)

This procedure refers to setting LBO values up in the VLNC60, VLNC61,and VLNC62 circuit packs. Refer to Table 6-1, "DS1 LBO values for the VLNC50/52/55, VLNC60, VLNC61, and VLNC62" (p. 2) for values.

Note: The VLNC60 and VLNC62 default the eight DS1/E1 ports to a 0 to110 ft. setting. The VLNC61 defaults the 16 DS1/E1 ports to a 0 to 110 ft. setting. If this value needs to be changed, this procedure will be necessary.

1 Connect an RS-232 cable to the RS-232 port on the VLIU labeled M1 or M2 depending on which slot is equipped with the VLNC60/61/62.

2 Connect the other end of the RS-232 cable to the PC. See Chapter 3, "RS-232 cable assembly" (p. 3-41).

3 Launch a Hyper Terminal session from the PC.

4 Start -> Programs -> Accessories -> Communications -> Hyper Terminal.

Result: A connection window opens.

5 Enter a name in the window and click OK.

6 If using COM1 on the PC, click OK; otherwise, connect using COM2.

7 Click OK.

8 The default settings are as follows;

Table 6-2 VLNC60/61/62 default RS-232 settings

Value	Description
9600	Baud Rate
8	Data Bits

Value	Description
None	Parity
1	Stop Bits
None	Flow Control

9 Click OK.

Result: A hyper terminal window will open.

10 Enter a <CR> return.

Result: A “User:” prompt will be echoed back.

11 Login into the Alcatel-Lucent 1850 TSS-5 shelf using the following values;

Prompt	Value
User:	Admin
Password:	blank

Result: The default system prompt **(ALU 1850TSS-5)** will be echoed back.

12 Enter user privilege mode by entering an “e” at the (ALU 1850TSS-5) prompt.

13 Enter a <CR> at the password prompt.

Result: The default system prompt **(ALU 1850TSS-5) #** will be echoed back.

14 At the **(ALU 1850TSS-5) #** prompt, type in: **config.**

Result: The system prompt **(Config) #** will be echoed back.

15 At the prompt, type: **interface a-1-1.**

Note: Interface numbers can be “a-1-1”, “a-1-2”, “a-1-3”, “a-1-4”, “a-2-1”, “a-2-2”, “a-2-3”, “a-2-4”, “a-3-1”, “a-3-2”, “a-3-3”,”a-3-4”, “a-4-1”,”a-4-2”,”a-4-3”,and “a-4-4” for the eight (VLNC60) and (VLNC62) or sixteen (VLNC61) ports, respectively.

16 At the **(interface a-1-1)#** prompt, type: **linebuildout short 0-110.**

Result: The interface a-1-1 has an LB0 setting 0-110.

17 Repeat Step 15 and Step 16 for the other DS1 ports.

18 Enter a **exit** command to go up one prompt level.

Example: (interface a-1-1)# exit

(Config)# prompt

19 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

Description

This section provides instructions for setting the software LBO for the DS3/E3 cabling and requires that the SYSCTL and VLNC50/52/55 are installed and that software has been downloaded.

Setting DS3/E3 LBO values

Follow this procedure to set the LBOs for DS3/E3 interfaces.

1 Log into the Alcatel-Lucent 1850 TSS-5 shelf using the CIT software as described in Chapter 5, “Use of WaveStar® CIT software”.

2 Refer to the following table for cable types and LBO values. Determine the LBO value corresponding to the DS3/E3 cables installed.

Table 6-3 DS3/E3 LBO values

Cable Type	LBO In	LBO Out
728A/B	0 - 225 ft.	225 - 450 ft.
735A	0 - 112 ft.	112 - 225 ft.

3 To provision LBO values, right-click on the graphical representation of the DS3/E3 ports on the VLNC50/52/55 circuit pack. Notice that there are three circles, representing the 3DS3/E3 ports.

4 Right-click on port b-1.

5 Right-click and select **Configure port.**

6 Select the appropriate value (IN/OUT) for the cable lengths**.**

7 At the bottom of the screen, choose **all ports this pack.**

8 Select **Close**.

Result: The LBO values will be set appropriately for your cable lengths.

9 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

Clearing alarms

Description

To clear standing alarms, the DCC channels will be disabled due to the optical loopback on the VLNC50/52/55.

1 To disable the DCC on the main 1 ports, right-click on the graphical representation of port 1 (top port).

2 Select **Configuration DCC termination** from the menu.

3 Select **Port AID: dcc-m1-1**.

4 Set **Termination State = disabled**.

5 Then select **Apply** at the bottom of the screen.

6 Select **Port AID: dcc-m1-2**.

7 Set **Termination State = disabled**.

8 Select **Apply** at the bottom of the screen.

9 Close this screen.

10 If there are any FAULT LEDs on or flashing, press the UPD/INIT push-button on the SYSCTL circuit pack.

If FAULT LEDs remain lit on any of the inserted circuit packs retrieve alarms using the **RTRV-ALM** command and refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Maintenance and Trouble-Clearing Guide*, 365-372-402R7.2, for procedures for addressing the problem.

11 Leave the office alarm cable disconnected until all procedures and testing have been completed.

12 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

Local equipment and cross-connect tests

Description

The tests in this section verify the proper operation of the circuit packs in the Alcatel-Lucent 1850 TSS-5 shelf. It verifies proper cabling from the Alcatel-Lucent 1850 TSS-5 to the access panel or connecting equipment. The shelf must successfully pass this test before testing any other feature of the Alcatel-Lucent 1850 TSS-5.

It is assumed that all procedures in Chapters 1 through 5 have been completed.

Note: After completing this test, isolate and correct any incorrect wiring or isolate and replace any failed units. If any cabling is corrected or units replaced, repeat the Local Equipment and cross-connect tests until the units pass without failures.



CAUTION

ESD hazard

A properly grounded ESD wrist strap MUST be worn when handling circuit packs.



WARNING

Laser hazard

Unterminated optical connectors may emit laser radiation. Do not view beam with optical instruments.

Important! Verify that the VLNC50/52/55 circuit pack still has both mains ports looped back on themselves with fiber before performing these tests.

DS1 testing procedure

Perform the following steps to verify backplane cabling to A function slot of the VLIU access panel. This test case is only necessary if SONET mode testing is to be done.

Cabling to DS1 connectors located on the VLIU access panel are via backplane connections. If a VLNC50/52/55 circuit pack is installed, DS1 cabling will need to be tested.

This procedure requires the use of a DS1 test set.

Note: The access panel requires a RJ-45 connector for DS1 inputs, a cable that will connect from the RJ-45 to the test set is required to complete this testing.

Note: If an error-free signal is not received, check DS1 cabling for proper connections.

1 Set the DS1 test set to transmit and receive a Quasi-Random Sequence Signal (QRSS) with B8ZS line coding.

2 Connect a cable from the DS1 test set to the associated DS1 port of the A Group on the access panel.

3 Enter a VT cross connect to the port under test. Check for cross-connections at the NE system view screen, under **View -> Cross-connections** and choose the DS1 circuit pack. If there are no cross-connections established, enter one to the port under test with the **Configuration**, select **Cross-Connection** command.

Result: The cross-connect wizard will open and guide you through setting up a VT cross connect.

4 Select **Create a new cross-connection**, and enter **Next** at the bottom of the screen.

5 Select **Rate** of the cross-connection (**VT1.5**); enter **Next**.

6 Select **UPSR Ring Add/Drop** and select **Next.**

7 Click on the **Select** button.

8 Select the "+" sign next to **CP main-1 (OC-N)** where **N** is equal to **OC-3**, **OC-12, or OC-48**.

9 Select **Port 1** (OC-N).

Result: A window appears with either 3 STS-1s, 12 STS-1s, or 48 STS-1s.

10 Select the "+" sign next to the first STS-1.

11 Select **VT Group 1.**

12 Highlight an available tributary on the right hand side (**m-1-1-1-1**) and click on **Select.**

13 Select the DS1 to drop to, (B). Choose an available trib from the "A" function group VT Group 1 (a-1-1-1),

14 Highlight an available tributary on the right hand side (**a-1-1-1**) and click on **Select.**

15 Click **Next.**

16 Select **Finish** from the bottom of screen.

Result: A cross-connection is established from m1-1-1-1 to a-1-1.

Requirement: The DS1 test set will indicate it is receiving an error-free QRSS signal with B8ZS linecoding.

If an error-free signal is still not received:

- Verify the cross-connect under **View- > Cross connections** and select the port.
- Verify that the DS1 line coding format is set to B8ZS that the LBOs are set according to cable length by right clicking on the DS1 port and choosing **view port configuration**.
- Verify the correct framing format is being sent either SF/ESF. ESF is the default.
- Verify the port monitoring mode is IS (In Service).
- Check DS1 cabling for proper connections.
- To change provisioning port information, right-click on the DS1 port and select **Configure port**.

17 Repeat Step 2 to Step 16 above for all other DS1 ports associated with the VLNC50/52/55.

END OF STEPS

E1 testing procedure

Perform the following steps to verify backplane cabling to A function slot of the VLIU access panel. This test case is only necessary if SDH mode testing is to be done.

Cabling to E1 connectors located on the VLIU access panel are via backplane connections. If a VLNC50/52/55 circuit pack is installed, E1 cabling will need to be tested.

This procedure requires the use of a E1 test set.

Note: The access panel requires a RJ-45 connector for E1 inputs, a cable that will connect from the RJ-45 to the test set is required to complete this testing.

Note: If an error-free signal is not received, check E1 cabling for proper connections.

1 Provision the shelf for SDH mode of operation using the GUI **Configuration -> Equipment -> 1850TSS-5** command.

2 Click **Select.**

3 Select **Interface Standard:SDH.**

4 Click **OK.**

5 Set the E1 test set to transmit and receive a Quasi-Random Sequence Signal (QRSS).

6 Connect a cable from the E1 test set to the associated E1 port of the A Group on the access panel.

7 Enter a VC12 cross connect to the port under test. Check for cross-connections at the NE system view screen, under **View -> Cross-connections** and choose the E1 circuit pack. If there are no cross-connections established, enter one to the port under test with the **Configuration**, select **Cross-Connection** command.

Result: The cross-connect wizard will open and guide you through setting up a VT cross-connect.

8 Select **Create a new cross-connection**, and enter **Next** at the bottom of the screen.

9 Select **Rate** of the cross-connection (**VC12**); enter **Next**.

10 Select **SNCP Ring Add/Drop** and select **Next.**

11 Click on the **Select** button.

12 Select the "+" sign next to **CP main-1 (STM-N)** where **N** is equal to **STM-1**, **STM-4, or STM-16**.

13 Select **Port 1** (STM-N).

Result: A window appears with either 3 TUG-3, 12 TUG-3s, or 48 TUG-3s.

14 Select the "+" sign next to the first TUG-3.

15 Select TUG-2 1-1**.**

16 Highlight an available tributary on the right hand side (**m-1-1-1-1**) and click on **Select.**

17 Select the E1 to drop to, (B). Choose an available trib from the "A" function group TUG-2 Port 1-1 (E1)1 (a-1-1-1),

18 Highlight an available tributary on the right hand side (**a-1-1-1**) and click on **Select.**

19 Click **Next.**

20 Select **Finish** from the bottom of screen.

Result: A cross-connection is established from m1-1-1-1 to a-1-1.

Requirement: The E1 test set will indicate it is receiving an error-free QRSS signal.

If an error-free signal is still not received:

- Verify the cross-connect under **View- > Cross connections** and select the port.
- Verify that the correct framing format is being sent either Cycle Redundancy Check-4 or Frame Alignment Signal; CRC-4 is the default.
- Verify the port monitoring mode is IS (In Service).
- Check E1 cabling for proper connections.
- To change provisioning port information, right click on the E1 port and select **Configure port**.

21 Repeat Step 2 to Step 20 above for all other E1 ports associated with the VLNC50/52/55.

END OF STEPS

DS1/E1 facility loopback testing

Facility loopback testing allows the installer to verify the electrical cabling to the Alcatel-Lucent 1850 TSS-5 shelf. When the shelf is cabled to other DS1/E1 terminating equipment, it will be necessary to contact the Customer Network Control Center and have a signal established at the port under test, in order to complete the loopback testing.

1 With the DS1/E1 test set still connected to the port under test, establish a loopback. Under the NE system view, select F**ault -> Analysis -> Port Loopback**.

2 Select the "+" sign next to **GRP grp-a-1 (8/28 DS1 or 8/21 E1)**.

3 Select the VT group under test (VT Group 1,VT Group 2, VT Group 3, or VT Group 4).

Note: For E1, select the TUG-2 -2, TUG-2-2,... TUG-2-7.

4 Select the DS1/E1 port.

5 Once the DS/E1 is selected, choose **Facility** and **Operate** from the loopback buttons and select **Apply** at the bottom of the screen. Verify the loopback under the **Alarm List** at the system level view. The ABN light on the VLNC2 is on.

Result: Once the loopback is established, a test signal from the DS1/E1 test set will be error-free.

6 While observing error-free transmission, grasp the DS1/E1 cable about 2 inches from the RJ45 connector head and gently tug the cable.

Result: If any errors are detected while performing this "wiggle" test, the RJ45 connector must be cut off and replaced.

If an error-free signal is not received:

- Check the LBO settings for DS1s only.
- Verify that the pack is provisioned for the framing format being sent from the test set: SF or ESF for DS1s; CRC-4 or FAS (Frame Alignment Signal) for E1s.
- Check the DS1/E1 cabling for proper connections.

7 Once the test is complete, remove the loopback. At the NE system level view screen, select **Fault -> Loopback.**

8 Choose the DS1 that is under test and select **Release** from the loopback radio button.

9 **Apply** the command at the bottom of the screen.

Result: The loopback is releases. Verify this under the **Alarm List** at the system level view and also notice that the MN/ABN light on the VLNC2 is extinguished.

10 Remove the test set connections from the associated port on the access panel.

11 Verify that an LOS alarm is present on the port that the test set connections have been removed from. Use the **Alarm List** at the system level view.

12 Repeat entire procedure on each of the remaining DS1/E1 (VLNC50/52/55) tributaries of function group “A.”

13 At the NE system level view, select Configuration -> Update system and choose update all.

Result: This command will remove alarms generated by removing the test signals from the DSX-1.

14 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

DS3/E3 testing procedure

Perform the following steps to verify backplane cabling to GRP B function slot of the VLIU access panel.

Cabling to DS3/E3 connectors located on the VLIU access panel are located on the front panel labeled “GRP B.” If a VLNC50/52/55 circuit pack is installed, DS3/E3 cabling will need to be tested.

This procedure requires the use of a DS3/E3 test set.

Note: The access panel requires Mini-BNC connectors for DS3/E3 inputs, a cable that will connect from the Mini-BNC to the test set is required to complete this testing.

Note: If an error-free signal is not received, check DS3/E3 cabling for proper connections.

1 Set the DS3/E3 test set to transmit and receive a valid M13 or framed E3 signal.

2 Connect an input and output cable from the DS3/E3 test set to the associated DS3/E3 port of “GRP B” on the VLIU access panel.

3 Enter a STS1/VC3 cross-connect to the port under test. To determine if a cross-connection exists, **View -> Cross-connections** at the NE system view and select the DS3/E3 circuit

pack. If there is not an established cross-connection for the port under test, enter one with the following command.

4 At the NE system view screen, under **Configuration**, select **Cross-Connection**.

Result: The cross-connect wizard will open and guide you through setting up a cross-connect.

5 Select **enter new cross-connection**, and enter **next** at bottom of screen.

6 Select the **rate** of the cross-connection (**STS1**), (**VC3**), and enter **next**.

7 Select **UPSR/SNCP Ring Add/Drop** and select **next.**

8 The next screen will have you select the Main tributary of your cross-connection (A). Select the "+" sign next CP main-1 (OC-N/STM-N) select Port 1 (OCN/STM-N).

9 Highlight an available tributary on the right-hand side and select **next** (m-1-1).

10 Select the DS3/E3 to drop to (GRP grp-b-1). Choose the port under test port 1 (b-1 or E3).

11 Highlight the available port tributary on the right-hand side.

12 Click **Select.**

13 Click **Next**.

14 Select **Finish** from the bottom of screen.

Result: A cross-connection is established from m1-1 to b-1 or E3.

Requirement: The DS3/E3 test set will indicate it is receiving an error-free signal.

Important! If an error-free signal is still not received:

- Verify the cross-connect under **View- > Cross-connections** and select the port.
- Verify that the DS3/E3 format of the port and the format of the test set are set to the same setting by choosing **view port configuration**. To provision port information, right-click on port and select **Configure port**.
- Check DS3/E3 cabling for proper connections.

END OF STEPS

DS3/E3 facility loopback testing

Facility Loopback testing allows the installer to verify the electrical cabling to the Alcatel-Lucent 1850 TSS-5 shelf. When the shelf is cabled to other DS3/E3 terminating equipment, it will be necessary to contact the Customer Network Control Center and have a signal established at the port under test, in order to complete the loopback testing.

1 With the DS3/E3 test set still connected to the port under test, establish a loopback. Under the NE system view, select F**ault -> Analysis -> Port Loopback**.

2 Select the group under test.

3 Once the DS3/E3 is selected, choose **facility** from the loopback buttons and select **operate**.

4 Select **Apply** at the bottom of the screen. Verify the loopback under the **Alarm List** at the system level view. The ABN light on the VLNC2 is on.

Result: Once the loopback is up, a test signal shall be generated at the DS3/E3 test set which will verify the cabling is correct.

5 While observing error-free transmission, grasp the DS3/E3 cable about 2 inches from the Mini-BNC connector head and gently tug the cable.

Result: If any errors are detected while performing this “wiggle” test, the Mini-BNC connector must be cut off and replaced.

If an error-free signal is not received:

- Check the LBO settings.

- Verify that the pack is provisioned for the framing format being sent from the test set, CBIT, or M13.
- Check the DS3/E3 cabling for proper connections.

6 Once the test is complete, remove the loopback. At the NE system level view screen, select F**ault -> Analysis -> Port Loopback**.

7 Choose the DS3/E3 that is under test and select **Release** from the loopback radio button.

8 **Apply** the command at the bottom of the screen.

Result: The loopback is down. Verify this under the **Alarm List** at the system level view and also notice that the MN/ABN light on the VLNC2 is extinguished.

9 Remove the test set connections from the associated port on the access panel.

10 Verify that an alarm is present on the port that the test set connections have been removed from. Use the **Alarm List** at the system level view.

11 Repeat the entire procedure on each of the remaining two DS3/E3s tributaries of function group B.

12 At the NE system level view, select Configuration -> update system and choose update all.

Result: This command will remove alarms generated by removing the test signals from the DSX-1.

13 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

VLNC33 and VLNC35 standalone test

This procedure will verify the four electrical RJ-45 ports are working on the VLIU I/O panel when the Alcatel-Lucent 1850 TSS-5 shelf is equipped with a VLNC33 or VLNC35 circuit pack. If the VLNC33 or VLNC35 is equipped, the optical PTMs these ports will be tested as well.

Note: MAIN 2 must be equipped with a VLNC42B in order for the VLNC33 to work in function slot C.

1 Connect the Front CIT cable between the PC and the CIT/RS 232 jack of the System Controller and login to the shelf using the serial connection.

2 Identify the function group “C” that contains the VLNC33 or VLNC35 (10/100T) circuit pack.

3 Identify the RJ45 patch panel on the associated VLIU with the function group “C” identified above.

4 Connect the RJ45 cable from the first RJ45 port on the VLIU I/O panel to the ethernet port on your PC.

5 Watch for the link LED to light on the PC’s Ethernet card or wait for 30 seconds and then disconnect the RJ45 cable from the VLIU I/O panel.

6 The Fault LED will start flashing on the VLNC35 circuit pack.

7 Verify that there is an inc. FE-LAN LOS alarm associated with the ethernet port where the signal was removed. Use the Alarm List button on the CIT system view.

8 Select **Configuration -> Update System... -> Update All**.

9 Connect the RJ45 cable to the next jack on the VLIU I/O panel and repeat starting at Step 5 until all electrical ports have been tested.

10 If Optical PTMs are inserted in the VLNC33 or VLNC35, loop the transmitter to the receiver on one port. Wait 10 seconds and disconnect the fiber.

11 The Fault LED will start flashing on the VLNC33 or VLNC35 circuit pack.

12 Verify that there is an inc. FE-LAN LOS alarm associated with the ethernet port where the signal was removed. Use the Alarm List button on the CIT system view.

13 Select **Configuration -> Update System... -> Update All**.

Result: The flashing fault LED on the VLNC33 or VLNC35 will clear.

14 Repeat Steps 10 to 13 for the other optical port.

15 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

VLNC40/VLNC42/VLNC42B standalone test

This procedure will verify that the 20 10/100-Mbs ports are working on the VLIU panel when the Alcatel-Lucent 1850 TSS-5 shelf is equipped with a VLNC40,VLNC42, and VLNC42b circuit pack.This test case will use a PC set up temporarily with a specific static IP address to verify each 100-Mb port can ping the Alcatel-Lucent 1850 TSS-5 shelf’s switch IP address. This switch IP address will be removed upon completion of these tests.

Note: The VLIU is installed and software has been successfully downloaded to the VLNC4x circuit pack as described in the “Install NE Software on a new Alcatel-Lucent 1850 TSS-5 network Element” chapter of the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes*.

1 Connect an RS-232 cable to the RS-232 port on the VLIU labeled M2.

2 Connect the other end of the RS-232 cable to the PC. see Chapter 3, "RS-232 cable assembly" (p. 3-41).

3 Launch a Hyper Terminal session from the PC. **Start -> Programs -> Accessories -> Communications -> Hyper Terminal.**

Result: A Connection Window opens.

4 Enter a name in the window and click OK.

5 If using COM1 on the PC, click OK; otherwise, connect using COM2.

6 Click OK.

7 The default settings are as follows:

Table 6-4 VLNC40/42 default RS-232 settings

Value	Description
9600	Baud Rate
8	Data Bits
None	Parity
1	Stop Bits
None	Flow Control

8 Click OK.

Result: A Hyper Terminal Window will open.

9 Enter a <CR> return.

Result: A "User:" prompt will be echoed back.

10 Login into the Alcatel-Lucent 1850 TSS-5 shelf using the following values;

Prompt	Value
User:	Admin
Password:	blank

Result: The default system prompt **(ALU 1850TSS-5) >** will be echoed back.

11 Enter user privilege mode by entering an “e” at the (**ALU 1850TSS-5**) prompt.

12 Enter a <CR> at the password prompt.

Result: The default system prompt **(ALU 1850TSS-5)#** will be echoed back.

13 Enter the CLI command **show network.**

Result: The IP address, Subnet Mask, Default Gateway, MAC address, etc. will be echoed back. The IP address Subnet Mask and Default Gateway will be **0.0.0.0.**

If nothing is echoed back, make sure you are logged in the privilege mode and a “#” sign follows the prompt.

14 Enter the following CLI command to set up the network IP address; **network parms 10.10.10.1 255.255.255.0.**

15 Enter the CLI command **show network.**

Result: The IP Address =**10.10.10.1** and Subnet Mask **255.255.255.0** will be echoed back.

16 Enter the CLI command **show network.**

17 Enter the CLI command **write memory** to save these settings.

18 Configure a static IP address on the PC to match the subnet mask in Step 15 above.

19 Click **Start -> Settings -> Network and Dial-up Settings** on the PC.

Result: A Network and Dial-up Connections window will open.

20 Right Click on the LAN card being used.

21 Select **Properties.**

22 Search for the Component “Internet Protocol (TCP/IP).”

23 Highlight this component “Internet Protocol (TCP/IP)” and left click properties.

Important! If the button “Obtain an IP address automatically” is checked you will need to restore this connection once this test case is complete.

24 Selec**t Use the following IP address:** button.

25 Enter the following IP address **10.10.10.3.**

26 Enter the following Subnet mask **255.255.255.0.**

27 Click OK.

28 Click OK.

29 Minimize the “Network and Dial-up Connections” window.

30 From the PC enter the following command. **Start -> Run -> cmd.**

Result: A **cmd.exe** window will open.

31 Enter **ipconfig** in this window.

Result: The LAN card will display the IP address and subnet mask configured in Step 24 and Step 25.

32 Connect a straight RJ-45 to RJ-45 cable to the VLIU port 9 or VLIU port 41 and the other end to the LAN port on laptop.

33 Visually verify the Link LED lights on port 9 or port 41of the VLIU.

34 In the **cmd.exe** window type in the following **ping 10.10.10.1**

Result: The ping response will be in the following format but may have different values.

Reply from 10.10.10.1: bytes=32 time <10ms TTL64

Reply from 10.10.10.1: bytes=32 time <10ms TTL64

Reply from 10.10.10.1: bytes=32 time <10ms TTL64

Reply from 10.10.10.1: bytes=32 time <10ms TTL64

35 If a ping response is "**Request timed out.**" repeat the test. Make sure that the PC IP address and the system IP address are as specified above.

36 Repeat the ping test for the remaining 100-Mb ports 10 to 28 or 42 to 60 moving the RJ-45 cable each time to a different port.

37 Replace the VLIU paddle board if one or more ports fail.

38 Close the **cmd.exe** window when completed.

39 Login into the Alcatel-Lucent 1850 TSS-5 shelf using the RS-232 cable and the following values;

Prompt	Value
User:	Admin
Password:	blank

Result: The default system prompt **(ALU 1850TSS-5) >** will be echoed back.

40 Enter user privilege mode by entering an “e” at the (ALU 1850TSS-5) prompt.

41 Enter a <CR> at the password prompt.

Result: The default system prompt **(ALU 1850TSS-5)#** will be echoed back.

42 Enter the following CLI command to clear out the IP address; **network protocol none.**

43 Enter the CLI command **write memory** to save these settings.

44 Enter the CLI command **show network.**

Result: The IP address, Subnet Mask, Default Gateway, MAC address, etc. will be echoed back. The IP address Subnet Mask and Default Gateway will be **0.0.0.0.**

If nothing is echoed back, make sure you are logged in the privilege mode and a “#” sign follows the prompt.

45 If necessary restore the Network and Dial-up Connections window.

46 Right-click on the LAN card being used.

47 Select **Properties.**

48 Search for the Component “Internet Protocol (TCP/IP).”

49 Highlight this component “Internet Protocol (TCP/IP)” and left-click properties.

Important! If the button “Obtain an IP address automatically” is checked you will need to restore this connection once this test case is complete.

50 Select **Obtain an IP address automatically:** button.

51 Click OK.

52 Click OK.

53 Close the **Network Connections** window and **Hyper terminal** window.

54 Disconnect the RS232 and straight RJ-45 to RJ-45 cable.

55 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

VLNC60/61/62 standalone test

This procedure will test the eight DS1/E1 ports on the VLNC60/61/62 circuit packs from the VLIU panel using a facility loopback command.

Note: This assumes the VLIU is installed and software has been successfully downloaded to the VLNC60/61/62 circuit pack as described in the “Install NE Software on a new Alcatel-Lucent 1850 TSS-5 network Element” chapter of the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Customer Release Notes*.

1 Connect an RS-232 cable to the RS-232 port on the VLIU labeled M1.

2 Connect the other end of the RS-232 cable to the PC. see Chapter 3, "RS-232 cable assembly" (p. 3-41).

3 Launch a Hyper Terminal session from the PC. **Start -> Programs -> Accessories -> Communications -> Hyper Terminal.**

Result: A Connection Window opens.

4 Enter a name in the window and click OK.

5 If using COM1 on the PC, click OK; otherwise, connect using COM2.

6 Click OK.

7 The default settings are as follows;

Table 6-5 VLNC60/61/62 default RS-232 settings

Value	Description
9600	Baud Rate
8	Data Bits
None	Parity
1	Stop Bits
None	Flow Control

8 Click OK.

Result: A Hyper Terminal Window will open.

9 Enter a <CR> return.

Result: A "User:" prompt will be echoed back.

10 Login into the Alcatel-Lucent 1850 TSS-5 shelf using the following values;

Prompt	Value
User:	Admin
Password:	blank

Result: The default system prompt **(ALU 1850TSS-5) >** will be echoed back.

11 Enter user privilege mode by entering an “e” at the (**ALU 1850TSS-5**) prompt.

12 Enter a <CR> at the password prompt.

Result: The default system prompt **(ALU 1850TSS-5)#** will be echoed back.

13 At the **(ALU 1850TSS-5)#** prompt, type: **config.**

Result: The system prompt **(Config)#** will be echoed back.

14 At the prompt, type: **interface a-1-1.**

Note: Where “interface numbers can be “a-1-1”, “a-1-2”, “a-1-3”, “a-1-4”, “a-2-1”, “a-2-2”, “a-2-3”, “a-2-4”, “a-3-1”, “a-3-2”, “a-3-3”, “a-3-4”,a-4-1”, “a-4-2”, “a-4-3”, and “a-4-4” for the 16 ports respectively.

15 At the **(interface a-1-1)#** prompt, type: **loopback facility.**

Result: The interface a-1-1 is now looped back toward the RJ-45 port 1 on the VLIU panel.

16 Connect a cable from the DS1 test set to **port 1** of the VLIU panel.

17 Set the DS1 test set to transmit and receive a ESF quasi-random sequence signal (QRSS) with B8ZS linecoding.

Result: Error-free transmission should be observed at the test set.

18 At the **(interface a-1-1)#** prompt type **no loopback.**

Result: The interface a-1-1 is now released on port 1 on the VLIU panel.

19 Repeat Step 14 to Step 18 for the other 7 or 15 DS1/E1 ports.

20 Enter a **exit** command to go up one prompt level.

Example: (interface a-1-1)# exit

Result: (Config)# prompt

21 Check off the appropriate box in Table 2-1, "Part II installation checklist" (p. II-1).

END OF STEPS

VLNC64 standalone test

This procedure will verify only verify the OC-3/STM-1 functionality of the VLNC64 circuit pack.

Note: This assumes the VLIU is installed and software has been successfully downloaded to the VLNC64 circuit pack as described in the "Install NE Software on a new Alcatel-Lucent 1850 TSS-5 network Element" chapter of the *Alcatel-Lucent 1850 Transport Service Switch 5 (TSS-5) Customer Release Notes*.

1 Connect an RS-232 cable to the RS-232 port on the VLIU labeled M1.

2 Connect the other end of the RS-232 cable to the PC. see Chapter 3, "RS-232 cable assembly" (p. 3-41).

3 Launch a Hyper Terminal session from the PC. **Start -> Programs -> Accessories -> Communications -> Hyper Terminal.**

Result: A Connection Window opens.

4 Enter a name in the window and click OK.

5 If using COM1 on the PC, click OK; otherwise, connect using COM2.

6 Click OK.

7 The default settings are as follows;

Table 6-6 VLNC64 default RS-232 settings

Value	Description
9600	Baud Rate
8	Data Bits
None	Parity
1	Stop Bits
None	Flow Control

8 Click OK.

Result: A Hyper Terminal Window will open.

9 Enter a <CR> return.

Result: A “User:” prompt will be echoed back.

10 Login into the Alcatel-Lucent 1850 TSS-5 shelf using the following values;

Prompt	Value
User:	Admin
Password:	blank

Result: The default system prompt **(ALU 1850TSS-5) >** will be echoed back.

11 Enter user privilege mode by entering an “e” at the (ALU 1850TSS-5) prompt.

12 Enter a <CR> at the password prompt.

Result: The default system prompt **(ALU 1850TSS-5)#** will be echoed back.

13 AT the **(ALU 1850TSS-5)#** prompt type in **config.**

Result: The system prompt **(Config)#** will be echoed back.

14 At the prompt type **interface main-1-1.**

Note: where “interface numbers can be “**main-1-1**”, or “**main-2-1**”depending on which main slot the VLNC64 is installed in.

15 At the **(interface main-1-1)#** prompt type **loopback facility.**

Result: The interface main-1-1 is now looped back toward the PTM module.

16 Connect an optical test set to the PTM module and configure the test set for an OC-3/STM-1 signal format.

Result: The test set will report a valid error-free signal.

17 At the **(interface main-1-1)#** prompt, type: **no loopback.**

Result: The interface main-1-1 optical loopback is released.

END OF STEPS

LED test

Description

This test verifies proper operation of all LEDs on the VLNC2, VLNC33, VLNC35, VLNC50, VLNC52 and VLNC55 Alcatel-Lucent 1850 TSS-5 circuit packs. Operation of all the LEDs is necessary to assist in trouble isolation.

Note: This test case requires the VLNC2 and either an VLNC50, VLNC52, VLNC55, VLNC33, and VLNC35 be present.

Note: If there are any LED failures, determine if the problem is with the circuit pack or shelf and replace the faulty unit.

Procedure

Proceed as follows:

1 At the NE system level view, select **Fault -> Test -> LED.**

2 Select Shelf (**Shelf TSS-5).**

3 Click **Select**.

4 Select number of iterations and verify by looking at the shelf.

Result: All LEDs on the shelf (VLNC2, VLNC33, VLNC35, VLNC50, VLNC52, and VLNC55) will light for 10 seconds, then extinguish for 10 seconds, and then the proper LEDs will light to indicate the current status of the shelf.

5 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

Office alarm test

Description

This test verifies proper operation and wiring of the office alarms in a network equipment building system (NEBS) environment.

Audible and visual reporting of critical, major, minor alarms will be verified if there is a VLNC2 installed.

Prerequisite

The following is a list of items to verify before beginning tests in this section.

- The Alcatel-Lucent 1850 TSS-5 main OLIUs should be optically looped from the previous section. Verify that the Alcatel-Lucent 1850 TSS-5 shelf is clear of all alarms (only green LEDs are lighted) prior to and after completing this test.
- The office alarm cable will be temporarily connected during this procedure. Table 6-7, "Office alarm connections" (p. III-35) lists the office alarms connections.
- It is a requirement that alarms on the Alcatel-Lucent 1850 TSS-5 do not affect and are not affected by other equipment via office alarm connections. During this test, the alarm state of other equipment connected to the same office alarms as the Alcatel-Lucent 1850 TSS-5 should be examined after creating or clearing every alarm.
- A properly grounded ESD wrist strap must always be worn while handling circuit packs.
- This test should be performed on all shelves where office alarm reporting is required.
- After completing the office alarm test, the Alcatel-Lucent 1850 TSS-5 office alarms should be disconnected from the office alarm system for the remainder of the test procedures. This will prevent the office alarms from being activated while performing the other tests in this section.

Table 6-7 Office alarm connections

Pin#	Color	Name
11	BL	MJ Audible +
12	BL-W	MJ Audible -
13	O	MJ Visual +
14	O-W	MJ Visual -
15	G	MN Audible +
16	G-W	MN Audible -

Pin#	Color	Name
17	BR	MN Visual +
18	BR-W	MN Visual -

Procedure

Proceed as follows:

6 At the NE system level view, right-click on the DS1/E1 port of the VLNC50, VLNC52, and VLNC55.

7 Select provision port.

8 Under the **Parameters** section, provision the notification code = Minor.

9 Select all ports this pack from the bottom of the screen, and apply.

10 Connect the office alarm cables to ALARM termination block on the VLIU access panel of the Alcatel-Lucent 1850 TSS-5 shelf.

11 Introduce a valid DS1/E1 signal, then remove the signal.

Requirement: Activated office alarms: MN visual, MN audible.

Important! Alarms will not be activated until the alarm delay time has passed. The default time is 2 seconds.

12 Press the ACO/TST push-button on the SYSCTL.

Result: Activated office alarm: MN visual, the MN audible alarm clears.

13 Reconnect valid DS1/E1 signal, and wait for alarms to clear.

14 Follow Step 6 to Step 9 to provision notification code for all DS1/E1 ports to MJ.

Important! Select MJ instead of MN in Step 7.

15 Remove the valid DS1/E1 signal.

Result: Activated office alarms: CR/MJ visual, CR/MJ audible.

16 Press the ACO push-button on the SYSCTL.

Result: Activated office alarm: CR/MJ visual.
The CR/MJ audible alarm clears.

17 Reconnect valid DS1/E1 signal, and wait for alarms to clear.

18 Follow Step 6 to Step 9 to provision notification code for all ports to NA.

Important! Select NA instead of MN in Step 7.

19 Remove valid DS1/E1 signal, and issue a **Configuration -> update system -> update all command** to clear LOS alarm.

20 Disconnect the office alarm cable connected in Step 10 for the remainder of the test procedures in this chapter.

21 Check off the appropriate box in Table 2-1, "Part II installation checklist" (p. II-1).

END OF STEPS

Miscellaneous (environmental) discrete telemetry test

Description

Miscellaneous discrete telemetry access allows the maintenance center to control and monitor equipment co-located with the Alcatel-Lucent 1850 TSS-5 shelf. Perform this procedure for shelves that are cabled for miscellaneous discrete telemetry.

Table 6-8 Miscellaneous (environmental) discrete in (MDI); miscellaneous discrete out (MDO) connections

Pin#	Color	Designation
MDI/O 1	BL	TLMI/O#1+
MDI/O 2	BL-W	TLMI/O#1-
MDI/O 3	O	TLMI/O#2+
MDI/O 4	O-W	TLMI/O#2-
MDI/O 5	G	TLMI/O#3+
MDI/O 6	G-W	TLMI/O#3-
MDI/O 7	BR	TLMI/O#4+
MDI/O 8	BR-W	TLMI/O#4-
MDO 9	Cable 2, BL	MDO#1+
MDO 10	Cable 2, BL/W	MDO#1-
MDO 11	Cable 2, O	MDO#2+
MDO 12	Cable 2, O/W	MDO#2-
Note: Output commons are tied together internally. It is necessary only to connect one output common to a ground source.		

MDI test procedure

Proceed as follows:

1 Determine which environmental inputs to be monitored via the Alcatel-Lucent 1850 TSS-5 shelf.

2 Verify that the miscellaneous discrete cables are connected to the MDI connector block on the VLIU Access Panel. See Figure 3-18, “VLIU MDI/MDO/alarm terminal block” (p. 3-26) and Figure 3-19, “VLIU MDI/MDO/alarm terminal block shelf view” (p. 3-26) in Chapter 3, “Cable and fiber installation”.

3 Refer to Table 6-8, "Miscellaneous (environmental) discrete in (MDI); miscellaneous discrete out (MDO) connections" (p. III-38) to determine the wire color of the cable lead associated with the environmental input to be tested.

4 At the far end of the cable, short the associated environmental input lead to the red-slate (R-S) input common lead.

5 Verify that the minor (MN/ABN) alarm lights on the SYSCTL.

6 Use the **Alarm List** at the NE system view to verify the correct environmental alarm has been activated.

7 Remove the short and verify that the minor (MN/ABN) alarm indication on the SYSCTL clears.

8 Use the **Alarm List** at the NE system view to verify the correct environmental alarm has been cleared.

9 Repeat Step 3 through Step 7 for each environmental input being used.

10 Check off the appropriate box in Table 2-1, "Part II installation checklist" (p. II-1).

END OF STEPS

MDO Test Procedure

This procedure only tests MDOs 1-4 which are connected to the VLNC2. To verify MDO6 a service-affecting alarm must be created on the VLNC40 or VLNC42 circuit pack if equipped.

1 Determine which environmental outputs are to be activated via the Alcatel-Lucent 1850 TSS-5 shelf.

2 Verify that the miscellaneous discrete cables are connected to the MDO connector block on the Access Panel. See Figure 3-18, "VLIU MDI/MDO/alarm terminal block" (p. 3-26) and Figure 3-19, "VLIU MDI/MDO/alarm terminal block shelf view" (p. 3-26) of Chapter 3, "Cable and fiber installation".

3 At the NE system level view, **Select Fault -> Operate Output Misc. Discretes**.

4 Select **Output -> Control 1.**

5 Click the radio button for **Operate Control Point** and click Apply.

6 Verify the correct control output was operated (e.g., generator, pump etc.).

7 At the NE system level view, **Select Release Control Point.**

8 Verify the correct control output has been released (e.g., generator, pump etc.).

9 Repeat Step 3 through Step 8 for each environmental output being used.

10 Check off the appropriate box in Table 2-1, "Part II installation checklist" (p. II-1).

END OF STEPS

Final operations

Description

The following procedure ensures that all test signals have been removed and the Alcatel-Lucent 1850 TSS-5 shelf is alarm free and ready for network connection procedures.

Procedure

Proceed as follows:

1 Verify that no alarm LEDs are lit and no FAULT LED is lit on any circuit pack.

Note: Sending an upd-sys command will update the system database to reflect the current configuration and incoming signals.

If any alarm is present, refer to the *Alcatel-Lucent 1850 Transport Service Switch 5 (TSS-5) Maintenance and Trouble-Clearing Guide*, 365-372-402R7.2

2 If desired, reconnect the office alarm cable at this time.

3 Check off the appropriate box in Table 2-1, “Part II installation checklist” (p. II-1).

END OF STEPS

7 Connecting adjacent network elements

Overview

Purpose

This procedure is used to make fiber connections between nodes in a UPSR/SNCP ring. It is not intended to replace acceptance test procedures. If problems are encountered, refer to the *Alcatel-Lucent 1850 Transport Service Switch 5 (TSS-5) Maintenance and Trouble-Clearing Guide,* 365-372-402R7.2*,* for detailed troubleshooting procedures.

Contents

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Fiber installation

Description

This section is used to verify proper fiber connections between Alcatel-Lucent 1850 Transport Service Switch (TSS-5) (Alcatel-Lucent 1850 TSS-5) nodes. this procedure assumes a UPSR/SNCP ring is being established. Other applications such as 0X1 or 1+1 for point to point configurations could be tested as well.

Prerequisite

The following is a list of items to verify before beginning tests in this section.

- Two people are required to perform the end-to-end turn up in this section (one at each adjacent node).
- The Alcatel-Lucent 1850 TSS-5 VLNC50, VLNC52, or VLNC55 in Main 1 and/or Main 2 should be optically looped from the previous section. Verify that the Alcatel-Lucent 1850 TSS-5 shelf is clear of all alarms (only green LEDs are lighted) prior to and after completing this test.
- CIT is still connected to the Alcatel-Lucent 1850 TSS-5 and is running.
- The office alarm cable will remain disconnected during this procedure.



CAUTION

ESD hazard

A properly grounded ESD wrist strap MUST be worn when handling circuit packs.



WARNING

Laser hazard

Unterminated optical connectors may emit laser radiation. Do not view beam with optical instruments.

Procedure

The following procedures are performed at each end of the optical span being tested.

1 Verify that the office alarm cabling to the ALARM terminal block on the access panel of the Alcatel-Lucent 1850 TSS-5 shelf is disconnected.

2 At each Alcatel-Lucent 1850 TSS-5 shelf, enter the shelf TID per the customer order or use ALU-TSS-5 as default. This can be done at the NE system level view by entering **Administration -> Set TID** and entering the TID.

3 This will log you out of the CIT. Log back into the CIT by following the "Login procedure" (p. 5-13) in 5.

4 Verify there are no cross-connections on the shelf with the **View -> Cross-Connection** screen.

5 If cross connections are present, delete them all under the **Configuration -> Cross-Connection -> Delete Leg(s) of an Existing Cross-connection,** select **next.**

6 Open Main1 and delete any existing cross-connections.

7 Right-click on each port of the VLNC50/52/55 main pack, and verify that the ports are provisioned for UPSR/SNCP under port configuration.

8 Route the optical jumpers from the side of the shelf.

9 Establish verbal communications with the technician at the other end of the optical span.

10 At both ends of the optical span, remove protective covers from receive and transmit optical jumper cables and clean LC connectors.

Note: The Alcatel-Lucent 1850 TSS-5 VLNC50/52/55 require single-mode lightguide cable. Single-mode optical fibers connecting this shelf with the far-end shelf should not be connected to the VLNC50/52/55 until at least 45 seconds after an optical loopback is removed. It may take from 15 seconds to 3.5 minutes for the FAULT LEDs to stop flashing after the cables are connected, depending on the setting of the OC-3/OC-12/OC-48 or STM-4/STM-1/STM-16 signal degrade threshold.

11 At both ends of the optical span, ensure that only the dual LC adapter is installed on the OLIU (no LBO).

Note: For Alcatel-Lucent 1850 TSS-5 OC-3/STM-1/OC-12/STM-4 **UPSR/SNCP** ring configurations, optical fibers extend in two different directions to make up the

ring. At each shelf (node) in the ring, in unprotected pack operation the **M1-1** port will connect to the **M1-2** port in one adjacent node, and the **M1-2** port will connect to the **M1-1** port in the other adjacent node. For protected pack operation UPSR/SNCP **M1-1** port will connect to the adjacent node **M2-1** and the **M2-1** port will connect to the adjacent node **M1-1** port.

Note: For 1+1 applications M1-1 port will connect to the M1-1 port of the adjacent node, and the M1-2 port will connect to the adjacent node M1-2 port for unprotected pack 1+1 operations. For protected pack operations, the M1-1 port will connect the adjacent node M1-1 port and the M2-1 port will connect the adjacent node M2-1 port.

12 At each end of the optical spans, connect the optical fiber transmit cables to the VLNC50/52/55 M1-1, M1-2 OUT connectors.

13 At each end of the optical span, measure the optical power of the optical fiber receive cables using an optical power meter.

14 Select the appropriate LBO value required based on the received optical power measurement. Attenuate to the middle of the allowable optical receive power range. Refer to the following tables for the Alcatel-Lucent 1850 TSS-5 main circuit pack receive levels.

OC-3/STM1 SFP Optics	Wave Length	Transmit Signal (dBm)	Received Power (dBM)
Short Reach (SR-1) Optics	1310	-8 to -15	-8 to -23
Intermediate Reach (IR) Optics	1310	-8 to -15	-8 to -28
Long Reach (LR) Optics	1310	0 to -5	-10 to -34

OC-12/STM4 SFP Optics	Wave Length	Transmit Signal (dBm)	Received Power (dBM)
Intermediate Reach (SR-1) Optics	1310	-8 to -15	-8 to -28
Long Reach (LR-1) Optics	1310	+2 to -3	-8 to -28
Long Reach (LR-2) Optics	1550	-3 to +2	-8 to -28

Optics	Circuit Pack PTM	Allowable Receiver Range (dBm)
OC-48/STM-16 CWDM-LR	OM2488wavelengths 1471,1491,1511,1531,1571,1591,1611 nm	-9.0 to -28.0

15 Select the proper LBO based on the value required and the comcode as listed below.

Code	Comcode	Loss (dB)
ABLCS-05.0	108279381	5
ABLCS-10.0	108279431	10
ABLCS-15.0	108279480	15
ABLCS-20.0	108279530	20

16 Clean LC LBOs and install LBO assemblies to the M1-1 and M1-2 IN connector.

17 At the far end, connect the input optical fiber to the proper M1-1 and M1-2 IN connectors.

Requirement: The FAULT LED on the OLIU extinguishes after approximately 10 seconds.

18 Verify that LBO has been installed at far end.

19 At the near end, connect the input optical fiber to the proper M1-1 and M1-2 IN connectors.

Requirement: The FAULT LED on the OLIU extinguishes after approximately 10 seconds.

20 Disconnect the fiber cable from the OUT connector on the OLIU at one end of the span. At the other end, verify that the associated FAULT LED is flashing, indicating a loss of signal. Reconnect the fiber and repeat the process for the other direction of transmission.

21 In order to enable communications with the adjacent Alcatel-Lucent 1850 TSS-5 nodes, right click on the ports of the VLNC50/52/55 pack and enable DCC.

Select the following options for Main 1-1 based on work instructions:
dcc-m1-1, COM=ENABLED, SIDE=US

Select the following options for Main 1-2 based on work instructions:
dcc-m1-2, COM=ENABLED, SIDE=NS

Note: If inconsistent DCC alarms are raised, US and NS settings may need to be swapped.

22 Verify proper shelf timing at each node using **View -> Timing Sync**. To change timing modes use the **Configuration -> Timing/Sync** command.

23 In order to verify proper communications with the adjacent Alcatel-Lucent 1850 TSS-5 nodes, execute the following command:

Administration -> OSI Neighbor Map

Result: The TIDs and NSAPs of adjacent nodes will be displayed along with the OLIU and port they are connected and the TIDs and NSAPs of all the nodes in the TARP area will be displayed.

24 Perform steps in this procedure on all adjacent nodes in the ring.

25 After all connections and tests have been made, verify optical fiber cables are properly routed in bay framework.

26 Check off the appropriate box in Table 5-1, “Part III installation checklist” (p. III-1).

END OF STEPS

OC-3/STM-1/OC-12/STM-4/OC-48/STM-16 optical transmission test

Procedure

This procedure should be conducted when the Alcatel-Lucent 1850 TSS-5 shelf is set to UPSR/SNCP or any other application and connected end to end and not looped back on itself.

1 At the NE system level view. Initialize all performance monitoring registers by entering the **Performance -> Initialize- > PM Registers** command and select **Both**.

2 Wait 15 minutes.

3 At the test location, enter the following command at the NE system level:
View Performance -> View PMreport and select **OCnLine**, **Select Time Period of 1-Day Current Date, 0-up.**
Highlight all on the left-hand side and **Apply.**

Requirement: The Response Window indicates no transmission errors, all monitor values should be "0".

4 Repeat Step 1 thorough Step 3 for all Alcatel-Lucent 1850 TSS-5 shelves at the test location.

5 Repeat Step 1 three Step 3 for each node in the ring.

6 Check off the appropriate box in Table 5-1, "Part III installation checklist" (p. III-1).

END OF STEPS

Automatic protection switching test

Description

This section provides the procedures for verifying the Alcatel-Lucent 1850 TSS-5 shelf automatic and manual protection switching.

Note the following:

- These tests do NOT simulate circuit pack failures.
- A properly grounded wrist strap must always be worn while handling circuit packs.
- Prior to performing each test, the shelf under test must be clear of all alarms (that is, only green LEDs are lighted).

MAIN1 VLNC50/52 switch test

Proceed as follows:

1 There must be cross-connects present to complete this test. Enter VT1.5 cross-connects using the cross-connect wizard. At the system level view, **Configuration -> Cross-Connection.** Then follow the wizard to establish cross-connections to the DS1 ports. See "DS1 testing procedure" (p. 6-10) for details.

2 At the NE system level view, **View -> Protection** and open by clicking the + sign until you see the path pertaining to the cross connection that was established above and enter select at the bottom of the screen.

Result: Path state information will be given including which path is in the active state.

Note: M1-1 is associated with Ring 1 and M1-2 is associated with Ring 2. Note the active path.

3 Disconnect the optical fiber connected to the IN of the port that is the active receiver on the VLNC50 circuit pack.

Result: The NE and then MN/ABN alarm LED will light on the SYSCTL and the FAULT LED will flash on the OLIU.

4 At the NE system level view, **View -> Protection** and open the menu until you see the path pertaining to the cross connection that was established above.

Result: The ring that was active in the previous step is now in signal failure and the other ring is now in the active state.

5 Reconnect the optical fiber to the port of the VLNC50, VLNC52, or VLNC55.

Result: After a short time, the MN/ABN alarm LED on the SYSCTL and the FAULT LED on the OLIU will extinguish.

6 Repeat Step 2 through Step 5 to verify a switch back to the port that was originally active.

7 Leave the cross-connects in the system to complete the next section "Manual switching tests" (p. 7-10).

8 Check off the appropriate box in Table 5-1, "Part III installation checklist" (p. III-1).

END OF STEPS

Manual switching tests

Description

This test will initiate switching commands from the CIT and verify proper switching and LED indications for a UPSR/SNCP ring. This test may be performed on the VLNC50, VLNC52, or VLNC55 optical ports.

Main1 VLNC50/52/55 switch test

Important! Cross-connects are required in order to perform manual switching tests.

1 Verify the existence of cross-connections to the main 1 VLNC50/52/55 pack with the view cross connections command. If cross connections are not present use the **Configuration -> Cross-Connection** command to establish cross connections.

2 At the NE system level view, **View -> Protection** and open by clicking the + sign until you see the path pertaining to the cross-connection that was established above, and enter select at the bottom of the screen.

Result: Path state information will be given including which path is in the active state.

3 At the NE system level view, establish a protection switch with **Fault -> Protection**, click the + sign to open up to the path level **switch type = manual** then choose the **Apply** button at the bottom of the screen.

4 View the protection to determine that the switch was established.

Result: The active path should now be different from what it was prior to the manual switch being issued.

5 At the NE system level view, establish a protection switch with **Fault -> Protection**, click the + sign to open up to the path level **switch type = clear** then choose the **Apply** button at the bottom of the screen.

6 View the protection to determine that the switch has cleared.

7 At the NE system level view, establish a protection switch with **Fault -> Protection**, click the + sign to open up to the path level **switch type = manual** then choose the **Apply** button at the bottom of the screen.

8 View the protection to determine that the switch was established and now the path that was originally active is active again.

Result: The active path should now be different from what it was prior to the manual switch being issued.

9 At the NE system level view, establish a protection switch with **Fault -> Protection**, click the + sign to open up to the path level **switch type = clear** then choose the **Apply** button at the bottom of the screen.

10 View the protection to determine that the switch has cleared.

11 Repeat Step 4 through Step 10 for every circuit.

12 Delete any VT1.5 /VC12 or STS-1 cross-connections under **Configuration -> Cross-Connection -> Delete Cross-Connections**.

13 Check off the appropriate box in Table 5-1, “Part III installation checklist” (p. III-1).

END OF STEPS

Final operations

Description

The following procedure ensures that all test signals and cross-connects have been removed and the Alcatel-Lucent 1850 TSS-5 shelf is alarm free and ready for network connection procedures.

Procedure

Proceed as follows:

1 Update the system by entering **Configuration -> Update System -> Update All**.

2 Verify that no alarm LEDs are lit and no FAULT LED is lit on any circuit pack.

Important! Sending an upd-sys command will update the system database to reflect the current configuration and incoming signals.

3 If any alarms are present, refer to the *Alcatel-Lucent 1850 Transport Service Switch (TSS-5) Alarm Messages and Trouble-Clearing Guide*, 365-372-402R7.2.

END OF STEPS

Clear PM registers

The following steps will clear all the performance monitoring registers:

1 Enter the **Performance -> Initialize PM Registers** at the NE system view and select both.

2 If desired, reconnect the office alarm cable at this time.

3 If desired, bring the system back to default values with the **Fault -> Reset -> Initialize System** command.

Important! Since this will bring the system back to default values, DS1 LBO values may need to be re-entered.

4 Check off the appropriate box in Table 5-1, "Part III installation checklist" (p. III-1).

END OF STEPS

Cover installation for Alcatel-Lucent 1850 TSS-5

Description

Proceed as follows:

1 For the rack-mount Alcatel-Lucent 1850 TSS-5 shelf, align the slots of the front cover with the slots located on the bottom corners of the shelf.

2 Rotate the cover up and align the screws on the top corners with the screw holes.

3 Gently screw the cover to the shelf do not over tighten.

END OF STEPS

Part IV: Miscellaneous detailed installation procedure and reference material

Overview

This section provides supplementary information that is useful when installing the Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) system and using this Installation and System Turn-up Guide.

Contents

This part of the document contains the following:

Fiber cleaning	Appendix A
PTM installation	Appendix B
Installing fiber connectors and LBOs	Appendix C
Backplane pin replacement	Appendix D
Fiber labeling	Appendix E
Glossary	
Index	

A Fiber cleaning

Overview

Purpose

This appendix describes the Alcatel-Lucent recommended method for the cleaning and inspection of optical connectors using specific tools and materials that have been proven to be effective in the assembly and testing of optical transmission equipment. It is critical that connector faces are clean and free from particular contamination to assure proper performance and reliability of lightwave systems. With the modern high-speed, high-power, and wider bandwidth optical transmission systems, clean connectors along the optical path are essential for successful operation.

Contents

This appendix provides information on the following topics:

Equipment requirements and recommendations	A-2
Safety instructions	A-3
Cleaning/inspecting optical connectors	A-4

Objectives

This chapter provides information to perform the following:

1. Properly clean an optical connector
2. Inspect an optical connector for cleanliness

Related information

A course on connector cleaning and the connector inspection process is now offered through Alcatel-Lucent, Course Code: LMC200H “Understanding Fiber Optic Cleaning, Inspection and Testing.” To learn more about this course, consult your local Alcatel-Lucent Account Representative.

Equipment requirements and recommendations

Description

For proper cleaning, the following equipment and materials are recommended:

Table A-1 Required and recommended equipment and materials

Product	Model/Description	Comcode	ITE #	Installation Order #
Optical Fiber Scope	Noyes OFS 300-200X	408197028	ITE-7129	33712900
2.5 mm Universal adapter cap	For use with the Noyes OFS 300-200X	408197044	ITE-7129D1	33712901
1.25 mm Universal adapter cap	For use with the Noyes OFS 300-200X	408197069	ITE-7129D2	33712902
Video Fiber Scope[1]	Noyes VFS-1	TBD	TBD	TBD
Individual presaturated alcohol wipes	99% pure isopropyl alcohol	901375147	ITE-7136	33713600
CLETOP Cleaning Cassette	Type A Reel	901375154	ITE-7137	33713700
CLETOP Cleaning Cassette Replacement Reel	Type A Reel	901375014	ITE-7137 D1	33713701
Luminex Stick port cleaners	1.25 mm	901375030	ITE-7134	33713400
Luminex Stick port cleaners	2.5 mm	901375022	ITE-7135	33713500
Luminex Cloth	5.5” x 5.5”	408201226	R6033	23603300
This equipment may not be necessary at all locations. It is to be used when the ports need to be verified for cleanliness. If care is exercised when cleaning fibers, the video scope may not be needed.				

Important! The equipment and material listed above has been tested and is proven effective when used in conjunction with this procedure. Substitution of equipment or materials is at the discretion of the user and is not recommended.

Safety instructions

Safety instructions



WARNING

Laser hazard

Never view an energized optical cable with the naked eye or with an optical magnifying instrument. Disconnected or separated optical connectors may emit invisible laser radiation and direct exposure can severely injure the eye. If inspecting the endfface of a connector with a fiberscope, be absolutely certain that the system is deactivated.



WARNING

Noxious substance hazard

Alcohol is flammable and is harmful if swallowed, inhaled or absorbed through the skin. Keep alcohol away from heat, sparks, or flame. Avoid contact with eyes, skin and clothing.

Cleaning/inspecting optical connectors

Introduction

The procedure that follows utilizes the “Wet/Dry” method for connector cleaning. This method first applies a “wet” solvent such as high purity alcohol to the connector endface to dissolve/remove any organic particulate or oily films, followed by a “dry” double clean wipe using the CLETOP cleaning cassette.

This procedure is recommended for connector ferrules 2.5 mm and 1.25 mm in diameter associated with ST, SC, FC, and LC connectors. The ferrule of a fiber optic connector consists of a ceramic or stainless steel cylinder with a hole located longitudinally down the center of its axis, allowing enough tolerance for a fiber to pass through.

All optical connectors should be cleaned prior to being connected. Keep the protective ferrule dust cap on the connector until initiating the cleaning process.

Cleaning procedure

The following cleaning procedure is acceptable for field service/installation activities:

1 Remove the dust cap from the connector ferrule, thus exposing the connector endface.

2 Open an individual foil packet of pre-saturated isopropyl alcohol (99% pure) wipe.

See Figure A-1, “Cleaning the ferrule endface” (p. A-5).

Grasp the connector housing and place the connector ferrule endface perpendicular to the alcohol wipe.

Drag it against the wipe three (3) times in a figure eight pattern. This action applies the alcohol solvent to the endface and initially loosens and scrubs away organic/solid contaminates.

Figure A-1 Cleaning the ferrule endface



3 If a CLETOP cassette cleaner is not available, proceed with Step 7. Otherwise, hold the CLETOP cassette cleaner in the palm of your hand with the cassette shutter door facing up.

See Figure A-2, “CLETOP cleaner” (p. A-6)

Rotate the cassette lever all the way down with your thumb. Do not release the lever. The lever advances the “dry” Luminex cleaning cloth inside the case and simultaneously opens the shutter. The CLETOP cassette shutter door is now open and ready for cleaning the connector.

Figure A-2 CLETOP cleaner



4 Insert and press the connector ferrule endface perpendicular against the cleaning cloth in the first of two slots of the cleaner.

See Figure A-3, “Acceptability criteria for fiber cleaning” (p. A-8).

Drag it down (in the direction indicated by the arrows on the cleaner). Make certain not to release the lever of the cassette.

5 Lift the connector from the first slot and rotate it 90 degrees and repeat the downward motion using the second slot. Be sure the ferrule is pressed snug against the cleaning cloth while dragging the ferrule to assure the proper cleaning action.

6 Release the cassette lever allowing the shutter door to close to its initial position. Continue with Step 8.

7 Wrap a Luminex cleaning cloth around the ferrule and rotate the connector housing, cleaning the outside periphery of ferrule.

Follow this by folding an unused portion of the cloth over the end of the ferrule endface and then with light pressure from the thumb, slightly drag the cloth from the center of the ferrule to the edge while rotating the connector 360 degrees. If the Luminex cleaning cloth is not available, a lint free cleanroom optic wipe can be used. The Luminex cleaning cloth is washable and can be used multiple times, optic wipes are single use and disposable.

8 Inspect the connector for cleanliness. If necessary, repeat the cleaning process.

See "Connector inspection" (p. A-7).

END OF STEPS

Connector inspection

After cleaning the connector, inspect the ferrule endface to ensure that it is free from any particulate contamination using an optical fiber inspection scope of at least 200X magnification. When using an optical fiber scope (for example, the Noyes OFS 300-200X) exercise extreme caution to assure fiber being examined is de-energized.



WARNING

Laser hazard

When using an optical power meter to verify the connector and fiber to be clean, take special precaution to make sure that no power is being emitted from the fiber before viewing.

1 Follow the instructions in the manual provided with the Optical Fiber Scope to view the ferrule endface of the fiber under inspection.

2 The visual area of the ferrule endface (ferrule and fiber) as observed by the inspection system/scope should be free of any contaminates. See Figure A-3, "Acceptability criteria for fiber cleaning" (p. A-8).

Repeat the Cleaning Procedure if the fiber endface does not meet the following requirements:

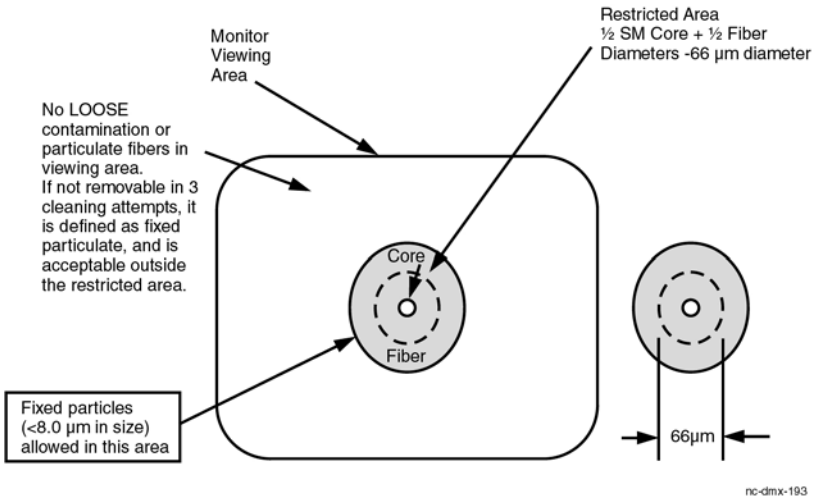
Requirement: No fixed type of contamination (contaminates that remain at the same location after 3 wet-dry cleaning cycles), regardless of size, is allowed in the restricted area of the glass fiber endface.

Requirement: The restricted area is defined as ~66 microns (µm) diameter for both singlemode and multimode fibers.

Requirement: No chips, cracks or scratches are allowed near the core of the glass fiber endface.

Requirement: No large floating (loose) contaminates are allowed on the glass fiber and ceramic ferrule endface.

Figure A-3 Acceptability criteria for fiber cleaning



3 After the connector has been verified to be cleaned, it should be immediately inserted into the adapter buildout of the optical component. This will assure maximum cleanliness and effectiveness of the connector.

4 If the cleaned connector can not be immediately connected to a corresponding adapter, the connector ferrule must be protected with a connector dust cap. Before placing the cap on the ferrule, make sure the cap is clean. This can be accomplished by inserting a CLETOP stick cleaner (swab) of the same inside diameter as the cap (either 2.5 or 1.25 mm) and rotating the stick 360 degrees three (3) times. Following this procedure, carefully place the cap over the ferrule. When the cleaned connector is ready for assembly, it should be re-inspected for cleanliness prior to connection.

END OF STEPS

Fiber adapters or circuit pack connectors

During testing and/or trouble shooting activities it may be necessary to clean the optical buildout adapter or the circuit pack connector. The following procedure is recommended.

NOTICE

Do not attempt to clean ports equipped with yellow Light guide BuildOut (LBO) attenuators. Attenuators contain a thin glass lens that is extremely fragile. The LBO will be damaged if cleaned using this method.

1 Using the appropriate CLETOP stick cleaner (2.5 mm for SC, ST, and FC connectors, 1.25 mm for LC connectors) dampen the stick cleaner with Ethyl alcohol using the alcohol wipe. Insert the stick cleaner into the adapter rotating the stick 360 degrees while inserting. Push/rotate stick until the stick cleaner makes contact with the connector. Apply slight pressure upon contact and rotate stick 360 degrees at least three (3) times.

2 Remove the stick cleaner rotating it upon removal.

3 Using a dry CLETOP stick cleaner of appropriate diameter, repeat the above cleaning procedure. This procedure will clean the side walls of the adapter and the endface of the circuit pack connector.

4 Gently insert the Video Fiber Scope probe into the port until the fiber ferrule comes into view.

5 Verify that the fiber ferrule is clean. Repeat Step 1 through Step 3 if the fiber does not meet the requirements specified in “Connector inspection” (p. A-7).

END OF STEPS

B PTM installation

Overview

Purpose

This chapter describes how to insert a small form pluggable (SFP) optics module into a Alcatel-Lucent 1850 Transport Service Switch 5 (Alcatel-Lucent 1850 TSS-5) circuit pack.

Contents

This chapter contains the following.

PTM modules	B-2
Install pluggable optics	B-5

PTM modules

Alcatel-Lucent approved Class 1 SFP transceivers

The following table lists all the current approved SFP modules to be used with Alcatel-Lucent 1850 TSS-5 approved SFPs

Name	Optical Module Code/Comcode	Description
VLNC40 PTMs	100 MbE 100 base-LX 109527812	1310 nm Single Mode
	GbE/FE/10 1000/100/10Base-T 109565549	Electrical
	GbE-1X2XFC-1000BaseSX 109570606	850 nm Multimode
	GbE-1X2XFC-1000BaseLX 109568782	1310 nm Single Mode
	GbE-149T131R-I1 GBE BIDI 1000Base 40km	1490nm TX, 1310nm RX, Single Mode
	GbE -131T149R-I1 GBE BIDI 1000Base 40km	1310nm TX, 1490nm RX, Single Mode
VLNC 40 GbE CWDM	Ch 47 1471 nm	GbE CWDM PTM
	Ch49 1491 nm	GbE CWDM PTM
	Ch51 1511 nm	GbE CWDM PTM
	Ch53 1531 nm	GbE CWDM PTM
	Ch55 1551 nm	GbE CWDM PTM
	Ch57 1571 nm	GbE CWDM PTM
	Ch59 1591 nm	GbE CWDM PTM
	Ch61 1611 nm	GbE CWDM PTM
VLNC50 PTMs	GbE-1X/2XFC-1000BaseSX 109570606	850 nm Multimode
	GbE-1X/2XFC-sBaseLX 109568782	1310 nm Single Mode
OC-12	15km XT 1310 nm 109453902	Single Mode
	40km XT 1310 nm 109467522	Single Mode
	80km XT 1550 nm 109604447	Single Mode

Name	Optical Module Code/Comcode	Description
OC-3	2km XT 1310 nm 109602599	Single Mode
	15km XT 1310 nm 109453894	Single Mode
	40km XT 1310 nm 109453886	Single Mode
OC-3/STM-1/OC12/STM-4/OTU-1 CWDM Types:	Ch47 1471 nm	OCN CWDM Optics
	Ch49 1491 nm	OCN CWDM Optics
	Ch51 1511 nm	OCN CWDM Optics
	Ch53 1531 nm	OCN CWDM Optics
	Ch55 1551 nm	OCN CWDM Optics
	Ch57 1571 nm	OCN CWDM Optics
	Ch59 1591 nm	OCN CWDM Optics
	Ch61 1611 nm	OCN CWDM Optics
	622-131T155R-I1, OC3/OC12 BIDI SFP 40 km, SM, 1310 nm Tx, 1490 nm Rx	Singe Mode
	622-155T131R-I1, OC3/OC12 BIDI SFP 40 km, SM, 1490 nm Tx, 1310 nm Rx	Single Mode
OC-48/STM-16	OC-48/STM-16 SR-1 1266 to 1360 nm 2km	Single Mode
	OC-48/STM-16 LR-1 1280 to 1335nm 40 km	Single Mode
	OC-48/STM-16 LR-2 1500 to 1580 nm 80 km	Single Mode
	Ch47 1471 nm 96 km	OCN CWDM Optics
	Ch49 1491 nm 96 km	OCN CWDM Optics
	Ch51 1511 nm 96 km	OCN CWDM Optics
	Ch53 1531 nm 96 km	OCN CWDM Optics
	Ch55 1551 nm 96 km	OCN CWDM Optics
	Ch57 1571 nm 96 km	OCN CWDM Optics
	Ch59 1591 nm 96 km	OCN CWDM Optics

Name	Optical Module Code/Comcode	Description
	Ch61 1611 nm 96 km	OCN CWDM Optics
VLNC60 PTMs	GbE/FE/10 1000/100/10Base-T-C1 109565549	Electrical
	GbE-1X/2XFC-1000BaseSX 109570606	850 nm Multimode
	100MbE 10/100BASE LX 109527812	40km 1310 nm Singlemode
	GbE-1X/2XFC-sBASELX 109568782	40km 1310 nm Singlemode
VLNC60 CWDM Optics	Ch 47 1471 nm	109669622
	Ch49 1491 nm	109669630
	Ch51 1511 nm	109669648
	Ch53 1531 nm	109669655
	Ch55 1551 nm	109669663
	Ch57 1571 nm	109669671
	Ch59 1591 nm	109669689
	Ch61 1611 nm	109669697
VLNC 64 CWDM Optics	Ch 47 1471nm	109669622
	Ch49 1491nm	109669630
	Ch51 1511nm	109669648
	Ch53 1531nm	109669655
	Ch55 1551nm	109669663
	Ch57 1571nm	109669671
	Ch59 1591nm	109669689
	Ch61 1611nm	109669697

Install pluggable optics

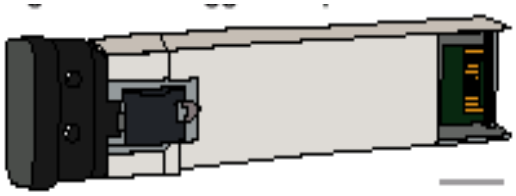
Task

Complete the following steps to install pluggable optical modules in a circuit pack that has already been installed in a shelf.

1 Determine the circuit pack and socket being equipped with the pluggable optical module.

2 Hold the optical connector/latch-end of the module in your left hand with the gold fingers facing you. The module should be positioned in manner similar to Figure B-1, “Pluggable optics module” (p. B-5)

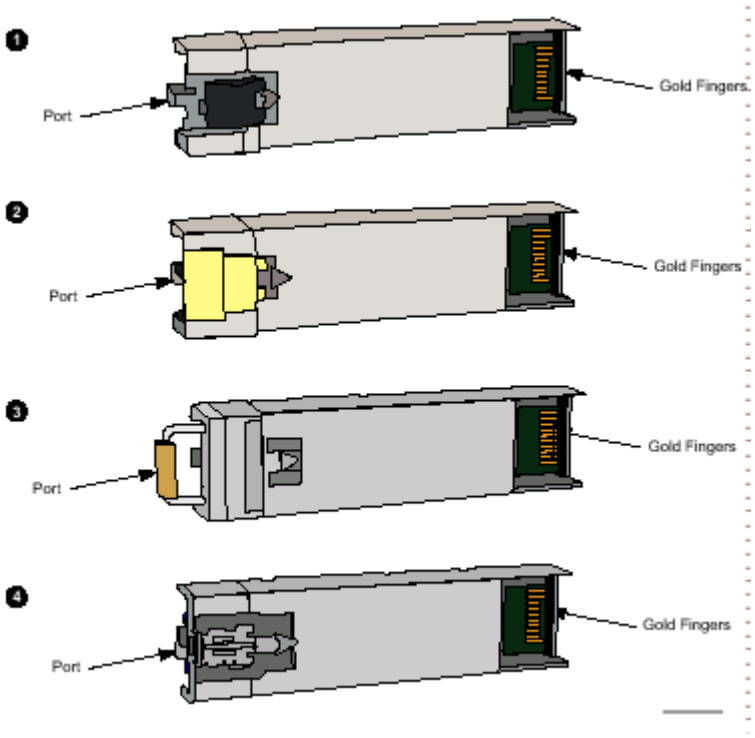
Figure B-1 Pluggable optics module



Note: Do not remove the dust plug unless you are ready to connect fibers or if you need to clean the module.

3 Referring to Figure B-1, “Pluggable optics module” (p. B-5) below, determine the type of latching mechanism on the pluggable optical module you have.

Figure B-2 Module types



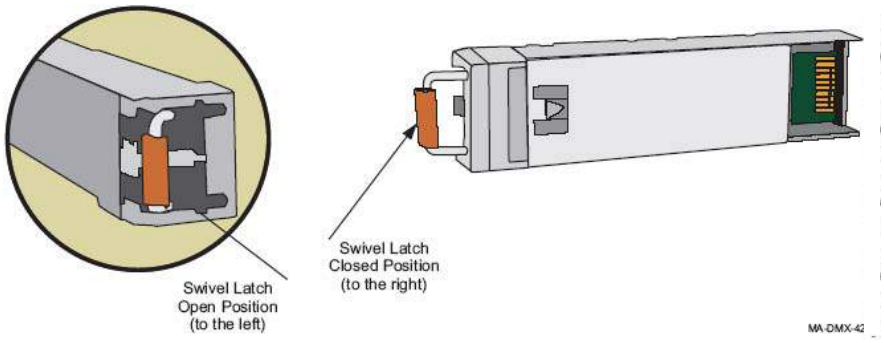
4 **Important!** Pluggable optical modules are shipped with a dust plug installed into the optical ports to maintain cleanliness during storage and/or transportation. It is recommended that the dust plug be kept in place to maintain cleanliness until the optical fiber is connected. With proper care and handling, cleaning the pluggable optical modules should not be necessary.

5 Referring to Step 3 determine which type of SFP is provided.

If...	Then...
Type 1 or 2	Proceed to Step 9
Type 3	Continue with Step 6
Type 4	Proceed to Step 8

6 Before inserting the module, the latch must be in the closed position. With the dust plug in place, the latch is in the closed position.

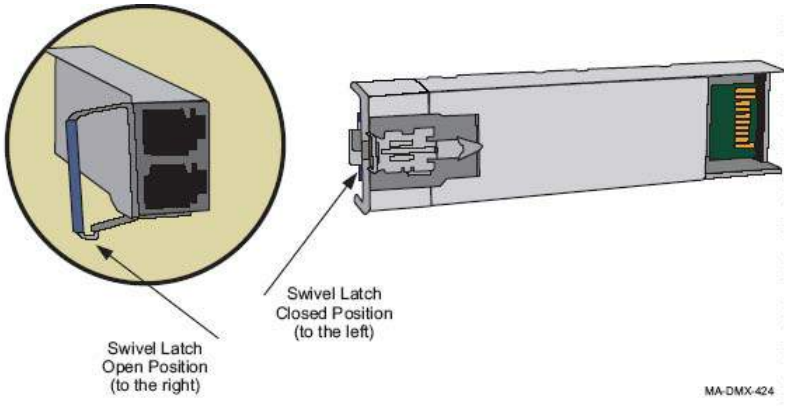
Figure B-3 Latch type 3 (opened and closed)



7 Proceed to Step 9.

8 Before inserting the module, the latch must be in the closed position. With the dust plug in place, the latch is in the closed position.

Figure B-4 Latch type 4 (opened and closed)

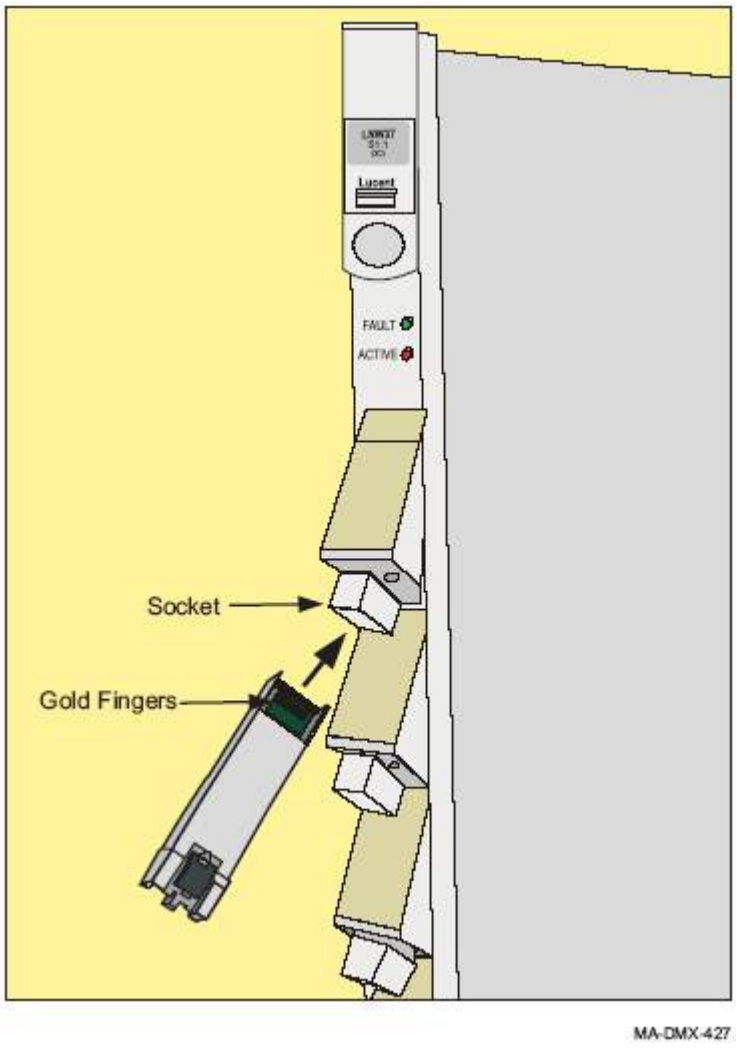


9 With your left hand, hold the optical module by the dust plug. The optical ports are in your left hand and the gold fingers are visible (facing you). (Do not insert optical module.)

10 Rotate the module; the dust plug is facing you and the gold fingers are pointing away from you and are visible from the right. (Do not insert optical module.)

11 Insert the pluggable optical module in the required socket of the circuit pack faceplate. Confirm that the optical module is locked in the socket. Verify that all unused sockets on the circuit pack are equipped with dust covers.

Figure B-5 Insert optical module into socket



Result: The port appears in the WaveStar® CIT System View indicating successful installation.

If response is not correct, replace the optical module. If the optical module fails when inserted, and another optical module in the shelf fails at the same time, replace the newly-installed optical module. Each optical module has unique internal data for warranty purposes. If this data for any reason is not unique, both optical modules with the duplicated information will be declared failed. Refer to the *Navis Network Manager Alarm Messages and Trouble Clearing Guide, 365-372-302*.

12 Push on the dust plug to insert the module. The latch automatically catches when the module is inserted. The module is secure.

13

If installing a pluggable optical module in an...	Then...
Optical OLIU circuit pack,	Continue with Step 14.
Ethernet circuit pack,	Proceed to Step 18.

14 To test the OC-n optical port on installed OLIU circuit packs, loop back the OC-n optical port on itself (OUT to IN) with a 15-dB Attenuator.

Result: No alarms on the OLIU.

15 Remove the light guide jumper used to loop back the OC-n optical port and the LBO.

Result: The port LED starts flashing. The **MN** and **NE** LEDs are lighted on the SYSCTL circuit pack.

16 From the System View window, select **Configuration -> Update System -> Update All**.

Result: The port LED stops flashing. All alarms are cleared.

17 Repeat Step 1 to Step 16 for additional SFP modules.

18 If all SFP modules are installed, then from the System View menu click on the Alarm List button to verify that no alarms are present for the SFP ports just installed on the circuit packs.

END OF STEPS

C Installing fiber connectors and LBOs

Overview

Purpose

This appendix provides procedures for installing and removing Line Build Out (LBOs) units and fiber connectors onto input and output ports found on the Alcatel-Lucent 1850 Transport Service Switch (TSS-5) (Alcatel-Lucent 1850 TSS-5) optical circuit packs.

Contents

This chapter provides information on the following topics:

LBOs	C-2
Fiber connections	C-5

Objectives

This appendix provides information to perform the following:

- Install and remove LC-type LBOs onto and from LC-type ports.
- Install and remove LC-type fiber connections.

Fiber cleaning

Refer to Appendix A, “Fiber cleaning” for fiber cleaning information. Do not attempt to clean LBOs as they may be damaged by a cleaning attempt. Discard suspect LBOs and replace with a new unit.

LBOs

General

LBOs are fixed-value optical attenuators that mate into mounting blocks and provide a specific connector interface (LC, ST, FC or SC-type) for external fiber connections. The Alcatel-Lucent 1850 TSS-5 optical circuit packs are equipped with LC-type connector ports designed for use with LC-type LBOs and fiber connectors. Dust caps should be applied on all LBOs when not installed in connector ports.

LC-type connector port

The LC-type connector port will only accept LC-type LBOs for external fiber connection.

Figure C-1 LC-type connector ports on circuit pack

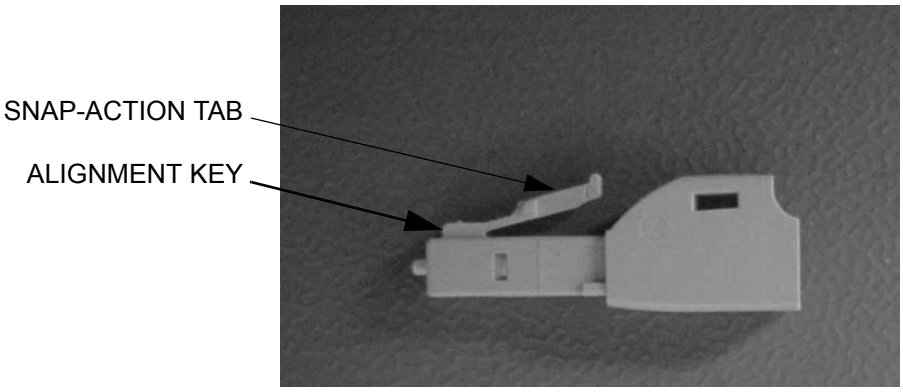


LC-type LBO

Alcatel-Lucent 1850 TSS-5 utilizes Alcatel-Lucent's state-of-the-art *AllWave ADVANTAGE*™ Fiber Optic Attenuators. These attenuators reduce optical power from the transmitter that can result in over-saturation of the receiver, have low reflection to meet stringent system requirements, and are backward-compatible with existing transmission systems. Unique to the AllWave ADVANTAGE optical connectivity solution (OCS), the

new *LC*™ optic attenuators are designed to provide flat spectral loss across the full spectrum, allowing the attenuators to be used in the 1300-nm, 1400-nm, and 1500-nm bands.

Figure C-2 LC-type LBO



Assembly of LC-type LBO into LC block

The LC-type LBOs are installed into the LC-type connector by aligning the alignment key with the slot in the connector port and pushing the LBO into the port until it snaps into place.

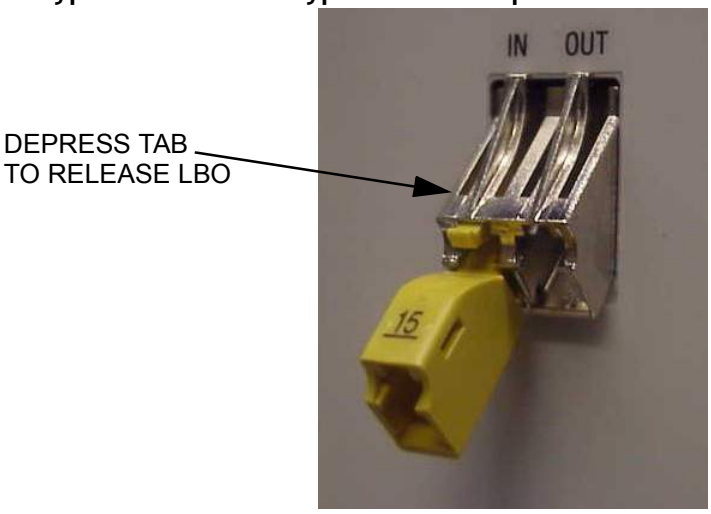
Figure C-3 LC-type LBO inserted into LC-type connector port



Removal of LC-type LBO from LC block

The LC-type LBOs are removed from the LC-type connector port by depressing the tab to release the LBO and then pulling straight out.

Figure C-4 Removing LC-type LBO from LC-type connector port



Fiber connections

General

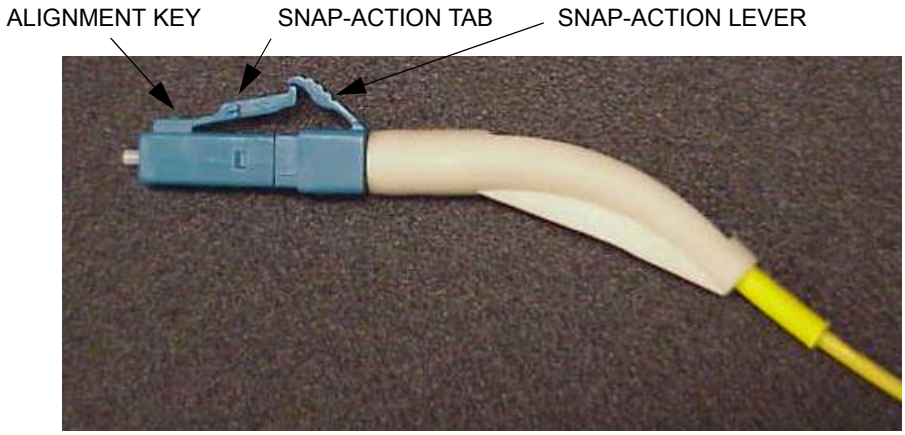
Alcatel-Lucent 1850 TSS-5 uses *AllWave ADVANTAGE*™ Lightguide Jumpers, part of Alcatel-Lucent's AllWave ADVANTAGE™ Optical Connectivity Solution (OCS). These jumpers contain a boot angled at 40 degrees, allowing the jumpers to dress appropriately into the fiber tray. The angled boot eliminates projection outside the front of the shelf assembly.

All fiber connectors should be cleaned and inspected before assembling into connector ports. Refer to Appendix A, "Fiber cleaning" for fiber cleaning information. Dust caps should be applied to all fiber connectors when not installed in a connector port.

LC-type connections

LC-type fiber connectors use a snap-action, lever-tab locking method to join the fiber connector to the port connector.

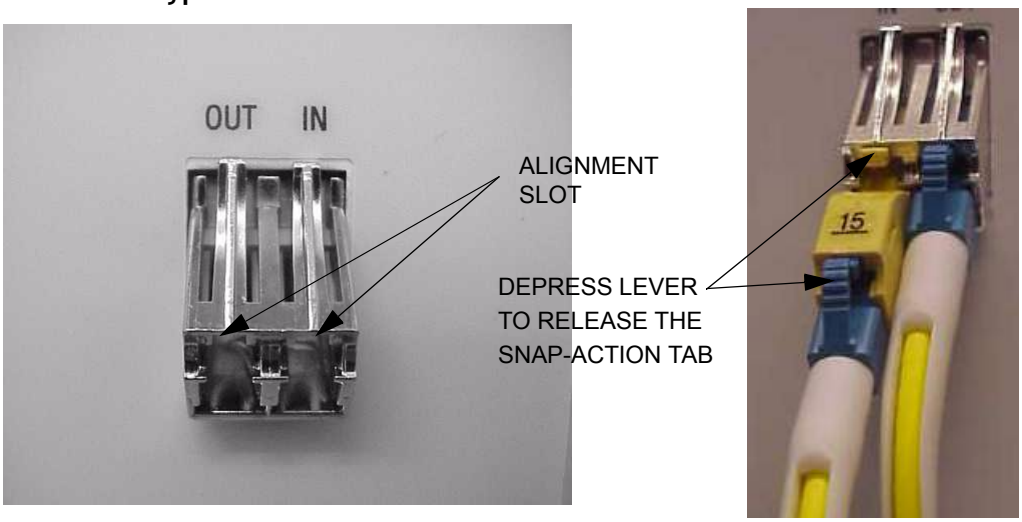
Figure C-5 LC-type Angled fiber connector



The LC-type fiber connector is assembled onto an LC-type connector port of a circuit pack or LC-type LBO by aligning the alignment key with the slot in the connector port and pushing the connector into the port until it snaps into place.

The LC-type fiber connector is removed from a connector port by depressing the snap-action lever to disengage the fiber connector.

Figure C-6 LC-Type fiber connection



D Backplane pin replacement

Overview

Purpose

This appendix provides information and the procedures used when a connector and/or pin on the Alcatel-Lucent 1850 Transport Service Switch (TSS-5) (Alcatel-Lucent 1850 TSS-5) backplane has been bent or broken.

Contents

This appendix provides information on the following topics:

Pin and connector background	D-2
Repair kits and tools	D-4
Simple repair methods	D-5
Replacement methods	D-7

Objectives

This appendix provides information and procedures to do the following:

- Identify a bent or broken pin
- Determine the correct replacement pin and pin kit
- Straighten bent pin
- Replace broken pins

Pin and connector background

Description

This section describes the procedures for the repair/replacement of the press-fit connector pins used on the backplane of the Alcatel-Lucent 1850 TSS-5 shelf. Trouble-clearing procedures may lead you to inspect the backplane for damaged connectors.

Circuit packs are plugged into METRAL™ signal pin connectors which have been press-fit into the backplane. A plastic shroud is included with the connectors to protect the pins. The signal pin press-fit terminals in these connectors my be replaced individually if they have been damaged beyond simple repair methods.

D-subminiature connectors

Interface cabling to and from the Alcatel-Lucent 1850 TSS-5 shelves is connected through D-Subminiature connectors which have been press-fit into the backplane. Should these connectors be damaged beyond simple repair methods, contact your next level of support for the replacement procedure.

RJ45 jacks

Interface cabling to and from the Alcatel-Lucent 1850 TSS-5 shelves is connected through RJ45 connectors (jacks) which have been press-fit into the backplane. Should these jacks be damaged beyond simple repair methods, contact your next level of support for the replacement procedure.

Shelves and backplanes

The Alcatel-Lucent 1850 TSS-5 has its connectors and terminal identifiers stenciled on the back surface for identification of location or position. The stenciling can only be seen when the back cover is removed.

Pins are identified by a column and row position on the backplane. D-Subminiature connectors are identified by their designation and J-number. All the METRAL™ pins used on the Alcatel-Lucent 1850 TSS-5 shelves have the same tail length of 4.30mm (0.169 in.).

Table D-1 show the location and type of METRAL™ pins on the Alcatel-Lucent 1850 TSS-5 backplane.

Table D-1 Backplane locations of METRAL™ pins

Slot	Row	Column	Type	Mating Length (mm)	Tail Length (mm)
MAIN	001, 103 to 108	a,b,c,d,e	Signal Pin	8.00	4.30
SYSCTL	001, 037 to 042	a,b,c,d,e	Signal Pin	8.00	4.30
LAN	001, 043 to 048	a,b,c,d,e	Signal Pin	8.00	4.30
	All others	All others	Signal Pin	5.75	4.30

Repair kits and tools

Repair kits

For the repair or replacement of METRAL™ signal pins, use one of the following repair kits:

- Berg Electronic MT370-01 Shelf Level Press-Fit Repair Kit
- IMDARC R-6004 Metral Pin Repair Kit - Comcode 407959881

This kit includes the tools, parts and instructions for repair and replacement of signal pins.

Replacement pins

Replacement pins are available. These pins are defined by the mating length extending beyond the inside of the plastic shroud and by their tail length for press-fitting into the backplane. The tail length includes a compliant press-fit section needed to achieve a gas-tight connection in four contact areas. All the METRAL™ pins used on the Alcatel-Lucent 1850 TSS-5 shelves have the same tail length of 4.30 mm (0.169 in.).

Additional replacement signal pins may be ordered in packages of 100 by the part number shown in **Table D-2, "Metral™ pins" (p. D-4)**.

Table D-2 Metral™ pins

Type	Mating Length (mm)	Berg Part #
Ground	5.75	88929-502
Signal Pin	5.75	88929-502
Signal Pin	8.00	88929-519

Simple repair methods

Precautions



CAUTION

Service disruption hazard

These procedures should be done with the shelf out of service and powered down to insure no further damage to the equipment or to the person doing the repair. If service cannot be removed or rerouted, contact your next level of support before proceeding.



CAUTION

ESD hazard

Proper ESD precautions must be followed.

Make sure that you have adequate space to access the backplane area and that you have good light sources so that you can see what you are doing.

Visual examination

Visually examine the connector pins to determine which pins may have been damaged and the degree of the damage. Pins that have been slightly bent may be carefully restored to their initial straight position. Examine both sides of the backplane to determine if the press-fit termination has been disturbed. These pins depend on an undisturbed interference fit between the terminal body and the plated-through hole in the backplane to create a reliable connection.

If the visual examination suggests that the connector pins are loose or are damaged beyond repair, replace the connector pin.

METRAL™ backplane pins



NOTICE

This is a delicate procedure. Take your time to gently straighten the pin in several small steps. Large movements may damage adjacent pins.

Follow the instructions and use the tools provided in the MT370-01 Shelf Level Press-Fit Repair Kit to straighten METRAL™ pins which may have been bent out of position.

Guide pins and keying pins

If a stainless steel guide pin or keying pin has been bent out of alignment, attempts to straighten it may damage the backplane. The recommended alternative is to replace the bent pin.

D-subminiature pins

The D-Subminiature connectors on the Alcatel-Lucent 1850 TSS-5 backplane are all of the receptacle type. These connectors are designated as jacks and not as plugs. The individual connector terminals are protected somewhat by the molded plastic insert inside the connector shell. It is unlikely that these terminals would be bent in the manner that the exposed pin terminals of a plug might be bent. The damage concern for these receptacle terminals is that they may be “crushed” or otherwise distorted out of shape. Attempts to “straighten” these terminals may result in fracturing them. If a receptacle terminal has been damaged to the extent that the mating plug connector cannot be connected, then the recommended alternative is to replace the entire backplane.

RJ45 jacks

The RJ45 connectors (jacks) are press-fitted into the Alcatel-Lucent 1850 TSS-5 backplane. Should these jacks be damaged beyond simple repair methods, contact your next level of support for the replacement procedure.

Replacement methods

Background

Connector pins are designed to withstand a considerable removal force. An impact-type tool is used to generate a controlled removal force. Similarly, proper insertion of a press-fit connector pin is done with an impact-type tool to control the insertion forces and not damage adjacent pins.

Precautions

Read the following Important statements before proceeding:

Important! Any press-fit connector pin may be removed and replaced **one time** in the Alcatel-Lucent 1850 TSS-5 backplane. A second removal and replacement in the same plated-through hole may not meet the long-term reliability objectives. If a replacement is needed for a previously replaced connector pin, contact your next level of support before proceeding.

Important! Protect the surrounding area from any debris which may be generated during the pin removal and replacement.

Procedure for METRAL™ pins

Use the procedure below to replace pins when required:

1. Verify that the problem cannot be fixed using a simple repair procedure.
2. Secure the proper tool kit.
3. Read the tool kit instructions before beginning.
4. Plan and write out a “Method of Procedure” specific to your location.
5. Follow the instructions provided to remove the damaged pin.
6. Install the replacement pin.

7 Verify that the new pin is securely in the backplane.

8 If the replacement is not successful, contact your next level of support.

END OF STEPS

Guide and keying pin procedure

If it becomes necessary to replace guide or keying pins, contact your next level of support for tooling, replacement parts and detailed replacement procedures. The replacements will need to installed with screws and washers.

D-subminiature pin procedure

If it becomes necessary to replace either the D-Subminiature pins or connector, contact your next level of support for detailed replacement procedures.

RJ45 jacks

If it becomes necessary to replace a RJ45 connector, contact your next level of support for the replacement procedure.

E Fiber labeling

Overview

Purpose

This chapter describes the labeling of the fiber.

Contents

This appendix provides information on the following topics:

Fiber description	E-2
Fiber labels	E-4

Fiber description

Fibers

There are three different types of single-mode fiber used with theAlcatel-Lucent 1850 Transport Service Switch (TSS-5) (Alcatel-Lucent 1850 TSS-5) system, simplex blue fiber, simplex yellow fiber, and the customer's fiber

Blue fiber

Blue fiber is made up of a single blue colored fiber equipped with LC connectors at both ends. It is referred to as **Simplex LC Blue Fiber**. The Blue Fibers are custom cut to length for their application. The length is given on the protection boot of the LC connector.

Yellow fiber

Simplex fibers are Yellow in color and come in six different lengths (15, 20, 25, 30, 35 and 50 feet), as well as custom lengths.

Outside fiber

Outside fiber is the fiber connecting the Customer equipment to the Alcatel-Lucent 1850 TSS-5. Depending on the customers specifications, these fibers may be any combination of SC, FC, or ST connectors. The length of these fibers depends on the system interface setup. This fiber is usually referred to as the ***Outside Bay or Plant Fiber***.

Outside bay fiber management should be specified by the customer. It is beyond the scope of this document to specify the route or dressings that the fiber should take once it leaves the equipment bays.

Precautions



NOTICE

Fiber is constructed of glass and should be treated with care. It should not be pulled or stretched. This could cause damage to the fiber or the fiber connector.



NOTICE

Fiber should not be bent in a radius of less than 1-1/2”.

Single-mode fiber testing requirements

All fibers shall be tested after they are installed as follows:

- All fibers shall be tested after installation, but prior to turn-up
- Before fibers are tested, they shall be labeled properly and all cable tags shall be removed.

- A 1310nm or 1550-nm test source and an ITE# 7116 (or equivalent) optical power meter shall be used to perform all tests.
- The light source shall first be measured for a reference point/baseline.
- No fiber jumper may have a measured loss of more than 2 dB.

Fiber labels

Introduction

If pre-printed labels are not available, use a label-maker to create labels for each end of each fiber. The label should include:

- Rack location
- Circuit pack
- Port
- Direction (IN, OUT)

Labeling the fibers

To apply the labels to the connectors, use the following procedure.

1. Remove the appropriate label from the backing sheet or the label maker.
2. Apply the label to the strain relief boot, close to the body of the LC connector.
3. Adhere the end of the label with the printed text first.
4. The label must be oriented perpendicular to the main axis of the connector.
5. Wrap the label around the boot so that the second wrap is directly on top of the first wrap. (The label will wrap around the boot approximately two times). The text is printed diagonally on the label so that it can be read when applied the correct way.

   Note: Do not apply the label diagonally to the boot. The label must wrap directly on top of itself for the adhesive to work.

END OF STEPS

Glossary

Acronyms and Abbreviations

A

ABN
Abnormal (status condition)

AC
Alarm Cutoff

ACO/SW
Alarm Cutoff and Test

ADM
Add/Drop Multiplexer

AGNE
Alarm Gateway Network Element

AIS
Alarm Indication Signal

AMI
Alternate Mark Inversion

ANSI
American National Standards Institute

APS
Automatic Protection Switch

ARM
Access Resource Manager

AS&C
Alarm, Status, and Control

ASCII
American Standard Code for Information Interchange

ASN.1
Abstract Syntax Notation 1

ASNE
Alarm Server Network Element

ATM
Asynchronous Transfer Mode

Auto
Automatic

AUXCTL
Auxiliary Control

B

B3ZS
Bipolar 3-Zero Substitution

B8ZS
Bipolar 8-Zero Substitution

BDFB
Battery Distribution and Fuse Bay

BER
Bit Error Ratio

BIP
Bit Interleaved Parity

BITS
Building Integrated Timing Supply

BRI
Basic Rate Interface

C

CC
Clear Channel

CCITT
International Telephone and Telegraph Consultative Committee

CEV
Controlled Environment Vault

CD-ROM
Compact Disk, Read-Only Memory

CDTU
Channel and Drop Test Unit

CIT
Craft Interface Terminal

CLF
Carrier Line Failure Status

CLK
Clock

CMISE
Common Management Information Service Element

CMOS
Complementary Metal Oxide Semiconductor

CMTS
Cable Modem Termination System

CO
Central Office

CP
Circuit Pack

CPE
Customer Premises Equipment

CR
Critical (alarm status)

CRN
Customer Release Notes

CSA
Carrier Serving Area

CSU
Channel Service Unit

CS&O
Customer Support and Operations

CV
Coding Violation

CVFE
Coding Violation Far End

D

DCC
Data Communications Channel

DCE
Data Communications Equipment

DEMUX
Demultiplexer

DLC
Digital Loop Carrier

DPLL
Digital Phase-Locked Loop

DRI
Dual Ring Interworking

DS1
Digital Signal Level 1

DS3/E3
Digital Signal Level 3

DSLAM
Digital Subscriber Line Access Multiplexer

DSNE
Directory Services Network Element

DSX
Digital Cross-Connect Panel

DT
Distant Terminal

DTE
Data Terminating Equipment

E

EC-1
Electrical Carrier Level 1

ECI
Equipment Catalog Item

EEPROM
Electrically-Erasable Programmable Read-Only Memory

EIA
Electronic Industries Association

EMC
Electromagnetic Compatibility

EMI
Electromagnetic Interference

EOOF
Excessive Out of Frame

EPROM
Erasable Programmable Read-Only Memory

EQ
Equipped (memory administrative state)

ES
Errored Seconds

ESD
Electrostatic Discharge

ESF
Extended Super Frame

EST
Environmental Stress Testing

F

FCC
Federal Communications Commission

FDDI
Fiber Distribution Data Interface

FE
Far End

FE ACTY
Far End Activity

FEBE
Far End Block Error

FE ID
Far End Identification

FEPROM
Flash EPROM

FERF
Far End Receive Failure

FE SEL
Far End Select

G

GbE
Gigabit Ethernet

GNE
Gateway Network Element

GR
Telcordia Technologies General Requirement

GTP
General Telemetry Processor

GTSIP
Global Technical Support Information Platform

GUI
Graphical User Interface

H

HECI
Humans Equipment Catalog Item

I

IC
Internal Clock

ID
Identifier

IEC
International Electrotechnology Commission

IMF
Infant Mortality Factor

INC
Incoming Status

I/O
Input/Output

IP
Internet Protocol

IR
Intermediate Reach

IS
In Service

ISCI
Intershelf control Interface

ISI
Intershelf Interface

ISDN
Integrated Services Digital Network

ISO
International Standards Organization

ISP
Internet Service Provider

IVHS
Intelligent Vehicle Highway System

L

LAN
Local Area Network

LAPD
Link Access Procedure "D"

LBO
Line Build Out

LCN
Local Communications Network

LEC
Local Exchange Carrier

LED
Light-Emitting Diode

LOF
Loss of Frame

LOP
Loss of Pointer

LOS
Loss of Signal

LR
Long Reach

LS
Low Speed

M

MD
Mediation Device

MJ
Major Alarm

MM
Multimode

MML
huMan-Machine Language

MN
Minor Alarm

MPEG
Moving Picture Experts Group

MSDT
Multi-Services Distant Terminal

MTBF
Mean Time Between Failures

MTBMA
Mean Time Between Maintenance Activities

Mult
Multipling

MUX
Multiplex

MXBIU
Multiplexer and Backplane Interface Unit

N

NE
Near End

NE
Network Element

NE ACTY
Near-End Activity

NEBS
Network Equipment-Building System

nm
Nanometer (10^{-9} meters)

NMA
Network Monitoring and Analysis

NMON
Not Monitored (provisioning state)

NRZ
Nonreturn to Zero

NARTAC
Lucent North American Regional Technical Assistance Center
call **1-866-LUCENT8** (866-582-3688): *Prompt 1*

NNI
Network-Network Interface

NSA
Not Service Affecting

NSAP
Network Services Access Point

NTF
No Trouble Found

O

OAM&P
Operations, Administration, Maintenance, and Provisioning

OC-1
Optical Carrier Level 1 Signal (51.84 Mb/s)

OC-3
Optical Carrier Level 3 Signal (155 Mb/s)

OC-12
Optical Carrier Level 12 Signal (622 Mb/s)

OC-48
Optical Carrier Level 48 Signal

OLIU
Optical Line Interface Unit

OOF
Out of Frame

OOL
Out of Lock

OPS/INE
Operations System/Intelligent Network Element

OS
Operations System

OSGNE
Operations System Gateway Network Element

OSI
Open Systems Interconnection

OSMINE
Operations Systems Modifications for the Integration of Network Elements

OSP
Outside Plant

P

P-bit
Performance Bit

PC
Personal Computer

PCU
Power Conversion Unit

PID
Program Identification

PINFET
Positive Intrinsic Negative Field Effect Transistor

PJC
Pointer Justification Count

PLL
Phase-Locked Loop

PM
Performance Monitoring

PMN
Power Minor Alarm

POH
Path Overhead

POP
Points of Presence

POTS
Plain Old Telephone Service

PRM
Performance Report Message

PROTN
Protection

PRS
Primary Reference Source

PSU
Power Supply Unit

PVC
Permanent Virtual Circuit

PWR
Power

R

RAM
Random Access Memory

RPP
Reliability Prediction Procedure (described in Telcordia Technologies TR-NWT-00032)

RT
Remote Terminal

RZ
Return to Zero

S

SA
Service Affecting

SCADA
Supervisory Control and Data Acquisition

SD
Signal Degrade

SDH
Synchronous Digital Hierarchy

SEFS
Severely Errored Frame Seconds

SEO
Single-Ended Operations

SES
Severely Errored Seconds

SF
Super Frame (format for DS1 signal)

SID
System Identification

SLA
Service Level Agreements

SLIM
Subscriber Loop Interface Module

SM
Single Mode

SONET
Synchronous Optical NETwork

SPE
Synchronous Payload Envelope

SQU
Sync Quality Unknown

SRD
Software Release Description

STS, STS-n
Synchronous Transport Signal

STM
Synchronous Transfer Mode

STS-1 SPE
STS-1 Synchronous Payload Envelope

STS-3c
Synchronous Transport Level 3 Concatenated Signal

STS-12c
Synchronous Transport Level 12 Concatenated Signal

SYSCTL
System Controller (circuit pack)

T

T1X1 and T1M1
The ANSI committees responsible for telecommunications standards

TA
Telcordia Technologies Technical Advisory

TABS
Telemetry Asynchronous Byte Serial (Protocol)

TARP
Target ID Address Resolution Protocol

TCA
Threshold-Crossing Alert

TCP/IP
Transmission Control Protocol/Internet Protocol

TCVCXO
Termperature-Compensated Voltage-Controlled Crystal Oscillator

TDM
Time Division Multiplexing

TID
Target Identifier

TL1
Transaction Language 1

TLB
Timing Looped Back

TOP
Task Oriented Practice

TR
Telcordia Technologies Technical Requirement

TSA
Time Slot Assignment

TSI
Time Slot Interchange

TSO
Technical Support Organization

U

UAS
Unavailable Seconds

UNI
User Network Interface

UOC
Universal Optical Connector

UPD/INIT
Update/Intialize

UPSR
Unidirectional Path Switched Rings

V

VF
Voice Frequency

VLAN
Virtual Local Area Network

VLSI
Very Large Scale Integration

VM
Violation Monitor

VMR
Violation Monitor and Removal

VoIP
Voice over Internet Protocol

VONU
Virtual Optical Network Unit

VPN
Virtual Private Network

VT
Virtual Tributary

VT1.5
Virtual Tributary 1.5 (1.728 Mb/s)

VT-G
Virtual Tributary Group

W

WAN
Wide Area Network

Terms and Definitions

Numerics

0x1
Set up using unswitched cross connections on UPSR Ring Interfaces.

1+1
The 1+1 protection switching architecture protects against failures of the optical transmit/receive equipment and their connecting fiber facility. One bidirectional interface (two fibers plus associated OLIUs on each end) is designated "service," and the other is designated "protection." In each direction, identical signals are transmitted on the service and protection lines ("dual-fed"). The receiving equipment monitors the incoming service and protection lines independently, and selects traffic from one line (the "active" line) based on performance criteria and technician/OS control. In 1+1 both service and protection lines could be active at the same time (service in one direction, protection in the other).

A

Active
Active identifies a 1+1 protected OC-N line which is currently selected by the receiver at either end as the payload carrying signal or a 1x1 or 1xN protected circuit pack that is currently carrying service. (See Standby).

AGNE - Alarm Gateway Network Element
A defined NE in an alarm group through which members of the alarm group exchange information.

AIS - Alarm Indication Signal
A code transmitted downstream in a digital network that shows that an upstream failure has been detected and alarmed.

AMI - Alternate Mark Inversion
A line code that employs a ternary signal to convey binary digits, in which successive binary ones are represented by signal elements that are normally of alternating, positive and negative polarity but equal in amplitude, and in which binary zeros are represented by signal elements that have zero amplitude.

ASCII - American Standard Code for Information Interchange
A standard 8-bit code used for exchanging information among data processing systems and associated equipment.

Auto
One possible state of a service interface port. In this state, the port will automatically be put "in service" if a good incoming signal is detected on the port.

Automatic Protection Switch
A feature that allows another synchronization source to be automatically selected and the synchronization source provisioning to be automatically reconfigured in the event of a synchronization source failure or network synchronization change, for example, a fiber cut.

Available Time
In performance monitoring, the 1-second intervals.

B

B3ZS - Bipolar 3-Zero Substitution
A line coding method that replaces a string of three zeros with a sequence of symbols having some special characteristic.

B8ZS - Bipolar 8-Zero Substitution
A line coding method that replaces a string of eight zeros with a sequence of symbols having some special characteristic.

Backbone Ring
A host ring.

BER - Bit Error Ratio
The ratio of bits received in error to the total bits sent.

BIP - Bit Interleaved Parity
A method of error monitoring over a specified number of bits, that is BIP-3 or BIP-8.

BITS - Building Integrated Timing Supply
A single clock that provides all the DS1 and DS0 synchronization references required by clocks in a building.

Broadband
Any communications channel with greater bandwidth than a voice channel; sometimes used synonomously with wideband. Also refers to signals at the DS3/E3 (44.736 Mb/s) and higher. Wideband refers to lower rates (i.e. DS1, VT1.5, etc.).

C

CC - Clear Channel
A provisionable mode for the DS3/E3 output that causes parity violations not to be monitored or corrected before the DS3/E3 signal is encoded.

CCITT - International Telephone and Telegraph Consultative Committee
An international advisory committee under United Nations' sponsorship that has composed and recommended for adoption worldwide standards for international communications. Recently changed to the International Telecommunications Union Telecommunications Standards Sector (ITU-TSS).

Channel
A logical signal within a port. For example, for an EC-1 port, there is one STS-1 channel and sometimes 28 VT1.5 channels. See Port.

Channel State Provisioning
A feature that allows a user to suppress reporting of alarms and events during provisioning by supporting multiple states (automatic, in-service and not monitored) for VT1.5 and STS-1 channels. See Port State Provisioning.

CV - Coding Violation
A performance monitoring parameter.

CVFE - Coding Violation Far-End
An indication returned to the transmitting terminal that an errored block has been detected at the receiving terminal.

D

DACS III-2000
Digital Access and Cross-Connect System that provides clear channel switching at either the DS3/E3 or the STS-1 rates, eliminating the need for manual DSXs.

DACS IV-2000
Digital Access and Cross-Connect System that provides electronic DS3/E3/STS-1 or DS1/VT1.5 cross-connect capability, eliminating the need for manual DSXs.

DCC - Data Communications Channel
The embedded overhead communications channel in the SONET line. It is used for end-to-end communications and maintenance. It carries alarm, control, and status information between network elements in a SONET network.

DCE - Data Communications Equipment
In a data station, the equipment that provides the signal conversion and coding between the data terminal equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

DDM-2000
Lucent's first generation SONET multiplexers that multiplex DS1, DS3/E3, or EC-1 inputs into EC-1, OC-1, OC-3, or OC-12 outputs.

Default Provisioning
The parameter values that are preprogrammed as shipped from the factory.

Demultiplexing

A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

DEMUX - Demultiplexer

The DEMUX direction is from the fiber toward the DSX.

Digital Multiplexer

Equipment that combines time-division multiplexing several digital signals into a single composite digital signal.

DRI - Dual Ring Interworking

Two ring networks interconnected at two common nodes.

Drop and Continue

A technique that allows redundant signal appearances at two central offices in a DRI network, allowing protection against central office failures.

DS1

Digital Signal Level 1 (1.544 Mb/s).

DS3/E3

Digital Signal Level 3 (44.736 Mb/s).

DS3/E3/EC-1 Circuit Pack

The DS3/E3/EC-1 circuit pack interfaces to the DSX-3 panel.

DSn - Digital Signal Rate n

One of the possible digital signal rates at Alcatel-Lucent 1850 TSS-5 interfaces: DS1 (1.544 Mb/s) or DS3/E3 (44.736 Mb/s).

DSX - Digital Cross-Connect Panel

A panel designed to interconnect to equipment that operates at a designated rate. For example, a DSX-3 interconnects equipment operating at the DS3/E3 rate.

DTE - Data Terminating Equipment

That part of a data station that serves as a data source (originates data for transmission), a data sink (accepts transmitted data), or both.

Dual Homing

A network topology in which two Alcatel-Lucent 1850 shelves serve as hosts supporting up to 8 OC-3 rings or 4 OC-12 rings. Each OC-3 and OC-12 ring is interconnected between the two separate hosts.

E

EC-1, EC-n - Electrical Carrier

The basic logical building block signal with a rate of 51.840 Mb/s for an EC-1 signal and a rate of n times 51.840 Mb/s for an EC-n signal. An EC-1 signal can be built in two ways: A DS1 can be mapped into a VT1.5 signal and 28 VT1.5 signals multiplexed into an EC-1 (VT1.5 based EC-1), or a DS3/E3 can be mapped directly into an EC-1 (DS3/E3 based EC-1).

ECI - Equipment Catalog Item
The bar code number on the faceplate of each circuit pack used by some inventory systems.

ES - Errored Seconds
A performance monitoring parameter.

ESF - Extended Super Frame
The format for a DS1 signal.

F

FE - Far End
Any other network element in a maintenance subnetwork other than the one the user is at or working on. Also called remote.

FE ACTY - Far End Activity
An LED on the SYSCTL circuit pack faceplate.

FEBE - Far End Block Error
An indication returned to the near-end transmitting node that an errored block has been detected at the far end.

FEPROM - Flash EPROM
Nonvolatile Electrically-erasable Programmable Read-Only Memory.

FERF - Far End Receive Failure
An indication returned to the transmitting terminal that the receiving terminal has detected an incoming section failure.

FE SEL - Far End Select
An LED on the faceplate of the SYSCTL circuit pack.

FIT
Failures in 10^{-9} hours of operation.

Free Running
An operating condition of a clock in which its local oscillator is not locked to an internal synchronization reference and is using no storage techniques to sustain its accuracy.

FT-2000
Lucent's SONET OC-48 Lightwave System.

Function Unit
Refers to any circuit pack that is designated for Function-Group-C of the Alcatel-Lucent 1850 TSS-5 shelf.

G

GNE - Gateway Network Element
A network element that has an active X.25 link. Can also be a DSNE.

H

Hairpin Routing
A cross-connection within the same function unit (intra-function unit).

Holdover
An operating condition of a network element in which its local oscillator is not locked to any synchronization reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

I

IC - Internal Clock
Used in synchronization messaging.

ID
See shelf ID and site ID.

IR - Intermediate Reach
A term used to describe distances of 15 to 40 km between optical transmitter and receiver without regeneration. See long reach.

IS - In Service
One possible state of a DS or DS3/E3 port. Other possible states are "auto" (automatic) and "nmon" (not monitored).

J

Jitter
Timing jitter is defined as short-term variations of the significant instants of a digital signal from their ideal positions in time.

L

LBO - Line Build Out
An equalizer network between the Alcatel-Lucent 1850 TSS-5 and the DSX panel. It guarantees the proper signal level and shape at the DSX panel.

LED - Light Emitting Diode
Used on a circuit pack faceplate to show failure (red) or service state. It is also used to show the alarm and status condition of the system.

Line Timing
The capability to directly derive clock timing from an incoming OC-N signal while providing theuser the capability to provision whether switching to an alternate OC-N from a different source (as opposed to entering holdover) will occur if the OC-N currently used as the timing reference for that NE becomes unsuitable as a reference. For example, intermediate nodes in a linear network are line timed. See Loop Timing.

Local
See Near-End.

LOF - Loss of Frame
A failure to synchronize to an incoming signal.

Loop Timing
Loop timing is a special case of line timing. It applies to NEs that have only one OC-N interface. For example, terminating nodes in a linear network are loop timed. See Line Timing.

LOP - Loss of Pointer
A failure to extract good data from an STS-1 payload.

LOS - Loss of Signal
The complete absence of an incoming signal.

LR - Long Reach
A term used to describe distances of 40 km or more between optical transmitter and reciever without regeneration. See Intermediate Reach.

M

Main
The two slots (M-1 and M-2) on the Alcatel-Lucent 1850 TSS-5 shelf in which the OC-3 or OC-12 main OLIU circuit packs are installed.

Midspan Meet
The capability to interface between two lightwave terminals of different vendors. This applies to high-speed optical interfaces.

Multiplexing
The process of combining several distinct digital signals into a single composite digital signal.

N

NE - Near End
The network element the user is at or working on. Also called local.

NE - Network Element
The basic building block of a telecommunications equipment within a telecommunication network that meets SONET standards. Typical internal attributes of a network element include: onr or more high- and low-speed transmission ports, built-in intelligence, synchronization and timing capability, and access interfaces for use by technicians and/or operation systems. In addition, a network element may also include a time slot interchanger.

NMA - Network Monitoring and Analysis
An operations system designed by Telcordia Technologies which is used to monitor network facilities.

NMON - Not Monitored
A provisioning state for equipment that is not monitored or alarmed.

Node
In SONET, a node is a line terminating element.

Non-Revertive
A protection switching mode in which, after a protection switch occurs, the equipment remains in its current configuration after any failure conditions that caused a protection switch to occur clear or after any external switch commands are reset. See Revertive.

NSAP - Network Services Access Point
An address that identifies a network element. Used for maintenance subnetwork communication using the OSI protocol.

O

OC, OC-n - Optical Carrier
The optical signal that results from an optical inversion of an STS signal; that is, OC-1 from STS-1 and OC-n from STS-n.

OC-1
Optical Carrier Level 1 Signal (51.844 Mb/s).

OC-3
Optical Carrier Level 3 Signal (155 Mb/s).

OC-3c (STS-3c)
Optical Carrier Level 3 Concatenated Signal. Low-speed broadband equivalent to three STS-1s linked together with a single path overhead.

OC-12
Optical Carrier Level 12 Signal (622 Mb/s).

OC-12c (STS-12c)
Optical Carrier Level 12 Concatenated Signal. High-speed broadband equivalent to twelve STS-1s linked together with a single path overhead.

OC-48
Optical Carrier Level 48 Signal.

Operations Interface
Any interface that provides information on the system performance or control. These include the equipment LEDs, SYSCTL faceplate, and office alarms.

OS - Operations System
A central computer-based system used to provide operations, administration, and maintenance functions.

OSI - Open Systems Interconnection
Referring to the OSI reference model, a logical structure for network operations standardized by the Internation Standards Organization (ISO).

P

Pass Through
Paths that are cross-connected directly across an intermediate node in a ring network.

Plesiochronous Network
A network that contains multiple maintenance subnetworks, each internally synchronous and all operating at the same nominal frequency, but whose timing may be slightly different at any particular instant. For example, in SONET networks, each timing traceable to their own Stratum 1 clock are considered plesiochronous with respect to each other.

PM - Performance Monitoring
Measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

Port
The physical, electrical, or optical interface on a system. For example, DS1, DS3/E3, OC-3, and OC-12. ***See Channel***.

Port State Provisioning
A feature that allows a user to supress alarm reporting and performance monitoring during provisioning by supporting multiple states (automatic, in-service, and not monitored) for low-speed ports. ***See Channel State Provisioning***.

Proactive Maintenance
Refers to the process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal fail or signal degrade defect (for example, performance monitoring).

Protection Line
As defined by the SONET standard, the protection line is the pair of fibers (one transmit and one receive) that carry the SONET APS channel (K1 and K2 bytes in the SONET line overhead). On a Alcatel-Lucent 1850 TSS-5, a protection line is a pair of fibers that terminate an OLIU circuit pack in the Main-2 or C-2 slots. ***See Service Line***.

Product Family 2000
Lucent's first line of SONET standard network products providing total network solutions.

R

Reactive Maintenance
Refers to decting defects/failures and clearing them.

Remote
See Far-End (FE).

Revertive
A protection switching mode in which, after a protection switch occurs, the equipment returns to the nominal configuration (that is, the service equipment is active, and the protection equipment is standby) after the clearing of any failure conditions that caused a protection switch to occur or after any external switch commands are reset. ***See Non-Revertive***.

Ring
A configuration of nodes comprised of network elements connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over a protection line.

RPP - Reliability Prediction Procedure
Described in Telcordia Technologies TR-NWT-00032.

RT - Remote Terminal
An unstaffed equipment enclosure that may have a controlled or uncontrolled environment.

S

Self-Healing
Ring architecture in which two or more fibers are used to provide route diversity. Node failures only affect traffic dropped at the failed node.

SEO - Single-Ended Operations
The maintenance capability that provides remote access to all Alcatel-Lucent 1850 TSS-5 systems from a single location over the DCC.

Service Line
On a Alcatel-Lucent 1850 TSS-5 system, a service (or "working") line is a pair of fibers (one transmit and one receive) that terminate on an OLIU circuit pack in the Main-1 or C-1 slots. As defined by the SONET standard, the SONET APS channel is not defined on a service line. ***See Protection Line***.

SES - Severely Errored Seconds
This performance monitoring parameter is a second in which a signal fail occurs, or more than a preset amount of coding violations (dependent on the type of signal) occurs.

SF - Super Frame
The format for DS1 signals.

Single Homing
A network topoly in which a single Alcatel-Lucent 1850 TSS-5 serves as a DDM-2000 FiberReach, OC-3 Multiplexer, or OC-12 Multiplexer host.

Standby
Standby identifies a 1+1 protected OC-N line which is not currently selected by the receiver at either end as the payload carrying signal, or 1x1 or 1xN protected circuit pack that is not currently carrying service. ***See Active***.

Status
The indication of a short-term change in the system.

STS, STS-n - Synchronous Transport Signal
The basic building block signal with a rate of 51.840 Mb/s for an STS-1 signal and a rate of n times 51.840 Mb/s for an STS-n signal.

STS-1 SPE - STS-1 Synchronous Payload Envelope
A 125-microsecond frame structure composed of STS path overhead and the STS-1 payload.

Subnetwork
Group of SONET network elements that share a SONET data communications channel.

Synchronization Messaging
SONET synchronization messaging is used to communicate the quality of network timing, internal timing status, and timing states throughout a subnetwork.

SYSCTL - System Controller
The system controller circuit pack that provides overall administrative control of the terminal.

T

T1X1 and T1M1
The ANSI committees responsible for telecommunications standards.

TCA - Threshold Crossing Alert
A condition set when a performance monitoring counter exceeds a user-selected threshold. A TCA does not generate an alarm but is available on demand through the CIT and causes a message to be sent to NMA via the TL1 interface.

TL1 - Transaction Language 1
A Telcordia Technologies machine-to-machine communications language that is a subset of ITU-TSS, formerly CCITT's, human-machine language.

U

UAS - Unavailable Seconds
In performance monitoring, the count of seconds in which a signal is declared failed or, in which, 10 consecutively severely errored seconds (SES) occurred, until the time when 10 consecutive non-SES occur.

Unidirectional

A protection switching mode in which the system at each end of an optical span monitors both service and protection lines and independently chooses the best signal (unless overridden by an equipment failure or by an external request, such as a forced switch or lockout). In a system that uses unidirectional line switching, both the service and protection lines may be active simultaneously, with one line carrying traffic in one direction and other line carrying traffic in the other direction. For a 1+1 protection scheme the K1 and K2 bytes in the SONET line overhead are used to convey to the far end which line the near-end receiver has chosen, so that an "active" indication may be made at the far end.

UOC - Univeral Optical Connector

Receptacles on the faceplate of some OLIUs that accept ***ST***, SC, or FC connectors.

UPD/INIT

A push-button on the SYSCTL faceplate.

V

VM - Violation Monitor

A mode of the DS3/E3 circuit pack in which it will monitor but not remove P-bit parity violations on the DS3/E3 signal from the received fiber.

VMR - Violation Monitor and Removal

A mode of the DS3/E3 circuit pack in which it will monitor and remove P-bit parity violations on the DS3/E3 signal received from the fiber.

VT - Virtual Tributary

A structure designed for transport and switching of a sub-DS3/E3 payload.

VT1.5

A 1.728 Mb/s virtual tributary.

VT-G - Virtual Tributary Group

A 9-row by 12-column SONET structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte-interleaved within the VT-organized STS-1 synchronous payload envelope

Z

Zero Code Suppression

A technique used to reduce the number of consecutive zeros in a line-codes signal (B3ZS for DS3/E3 signals and B8ZS for DS1 signals).

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