



Alcatel-Lucent 1850

TRANSPORT SERVICE SWITCH 320 (TSS-320) | RELEASE 2.0

TURN-UP AND COMMISSIONING GUIDE

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Interference Information: Part 15 of FCC Rules

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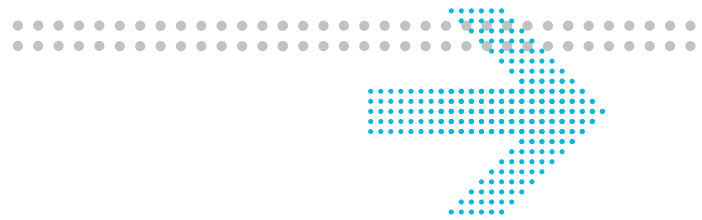
Documentation

Product documentation is available on Alcatel-Lucent Online Support Documentation and Software web site at <http://www.alcatel-lucent.com/osds>.

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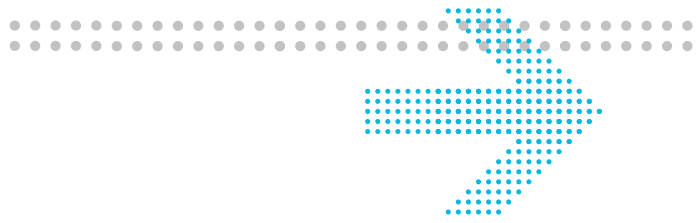
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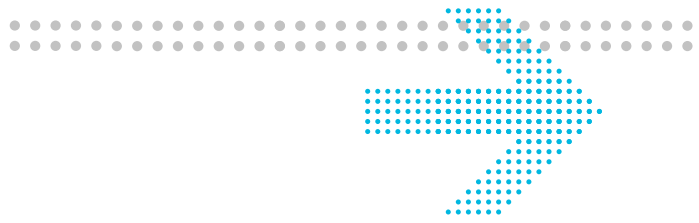
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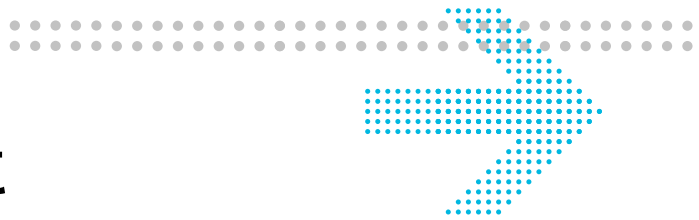
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About this document

Purpose

This manual provides instructions for installation, turn-up, and testing of the Alcatel-Lucent 1850 Metro Core Transport Service Switch 320 (1850 TSS-320). This manual is not a service manual. Refer to 8DG08136EAAA — *Alcatel-Lucent 1850 TSS-320 Craft Terminal Operation Guide* for any activities involving circuit turn-up, or 8DG08136DAAA — *Alcatel-Lucent 1850 TSS-320 Maintenance and Trouble Clearing Guide* for trouble analysis and regular maintenance.

Reason for reissue

Updated fibering information.

Intended audience

This document is intended for individuals who are responsible for the installation, turn-up, acceptance, operations, and maintenance of the 1850 TSS-320.

How to use this document

This manual is divided into several chapters and appendices. The first chapter contains safety information and general installation information. The other chapters provide instructional steps for personnel needing additional detail or background information.

This document describes the 1850 TSS-320 operations. Refer to the Table of Contents to locate specific information by chapter.

Safety information

This information contains hazard statements for your safety. Hazard statements are given at points where risks of damage to personnel, equipment, and operation may exist. Failure to follow the directions in a hazard statement may result in serious consequences.

Safety precautions

Adhere to the following safety precautions:

- Electrostatic discharge (ESD)

You must be properly grounded when making contact with the 1850 TSS-320 frame and handling circuit packs, disk drives, and tapes. Wrist strap ground cords should be routinely tested for the minimum 1-megohm resistance.

- Plug-in storage

Circuit packs should be stored in static-safe packaging or in a grounded cabinet.

For additional safety precautions, please see the *Alcatel-Lucent 1850 TSS-320 Safety Guide*.

Related information

The following is a list of related documents:

- 8DG08136AAAA — *1850 TSS-320 Product Information Guide*
- 8DG08136BAAA — *1850 TSS-320 Installation Guide*
- 8DG08136DAAA — *1850 TSS-320 Maintenance and Trouble Clearing Guide*
- 8DG08136EAAA — *1850 TSS-320 Craft Terminal Operation Guide*
- 8DG08136FAAA — *1850 TSS-320 TL1 Operation Guide*
- 8DG08136GAAA — *1850 TSS-320 CLI Operation Details*
- 8DG08136HAAA — *1850 TSS-320 Safety Guide*

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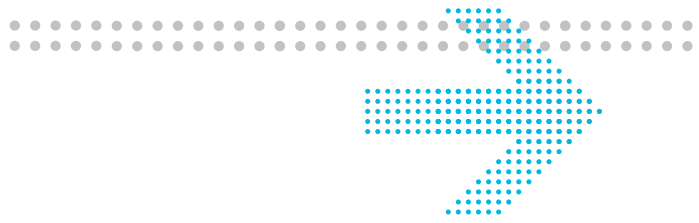
Electronic products bearing or referencing the symbol shown below, when put on the market within the European Union, shall be collected and treated at the end of their useful life in compliance with applicable European Union and local legislation. They shall not be disposed of as part of unsorted municipal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



Note: 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.

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1 Safety

Overview

Purpose

This chapter provides important information and safety instructions the for 1850 TSS-320 Release 2.0 equipment.

Contents

This chapter covers these topics.

Introduction	1-2
Safety rules	1-3

Introduction

Description

The current procedure defines the commissioning modality for the 1850 TSS-320 equipment. Particular attention is given to the fact that each component utilized on the link is tested at the factory's final acceptance dept. during the system test phase.

The real conditions of the plant are simulated during this phase, i.e., the line is a real suitably long optical fiber line and the equipment is configured according to customer requirements and to the link description table (LDT) supplied by the link designers.

The documentation of the tests carried out during the system test phase is provided with the equipment (TRS+LDT).

All the measurements necessarily executed to correctly insert the equipment into the network are repeated on site. To this concern, reference is made to the results of the factory tests carried out on the system.

Symbols

To simplify the description, some symbols have been used throughout this document to describe actions.

The table below shows the symbols and their relevant meaning.

Symbols Used	Meaning
√	Check/Verify
CT⇒	On Craft Terminal Select
NES⇒	On Network Element Synthesis
EML-USM⇒	On Element Management Level-User Service Manager
⇒	Select
☐	On Pattern Generator/Error Detector (Instrument) Operation

Safety rules

Description

The safety rules describe the operations and/or precautions to observe to safeguard operating personnel during the working phases and to guarantee equipment safety. Please read the *1850 TSS-320 Safety Guide* before starting each task.



CAUTION

Carefully read the front-panel warning labels prior to working on any connections.

General rules

Check that the equipment is operating with all the shields properly positioned (dummy covers, ESD connector protections, etc.).

Carefully observe the front-panel warning labels prior to working on optical connections while the equipment is in-service.

To reduce the risk of damaging the electrostatic sensitive devices, it is mandatory to use the elasticized band (worn around the wrist) and the coiled cord connected to the rack ground when having to touch the equipment.

All measures must be done at the ODF/DDF points (ODF= Optical Distribution Frame, DDF= Digital Distribution Frame).

Inserting the units (and modules) into the subrack



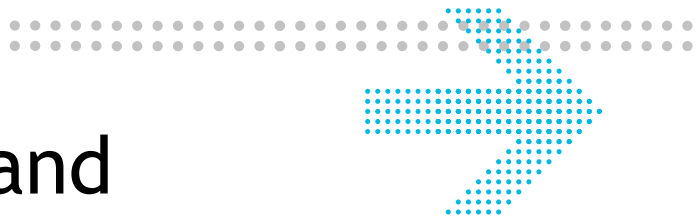
CAUTION

Avoid equipment damage

The screw tightening torque for inserting the units (and modules, if any and if screw fastened) into the subrack must be:

2.8 kg x cm (0.28 Newton x m) ± 10 %

Exceeding this value may result in screw breaking.



2 Initial Turn-up and Provisioning

Overview

Purpose

This chapter lists the instructions that must be sequentially carried out as well as additional information.

Contents

This chapter covers these topics.

Introduction	1-2
Safety rules	1-3

Initial turn-up sequence instructions

Visual inspection for subrack installation and cabling

Inspect the following:

- Verify rack and subrack location and equipment configuration based on engineering documentation.
- Verify any fiber connections to office DDF/ODF based on office documentation.
- Verify inter- and intra-subrack fiber connections as specified in Installation Guide and engineering documentation.
- Verify fiber labeling and routing and inspect for damaged or pinched fibers or fibers that exceed the minimum bend radius.
- Verify all electrical and power cable and ground connections as specified in the Installation Guide.

Note: For additional information see the *Alcatel-Lucent 1850 TSS-320 Installation Guide*.

Startup procedure

Scope

The scope of this procedure is to provide the steps required for initial software loading and equipment and craft terminal start-up.

Equipment Power-Up

The equipment is powered up by activating the two circuit breakers on the GENTRU unit.

PC Start-up

Computer hardware configuration

Refer to 8DG08136EAAA — *Alcatel-Lucent 1850 TSS-320 Craft Terminal Operation Guide*.

Note: A USB key with a minimum of 256-MB of available space is required for software download.

Computer software configuration and installation

Refer to the 8DG08136EAAA — *Alcatel-Lucent 1850 TSS-320 Craft Terminal Operation Guide*

Note: An FTP server program installed and running is mandatory for software download. It is also required that any firewalls running on the PC be disabled.

Software download at the first installation

For the 1850 TSS-320 connection points, refer to Figure 1 on page 27.

To perform the SW download procedure, it is required that an FTP server application be installed and running. In this example “1850” is both user name and password of this application.

- a. Connect the PC 9-pin COM1 port to the EC320 mUSB debugger port (17) by means of the debug cable.

Table 2-1 Debug Cable Pinout

Mini USB male	Signal	SUB-D 9 pin female
Pin 3	TX	Pin 3
Pin 2	RX	Pin 2
Pin 5	GND	Pin 5

Mini USB male	Signal	SUB-D 9 pin female
Pin 1	DTR	Pin 4

- b. On PC, select **Start -> Programs -> Accessories -> Communication -> Hyperterminal ->** and use the following settings (it is suggested to save these settings to have a faster access in the following connections).
Select COM1:

Bits per second	38,400
Data bits	8
Parity	None
Stop bits	1
Flow control	None

and click on Apply.

Click on **File -> Properties** and select “VT100” in the Emulation field.

Note: The above step outlining the use of Hyperterminal is given as an example. Other terminal emulators can be used.

- c. Connect the PC ethernet port to the EC320 ETH (LAN) port (20) by means of the ethernet cable

In the following, the commands to be entered by the operator in the Hyperterminal connection to the debug port (17) are in bold. After typing the command, press ENTER.

- d. **# reboot**
- e. when the program indicates PRESS CTRL C to stop the boot sequence, enter CTRL C
- f. **# login root**
- g. **# disk-init FORMAT HARDDISK RAID** (to format the hard disk)
- h. **# disk-init MOUNT**
- i. insert the USB key (on which the “keyfsimage” file have to be present) in the EC320 USB connector (19)
- j. **# key-init**

Two different procedures can be performed:

- Loading procedure with SW package on PC hard disk
- Loading procedure with SW package on USB key

These procedures are described in the following paragraphs.

First installation loading procedure with SW package on PC hard disk

- a. Set the PC's LAN IP address to a static address by clicking "Start/Settings/Network Connections/Local Area Connection", right click and select "Properties".
- b. In the "Local Area Connection Properties" window select "Internet Protocol (TCP/IP)" from the "This connection uses the following items" list and click on Properties
- c. In the Internet Protocol (TCP/IP) properties box select "Use the following IP address" and enter 151.98.152.195 for the IP address and 255.255.255.0 for the Subnet Mask
- d. Click 'OK' to accept and "OK" to exit the LAN Properties
- e. **# ifconfig eth1 151.98.152.196** (to configure the IP address of the ETH1 port on the 1850 TSS-320).
- f. Start the FTP server application.
- g. **# StartApp DWL 1850TSS320M 1850TSS320M V1.1.17 151.98.15.35 0 /d1-17 1850 1850 false**
 NE SW package (twice) Version IP address Port | FTPusern
 Directory: FTPpassword
 Three types of SW packages are available: 1850TSS320M (M = Multiservice), 1850TSS320T (T = Transport=SDH+WDM), 1850TSS320D (D = Data)
- h. At the end the program give the result of the procedure (i.e., success).
- i. **# key-exit** (it is now possible to remove the USB key).
- j. **# disk-init UMOUNT**
- k. **# reboot** - wait 5- 10 minutes for reboot to finish
- l. **# ifconfig eth1 151.98.152.196** (to configure the IP address of the ETH1 port of 1850 TSS-320).

Proceed to Initial Provisioning. It is now possible to start the CT application. (see the Craft Terminal Operations Guide for additional information).

First installation loading procedure with SW package on USB key

- a. **# StartApp LOCAL 1850TSS320M 1850TSS320M V1.1.17 /mnt/sdb1/d1-17 false**
 NE SW package (twice) SW Version Directory
 Three types of SW packages are available: 1850TSS320M (M = Multiservice), 1850TSS320T (T = Transport=SDH+WDM), 1850TSS320D (D = Data) Choose the SW package that matches you installation.
- b. at the end the program give the result of the procedure (i.e. SUCCESS)
- c. **# key-exit** (it is now possible to remove the USB key)
- d. **# disk-init UMOUNT**

- e. # **reboot** wait 5- 10 minutes for reboot to finish
- f. # **ifconfig eth1 151.98.152.196** (to configure the IP address of the ETH1 port of 1850 TSS-320).

Proceed to Initial Provisioning. It is now possible to start the CT application. (see the Craft Terminal Operations Guide for additional information).

Initial Provisioning

Scope

The scope of this procedure is to provide the steps required for initial shelf and equipment provisioning of the 1850 TSS-320 shelf using TL1 commands.

See the 1850 TSS-320 R2.0 TL1 Operations Guide for additional information.

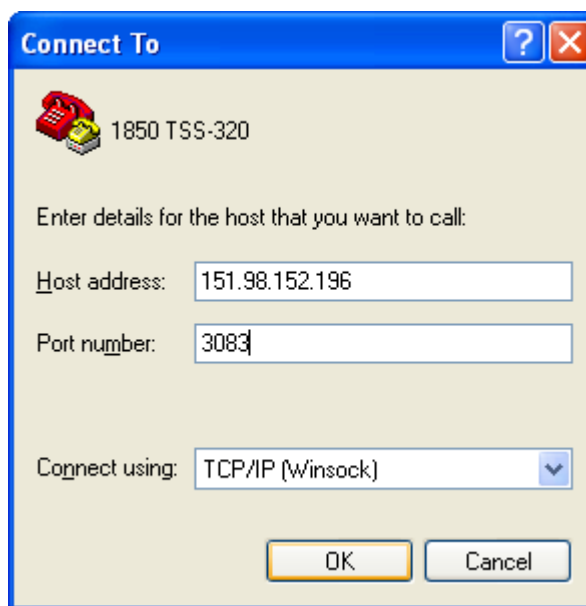
Note: It is also possible to use the Craft Terminal to provision the system. See the Craft Terminal Operation Guide for details on provisioning the NE using the Craft Terminal.

Initial Provisioning Using TL1

- a. Connect the PC ethernet port to the EC320 ETH (LAN) port (20) by means of the ethernet cable.
- b. Open a telnet session to port 3083 using the IP address provisioned during the Initial Software download.

Figure 2-1 shows the TL1 setup for Hyperterminal.

Figure 2-1 Hyperterm setup



- c. Start TL1 session by issuing the following command:
`ACT-USER::ALCATEL:::Ansi_4gx;`

Note: The default superuser User ID is “ALCATEL” and the default superuser password is “Ansi_4gx”.

- d. Issue the following command to set the new Site Identifier (SID)
(In this example, SET-SID is used to set the SID to 1850-1.)
SET-SID:::::1850-1;

DWDM shelf provisioning

The default shelf type is a TDM shelf. Perform the following additional steps if the shelf being provisioned is intended to be equipped as a DWDM shelf (ILA, UILA, or ROADM).

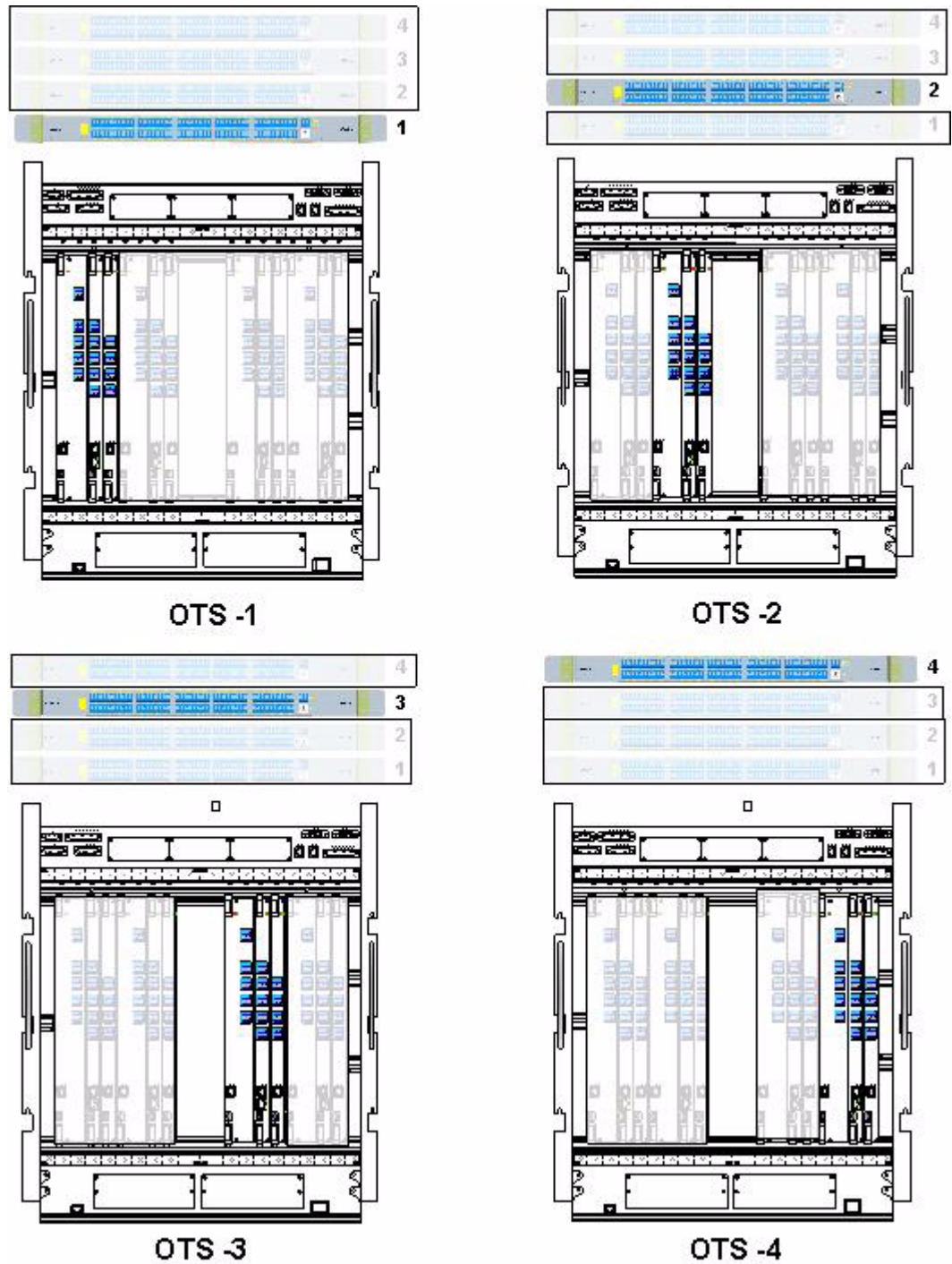
- e. Use the following command to delete the default shelf provisioning.
dlt-eqpt::SHELF-1-1;
- f. Use the “ENT-EQPT” command to provision the shelf for the appropriate DWDM shelf type.
ENT-EQPT:[TID]:SHELF-1-1::::PROVISIONEDTYPE=ROADM,
SHELFNUM=1,SHELFROLE=MAIN,SHELFWDMROLE=WDMMASTER:IS;
This example provisions the shelf as a ROADM, sets shelf number to 1, sets this shelf as the main shelf and the WDM master shelf and puts it in service. (This will cause the shelf to reboot.)

Note: See the TL1 Operations Guide for syntax options of the ENT-EQPT TL1 command.

- g. If provisioning a ROADM with OMD shelves use the following commands for provisioning the OMD and associate it to an OTS.
ENT-EQPT:[TID]:SHELF-1-2::::PROVISIONEDTYPE=OMD;
ENT-OTS:[TID]:OTS-1::::QUAD=1-1-2,OMD_AID=OMD-1-2-1;

Note: The “QUAD=1-1-2” field in the ENT OTS command is the AID of the WR circuit pack being associated with the OTS. See fig. 2-2 for OMD/OTS assignment convention.

Figure 2-2 OMD/OTS assignment



DWDM Optical channel provisioning

Use the following steps to provision DWDM optical channels and their associated Client optics.

- a. Use the ENT-EQPT-OCONN command to enter optical connection from OT port to the OMD port.

```
ENT-EQPT-OCONN:[TID]:OTPORT-1-1-12-L1,OMDPORT-1-2-1-9170:1::2WAY;
```

This example provisions a bidirectional channel to/from an OT located in slot 12 of shelf 1 to channel 9170 of the OMD designated as shelf 2.

- b. Use the ENT-CRS-PXC command to enter cross connect from OMD to optical channel ID.

```
ENT-CRS-PXC:[TID]:OMDPORT-1-2-1-9600,OTSOCHPORT-1-1-2-9600:ctag;
```

This example provisions bidirectional channel 9600 to/from the OMD designated as SHELF-1-2-1 to the WR pack in slot-1-1-2.

See the 1850 TSS-320 R2.0 TL1 Operations Guide for additional information on other circuit types.

- c. Use one of the following commands to provision the client side optics.

For OC-192 services use: ENT-OC192::OTPORT-1-1-12-C1;

For 10GE services use: ENT-10GE::OTPORT-1-1-12-C1;

For 10G fiber Channel use: ENT-10GFC::OTPORT-1-1-12-C1;

For OTU2 services use: ENT-OTU2::OTPORT-1-1-12-C1;

Note: See the *Alcatel-Lucent 1850 TSS-320 TL1 Operations Guide* for syntax and optional parameters for the above command.



3 Tests and Measurements

Overview

Purpose

This chapter lists the instructions that must be sequentially carried out as well as additional information.

Contents

This chapter covers these topics.

Instruments, accessories and related documents	3-2
Connection points position	3-4
Local measures list and operating sequence	3-8
Point-to-point measures list and operating sequence	3-56

Instruments, accessories and related documents

Instruments

The following instruments are required:

Table 3-1 Instruments

Ref.	Instrument	Qty.	Characteristics
[A]	Pattern Generator/Error Detector	1	Signals available: <ul style="list-style-type: none"> • G.957 compliant OC-3, OC-12, OC-48 optical • Ethernet 10/100 Mbit • Gb Ethernet, 10 Gb Ethernet
[B]	Optical power meter (Power Meter)	1	Capable of taking measurements at 1310 and 1550 nm
[C]	Single-mode variable optical attenuator (VOA)	1	Variable attenuator capable of 0-50 dB attenuation at both 1310 and 1550 nm
[D]	Digital multimedia	1	
[E]	Personal Computer (as Craft Terminal)	1	See the “Craft Terminal Operation Guide.”
[F]	Data Tester	1	Tx rate up to 64 kbit/s contra-directional CCITT interface V11
[G]	Frequency counter	1	10 MHz \pm 1 Hz
[H]	Optical Spectrum Analyzer	1	Capable of taking measurements up to 1600nm

Accessories

The following accessories are required:

Table 3-2 Accessories

Ref.	Accessories	Qty.	Characteristics
[I]	Single-mode single-fiber Jumpers	4	Terminations dependent on unit/pack/ODF connectors, power meter, and attenuator

Ref.	Accessories	Qty.	Characteristics
[J]	Shielded pair	2	Termination: Instrument (F)/(A) SUB.D 37-pin male connector for 2 Mbit/s SUB.D 50-pin male connector for service channels RJ45 for Ethernet ports
[K]	Optical loop	4	Terminations dependent on unit/pack/ODF connectors
[L]	PC cable	1	Refer to the Product Information Guide.
[M]	EC debugger cable	1	Refer to the Product Information Guide.
[N]	LAN cable	1	Termination: RJ45 connector (LAN port) on PC (RS-232) RJ45 connector on EC320 (Debugger port) - (20)
[O]	USB key	1	Termination: USB connector on EC320 (USB interface) - (19) Minimum 256M
[P]	Cables for synchronization	1	Termination: Instrument (G) Frequency Counter Synchronization termination (120 or 75 ohm)
[Q]	Multi-mode single-fiber splices	4	Terminations dependent on unit/pack/ODF connectors, power meter and attenuator
[R]	Fixed attenuators (suggested)	1	Suggested values: 1, 2,3,4,5,6,10 dB - MU type
[S]	Fixed attenuators (suggested)	1	Suggested values: 1, 2,3,4,5,6,10 dB - SC type
[T]	Cleaning kit for optical fibers	1	Add fiber cleaning appendix

Table 3-3 EC debugger cable pinout

Mini USB male	Signal	SUB-D 9 pin female
PIN 3	TX	PIN 3
PIN 2	RX	PIN 2
PIN 5	GND	PIN 5
PIN 1	DTR	PIN 4

Table 3-4 Craft Terminal cable pinout

Signal	M1 RJ45	M2 SubD 9PIN	Pair	Color
DATA CARRIER DETECT(DCD)	1	1	1	White/blue ring
OUTPUT SERIAL DATA LINE (RXD)	2	2		Blue
INPUT SERIAL DATA LINE (TXD)	3	3	2	White/orange ring
DATA TERMINAL READY (DTR)	4	4		Orange
GROUND (GND)	5	5	3	White/green ring
DATA SET READY (DSR)	6	6		Green
REQUEST TO SEND (RTS)	7	8	4	White/brown ring
CLEAR TO SEND (CTS)	8	7		Brown
		Shell		Shield

Connection points position

Description

See the *Alcatel-Lucent 1850 TSS-15 Product Information Guide* for the correct views.

Figure 3-1 Common cards connection points position

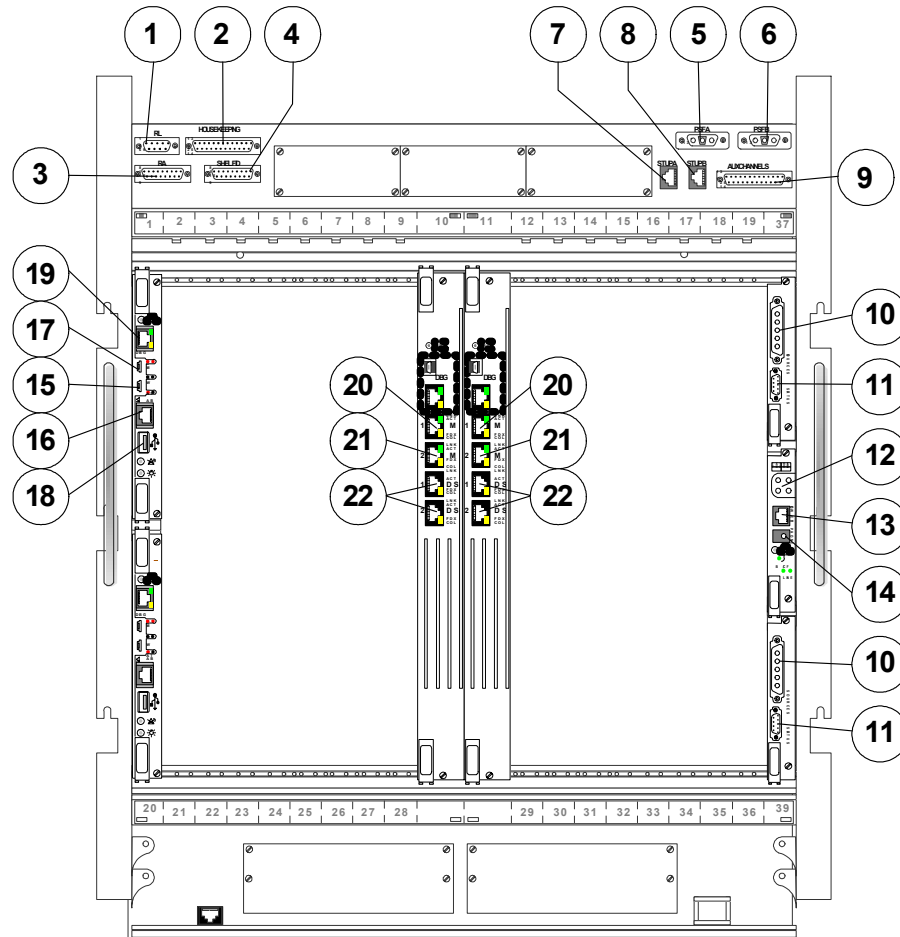


Table 3-5 Numbering and functions referred to the common cards connection points

Access Point	Slot	Function
1		Rack Lamps Connections (RL)
2		Housekeeping Connections (HK)
3		Remote Alarms Connections (RA)
4		Shelf ID Connectors

Access Point	Slot	Function
5		Power Supply (Battery A) Connections
6		Power Supply (Battery B) Connections
7		Alarms and Remote Inventory “Step-up” A Connector
8		Alarms and Remote Inventory “Step-up” A Connector
9		Auxiliary Alarms Connections
10	37, 39	Power Supply (Input Battery) Connections
11	37, 39	T3 (2MHz) / T6 (2Mbps) Input Synchronization Signal
12	38	I/O 2Mbps G.703 Auxiliary Channels (#1 and #2) (Not available in the current release.)
13	38	EOW Extension 4-Wire Interface (RJ45) (Not available in the current release.)
14	38	Phone Jack (Not available in the current release.)
15	1, 20	Local Craft Terminal Connection (mUSB) - F Interface
16	1, 20	Local Craft Terminal Connection (RS232) - F Interface
17	1, 20	RS2342 on mUSB Debug Connector
18	1, 20	USB Interface
19	1, 20	10/100 Mbps ETH Debug RJ45 Connector
20	10, 11	10/100 Mbps Q3 Interface
21	10, 11	10/100 Mbps Redundant Q3 Interface
22	10, 11	ETH/Fast ETH/GbE Interface for Drop Shelf Connections

Table 3-6 SONET/SONET, data, and WDM cards connection points

Card	Slot	Function
1P10GSO	02 to 09 12 to 19 21 to 28 29 to 36	10-Gbps (OC-192/OC-192) optical card with optical connections on XFP module.

Card	Slot	Function
4P2G5SO	02 to 09 12 to 19 21 to 28 29 to 36	2.5-Gbps (OC-36/OC-48) optical card with optical connections on SFP modules.
8PSO	02 to 09 12 to 19 21 to 28 29 to 36	155- / 622-Mbps (OC-3/OC-3 - STM4/OC-12) optical card with optical connections on SFP modules. It also supports electrical connections on the access module.
OTU-2	02 to 09 12 to 19 21 to 28 29 to 36	10 Gbps bidirectional unit that supports one DWDM optical interface (one optical channel) in the 1529 nm → 1563 nm range on a 100 GHz grid,
10XANY	02 to 09 12 to 19 21 to 28 29 to 36	Data/TDM concentrator which aggregates up to ten client signals (GE, 1/2/4 Fibre Channel, OC-3/12/48 SONET, OC-3/4/16 SONET)
PP20G	02+03+21+22 04+05+23+24 06+07+25+26 08+09+27+28 12+13+29+30 14+15+31+32 16+17+33+34 18+19+35+36	20-Gbps optical data card (packet processor). It doesn't provide optical connections.
PIM1GE	On PP20G	10 x 1GbE optical connections on SFP modules. It is inserted in PP20G cavities to provide optical connections.
PIM10GE	On PP20G	1 x 10GbE optical connections on XFP module. It is inserted in PP20G cavities to provide optical connections
PIMMS	On PP20G	Multiservice PIM. It doesn't provide optical connections

Card	Slot	Function
SS-11, SI-11, SL-12, SS-41, SL-41, SL-42, SS161, SL-161, SL-162, 1000B	On the relevant board, PIM	OC-3, OC-12, OC-36, multi-rate, GbE, B&W SFP modules providing optical connections to the cards and PIMs on which they are plugged.
XI-641, XS-642, XP1L12D2, 10GB	On the relevant board, PIM	10 Gbps B&W XFPs, providing optical connections to the cards and PIMs on which they are plugged.
WR4, WR8	2-3, 6-7, 12-13, 16-17	2 slot wide pack capable of routing signals between up to 4 optical lines (WR4) or 8 optical lines (WR8).
LDRXA, LDRXB,	5,9,15 and 19	Receive side OA capable of 9-29dB Gain, +16dBm out (LDRXA) or 13-33dB gain, +20dBm out (LDRXB)
LDTXA, LDTXB	4,8,14 and 18	Transmit side OA capable of 13-20dB Gain, +20dBm out (LDTXA) or 0dB gain without amplification (LDTXB).
OPS	02 to 09 12 to 19 21 to 28 29 to 36	Used for 1+1 protection and protected optical drop and continue applications.
11GBAR	02 to 09 12 to 19 21 to 28 29 to 36	11G Bidirectional AnyRate OT
11GUAR	02 to 09 12 to 19 21 to 28 29 to 36	11G Unidirectional AnyRate OT
OMD44	/	Used to multiplex and demultiplex 44 channels on a 100 GHz grid.
DCM	DCM shelf	SSMF DCMs available in 10 km granularity, from DCM 10 through DCM 140
XFP1 XFP2 XFP3		Provide Add to and Drop from the Client for the 11GBAR and 11GUAR

Local testing and operating sequence

Purpose

The purpose this section is to check the correct operating mode of the equipped units. They are detailed in the following paragraphs.

Free-running frequency check

Purpose:

Verify the correct value of the frequency of the oscillator on the MATRIX.

Test instruments

Note: See [Table 3-1, “Instruments” \(p. 3-2\)](#).

- Craft Terminal (E)
- Frequency Counter (G)

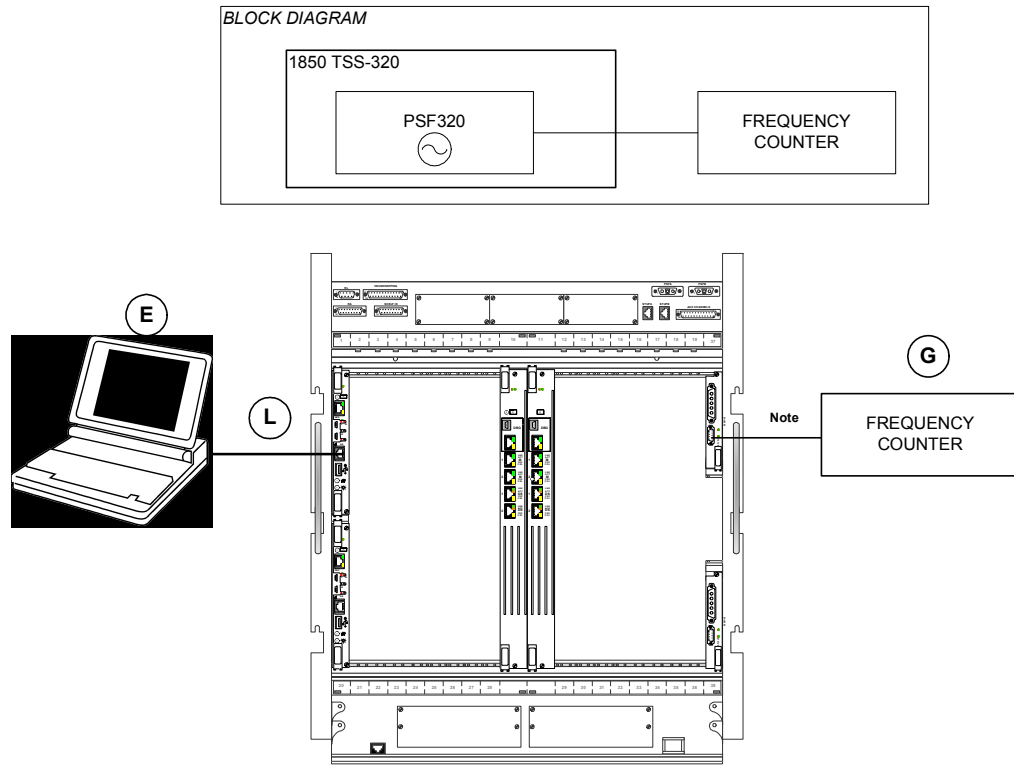
Accessories

Note: See [Table 3-2, “Accessories” \(p. 3-2\)](#).

- Cable for synchronization (P)
- Craft Terminal cable (L)

Test Bench

Figure 3-2 Free-running frequency check



Note: Connect the instrument to pins **1** (TXP) and **6** (TXN) if SUB-D 9-pole connector is used.

Note: Connect the instrument to wire-wrap terminals **TXP** and **TXN** if Timing Wire-Wrap adapter is used.

CT Procedure

- 1 Connect the outgoing synchronism to the frequency counter
- 2 Select **“Synchronization”** -> **“Modify synchronization”** from the menu bar.
 - Check that *Access identifier* = “NESYNC,” *Primary Reference* = “Stratum 1,” “Synchronized Traceability Unknown,” “Stratum 2,” “Transit Node Clock,” “Stratum 3E,” “Stratum 3,” “SONET minimum clock,” “Stratum 4,” “Do Not Use,” “failed state” and “Not Assigned,” *Secondary Reference* = “Stratum 1,” “Synchronized

Traceability Unknown,” “Stratum 2,” “Transit Node Clock,” “Stratum 3E,” “Stratum 3,” “SONET minimum clock,” “Stratum 4,” “Do Not Use,” “Failed state” and “Not Assigned,” Sync Messaging = “Yes” (Y) “No” (N) and Revertive = “Yes” (Y) “No” (N).

- 3 Select **“Synchronization”** -> **“Modify Synchronization Outgoing”**
 - Check that the “free-running” indication is present in the timing reference block dedicated to the internal oscillator G.783. If the “Hold-Over” indication is displayed, first switch the equipment off and then back on again. Afterwards repeat all the procedures.
- 4 Select **“Synchronization”** -> **“Modify Synchronization Switch”**
 - Check that the frequency counter reads a measured value of 2048 kHz \pm 4.6 ppm. To perform this measure, the “Squelch T0/T4” must be deactivated (green color), by selecting Synchronization -> T4 Configuration; in “Squelch T0/T4” field, set T0 = G.813

END OF STEPS

TL1 Procedure

- 1 Connect the outgoing synchronism to the frequency counter
 - Enter ED-BITS-
OUT: [TID] :: [CTAG] :: [, LINECDE=] [, FMT=] [, ESFTRANS=] ;
in order to verify that no reference has been selected for each Timing Reference block except for the internal oscillator block “G.813.” Protocol G.813 local synchronization level. To make the test set G.813 instead of G.811. Access the synchronization menu and click on T4 modification, a T0 and T4 window will appear. Set G.813. On the contrary remove all the timing reference source from each Timing Reference blocking as follows:
Enter ED-SYCN-OUT /PRIOREFA / SECOREFA
Enter OPR-SYCN-OUT /SWITCHTO / CMDMODE
- 2 Select the Timing Reference Block
- 3 Select **“Synchronization”** -> **“Remove Timing Reference”**

-
- Check that the “free-running” indication is present in the timing reference block dedicated to the internal oscillator G.783. If the “Hold-Over” indication is displayed, first switch the equipment off and then back on again. Afterwards repeat all the procedures.
-

4 Select “Synchronization” -> “Set T0 Equal T4”

- Check that the frequency counter reads a measured value of 2048 kHz \pm 4.6 ppm. To perform this measure, the “Squelch T0/T4” must be deactivated (green color), by selecting Synchronization -> T4 Configuration; in “Squelch T0/T4” field, set T0 = G.813

SONET ports test

Purpose

- Let through data to check if the ports are properly connected to the ODF.
- Check PTx.
- Check that ALS is working properly.

Test instruments

Note: See [Table 3-1, “Instruments”](#) (p. 3-2).

- Craft Terminal (E)
- Pattern Generator/Error Detector (A)
- Power meter (B)
- x dB fixed attenuator

Accessories

Note: See [Table 3-2, “Accessories”](#) (p. 3-2).

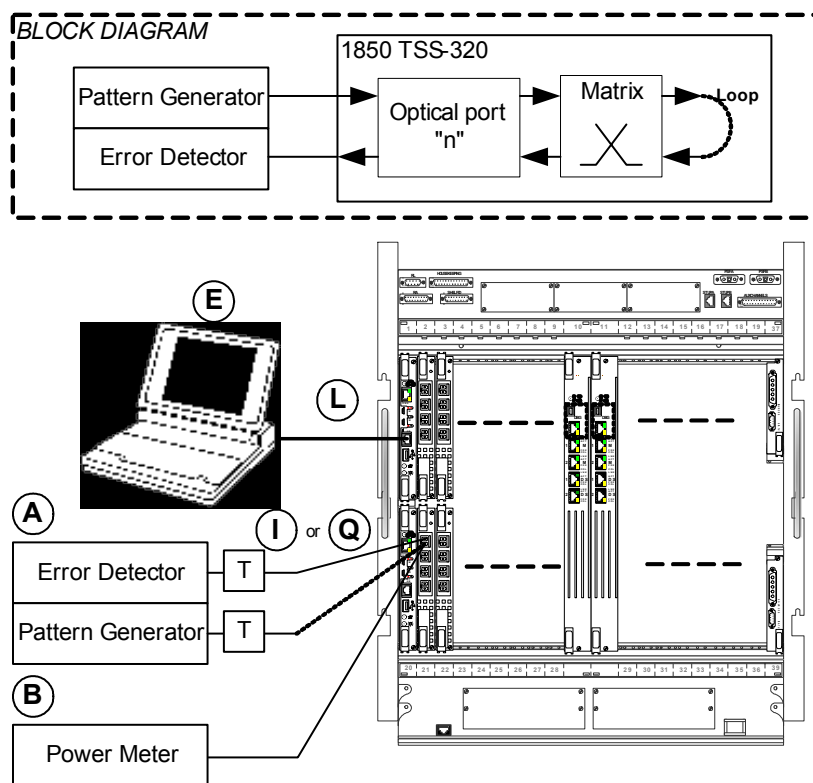
- Single-mode or multi-mode single-fiber splices (I) or (Q), according to the interface type
- Craft Terminal cable (L)

Test Bench

Set up the matrix loop via software.

OC-3/OC-12 ports test

Figure 3-3 Test on multi-demultiplexing and AIS for optical tributaries



Note: Insert x-dB fixed attenuator, according to the optical characteristics of instruments and boards.

Refer to [Table 3-1, “Instruments”](#) (p. 3-2) for the SFP list for the related technical specifications.

CT Procedure

By means of CT applications program the ALS-Enabling on the looped optical port (see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).

PTx power test

- 1 Preset the instrument to transmit a signal (based on the type of port used) with the following requirements:

Bit rate	155,520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-3 optical	
	or	
Bit rate	622,080 kbit/s	
Code/interface (SFP)	S-4.1, L-4.1, L-4.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-12 optical	

- 2 Insert the signal and test error-free data transit.

- 3 Connect power meter to the optical port output being tested.
 - Check that the optical power is within the range stated on the table in [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16).

- 4 Disconnect the pattern generator from the OC-3 or OC-12 input port. Check no power on Power Meter.

- 5 Repeat the test on each optical unit.

END OF STEPS

TL1 Procedure

By means of CT applications program the ALS-Enabling on the looped optical port (see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).

PTx power test

- 1 Preset the instrument to transmit a signal (based on the type of port used) with the following requirements:

Bit rate	155,520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-3 optical	
	or	
Bit rate	622,080 kbit/s	
Code/interface (SFP)	S-4.1, L-4.1, L-4.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-12 optical	

- 2 Insert the signal and test error-free data transit.

- 3 Connect power meter to the optical port output being tested.
 - Check that the optical power is within the range stated on the table in [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).

- 4 Disconnect the pattern generator from the OC-3 or OC-12 input port. Check no power on Power Meter.

- 5 Repeat the test on each optical unit.

END OF STEPS

CLI Procedure

By means of CT applications program the ALS-Enabling on the looped optical port (see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).

PTx power test

- 1 Preset the instrument to transmit a signal (based on the type of port used) with the following requirements:

Bit rate	155,520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-3 optical	
	or	
Bit rate	622,080 kbit/s	
Code/interface (SFP)	S-4.1, L-4.1, L-4.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-12 optical	

- 2 Insert the signal and test error-free data transit.

- 3 Connect power meter to the optical port output being tested.
 - Check that the optical power is within the range stated on the table in [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16).

- 4 Disconnect the pattern generator from the OC-3 or OC-12 input port. Check no power on power meter.

- 5 Repeat the test on each optical unit.

END OF STEPS

OC-36/SMT-64 ports test

Connect to OC-36 / OC-192 ports a lower bit rate ports, as shown in the following table. Performs the test using two different line ports (OC-36 / OC-192) per each tributary (OC-3) port.

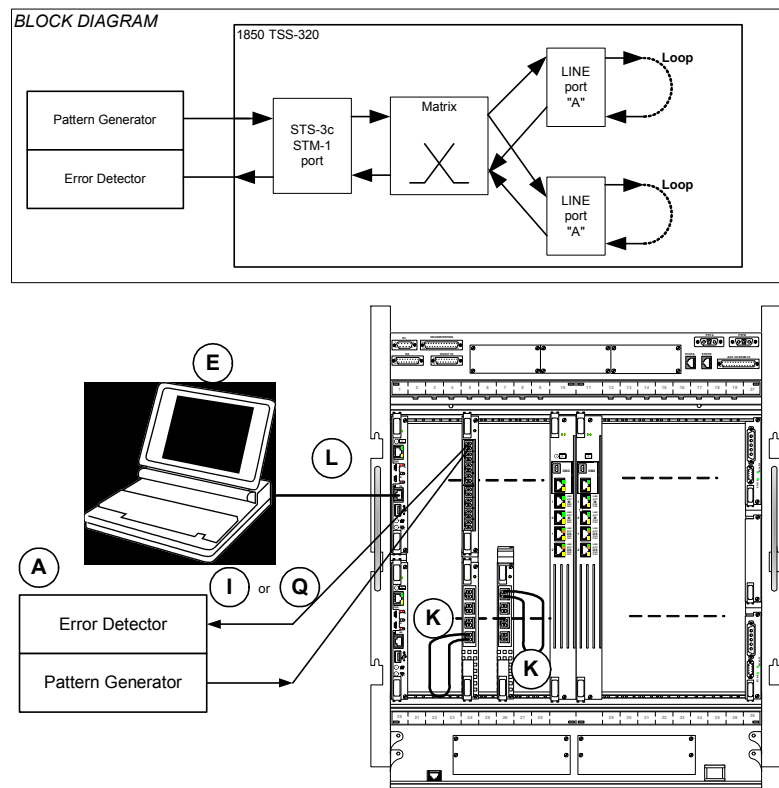
Type of protected cross-connections

OC-3 --> OC-48/OC-192

See [Chapter 4, “Bi-directional protected cross-connection: OC-3/OC-12 port and STM-n ports”](#) (p. 4-6).

Figure 3-4 OC-36/OC-192 ports test

Note: Insert x-dB fixed attenuator, according to the optical characteristics of instruments and boards.



Refer to [Table 3-1, “Instruments”](#) (p. 3-2) for the SFP/XFP list and [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for the related technical specifications.

CT Procedure

By means of CT applications program the ALS-Enabling on the looped optical port (see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).

By means of CT applications program the Laser-forced-ON on the optical port under test (see Chapter 4, “Standard procedures to turn the laser OFF then ON” (p. 4-14).

PTx power test

- 1 Connect power meter to the optical port output being tested.
 - Check LOS alarm on Error Detector.
 - Check that the optical power is within the range stated on the table reported in Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16).

- 2 Switch off the LASER as specified in Chapter 4, “Standard procedures to turn the laser OFF then ON” (p. 4-14).
 - Program ALS Enabling port [see Chapter 4, “Standard procedures to turn the laser OFF then ON” (p. 4-14)].
 - Check that the LASER power is null.

If the “ALS Automatic Restart” option is enabled, check if a power reset is attempted after approximately 0 seconds. This condition must last approximately 2 seconds.

If these conditions do not occur, replace the optical unit under test.
 - Check if the Tx optical power is null.
 - Repeat the test on each optical unit.
 - Preset the instrument to transmit a signal (based on the type of port used) with the following requirements:

Bit rate	155520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16).
Type	OC-3 optical	

END OF STEPS

TL1 Procedure

By means of CT applications program the ALS-enabling on the looped optical port (see Chapter 4, “Standard procedures to turn the laser OFF then ON” (p. 4-14).

By means of CT applications program the laser-forced-ON on the optical port under test (see Chapter 4, “Standard procedures to turn the laser OFF then ON” (p. 4-14).

PTx power test

- 1 Connect power meter to the optical port output being tested.
 - Check LOS alarm on error detector.
 - Check that the optical power is within the range stated on the table reported in [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16).

- 2 Switch off the LASER as specified in [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).
 - Program ALS Enabling port [see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14)].
 - Check that the LASER power is null.

If the “ALS Automatic Restart” option is enabled, check if a power reset is attempted after approximately 0 seconds. This condition must last approximately 2 seconds.

If these conditions do not occur, replace the optical unit under test.
 - Check if the Tx optical power is null.
 - Repeat the test on each optical unit.
 - Preset the instrument to transmit a signal (based on the type of port used) with the following requirements:

Bit rate	155520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-3 optical	

END OF STEPS

CLI Procedures

By means of CT applications program the ALS-Enabling on the looped optical port (see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).

By means of CT applications program the Laser-forced-ON on the optical port under test (see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).

PTx power test

- 1 Connect power meter to the optical port output being tested.
 - Check LOS alarm on Error Detector.
 - Check that the optical power is within the range stated on the table reported in [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16).

- 2 Switch off the LASER as specified in [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14).
 - Program ALS Enabling port [see [Chapter 4, “Standard procedures to turn the laser OFF then ON”](#) (p. 4-14)].
 - Check that the LASER power is null.

If the “ALS Automatic Restart” option is enabled, check if a power reset is attempted after approximately 0 seconds. This condition must last approximately 2 seconds.

If these conditions do not occur, replace the optical unit under test.
 - Check if the Tx optical power is null.
 - Repeat the test on each optical unit.
 - Preset the instrument to transmit a signal (based on the type of port used) with the following requirements:

Bit rate	155520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	[See Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details.]
Type	OC-3 optical	

END OF STEPS

Data ports tests

GbE Transport on VC4-xV

Check GbE packets transport by means of VC4-xV (virtual concatenation)

Purpose:

- Check if the Virtual concatenated ETS cross-connection works properly at maximum capacity of the Virtual concatenation group VC4-xV.
- Let through data to check if the ports are properly connected to ODF
- Alarms detection

Test instruments

Note: See [Table 3-1, “Instruments” \(p. 3-2\)](#).

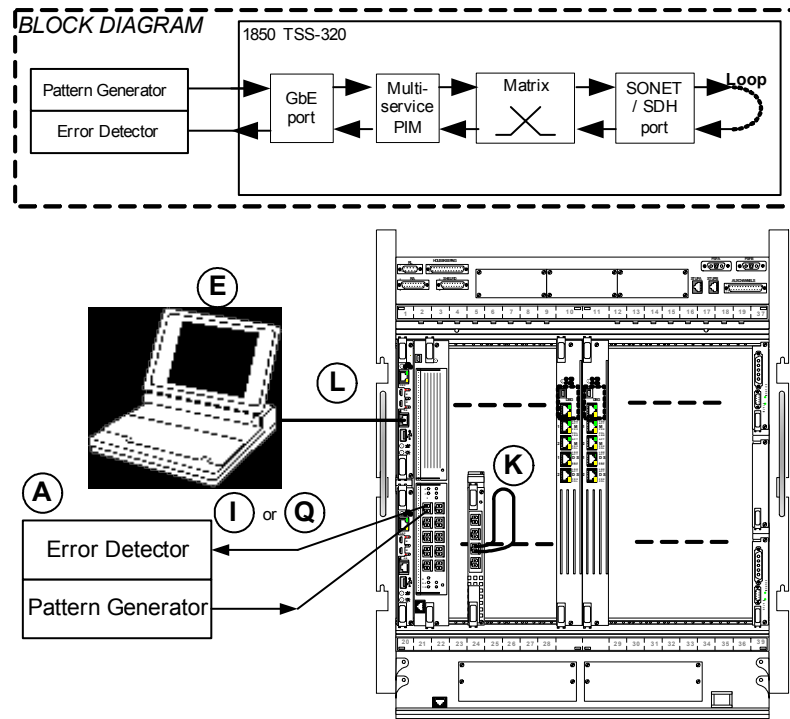
- Craft Terminal (E)
- Pattern Generator/Error Detector (A)
- x dB fixed attenuator

Accessories

Note: See [Table 3-2, “Accessories” \(p. 3-2\)](#).

- Optical loop (K)
- Single-mode or multi mode single-fiber splices (I) or (Q), according to the interface type
- Craft Terminal cable (L)

Figure 3-5 Test of GbE transport on VC3-xV



Refer to [Table 3-1, “Instruments”](#) (p. 3-2) for the SFP list and [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for the technical specifications.

CT Procedure

- 1 Cross-connect the GbE port (on PIM1GE) to the SONET port via the multiservice PIM (PIMMS) and the Matrix (MT320)
- 2 By CT create a number of active VC4-xV (x = 7) on PIMMS, as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).
- 3 Cross-connect the VC4-7V to an SONET port (OC-36), as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).

-
- 4 Cross-connect the VC4-7V to one port of the 10 x 1 GbE PIM (PIM1GE), as shown in Chapter 4, “Cross-connection between a local and a remote data port” (p. 4-12).
-

- 5 Start transmitting at 100% of the available bandwidth

Pattern generator / Error Detector setup

Port type	GbE
Auto-negotiation	ON
Frame length	1518 bytes
Bandwidth	100%

Optical interfaces (SFP) types (refer to Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) for details)

GbE SFP interface types (on PIM1GE)	B&W = 1000 Base SX / 1000 Base LX / 1000 Base ZX
	CWDM = APD (C8L1-1D2) for long haul, PIN (C8S1-1D2) for short haul

- 6 Check that all the frames received are the same of those transmitted and no alarms are detected by the instrument for 5 minutes.
-
- 7 Alarms detection — Perform the cross-connection described above.
- From EML-USM -> Select “Equipment” -> “Data board Navigation,” then insert login and password. The Data CT starts.
 - In the “1850TSS User Service Management..” window, double-click on the board (i.e., r1sr1/board#2). The local and remote Data ports are displayed.
 - Select a local port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the port again. From the pop-up menu (click on the right button of the mouse), select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the LOS alarm (red square).
-

-
- Connect the Pattern Generator/Error Detector and check that the LOS alarm disappears (green square) and that the on-board led related to the GbE port under test is green.
 - Open the SONET loop to check the presence of the TSF alarm on the remote port, as described in the following.
 - Select a remote port. From the pop-up menu, select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the remote port again, open the pop-up menu and select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the TSF alarm (red square).
 - Connect the instrument and check that the alarms (LOS and TSF) disappear.
 - The alarm signalling is also displayed in the CT main window, by a red circle on the left of the port.

END OF STEPS

TL1 Procedure

- 1 Cross-connect the GbE port (on PIM1GE) to the SONET port via the multiservice PIM (PIMMS) and the Matrix (MT320)

- 2 By CT create a number of active VC4-xV ($x = 7$) on PIMMS, as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).

- 3 Cross-connect the VC4-7V to an SONET port (OC-36), as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).

- 4 Cross-connect the VC4-7V to one port of the 10 x 1 GbE PIM (PIM1GE), as shown in [Chapter 4, “Cross-connection between a local and a remote data port”](#) (p. 4-12).

5 Start transmitting at 100% of the available bandwidth

Pattern generator / Error Detector setup

Port type	GbE
Auto-negotiation	ON
Frame length	1518 bytes
Bandwidth	100%

Optical interfaces (SFP) types (refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16). for details)

GbE SFP interface types (on PIM1GE)	B&W = 1000 Base SX / 1000 Base LX / 1000 Base ZX
	CWDM = APD (C8L1-1D2) for long haul, PIN (C8S1-1D2) for short haul

6 Check that all the frames received are the same of those transmitted and no alarms are detected by the instrument for 5 minutes.

7 Alarms detection — Perform the cross-connection above described.

- From EML-USM -> Select “Equipment” -> “Data board Navigation,” then insert login and password. The Data CT starts.
 - In the “1850TSS User Service Management..” window, double click on the board (i.e., r1sr1/board#2). The local and remote Data ports are displayed.
 - Select a local port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the port again. From the pop-up menu (click on the right button of the mouse), select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the LOS alarm (red square).
- Connect the Pattern Generator/Error Detector and check that the LOS alarm disappears (green square) and that the on-board led related to the GbE port under test is green.

- Open the SONET loop to check the presence of the TSF alarm on the remote port, as described in the following.
 - Select a remote port. From the pop-up menu, select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the remote port again, open the pop-up menu and select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the TSF alarm (red square).
- Connect the instrument and check that the alarms (LOS and TSF) disappear.
 - The alarm signalling is also displayed in the CT main window, by a red circle on the left of the port.

END OF STEPS

CLI Procedure

- 1 Cross-connect the GbE port (on PIM1GE) to the SONET port via the multiservice PIM (PIMMS) and the Matrix (MT320)
- 2 By CT create a number of active VC4-xV (x = 7) on PIMMS, as shown in [Chapter 4](#), “Unprotected, bi-directional cross-connect: concatenated group (VC4-7V) and STM-N port” (p. 4-9).
- 3 Cross-connect the VC4-7V to an SONET port (OC-36), as shown in [Chapter 4](#), “Unprotected, bi-directional cross-connect: concatenated group (VC4-7V) and STM-N port” (p. 4-9).
- 4 Cross-connect the VC4-7V to one port of the 10 x 1 GbE PIM (PIM1GE), as shown in [Chapter 4](#), “Cross-connection between a local and a remote data port” (p. 4-12).
- 5 Start transmitting at 100% of the available bandwidth

Pattern generator / Error Detector setup

Port type	GbE
Auto-negotiation	ON

Frame length	1518 bytes
Bandwidth	100%

Optical interfaces (SFP) types (refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for details)

GbE SFP interface types (on PIM1GE)	B&W = 1000 Base SX / 1000 Base LX / 1000 Base ZX CWDM = APD (C8L1-1D2) for long haul, PIN (C8S1-1D2) for short haul
-------------------------------------	---

- 6 Check that all the frames received are the same of those transmitted and no alarms are detected by the instrument for 5 minutes.
-
- 7 Alarms detection — Perform the cross-connection above described.
 - From EML-USM -> Select “Equipment” -> “Data board Navigation.” then insert login and password. The Data CT starts.
 - In the “1850TSS User Service Management..” window, double click on the board (i.e., r1sr1/board#2). The local and remote Data ports are displayed.
 - Select a local port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the port again. From the pop-up menu (click on the right button of the mouse), select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the LOS alarm (red square).
 - Connect the Pattern Generator/Error Detector and check that the LOS alarm disappears (green square) and that the on-board led related to the GbE port under test is green.
 - Open the SONET loop to check the presence of the TSF alarm on the remote port, as described in the following.
 - Select a remote port. From the pop-up menu, select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”

-
- Select the remote port again, open the pop-up menu and select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the TSF alarm (red square).
 - Connect the instrument and check that the alarms (LOS and TSF) disappear.
 - The alarm signalling is also displayed in the CT main window, by a red circle on the left of the port.

10 GbE Transport on VC4-xV

Check 10 GbE packets transport by means of VC4-xV (virtual concatenation).

Purpose

- Check if the Virtual concatenated ETS cross-connection works properly with limited capacity (7 VC4) of the Virtual concatenation group VC4-xV.
- Let through data to check if the ports are properly connected to ODF
- Alarms detection

Test instruments

Note: See [Table 3-1, “Instruments”](#) (p. 3-2)

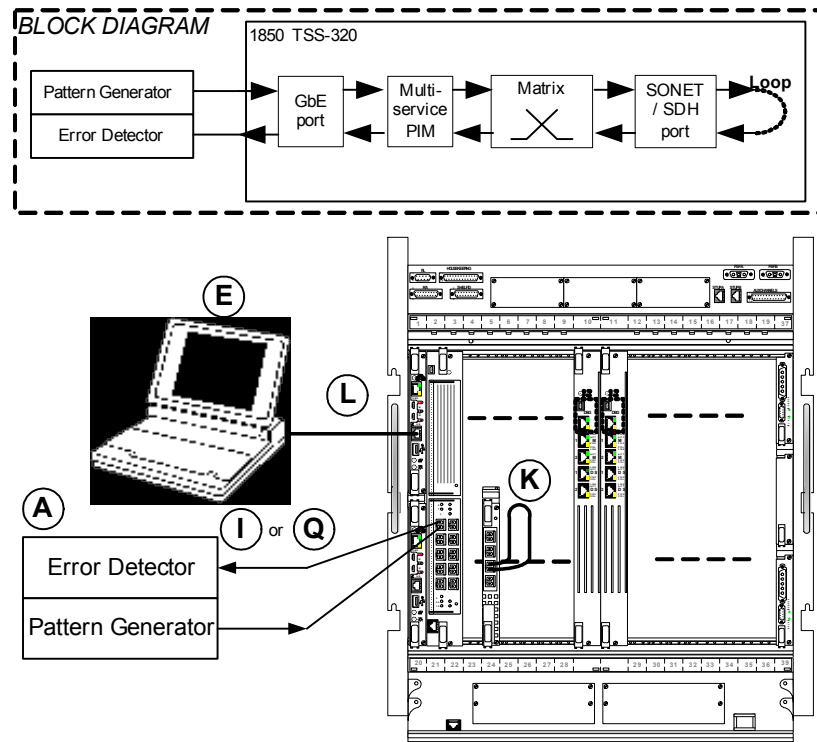
- Craft Terminal (E)
- Pattern Generator/Error Detector (A)
- x dB fixed attenuator

Accessories

Note: See [Table 3-2, “Accessories”](#) (p. 3-2)

- Optical loop (K)
- Single-mode or multi mode single-fiber splices (I) or (Q), according to the interface type
- Craft Terminal cable (L)

Figure 3-6 Test of 10 GbE transport on VC4-xV



Insert x dB fixed attenuator value on the SDH STM -64 port, according to the optical characteristics of instruments and boards

Refer to [Table 3-1, “Instruments”](#) (p. 3-2) for the XFP list and [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for the technical specifications.

CT Procedure

- 8 Cross-connect the 10 GbE port (on PIM10GE) to the SONET OC-192 port via the multiservice PIM (PIMMS) and the Matrix (MT320).
- 9 By CT create a number of active VC4-xV (x = 1 to 64, 7 VC4 are used in current example, VC4-7V) on PIMMS, as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).
- 10 Cross-connect the VC4-7V to an SONET port (OC-192), as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).

-
- 11 Cross-connect the VC4-7V to the 10 GbE PIM (PIM10GE), as shown in [Chapter 4](#), “[Cross-connection between a local and a remote data port](#)” (p. 4-12).
-

- 12 Start transmitting at 10% of the available bandwidth

Pattern generator / Error Detector setup

Port type	GbE
Auto-negotiation	OFF
Frame length	1574 bytes
Bandwidth	10%

Optical interfaces (XFP) types (refer to [Chapter 4](#), “[SFP and XFP modules optical characteristics](#)” (p. 4-16) for details)

10GbE XFP interface types (on PIM10GE) B&W = 10Gbase-E / 10Gbase-S / 10Gbase-L

DWDM = APD for long haul

- 13 Check that all the frames received are the same of those transmitted and no alarms are detected by the instrument for 5 minutes.
-

- 14 Alarms detection — Perform the cross-connection described above.

- From EML-USM, select “Equipment” -> “Data board Navigation,” then insert login and password. The Data CT starts.
 - In the “1850TSS User Service Management..” window, double-click on the board (i.e., r1sr1/board#2). The local and remote data ports are displayed.
 - Select a local port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the port again. From the pop-up menu (click on the right button of the mouse), select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the LOS alarm (red square).
-

-
- Connect the Pattern Generator/Error Detector and check that the LOS alarm disappears (green square) and that the on-board led related to the 10 GbE port under test is green.
 - Open the SONET loop to check the presence of the TSF alarm on the remote port, as described in the following:
 - Select a remote port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the remote port again, open the pop-up menu and select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the TSF alarm (red square).
 - Connect the instrument and check that the alarms (LOS and TSF) disappear.
 - The alarm signalling is also displayed in the CT main window, by a red circle on the left of the port

END OF STEPS

TL1 Procedure

- 1 Cross-connect the 10 GbE port (on PIM10GE) to the SONET OC-192 port via the multiservice PIM (PIMMS) and the Matrix (MT320)

- 2 By CT create a number of active VC4-xV (x = 1 to 64, 7 VC4 are used in current example, VC4-7V) on PIMMS, as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).

- 3 Cross-connect the VC4-7V to an SONET port (OC-192), as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).

- 4 Cross-connect the VC4-7V to the 10 GbE PIM (PIM10GE), as shown in [Chapter 4, “Cross-connection between a local and a remote data port”](#) (p. 4-12).

5 Start transmitting at 10% of the available bandwidth

Pattern generator / Error Detector setup

Port type	GbE
Auto-negotiation	OFF
Frame length	1574 bytes
Bandwidth	10%

Optical interfaces (XFP) types (refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for details)

10GbE XFP interface types (on PIM10GE) B&W = 10Gbase-E / 10Gbase-S / 10Gbase-L

DWDM = APD for long haul

6 Check that all the frames received are the same of those transmitted and no alarms are detected by the instrument for 5 minutes.

7 Alarms detection — Perform the cross-connection described above.

- From EML-USM, select “Equipment” -> “Data board Navigation,” then insert login and password. The Data CT starts.
 - In the “1850TSS User Service Management..” window, double click on the board (i.e., r1sr1/board#2). The local and remote Data ports are displayed.
 - Select a local port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the port again. From the pop-up menu (click on the right button of the mouse), select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the LOS alarm (red square).
- Connect the Pattern Generator/Error Detector and check that the LOS alarm disappears (green square) and that the on-board led related to the 10 GbE port under test is green.

- Open the SONET loop to check the presence of the TSF alarm on the remote port, as described in the following.
 - Select a remote port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select the “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the remote port again, open the pop-up menu and select “Ethernet Port Properties.” Open the “Alarms” tag and check the presence of the TSF alarm (red square).
- Connect the instrument and check that the alarms (LOS and TSF) disappear.
 - The alarm signalling is also displayed in the CT main window, by a red circle on the left of the port

END OF STEPS

CLI Procedure

- 1 Cross-connect the 10 GbE port (on PIM10GE) to the SONET OC-192 port via the multiservice PIM (PIMMS) and the Matrix (MT320)
- 2 By CT create a number of active VC4-xV ($x = 1$ to 64, 7 VC4 are used in current example, VC4-7V) on PIMMS, as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).
- 3 Cross-connect the VC4-7V to an SONET port (OC-192), as shown in [Chapter 4, “Unprotected, bi-directional cross-connect: concatenated group \(VC4-7V\) and STM-N port”](#) (p. 4-9).
- 4 Cross-connect the VC4-7V to the 10 GbE PIM (PIM10GE), as shown in [Chapter 4, “Cross-connection between a local and a remote data port”](#) (p. 4-12).
- 5 Start transmitting at 10% of the available bandwidth

Pattern generator / Error Detector setup

Port type	GbE
-----------	-----

Auto-negotiation	OFF
Frame length	1574 bytes
Bandwidth	10%

Optical interfaces (XFP) types (refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for details)

10 GbE XFP interface types (on PIM10GE)	B&W = 10Gbase-E / 10Gbase-S / 10Gbase-L DWDM = APD for long haul
---	---

- 6** Check that all the frames received are the same of those transmitted and no alarms are detected by the instrument for 5 minutes.
-

- 7** Alarms detection — Perform the cross-connection described above:

- From EML-USM, select “Equipment” -> “Data board Navigation,” then insert login and password. The Data CT starts.
 - In the “1850TSS User Service Management..” window, double-click on the board (i.e., r1sr1/board#2). The local and remote data ports are displayed.
 - Select a local port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In the “Ethernet port Configuration” window, select the “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - Select the port again. From the pop-up menu (click on the right button of the mouse), select “Ethernet Port Properties.” Open the “Alarms” tag, and check the presence of the LOS alarm (red square).
- Connect the pattern generator/error detector and check that the LOS alarm disappears (green square) and that the on-board LED related to the 10 GbE port under test is green.
- Open the SONET loop to check the presence of the TSF alarm on the remote port, as described in the following.
 - Select a remote port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”
 - In the “Ethernet port Configuration” window, select the “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”

-
- Select the remote port again, open the pop-up menu and select “Ethernet Port Properties. Open the “Alarms” tag and check the presence of the TSF alarm (red square).
 - Connect the instrument and check that the alarms (LOS and TSF) disappear.
 - The alarm signaling is also displayed in the CT main window, by a red circle on the left of the port.

END OF STEPS

Q-Bridge VLAN switching test, tagged frames

Purpose

Check that the Q-Bridge is able to transport tagged traffic among the ports set.

Test instruments

Note: See [Table 3-1, “Instruments” \(p. 3-2\)](#).

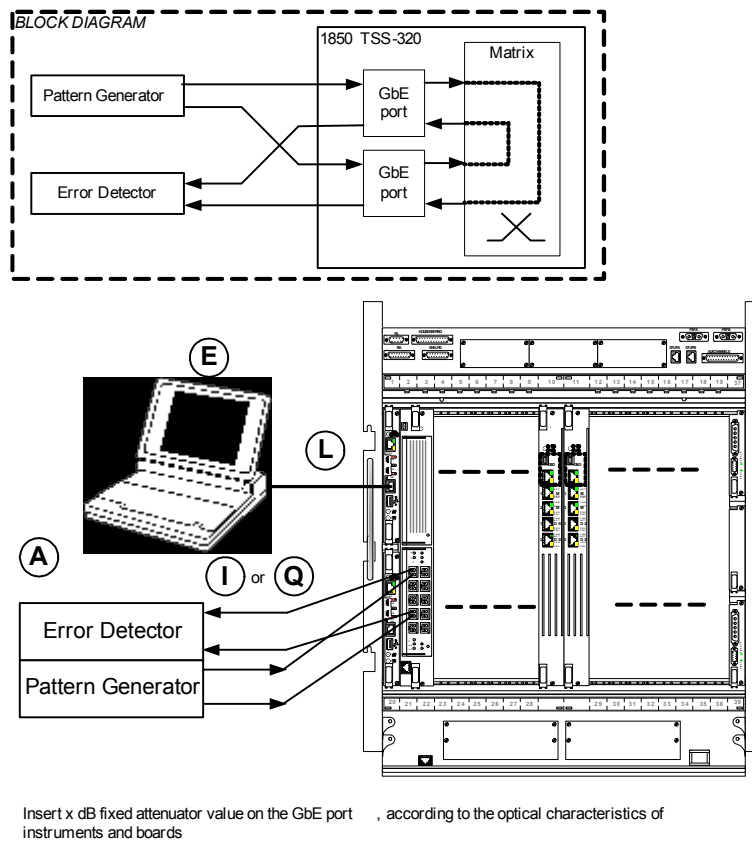
- Craft Terminal (E)
- Pattern Generator/Error Detector (A)
- x dB fixed attenuator

Accessories:

Note: See [Table 3-2, “Accessories” \(p. 3-2\)](#).

- Single-mode or multi-mode single-fiber splices (I) or (Q), according to the interface type
- Craft Terminal cable (L)

Figure 3-7 Q-Bridge VLAN switching test, untagged frames



Refer to [Table 3-1, “Instruments”](#) (p. 3-2) for the SFP modules list and [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for the related technical specifications.

CT Procedure

In the Equipment view, select the PP20G board.

From EML-USM, select “Equipment” -> “Data board Navigation,” then insert login and password. The data CT starts.

- 1 Select the Data Ethernet local port; from the pop-up menu (click on the right button of the mouse) select “Substitute Client Layer” and then “ETB Layer.” In the following window, click “Yes” to confirm.
- 2 Select the other Data Ethernet local port; from the pop-up menu (click on the right button of the mouse) select “Substitute Client Layer” and then “ETB Layer.” In the following window, click “Yes” to confirm.

-
- 3 Select one of the two ETB Ethernet local ports. From the pop-up menu, select “Configure Ethernet port.”
 - In “Ethernet port Configuration” window, select “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - 4 Select the other ETB Ethernet local port. From the pop-up menu, select “Configure Ethernet port.”
 - In the “Ethernet port Configuration” window, select the “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”
 - In the “1850 TSS Service Management..” window, select the node on top of the list, open the pop-up menu, and select “VLAN Registration.”
 - In the “VLAN Registration List” window, insert the value of the VLAN is being created (i.e., 10) in the “New VLAN” field and click on “Create.”
 - In the “VLAN Registration Management” window, select the local port in “Available Network Ports” and click on the >> button to get the VLAN identifier. The selected board will be displayed in the “Tagged Ports” field. Perform the same procedure on the other ETB Ethernet local port.
 - 5 Click on “OK” and “Apply,” and then close the “VLAN Registration List” window.

6 Connect the pattern generator/error detector and check that no errors are read

Pattern generator / Error Detector setup

Port type	GbE
Auto-negotiation	ON
Frame length	1518 bytes
Bandwidth	100%
VLAN TAG	Value set via CT, i.e. 10

Optical interfaces (SFP) types (refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16) for details)

GbE SFP interface types (on PIM1GE)	B&W = 1000 Base SX / 1000 Base LX / 1000 Base ZX
	CWDM = APD (C8L1-1D2) for long haul, PIN (C8S1-1D2) for short haul

END OF STEPS

DWDM ports test

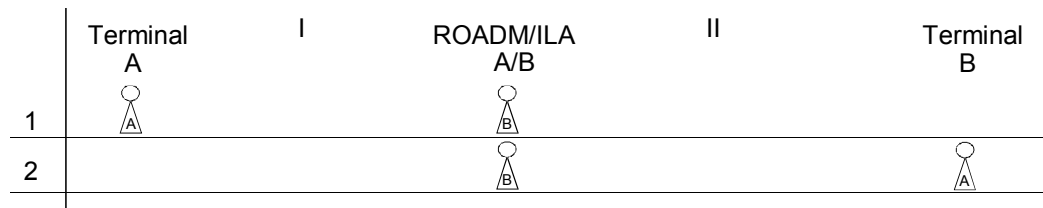
Before starting the DWDM commissioning, be sure that the optical fibers are properly cleaned.

All the single spans attenuation connecting the various link nodes, including the acceptable margin, are given in the Design Project document (released by a Project Manager) and in the Link Description Table (LDT).

The procedure is divided in two parts:

- Local test
- Link test

The node local test must be performed first. The link tests can be carried out after local tests on all nodes.

Figure 3-8 Commissioning example

For the local test optimization the two operators have to move along the link nodes route, as in the following example:

- They must be able to perform the local tests on all nodes;
- They must be able to perform the single span attenuation respecting the design project document;
- They must be able to perform the link tests.

Looking at the example link shown in [Figure 3-8](#), the commissioning steps examples are described in the following:

- 1 The operator A performs the local tests on the Terminal-A.
The operator B performs the local tests on ROADM/ILA-A/B.
The operators jointly perform the span I attenuation test.
- 2 The operators perform the same operations carried out in STEP 1, on Terminal-B, and SPAN II.

END OF STEPS

At the end of link tests it is necessary to come back on all nodes for all the link test presettings removal, if performed, and restore all the node settings according to initial configuration.

The available DWDM circuits packs are listed in [Table 3-6, “SONET/SONET, data, and WDM cards connection points”](#) (p. 3-6).

DWDM Commissioning Overview

The kinds of nodes that can be present in a link are the following:

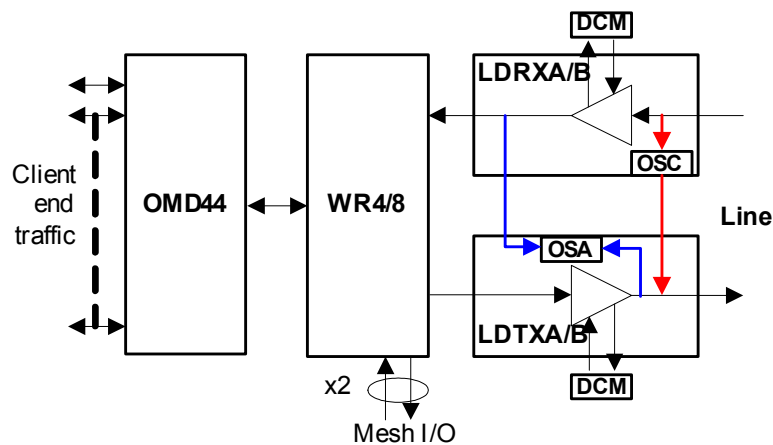
- ROADM
- ILA
- UILA

In 1 Degree ROADM configuration, the 1850 TSS-320 connects to one optical fiber DWDM line.

In the 1 Degree ROADM configuration, the equipment is placed at both ends of point-to-point links. The schematic representation of the 1 Degree ROADM configuration is reported in Figure 3-9. It consists of the following:

- Line Driver (LDRXA or LDRXB and LDTXA or LDTXB), with the OSC
- Wavelength router (WR4, Possibly WR8 if future in-service upgrades beyond 4 degrees is planned)
- Optical Mux/Demux (OMD44) up to 44-channel

Figure 3-9 Line terminal configuration in DWDM systems



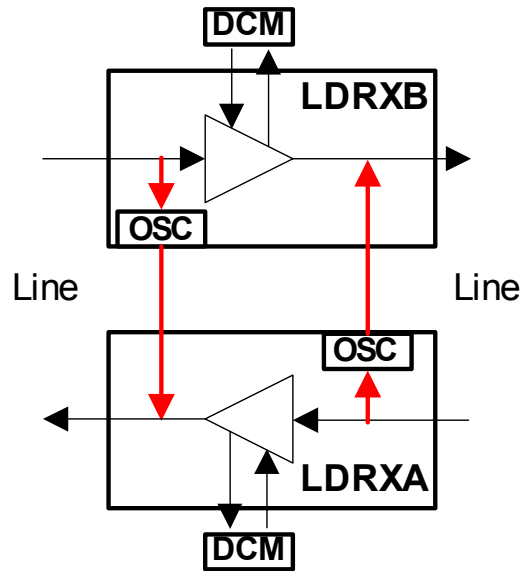
In an ILA (in-line amplifier) configuration, the 1850 TSS-320 connects to an optical fibre DWDM line in each direction:

- Line Drivers (LDRXA and LDRXB), with the OSC

The ILA consists of two optical double-stage ILAs providing bi-directional wide band amplification in order to boost the optical power of the aggregate DWDM signal avoiding any optical to electrical conversion. The ILA can utilize both LDRXA and LDRXB amplifiers. The placement of these Amplifiers will be determined in the LDT.

In Figure 3-10 on p. 3-41, a schematic block diagram is representing the ILA configuration.

Figure 3-10 ILA configuration in DWDM systems

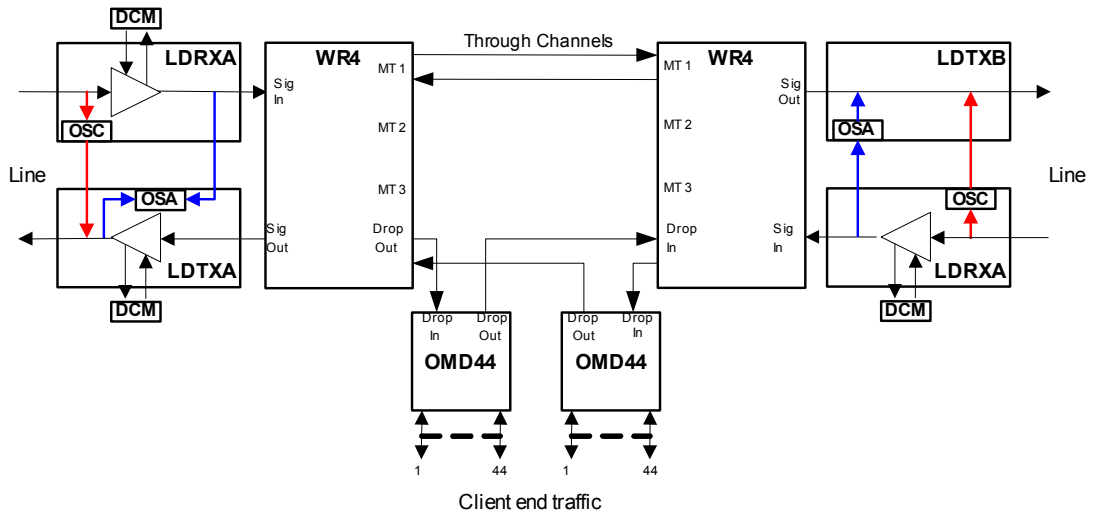


The **ROADM** is a NE configuration that brings the capabilities to add and drop one or more wavelengths to/from the aggregate signal in more than one direction.

The schematic representation of the ROADM configuration is shown in [Figure 3-11 on p. 3-42](#). The ROADM consists of the following:

- Line drivers (LDRX_ and LDTX_), with the OSC for each side of the line
- Wavelength router (WR4 or WR8) - one for each direction.
- Optical Mux/Demux (OMD44) up to 44-channels - one for each direction.

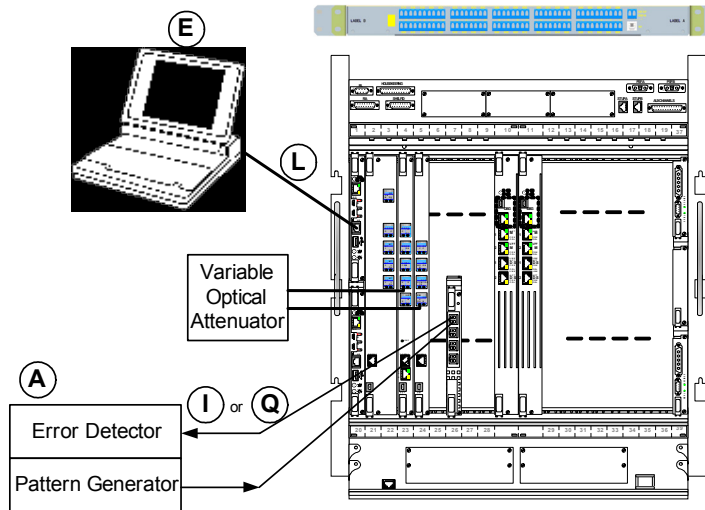
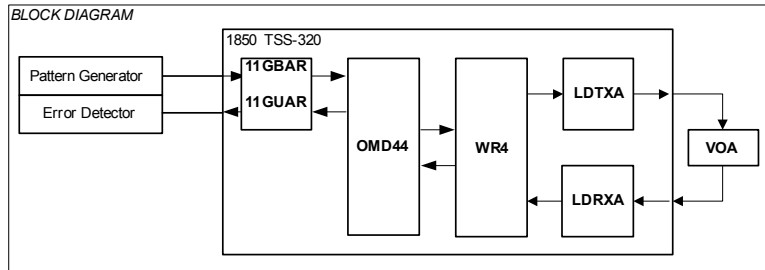
Figure 3-11 Optical add/drop multiplexer (ROADM degree-2) in DWDM system



DWDM local tests

Local test in line terminal configuration in DWDM systems

Figure 3-12 Local test in line terminal configuration in DWDM systems



Note: All the intra-shelf connections aren't shown.

Note: B&W ports are provided by PIM10GE (on PP20G), 4P2G5SO, 8PSO, 1P10GSO, units.

Note: DWDM ports are provided by 11GUAR and 11GBAR units [also refer to [“DWDM Commissioning Overview” \(p. 3-39\)](#)].

Note: Insert an X-dB optical attenuator, according to the client/B&W interface used.

CT Procedure

- 1 Perform a bidirectional unprotected cross-connection between the client and DWDM port(s) according to the units equipped.

- 2 Before connecting the VOA, disconnect the Rx input fiber of the DWDM board(s) - (11GUAR, 11GBAR).

- 3 Connect the VOA between the OMD MUX output and OMD DEMUX input; the VOA value must be equal to the total span loss budget.

- 4 Check the output power of each DWDM port by means of the Power Meter (refer to [Chapter 4, “SFP and XFP modules optical characteristics” \(p. 4-16\)](#) for power values). Then connect each fiber to the related XFP Transmitter, and disconnect the other end of the same fiber from each MUX input.

- 5 Check that the insertion loss of each fiber is 0.1 dB, then reconnect the fibers.

- 6 Disconnect the MUX output fiber and check the output power by means of the power meter.

- 7 Verify the insertion loss of each channel by connecting the DWDM MUX tributary input channels one by one, and checking the MUX output power with the power meter each time.

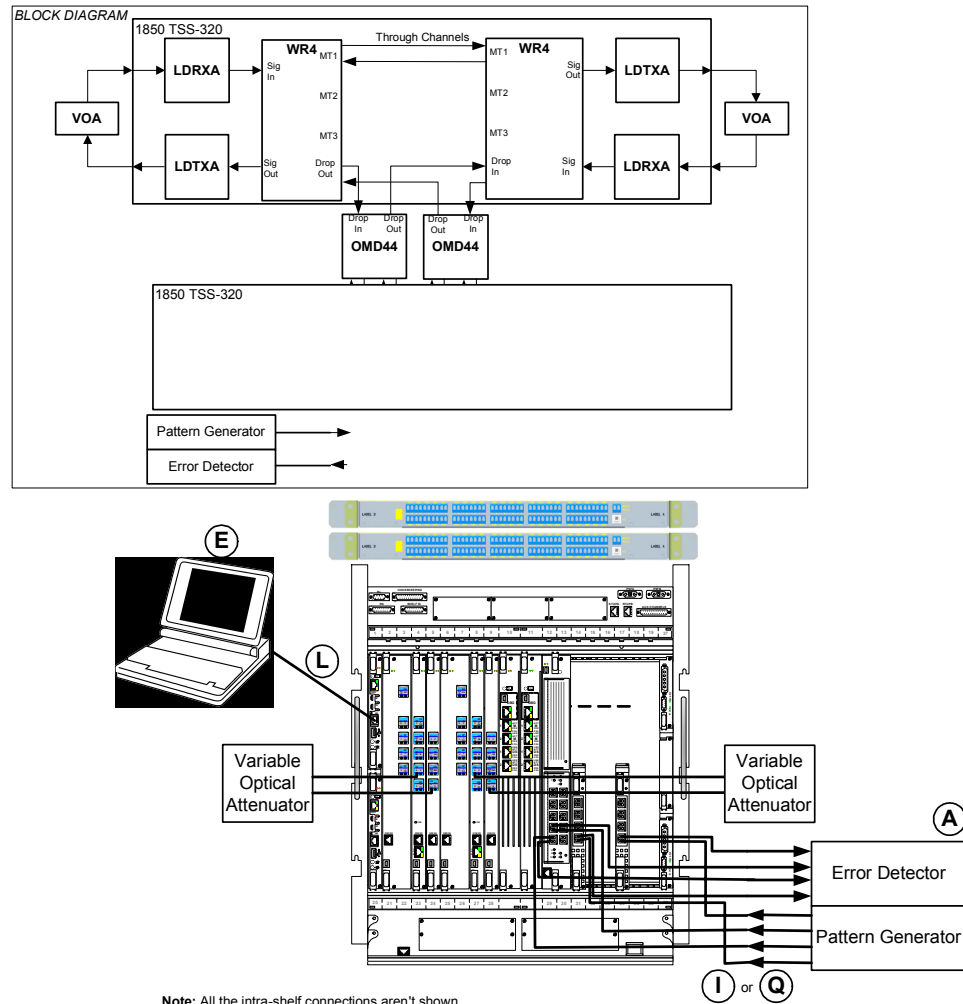
- 8 Connect the MUX output (multiplexed signal) to the VOA input and the VOA output to the DEMUX input (optical loop).

-
- 9 Verify the insertion loss of each DEMUX channel, connecting the Power Meter to each DEMUX output one-by-one, and checking the optical power each time.
-
- 10 Connect each fiber to the related DEMUX output, then disconnect the other end from each DWDM XFP, Rx side. Check the following:
- The insertion loss of each fiber is 0.1 dB.
 - For each port, the received power is in the supported optical range (refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16)).
-
- 11 Connect each fiber to the related port/XFP, Rx side,
-
- 12 Test the BER at a given bit rate, checking no errors for 5 minutes.

END OF STEPS

Local tests in OADM configuration in DWDM systems

Figure 3-13 Local test in OADM configuration in DWDM systems



Note: All the intra-shelf connections aren't shown.

Note: B&W ports are provided by PIM10GE (on PP20G), 4P2G5SO, 8PSO, 1P10GSO units.

Note: DWDM ports are provided by PIM10GE (on PP20G) and 1P10GSO units [also refer to “DWDM Commissioning Overview” (p. 3-39)].

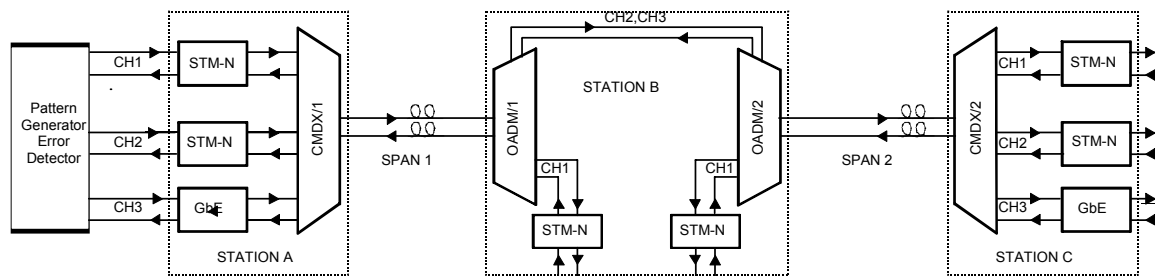
Note: Insert an X-dB optical attenuator, according to the client/B&W interface used.

Perform the procedure previously described in “Local tests in OADM configuration in DWDM systems” (p. 3-45) for both EAST and WEST sides of the OADM configuration. Only the added and dropped channels have to be checked.

If present, the pass-through channels will be tested in link test (End-to-end), described in “Link tests in DWDM systems” (p. 3-46).

Link tests in DWDM systems

Figure 3-14 Link test in DWDM system



a. Rx input power level check per each channel

Before connecting the line fiber between OMDX-A and OMDX-B, disconnect the Rx fiber per each channel (between OMDX-A and each DWDM XFP, plugged on each tributary unit). Check the Rx input power and, if necessary, insert a fixed optical attenuator, whose value depends on the interface type; refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16). for interfaces/XFP optical characteristics

b. Span 1 check

If the span loss is other than the one declared by the customer, please refer to the project manager.

Station B PRX check: disconnect the fiber from the OMDX-B Line signal input, connect it to the Power Meter and verify the compliance with the LDT. Reconnect the fiber

Station A PRX check: disconnect the fiber from the OMDX-A Line signal input, connect it to the Power Meter and verify the compliance with the LDT. Reconnect the fiber

c. Span 2 check

Station B PRX check: disconnect the fiber from the OMDX-C Line signal input, connect it to the Power Meter and verify the compliance with the LDT. Reconnect the fiber

Station C PRX check: disconnect the fiber from the OMDX-D Line signal input, connect it to the Power Meter and verify the compliance with the LDT. Reconnect the fi

d. End-to-end stability test

On ODF, perform a physical loop (station C, user side) on all the channels with the same bit rate. Referring to the example of [Figure 3-15](#), and assuming CH1 and CH2 are OC-192 and CH3 is 10 GbE, on ODF, perform a physical loop on CH1 and CH2 client side in Station C.

In Station B (OADM), connect CH1 in physical pass-through.

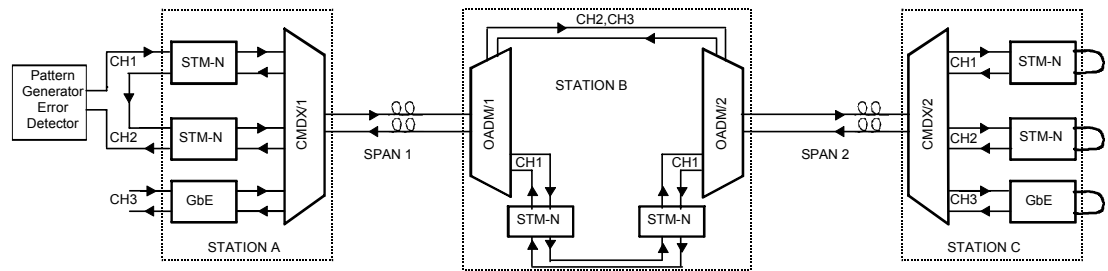
On ODF, connect the pattern generator/error detector output to the CH1 client input in station A, and check that the CH1 client output power (station A) is OK (refer to [Chapter 4, “SFP and XFP modules optical characteristics”](#) (p. 4-16).).

On ODF, perform a daisy chain in station A, connecting CH1 client output to CH2 client input.

Check that the CH2 client output power (Rx value on the instrument) is OK.

Connect the CH2 client output to the pattern generator/error detector input and start the stability test: at a given bit rate, check no errors.

Figure 3-15 End-to-end stability test example in DWDM system



e. After having checked all the channels, by CT check that all the ports under stability test don't have any alarm.

SNCP protection check (line ports)

Purpose

- Verify the SNCP protection efficiency

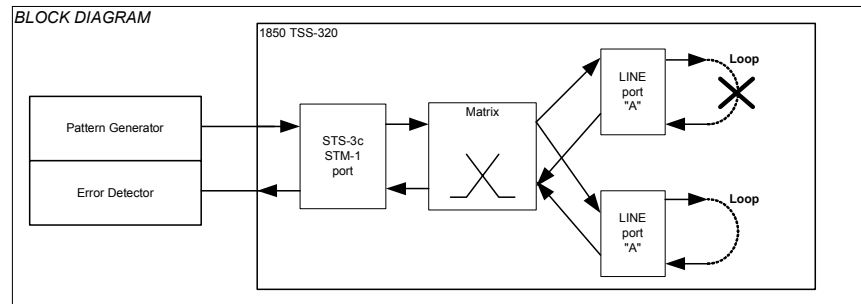
Test instruments [see [Table 3-1, “Instruments”](#) (p. 3-2)]

- Craft terminal (E)
- Pattern generator/error detector (A)

Accessories [see Table 3-2, “Accessories” (p. 3-2)]

- Optical loop (K)
- Single-mode single-fiber splices (I) or (Q), according to the interface type
- Craft terminal cable (L)

Test Bench:



For the 1850 TSS shelf configuration, refer to [Figure 3-5 on p. 3-22](#).

Note: Only one type of cross-connection is reported in the figure. The figure can change depending on the type of tributary port and on the line port selected.

Procedure

Cross-connect the tributary port and the line port as reported on the table.

Performs the test using two different line (OC-36 / OC-192) ports per each tributary (OC-3) port.

Type of protected cross-connections	See Section
OC-3 / OC-36 / OC-192	4.3 on page 82

Bit rate	155520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	(see Chapter 4, “SFP and XFP modules optical characteristics” (p. 4-16) .)
Type	OC-3 optical	

- a. Check that no errors are read on the error detector.
- b. Open one of the Optical loop present on the ODF.
- c. Check after a transient condition that no errors are read by the error detector.

Protection test Matrix/CRU EPS

Purpose:

- Check that EPS is working properly
- Check that following switching no data has been lost apart from an initial transient state.

Test instruments [see Table 3-1, "Instruments" (p. 3-2)]

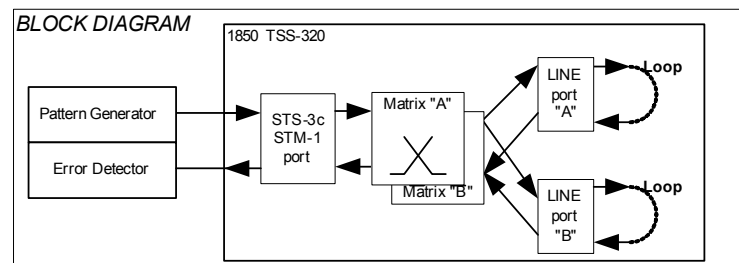
- Craft terminal (E)
- Pattern generator/error detector (A)

Accessories [see Table 3-2, "Accessories" (p. 3-2)]

- Optical loop (K)
- Single-mode single-fiber splices (I) or (Q), according to the interface type
- Craft Terminal cable (L)

Test Bench:

Figure 3-16 Matrix/CRU EPS protection check



Note: The figure can change depending on the type of tributary port and on the line port selected.

For the 1850 TSS-320 shelf configuration, refer to [Figure 3-5 on p. 3-22](#).

Procedure

Perform the same cross connection used for the previous SNCP protection test.

- Preset the instrument to transmit a signal with the following requirements:

Bit rate	155520 kbit/s	
Code/interface (SFP)	S-1.1, L-1.1, L-1.2	See Chapter 4, "SFP and XFP modules optical characteristics" (p. 4-16) .
Type	OC-3 optical	

- Check that no errors are read on the Error Detector.

- c. Remove the MASTER matrix (in slot 10) and insert it again; after a brief transient, check that no errors are read.

Synchronism priority and Holdover (if present)

Purpose

- Verify the efficiency of the synchronism (i.e., for the synchronisms that might be preset in the configuration) priority list and the Holdover

Test instruments [see Table 3-1, “Instruments” (p. 3-2)]

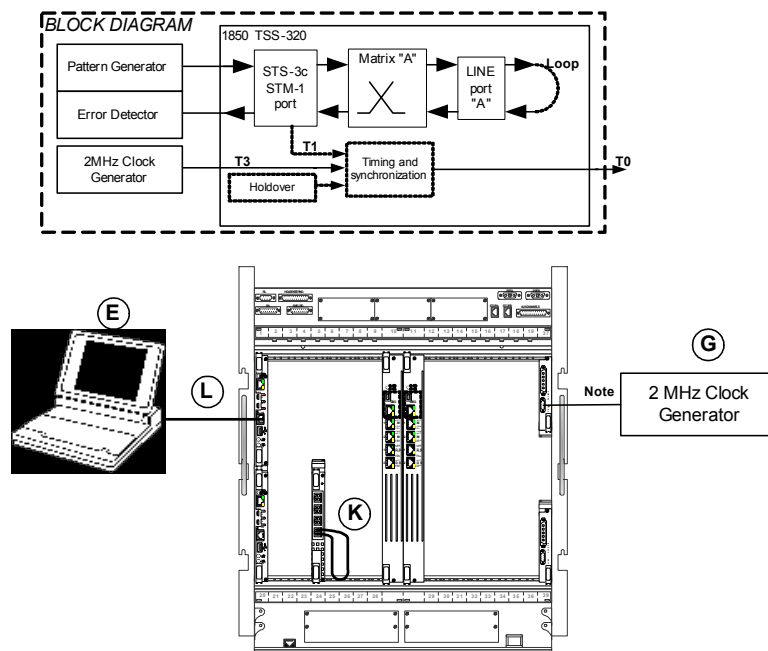
- Craft Terminal (E)
- Pattern Generator/Error Detector ((A)
- 2-MHz station distribution signal (if present)

Accessories [see Table 3-2, “Accessories” (p. 3-2)]

- Cable for synchronism P)
- Craft Terminal cable (L)
- Single-mode single-fiber splices (I) or (Q) according to the SFP/XFP type

Test Bench

Figure 3-17 Synchronism priority and holdover



Note: Connect the instrument to pins 5 (RXP) and 9 (RXN) if SUB-D 9-pole connector is used

Note: Connect the generator to wire-wrap terminals RXP and RXN if timing wire-wrap adapter is used

Procedure

Note: EML-USM — Select the “Synchronization” option from the “Views” menu.

- 1 Select a reference clock for each timing reference block (T0) in the following way:

- 2 Select the timing reference block

- 3 Select “Synchronization” -> “Timing Source Configuration.” A new window is opened.

- 4 Click on “Choose.” A new window is opened allowing the T.P. search procedure.

- 5 Select the physical SPI/PPI board termination point value (rack, subrack, board, port).
The example given in the following assumes the presence of two reference clocks:
 - Clock derived from a STM-n port (example r1srs134/port#1-OpS).
 - External clock (1.5 MHz/2 MHzT3#A or B) from the power supply (PSF320) board (A or B).

- 6 Select the first of the above listed reference clocks and give Priority “1” (“Synchronization” -> “Timing Source Configuration” -> “Priority” and click on “OK”.)

- 7 Repeat the same sequence for the other timing reference block (T0) using the reference clock [2] and giving priority “2.”

- 8 Remove the STM-n optical cable.

- 9 Check on the craft terminal that the signal T0 is extracted from the timing reference Block with priority (2) (solid line is visible).l

-
- 10 Check on the craft terminal that the signal T0 is derived from the “Int. Oscillator G.813” timing reference block” (full line is visible) and that hold-over is written.
-
- 11 The hold-over state is possible only if the other reference clock has been present for at least 30 minutes.
1. The following is the CT procedure to set the clock derived from a STM-n port:
 - a. Click twice on rack/subrack
 - b. Select the STM-n board. Then in the “TP Search Criteria” section, select “OPS” or “PPI” in the “Class” field and click on “Search.” The “OPS” or “PPI” ports are presented. Select one and click on “OK.”
 - c. In “Input Quality Configuration” field, select one of the listed options, then select the “Priority” and click on “OK.”
The selected port appears in the “Synchronization” view.
 2. The following is the CT procedure to set the timing reference from a 2-MHz external clock:
 - a. Click twice on Rack/Subrack
 - b. Select the PSF320 board. Then, in the “TP Search Criteria” section, select “Ignore” in the “Class” field, and click on “search.” The input (T3) and output (T4) timing references are presented.
 - c. Select “T3” (A or B, according to the PSF320 board selected) and click on “OK.”
 - d. The selected “T3” timing reference is presented in the “Timing Source Configuration” window.
 - e. In “Input Quality Configuration” field, select one of the listed options, then select the “Priority” and click on “OK.”

END OF STEPS

Alarms check (if connected)

Purpose

- Verify the correct restitution of the caused alarms and housekeeping alarms.

Test instruments [see Table 3-1, “Instruments” (p. 3-2)]

- Craft Terminal (E)

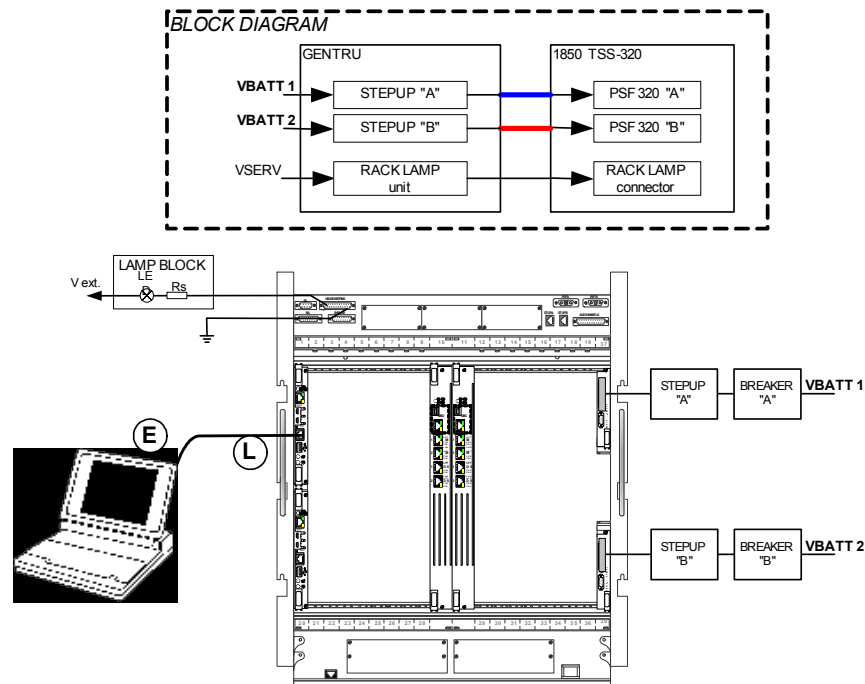
Accessories [see Table 3-2, “Accessories” (p. 3-2)]

- Craft Terminal cable (N)
- Lamp block, that might be a LED connected to a -Vtest voltage generator whose ground is common with the equipment, and a series resistance R_s , whose value is given by: $R_s=(V_{test})/10\text{ mA}$.

Note: V_{test} must not exceed 72V, and the output current from the pin must not exceed 50 mA. Further, the LED used should bear a 10-mA current.

Test Bench

Figure 3-18 Alarms check



Note: Check for alarms also on the EC320 panel (see 4.10 on page 98).

1. Primary power supply alarm check

Procedure

- a. Switch-OFF one Primary power supply (Breaker A).
 - Verify that the Green LED on the Step-up 1 turns OFF.
 - Verify that the NURG indication at the top of the rack (rack lamps) lights ON.
 - Verify that the NURG (minor) alarm LED of the EC320 lights ON, point (15).
 - Verify that the “Lamps block,” connected to the NURG pin of the Remote Alarms connector, turns ON.

EML-USM — Double-click on the PSF320 in slot 37.

- Verify that the BF alarm (battery failure) turns ON.

- b. Switch-ON breaker A.

- c. Switch-OFF the other primary power supply (Breaker B).

- Verify that the green LED on the step-up 2 lights OFF.
- Verify that the NURG indication at the top of the rack (rack lamps) lights ON.

EML-USM — Double-click on the PSF320 in slot 39.

- Verify that the BF alarm turns ON.

- d. Switch-ON breaker B.

- e. Switch-OFF the step-up A.

- Verify that the green LED on the step-up 1 turns OFF.
- Verify that the NURG indication at the top of the rack (rack lamps) lights ON.

EML-USM — Double-click on the PSF320 in slot 37.

- Verify that the BF alarm (battery failure) turns ON.

- f. Switch-ON step-up A.

- g. Switch-OFF the step-up B.

- Verify that the green LED on the Step-up 2 turns OFF.
- Verify that the NURG indication at the top of the rack (rack lamps) lights ON.

EML-USM — Double-click on the PSF320 in slot 39.

- Verify that the BF alarm (Battery Failure) turns ON.

- h. Switch-ON Step-up B.

2. Remote alarms check (if present)

Table 3-7 Rack alarms (RA) connector pin-out

#Pin	Signals	Description
1	RA_ANDBAT T	Fault or loss of both station batteries

#Pin	Signals	Description
2	RA_ORBATT	Fault or loss of one station battery
3	RA_URG	Urgent alarm
4		
5	RA_ANC	Fault or loss of both equipment-internal service power supplies
6		
7	RA_NURG	Not urgent alarm
8		
9	RA_ORC	Fault or loss of one equipment-internal service power supply
10		
11	RA_INT	Internal alarm
12		
13	RA_IND	Indeterminate alarm
14		
15	RA_REF	Voltage reference of remote alarms
case	GND	Electrical ground - Case

3. Rack lamps check

Procedure

Refer to [Figure 3-1 on p. 3-5](#) and [Figure 27 on page 72](#) for Rack Lamps (RL) connector location and pinout

- a. If present, remove all of the alarms.
- b. Originate the alarms as instructed below and verify that the related rack lamps LED at the top of the rack (TRU) turns ON.

- URG** Extract one unit (in service). Moreover this procedure turns-ON the major (M) LED on EC320. The major alarm is displayed on CT
- NURG** Switch-OFF one step-up. Moreover this procedure turns-ON the minor (m) LED on EC320. The minor alarm is displayed on CT
- MEM** With an URG or NURG alarm raised, press the “alarm cut-off key” (point 11) on EC320. Moreover this procedure turns-ON the Attended (AT) alarm LED on EC320

4. Housekeeping (HK) alarms check (if present)

Procedure

Refer to [Figure 3-1 on p. 3-5](#) and [Figure 27 on page 72](#) and [Table 10 on page 71](#) for HK connector location and pinout.

EML-USM — Select “External Points” from the “View” menu of EML-USM.

- a. Connect one housekeeping input (HK_IN) alarm pin at a time to the HK-REF (pin 24) and check the alarm detection on the CT.

EML-USM — Configure the Housekeeping output (HK_OUT) alarm.

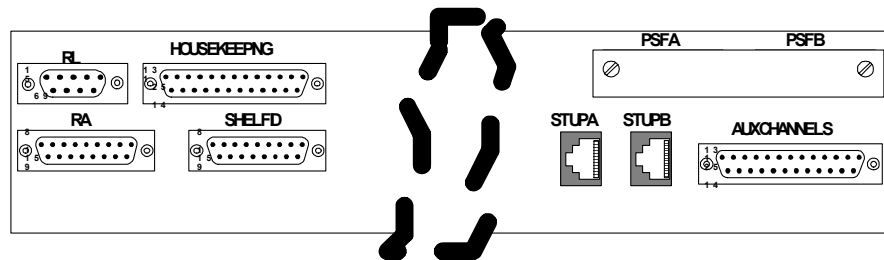
- b. Connect the “Lamp block” between the N and P contacts of the couple of HK-OUT signal to be tested (i.e., between HK_OUTN_1 and HK_OUTP_1).
- c. Select the HK_OUT to be tested and then, from the pop-up menu, select “Configuration” and set “ON” the “External state” field; click on “OK.”
- d. Verify that the related alarm is present, by observing that the “lamp block” turns ON; the alarm is also raised on the CT.

Table 3-8 Housekeeping connector pin-out

#Pin	Signals	Description
1		
2	HK_OUTN_1	# 1 Output; N wire
3	HK_OUTP_1	# 1 Output; P wire
4		
5	HK_OUTN_2	# 2 Output; N wire
6	HK_OUTP_12	# 2 Output; P wire
7		
8	HK_OUTN_3	# 3 Output; N wire
9	HK_OUTP_3	# 3 Output; P wire
10		
11	HK_OUTN_4	# 4 Output; N wire
12	HK_OUTP_4	# 4 Output; P wire
13		
14		
15	HK_IN1	# 1 Input
16	HK_IN2	# 2 Input

#Pin	Signals	Description
17	HK_IN3	# 3 Input
18	HK_IN4	# 4 Input
19	HK_IN5	# 5 Input
20	HK_IN6	# 6 Input
21	HK_IN7	# 7 Input
22	HK_IN8	# 8 Input
23		
24	HK_REF	Voltage reference of input housekeeping
25		
case	GND	Electrical ground - Case

Figure 3-19 Back panel electrical connectors location and pinout



5. Fan 19” alarm test

Procedure

- a. Extract one FAN unit
EML-USM — Double-click on the involved FAN.
 - Verify that the RUM alarm turns ON.
- b. Repeat the procedure on the other FAN.

Final checks

Purpose

- Check that the equipment has been properly configured.

Test instruments [see Table 3-1, “Instruments” (p. 3-2)]

- Craft Terminal (E)

Accessories: [see Table 3-2, “Accessories” (p. 3-2)]

- Cable for Craft Terminal (L)

The following operations must be carried out at the end of the STAND-ALONE tests:

- Disconnect all the cross-connections made on the equipment during the test operation phase.
- If set down in the executive design, configure the following:
 - The LAPD protocol based on the line interfaces implemented
 - The IP address
 - The NE local address NSAP
 - The OS address

Point-to-point measures list and operating sequence

Description

The aim of point to point measures is to check the whole link including the line.

If alarms and/or errors are detected and if all the local checks have been made, then the failure is due to external causes. If local checks have not been executed proceed as instructed in para.3.3 from page 32.

In this section, the following are detailed:

- Rx optical “line port” power check
- Optical “line port” link margin
- Point to point error-monitoring check

Rx Optical “line port” power check

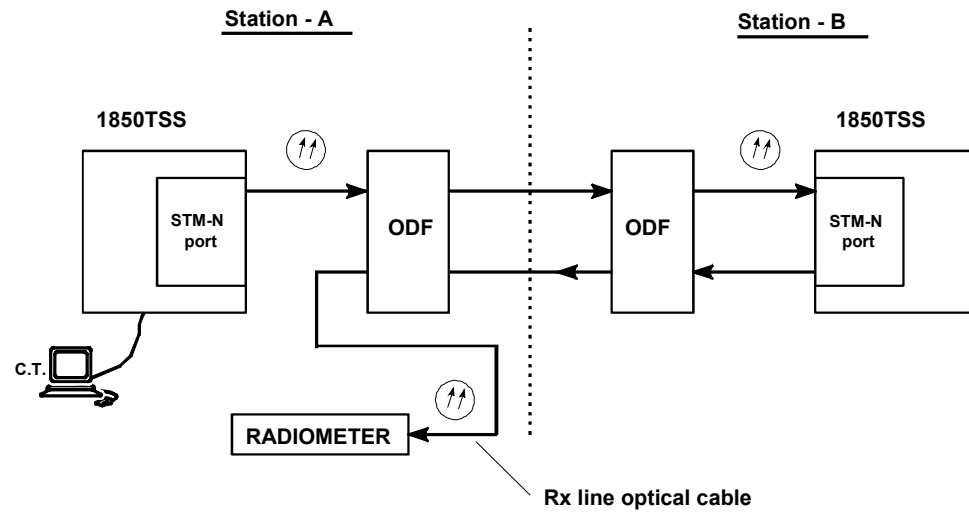
Purpose

- Verify the optical power of the signal received from the remote 1850 TSS-320 (Station B on the test bench).

Test instruments [see [Table 3-1, “Instruments” \(p. 3-2\)](#)]

- Craft Terminal (E)
- Power Meter B)

Test Bench



Procedure

- 1 Disconnect the Rx optical cable line from the ODF and connect it to the power meter input.
- 2 By means of the CT, turn-on the laser (see para. 4.6 on page 86) Station A
- 3 Wait for 180 seconds, and then check that the Rx optical power complies with the expected value.

Note: Rx power must be calculated on plant data. (PTx - Theoretical line attenuation based on customer data).

- 4 Repeat the check on the other port with “Line port” function.

END OF STEPS

Optical “line port” link margin

Purpose

- Verify the margin between the Rx optical power (in normal line condition) and the minimum received optical power (by introducing line attenuation) related to fixed bit error rate.

Test instruments [see [Table 3-1, “Instruments” \(p. 3-2\)](#)]

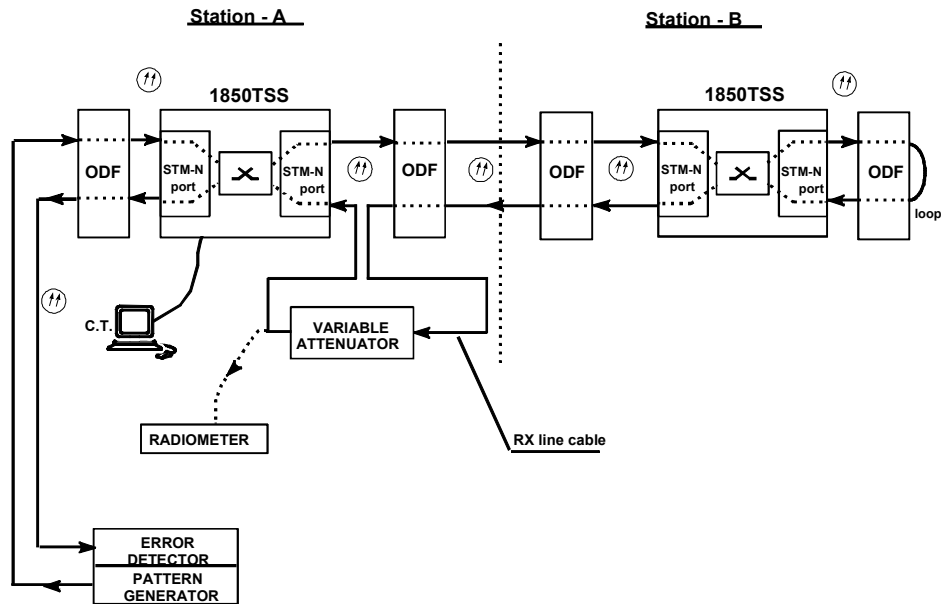
- Craft Terminal (E)
- Power Meter B)
- Variable optical attenuator C)
- Pattern Generator/Error Detector (A)

Accessories: [see [Table 3-2, “Accessories” \(p. 3-2\)](#)]

- Optical loop K

Test Bench

Figure 3-20 Optical “line port” link margin



Procedure

STATION-A

- 1 Connect the pattern generator output to the STM-N port input and the pattern generator input to the STM-N port output; all connections must be made on the ODF.
- 2 Connect the Rx optical line cable to a variable optical attenuator with attenuation equal to zero; connect the other side of the variable optical attenuator to the ODF.
- 3 Preset the instrument according to the port type under test, and send a fixed PRBS sequence.

STATION-B

- 4 On the ODF, make a loop on the STM-N concerned with point-to-point connection.

STATION-A

- 5 With the pattern generator, send a fixed PRBS sequence

- 6 Check that the error detector has read no errors.

- 7 Increase the optical attenuation till errors are read on the error detector.

- 8 Reduce attenuation until no errors are read.

- 9 Disconnect the optical cable from the STM-n input port (point A in [Figure 28](#)) and connect it to the power meter input.

- 10 Margin level must be minimum 4 dB better than the values reported in [para 4.7 on page 87](#).

- 11 Turn-on the laser through the CT (see [para. 4.6 on page 86](#)).

- 12 Wait for 180 sec. and then read the Rx optical power.
The difference between the Rx optical power [see [“Rx Optical “line port” power check” \(p. 3-59\)](#)] and the Rx optical power when introducing attenuation (as above explain) is the “link margin.”

- 13 Repeat the check on the other port with “line port” function.

END OF STEPS

Point-to-point error monitoring check

Purpose:

- Check the bit error rate on the link during a certain period of time (for example during night hours).

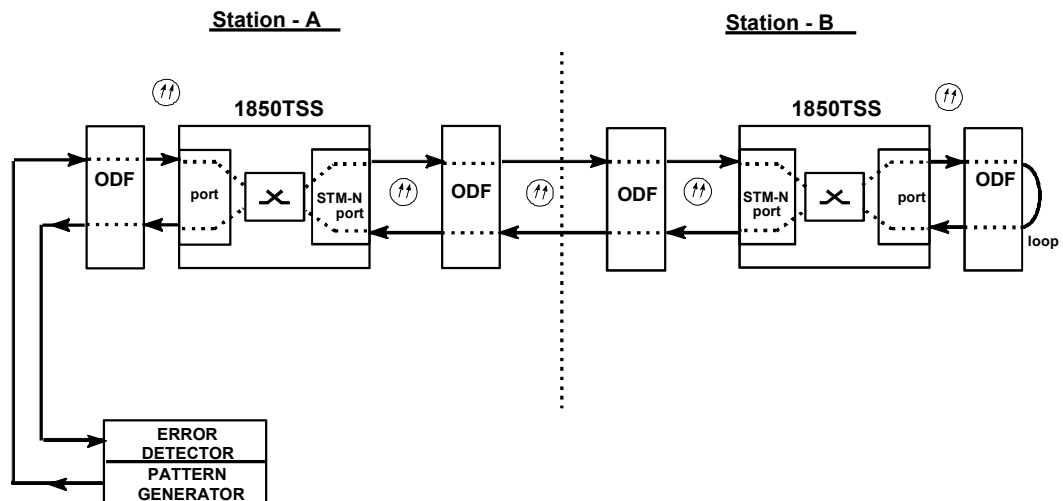
Test instruments [see Table 3-1, “Instruments” (p. 3-2)]

- Pattern Generator/Error Detector (A)

Accessories: [see Table 3-2, “Accessories” (p. 3-2)]

- Optical loop (K)

Test Bench:



Procedure

STATION-A

- 1 Connect the Pattern Generator output to the 1850 TSS-320 “port” input and the pattern generator input to the 1850 TSS-320 “port” output; all the connection must be made on the ODF.

STATION-B

- 2 On the ODF loop the 1850 TSS-320 “port” concerned with the point to point connection.

STATION-A

- 3 Set the pattern generator according to the 1850 TSS-320 “port” characteristics and send a fixed PRBS sequence.
- 4 After a certain period of time, check that no errors are read on the error detector.
- 5 Repeat the check on the other port with the 1850 TSS-320 “line port” function.

END OF STEPS

Ring error monitoring check

Purpose

- Check the bit error rate on the link during a certain period of time (for example during night hours)

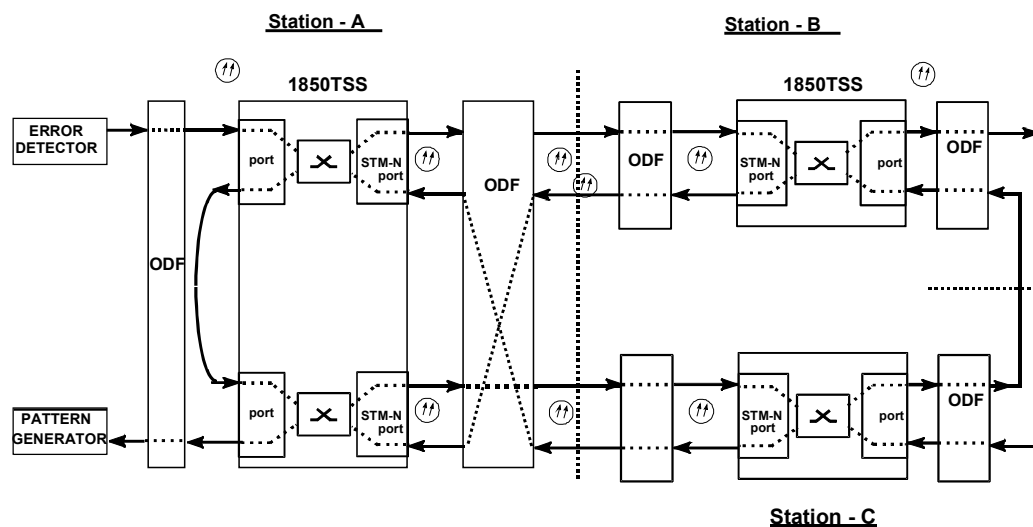
Test instruments [see Table 3-1, “Instruments” (p. 3-2)]

- Pattern Generator/Error Detector (A)

Accessories: [see Table 3-1, “Instruments” (p. 3-2)]

- Optical loop (K)

Test Bench



Procedure

STATION-A

- 1 Connect the pattern generator output to the 1850 TSS-320 “port” input and the Pattern Generator input to the 1850 TSS-320 “port” output; all the connection must be made on the ODF.

STATION-B

- 2 On the ODF loop the 1850 TSS-320 “port” concerned with the point-to-point connection.

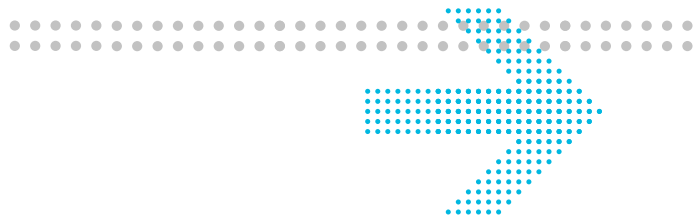
STATION-A

- 3 Set the pattern generator according to the 1850 TSS-320 “port” characteristics and send a fixed PRBS sequence.

- 4 After a certain period of time check that no errors are read on the error detector.

- 5 Repeat the check on the other port with the 1850 TSS-320 “line port” function.

END OF STEPS



4 Connections, Configurations, and Characteristics

Overview

Purpose

This chapter provides detailed lists of procedures and steps typically created with craft terminal configurations. This chapter also contains optical characteristics.

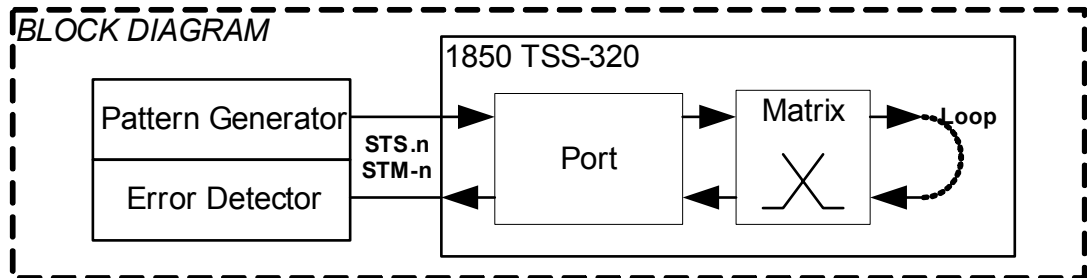
Contents

This chapter covers these topics.

STN-n cross-connection — Matrix looped STM-n	4-2
Bi-directional protected unstructured cross-connection: OC-3 and OC-3 port	4-4
Bi-directional protected cross-connection: OC-3/OC-12 port and STM-n ports	4-6
Unprotected, bi-directional cross-connect: Concatenated group (VC4-7V) and STM-N port	4-9
Cross-connection between a local and a remote data port	4-12
Standard procedures to turn the laser OFF then ON	4-14
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STN-n cross-connection – matrix looped STM-n

Description



Procedure

From EML-USM, select “Cross-Connection Management” from “Configuration” on the EML-USM window.

A “Cross-Connection Management” window is displayed.

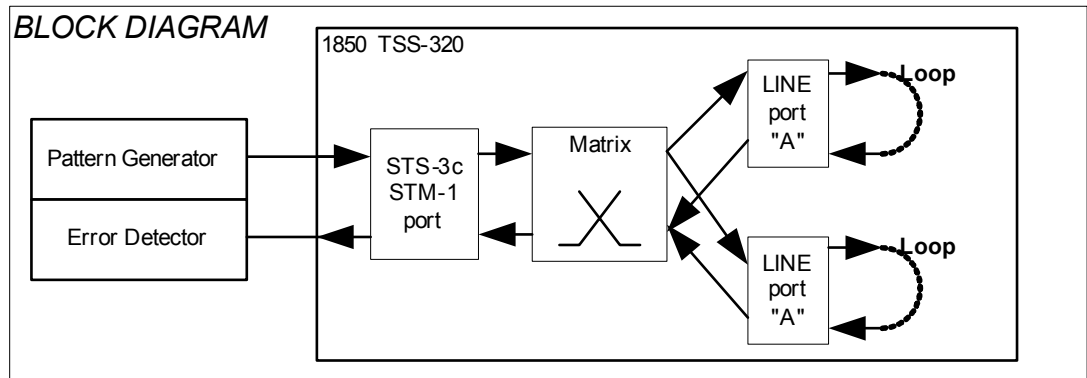
- 1 Click on “Create:” The “Main Cross-Connection” window is displayed.
- 2 Select “Unidirectional” in the “Type” field.
- 3 Click on “Choose” input. A “Search for Cross-connection input” window is displayed on the “Equipment” window.
- 4 Double-click on “Rack-1” and “SR320-1.”
- 5 Select the board in Slot n. In the “TP Search Criteria” field, select AU4 & VC4 in the “Class” field.
- 6 Click on “Search.”
The N AU4 will appear under the relevant board/slot in the “Termination Points” window.

-
- 7 Select the AU4 concerned and press “OK.”
The “Main Cross Connection” window will be displayed. The selected AU4 will be inserted in the input box.
 - 8 Click on “Choose” output. The “Search for cross-connection output” window will be displayed.
 - 9 Repeat the procedure above described for the “Input” field, selecting the same TP.
 - 10 Check that the loop symbol is active on the “CC Topology” box.
 - 11 Select “OK.”
 - 12 To check the performed connections, select “Configuration -> Cross-connection -> Cross-connection Management” and click on “Search.” All the cross-connections made will be displayed.
 - 13 To delete a connection, click on the “Cross-Connections List” line and select “Delete.”

END OF STEPS

Bi-directional protected unstructured cross-connection: OC-3 and OC-3 port

Description



Procedure

From EML-USM, select “Configuration” -> “Cross-Connection Management.”

Check that there are no cross-connections. If otherwise, click on “Search” in the “Cross-Connection Management” mask, and highlight the existing connection by clicking on the line and then click on “Delete.”

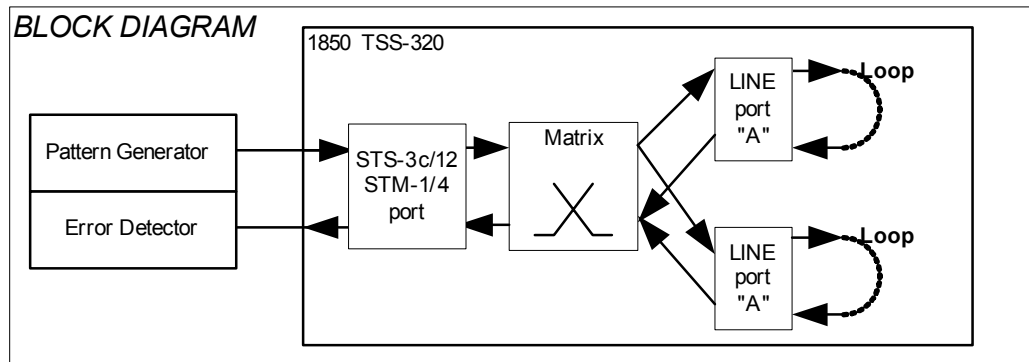
- 1 Click on “Create” in the Cross-connection Management window; a new window called “Main Cross-Connection” is opened.
- 2 Select the correct value in the fields: “Type” (bi-directional) and “Protection” (protected)
- 3 Click on “Select” relevant to the “Input” field; a new window called “TP search” is opened.
- 4 On the “Equipment” field, click twice on Rack/Subrack.
- 5 On the “Equipment” field, select the slot (containing ports “n” and “m”).
- 6 In the “Tp Class” filter, selection select AU4/VC4.

- 7 Click on “Search TPs”; in the “Termination points” field, two AU4 relevant to the two ports of the selected SLOT are displayed.
- 8 Select the AU4 port #m, and click on “OK”; the “TP search” window is closed.
- 9 Click on “Select” relevant to the “PROT INPUT” field of the “Main Cross-Connection” window; a new window called “TP search” is opened.
- 10 Select the AU4 port #n, and click on “OK.”
- 11 Click on “Select” relevant to the “Output” field of the main cross-connection window.
- 12 Select the slot wanted.

END OF STEPS

Bi-directional protected cross-connection: OC-3/OC-12 port and STM-n ports

Description



Procedure

From EML-USM, select “Cross-Connection Management” from the “Configuration” menu of the EML-USM window. A new window called “Cross-Connection Management” is opened.

- 1 In the “Cross-Connection Management” window, click on “Create” button; a new window called “Main Cross-Connection” is opened.
- 2 Select the correct value in the “Type” (bi-directional) and “Protection” (protected) fields.
- 3 Click on “Choose” related to the “Input” field; the “Search for Cross-Connection Input” window is opened.
- 4 On the “Equipment” field, click twice on Rack (Rack1) and then on Subrack (S320-1).
- 5 On the “Equipment” field, select the STM-N A board (i.e., OC-48/64) in slot n.
- 6 In the “Search Criteria” field, select AU4&VC4 in the “Class” field.

- 7 Click on “Search”; all the available TPs are displayed in the “Termination points” field i.e., up to 16 or 64 TPs for the port #A (if OC-48 or OC-192 board).
- 8 Select the AU4 to be used and click on “OK”; the “Search for Cross-Connection Input” window is closed.
- 9 Click on “Select” relevant to the “Prot. Input” field of the “Main Cross-Connection” window; a new window called “Search for Cross-Connection Protection” is opened.
- 10 On the “Equipment” field, select the STM-N B board (i.e., OC-48/64) in slot n.
- 11 In the “Search Criteria” field, select AU4&VC4 in “Class” field.
- 12 Click on “Search”; all the available TPs are displayed in the “Termination points” field i.e., up to 16 or 64 TPs for the port #B (if OC-48 or OC-192 board).
- 13 Select the AU4 and click on “OK”; the “Search for Cross-Connection Protection” window is closed.
- 14 Click on “Choose” relevant to the “Output” field; a new window called “Search for Cross-Connection Output” is opened.
- 15 On the “Equipment” field, select the STM-n board (i.e., OC-3/4) in slot n.
- 16 In the “Search Criteria” field, select AU4&VC4 in the “Class” field.
- 17 Click on “Search”; in the “Termination points” field. All the available TPs are displayed.

- 18 Select the AU4, and click on “OK”; the “Search for Cross-Connection Output” window is closed.
- 19 In the “Main Cross-Connection” window, click on “OK.”
- 20 Click on “Search” in the “Cross-Connection Management” window to see all cross-connections performed.
- 21 Check that the symbol of the bidirectional protected cross-connection is present (the main is a dashed line, the protecting is a dotted line).

END OF STEPS

Unprotected, bi-directional cross-connect: concatenated group (VC4-7V) and STM-N port

Procedure

This procedure is performed on an OC-48 port. In case a OC-192 port is used, the same.
From EML-USM, select “Configuration” -> “Data Port Configuration.”

- 1 In “Data Port Configuration” window, select the port number.

- 2 In “Selected Item” field, select the signal type (VC4XV) and the number of virtual concatenated VC4s (7 in the current example). It has to be taken into account that up to 7 VC4s may be concatenated to have a GbE stream, and up to 64 VC4s may be concatenated to have a 10 GbE stream. Then click on the “Create/Change” button.

- 3 In “Data Port Configuration” window, click on “LCAS Cfg.” Then click on “Enable” and “Apply.”

- 4 To activate TPs, click on “Ctrl Path Act.” In the “Control Path Activation” window, select the number of “TPs to be active” (7), and click on “Apply.”

END OF STEPS

All TPs are now active and it will be possible to create cross-connections.

Now we have to cross-connect the created VC4-7V (on PIMMS) to the STM-N port of the SONET board, by cross-connecting each AU4 of the VC4-7V to a different AU4 of the chosen STM-N port.

From EML-USM, select “Cross-Connection Management” from the “Configuration” menu.

- 1 The “Cross-Connection Management” window is displayed.

- 2 Click on “Create.” A “Main Cross-Connection” window is displayed.

- 3 Select the type: “Bidirectional” - “Not Protected.”

- 4 Click on “Choose” to select the input TP of the cross-connection. In “Search for Cross-connection input” window, double-click on Rack and Subrack (S320-1).
- 5 Select “PP20G” board. In “TP Search Criteria” field, select the “AU4&VC4” class and click on “Search.”
- 6 The seven (7) virtual concatenated VC4s are displayed in the “Termination Points” window.
- 7 Select the first VC4 and press “OK.”
- 8 The “Main Cross-Connection” window will be displayed. The selected VC4 is inserted in the input box.
This now has to be selected as the “Output” TP of the cross-connection.
- 9 Click on “Choose” to select the output TP of the cross-connection. In “Search for Cross-connection input” window, double-click on Rack and Subrack (S320-1).
- 10 Select the STM-N board (4P2G5SO or 1P10GSO). In the “TP Search Criteria” field, select the “AU4&VC4” class and click on “Search.” The AU4s are displayed in the “Termination Points” window.
- 11 Select the “Output” AU4 and press “OK.”
- 12 The “Main Cross Connection” window is displayed. The selected AU4 is inserted in the output box.
- 13 Check that the cross-connection symbol (') is displayed in the “CC Topology” box. Click on “OK.”

-
- 14 Repeat the same procedure for all the other six (6) virtual concatenated TPs.

 - 15 To check the connections made, access “Configuration -> Cross-connection Management” and click on “Search.” All the connections made will be displayed.

 - 16 To delete a connection, click on the “Cross-Connections List” line and select “Delete.” To delete a cross-connection, it is mandatory to have previously deactivated the virtual concatenation (VC4-xV).

END OF STEPS

Cross-connection between a local and a remote data port

Procedure

ON the equipment view, select the board.

From EML-USM, select “Equipment” -> “Data board Navigation.” then insert login and password. The Data CT starts.

- 1 To add a card, select the equipment (the first row). From the pop-up menu (click on the right button of the mouse), select “Add Data Board.” Choose the board from the list and click on “OK.”

- 2 In the “1850 TSS-320 User Service Management..” window, double-click on the board (i.e., r1sr1/board#2). The local and remote data ports are displayed.

- 3 Select a local port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”

- 4 In the “Ethernet port Configuration” window, select the “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”

- 5 In the “Ethernet port Configuration” window, for GbE ports only; select the “MAU” tag and set “Admin. Status” = “Enabled” in “Auto negotiation” field. Click on “OK.” Don't perform any setting in case of 10 GbE ports.

- 6 Select a remote port. From the pop-up menu (click on the right button of the mouse), select “Configure Ethernet port.”

- 7 In the “Ethernet port Configuration” window, select the “Configuration” tag and set “Up” in “Admin. Status” field. Click on “OK.”

- 8 Click on “Connection” tag and select the local port. Open the pop-up menu and select “Create ETS XC one step.”

-
- 9 In the “Port Ingress” field of the “Create ETS XC One Step” window, the selected local port is displayed.
 - 10 Select “Port Egress” by clicking on the relevant square. The “Filtered search” window appears.
 - 11 In the “Ethernet Port” tag, click on “Search.”
 - 12 Select the Remote port involved and click on “Apply.”
 - 13 In “Port Egress” field of the “Create ETS XC One Step” window, the selected remote port is displayed.
 - 14 The “Connection type” is “Bidirectional” (not selectable); click on “Apply.”
 - 15 In the “History” field, the performed Cross-Connection is described. Click on the “Finish” button.

END OF STEPS

Standard procedures to turn the laser OFF then ON

Safety rules



When disconnecting the optical fiber, follow the procedure stated below to avoid laser radiation.

Procedure

1 Turn OFF the laser.

From EML-USM, select the board and click twice.

- a. Select the port
- b. Select the module
- c. Select the SPI block
- d. Select “port” -> “Physical media” -> “ALS Management”
- e. Set ALS function. Laser Forced OFF and then click on Apply.

2 Check if the laser is OFF.

- a. Check in the message area port view that the message “ALS current state in test” is present.

3 Set the test bench.

- a. Disconnect the optical jumper.
- b. Connect the optical device (power meter or optical attenuator) to carry out the test.

4 Turn ON the laser.

From EML-USM, select the board and click twice.

- a. Select the port.
- b. Select the module.
- c. Select the SPI block.
- d. Select “port” -> “physical media” -> “ALS Management.”
- e. Set ALS function. Laser forced ON and click on Apply.

- 5 Check the laser status.
 - a. Check in the message area port view that the message “ALS current state inactive” is present.
-

- 6 ALS enable.

From EML-USM, select the board and click twice.

- a. Select the port.
 - b. Select the module.
 - c. Select the SPI block.
 - d. Select “port” -> “physical media” -> “ALS Management”
 - e. Set ALS function - ALS Enabled, and click on Apply.
-

- 7 Check ALS status.

- a. Check in the message area port view that the message “ALS current state active” is present.

END OF STEPS

SFP and XFP modules optical characteristics

OC-3 optical characteristics

Table 4-1 OC-3 optical characteristics

OC-3 SFP module type		S.1.1	L.1.1	L.1.2	Unit
Addressed wavelength		1261 -> 1360	1270 -> 1360	1480 -> 1580	nm
Min. launched power		-15	-5	-5	dBm
Max. launched power		-8	0	0	dBm
Allowed bit rates		155.520	155.520	155.520	Mbps
Min. extinction ratio (dB)		8.2	10	10	dB
Spectral width	Max. -20dB bandwidth (nm)	NA	1	1	nm
	Max. RMS width (nm)	7.7	3	NA	nm
Minimum SMSR		NA	30 if DFB laser	30	
Max. chromatic dispersion		-100 -> +100	-250 -> +250	1900	ps/nm
Min. sensitivity, @ BER=1E ⁻¹⁰		-28	-34	-34	dBm
Min. overload		-8	-10	-10	dBm
Max. optical path penalty		1	1	1	dB
Max. receiver reflectance		-14	-14	-25	dB
Optical connector (Tx/Rx) / Fibre type		LC / SMF	LC / SMF	LC / SMF	
Acronym / interface type		SS-11 / S-1.1	SL-11 / L-1.1	SL-12 / L-1.2	

OC-48 Optical Characteristics

Table 4-2 OC-48 optical characteristics

OC-48 SFP Module Type	I.16.1	S.16.1	L.16.1	L.16.2	
Addressed wavelength	1270 -> 1360	1270 -> 1360	1280 -> 1335	1500 -> 1580	nm
Min. launched power	-10	-5	-2	-2	dBm
Max. launched power	-3	0	+3	+3	dBm

OC-48 SFP Module Type		I.16.1	S.16.1	L.16.1	L.16.2	
Allowed bit rates		2.48832	2.125; 2.48832	2.48832	2.48832	Gbps
Min. extinction ratio (dB)		8.2	8.2	8.2	8.2	dB
Spectral width	Max. -20dB bandwidth (nm)	NA	1	1	1	nm
	Max. RMS width (nm)	4	NA	NA	NA	nm
Minimum SMSR		NA	30	30	30	
Max. chromatic dispersion		-12 -> +12	-100 -> +100	-250 -> +250	+1600	ps/nm
Min. sensitivity, @ BER=1E ⁻¹⁰		-18	-18	-27	-28	dBm
Min. overload		-3	0	-8	-8	dBm
Max. optical path penalty		1	1	1	2	dB
Max. receiver reflectance		-27	-27	-27	-27	dB
Optical connector (Tx/Rx) / Fibre type		LC / SMF		LC / SMF		
Acronym / interface type		SI-161 I-16.1	SS-161 S-16.1	SL-161 L-16.1	SL-162 L-16.2	

Table 4-3 OC-48 optical characteristics

OC-48 SFP Module Type		S.16.1 Multirate Multiformat	Unit
OC-48 SFP module type		S.16.1 Multirate Multiformat	Unit
Addressed wavelength		1290 -> 1330	nm
Min. launched power		-5	dBm
Max. launched power		0	dBm
Allowed bit rates		100 -> 2700	Mbps
Min. extinction ratio (dB)		for bit rates > 2.125Gbps = 8.2 for bit rates < 2.125Gbps = 9	dB
Spectral width	Max. -20 dB bandwidth (nm)	1	nm
	Max. RMS width (nm)	NA	nm

OC-48 SFP Module Type	S.16.1 Multirate Multiformat	Unit
Minimum SMSR	30	
Max. chromatic dispersion	-100 -> +100	ps/nm
Min. sensitivity, @ BER=1E ⁻¹⁰	-18	dBm
Min. overload	0	dBm
Max. optical path penalty	1	dB
Max. receiver reflectance	-27	dB
Optical connector (Tx/Rx) / Fibre type	LC / SMF	
Acronym / interface type	SS-161AR / S-16.1 (multirate)	

OC-192 optical characteristics

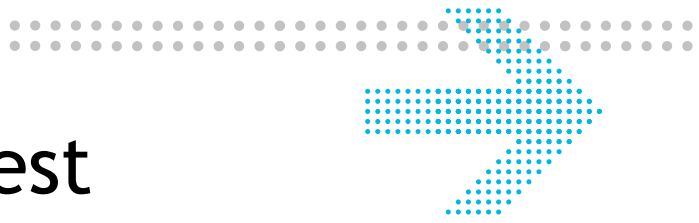
Table 4-4 OC-192 optical characteristics

OC-192 XFP Module Type	S-64.2b	I-64.1	P1L1-2D2	Unit
Addressed wavelength	1530 -> 1565	1290 -> 1330	1530 -> 1565	nm
Min. launched power	-1	-6	0	dBm
Max. launched power	+2	-1	+4	dBm
Allowed bit rates	9.95 10.3125 10.709	9.95 10.3125 10.709	-	Gbps
Min. extinction ratio (dB)	8.2	6	9	dB
Spectral width Max. -20 dB bandwidth (nm)	0.25	1	0.25	nm
Minimum SMSR	30	30	30	
Max. chromatic dispersion	800	60	1600	ps/nm
Min. sensitivity, @ BER=1E ⁻¹²	-14	-11	-24	dBm
Min. overload	-1	0.5	-7	dBm
Max. optical path penalty	2	1	2	dB
Max. receiver reflectance	27	14	27	dB
Optical connector (Tx/Rx)/Fiber type	LC / SMF			

OC-192 XFP Module Type	S-64.2b	I-64.1	P1L1-2D2	Unit
Acronym	XS-642	XI-641	XP1L12D2	
Interface type	S-64.2b 10GBASE-E	I-64.1 10GBASE-L	P1L1-2D2	

DWDM Optical Characteristics

Refer to the *Alcatel-Lucent 1850 TSS-320 Release 2.0 Product Information Guide* for Optical unit interface characteristics.



5 1850 TSS-320 Test Report Sheet Modules

Overview

Purpose

This chapter provides detailed test report sheet modules for the 1850 TSS-320.

Contents.

This chapter covers these topics.

Equipment acceptance sheet	5-2
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Equipment acceptance sheet

Acceptance sheet

Table 5-1 Equipment acceptance sheet

EQUIPMENT ACCEPTANCE SHEET	
CONTRACT N.	
SITE	
RING	
EQUIPMENT	
LOCATION Row/Rack/Subrack	
SW Version	

Addresses							
	AFI	IDI	VER	AUTH	RES	DOM	AREA
Local							
SYSTEM ID				ETHERNET ADDRESS			
IP ADDRESS							

FINAL TESTING RESULT	<input type="checkbox"/> OK	<input type="checkbox"/> OK
Note	<hr/> <hr/> <hr/> <hr/> <hr/>	
Date		
For Customer		Signature
For Alcatel-Lucent		Signature

Table 5-2 On-Site 1850 TSS-320 Final Test

ON-SITE 1850 TSS-320 FINAL TEST		
Units	Types	Serial Numbers
SHELF SERIAL NUMBER		
SLOT 1		
SLOT 2		
SLOT 3		
SLOT 4		
SLOT 5		
SLOT 6		
SLOT 7		
SLOT 8		
SLOT 9		
SLOT 10		
SLOT 11		
SLOT 12		
SLOT 13		
SLOT 14		
SLOT 15		
SLOT 16		
SLOT 17		
SLOT 18		
SLOT 19		
SLOT 20		
SLOT 21		
SLOT 22		
SLOT 23		
SLOT 24		
SLOT 25		
SLOT 26		
SLOT 27		
SLOT 28		
SLOT 29		
SLOT 30		
SLOT 31		
SLOT 32		
SLOT 33		
SLOT 34		
SLOT 35		
SLOT 36		
SLOT 37		
SLOT 38		
SLOT 39		
SLOT 40		
SLOT 41		

Table 5-3 On-Site 1850 TSS-320 Final Test: SONET/SONET Local Measurements

ON-SITE 1850 TSS-320 FINAL TEST: SDH/SONET LOCAL MEASUREMENTS						
Measure				Expected Value and Tolerance	Measure Value	Unit
Free-running frequency check				2048 + 4.6 ppm 1552 + x.x ppm		kHz
SDH/SONET Optical ports test	Port Nr	Port type/slot	Interfac type			
PTx power test	1			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
ALS check				Check		
Test error-free data transit				0 errors		Errors
PTx power test	2			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
A.L.S. check				Check		
Test error-free data transit				0 errors		Errors
PTx power test	3			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
A.L.S. check				Check		
Test error-free data transit				0 errors		Errors
PTx power test	4			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
A.L.S. check				Check		
Test error-free data transit				0 errors		Errors
PTx power test	5			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
A.L.S. check				Check		
Test error-free data transit				0 errors		Errors
PTx power test	6			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
A.L.S. check				Check		
Test error-free data transit				0 errors		Errors
PTx power test	7			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
A.L.S. check				Check		
Test error-free data transit				0 errors		errors
PTx power test	8			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
A.L.S. check				Check		
Test error-free data transit				0 errors		errors

Table 5-4 On-Site 1850 TSS-320 Final Test: Data Local Measurements

ON-SITE 1850TSS-320 FINAL TEST: DATA LOCAL MEASUREMENTS						
Measure				Expected Value and Tolerance	Measure Value	Unit
DATA	Port Nr	Port type/ slot	Interface type			
Optical ports test						
Alarms check	1			Check		
Test error-free data transit				0 errors		Errors
Alarms check	2			Check		
Test error-free data transit				0 errors		Errors
Alarms check	3			Check		
Test error-free data transit				0 errors		Errors
Alarms check	4			Check		
Test error-free data transit				0 errors		Errors
Alarms check	5			Check		
Test error-free data transit				0 errors		Errors
Alarms check	6			Check		
Test error-free data transit				0 errors		Errors
Alarms check	7			Check		
Test error-free data transit				0 errors		Errors
Alarms check	8			Check		
Test error-free data transit				0 errors		Errors
Alarms check	9			Check		
Test error-free data transit				0 errors		Errors
Alarms check	10			Check		
Test error-free data transit				0 errors		Errors
Alarms check	1			Check		
Test error-free data transit				0 errors		Errors
Alarms check	2			Check		
Test error-free data transit				0 errors		Errors
Alarms check	3			Check		
Test error-free data transit				0 errors		Errors
Alarms check	4			Check		
Test error-free data transit				0 errors		Errors
Alarms check	5			Check		
Test error-free data transit				0 errors		Errors
Alarms check	6			Check		
Test error-free data transit				0 errors		Errors
Alarms check	7			Check		
Test error-free data transit				0 errors		Errors
Alarms check	8			Check		
Test error-free data transit				0 errors		Errors
Alarms check	9			Check		
Test error-free data transit				0 errors		Errors
Alarms check	10			Check		
Test error-free data transit				0 errors		Errors

Table 5-5 On-Site 1850 TSS-320 Final Test: DWDM Local Measurements

ON-SITE 1850TSS-320 FINAL TEST: DWDM LOCAL MEASUREMENTS						
Measure				Expected Value and Tolerance	Measured Value	Units
DWDM Optical Ports Test	Port NR	Port Type/Slot	Interface Type			
PTx power test (on DWDM XFP output)	1			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
PTx power test (on DWDM XFP output)	2			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
PTx power test (on DWDM XFP output)	3			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
PTx power test (on DWDM XFP output)	4			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
PTx power test (on DWDM XFP output)	5			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
PTx power test (on DWDM XFP output)	6			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
PTx power test (on DWDM XFP output)	7			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
PTx power test (on DWDM XFP output)	8			See “SFP and XFP modules optical characteristics” (p. 4-16)		dBm
	???					
CH __ insertion loss on OMD44 (MUX side)	1			3.1 to 5.5		dB
CH __ insertion loss on OMD44 (MUX side)	8			3.1 to 5.5		dB

Table 5-6 On-Site 1850 TSS-320 Final Test: DWDM Link Measurements

ON-SITE 1850TSS-320 FINAL TEST: DWDM LINK MEASUREMENTS						
Measure				Expected Value and Tolerance	Measured Value	Unit
DWDM Optical Ports Test	Port Nr	Port Type/Slot	Interface Type			
Span loss BOL (Customer power budget)						dB
Line signal output power						
CH __ insertion loss on OMD44 (DEMUX side)	1			3.1 to 5.8		dB
	???					
CH __ insertion loss on OMD44 (DEMUX side)	8			3.1 to 5.8		dB
PRx power test (on DWDM XFP input)						
	1			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	2			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	3			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	4			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	5			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	6			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	7			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	8			See "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
	???					
Stability Test 12 h						
Stability Test 10 minutes per Gbit						

Table 5-7 On-Site Multiservice Node Final Test: Local Measurements

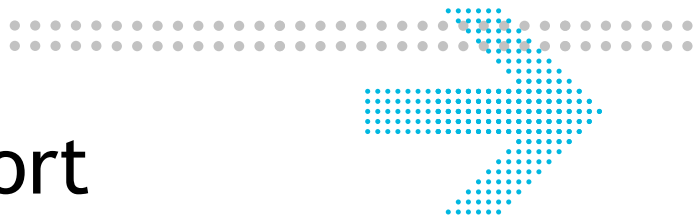
ON-SITE MULTISERVICE NODE FINAL TEST: LOCAL MEASUREMENTS			
Measure	Expected Value and Tolerance	Measured Value	Unit
Matrix check	Check		
	Quantity of matrix units		N
	0 errors		Errors
SNCP protection check (Line posts)	Check		
Matrix/CRU EPS protections check	Check		
Synchronism priority and Holdover	Check		
Alarm check (if connected)			
Primary power supply alarms check	Check		

ON-SITE MULTISERVICE NODE FINAL TEST: LOCAL MEASUREMENTS			
Measure	Expected Value and Tolerance	Measured Value	Unit
Housekeeping alarms check:			
HK-IN 1	check		
HK-IN 2	check		
HK-IN 3	check		
HK-IN 4	check		
HK-IN 5	check		
HK-IN 6	check		
HK-IN 7	check		
HK-IN 8	check		
HK-OUT 1	check		
HK-OUT 2	check		
HK-OUT 3	check		
HK-OUT 4	check		

Table 5-8 On-Site Multiservice Node Final Test: Point-to-Point Measures

ON-SITE MULTISERVICE NODE FINAL TEST: POINT-TO-POINT MEASURES	
SITE 1	
SITE 2	
EQUIPMENT TYPE	
EQUIPMENT RELEASE	

Measure			Expected value and tolerance	Measured value	Unit
Rx optical "line port" power check	PORT N°	TYPE	Expected value = Remote PTx – Theoretical line attenuation based on customer data		dBm
Rx optical "line port" power check	PORT N°	TYPE	Expected value = Remote PTx – Theoretical line attenuation based on customer data		dBm
Rx optical "line port" power check	PORT N°	TYPE	Expected value = Remote PTx – Theoretical line attenuation based on customer data		dBm
Rx optical "line port" power check	PORT N°	TYPE	Expected value = Remote PTx – Theoretical line attenuation based on customer data		dBm
Optical "line port" link margin	PORT N°	TYPE	Margin level must be min. 4 dB better than the values reported in "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
Optical "line port" link margin	PORT N°	TYPE	Margin level must be min. 4 dB better than the values reported in "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
Optical "line port" link margin	PORT N°	TYPE	Margin level must be min. 4 dB better than the values reported in "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
Optical "line port" link margin	PORT N°	TYPE	Margin level must be min. 4 dB better than the values reported in "SFP and XFP modules optical characteristics" (p. 4-16)		dBm
E O W check					
Point to point error monitoring check			0 Errors		errors



A Technical Support

Overview

Purpose

This chapter provides important technical assistance information for the 1850 TSS-320.

Contents

This appendix contains the following sections.

Technical assistance	A-2
Accessing and navigating the On-Line Customer Support (OLCS) web site	A-7
Other technical support services	A-13

Technical assistance

Overview

Alcatel-Lucent provides the following Technical Support Services:

- Remote Technical Support (RTS) - remote technical support to troubleshoot and resolve system problems.
- On-site Technical Support (OTS) - on-site assistance with operational issues and remedial maintenance.
- Repair and Replacement (R&R) - technical support services for device repair/return or parts replacement.
- Alcatel-Lucent On-Line Customer Support (OLCS) - online access to information and services that can help resolve technical support requests.

Note: Technical Support Services are available 24 hours a day, 7 days a week.

For additional information regarding Alcatel-Lucent Worldwide Services, refer to the Alcatel-Lucent web site at <http://www.alcatel-lucent.com/solutions>.

Select the appropriate category:

- Service Providers
- Enterprise

Note: Use the appropriate steps below for the above categories.

Service Providers:

1. Select **Service Providers**.
2. Select **Services**.
3. Select **Network Support and Maintenance Services** located in the Maintenance section.

Note: An overview of services provided is displayed. If more detailed information on a particular category is needed, then select the appropriate information from the top tabs displayed.

Enterprises:

1. Select **Enterprises**.
2. Under the **Evaluate** section at the bottom of the page, select **Products and Services**.
3. At the **Products and Services** page, select **Services**.

Note: An overview of the services provided is displayed. For more information, select one of the three categories shown at the bottom of the page: Consult & Design, Maintain & Operate, or Integrate & Deploy.

Technical support

Many of our customers have established their own support procedures. These procedures usually involve escalation within their own companies. However, some instances may require additional assistance from Alcatel-Lucent.

Alcatel-Lucent has been and continues to be committed to providing excellence in technical support for its products and services. Therefore, we provide a hierarchical support structure ready and available to solve any Alcatel-Lucent product technical issue.

When additional assistance is required, the Alcatel-Lucent Welcome Center is the first point of contact. An Alcatel-Lucent Welcome Center operator can direct the request to engineers that are highly trained and skilled in resolving issues, involving Alcatel-Lucent products. Technical assistance is available 24 hours a day, 7 days a week.

Alcatel-Lucent Welcome Center

1 866 582 3688, prompt 1 (continental U.S.)
+1 (630) 224 4672 (outside continental U.S.)
(24 hours a day, 7 days a week)

By using the Alcatel-Lucent Welcome Center as the entry point for Alcatel-Lucent support, customers will be assured of a timely and effective technical support service.

On-line customer support

Overview

On-Line Customer Support (OLCS) is the Customer Support web site for our customers' technical support needs. This customer web access tool provides an easy method to access data about Alcatel-Lucent products using the World Wide Web. A customer must first request access to this web site to gain access to the following customer support features:

- Ask AL Knowledgebase
- Customer Assistance Request Entry System (CARES)
- Data Drop Box
- Documentation
- Downloads
- Alcatel-Lucent Alerts
- Product Change Notices
- RMA (Repair and Exchange)

Ask AL Knowledgebase

The Ask AL Knowledgebase web interface feature connects you to the Knowledge Management solutions database. The Ask AL Knowledgebase feature lets you search for solutions by using natural language queries. Many products have an extensive set of Solutions available. Solutions are created by technicians to provide customers with a method to resolve issues without calling for assistance. Solutions are displayed, showing the percentage weight or percent match, based on search criteria. Searches can be performed on all products that are entitled, through the level of service contract a customer has for RTS services.

CARES

The CARES web interface feature makes it easy for you to submit an Assistance Request (AR), subscribe to AR Notifications (be notified when an AR is updated), and view all the customer ARs. The CARES feature lets you open an AR for low severity issues or questions. Any high severity issue should be called into CTAM. Users can stay informed about their ARs by using the flexible AR Notification subscriptions. Users can choose a method for receiving updates: email, text messaging messages, or none. Users can choose when updates are wanted (when the state of the AR changes, any update to the investigation field occurs, or any time any text field is modified). Users can log into the OLCS web site and view ARs 24 hours a day, 7 days a week.

Data Drop Box

The Data Drop Box feature allows Alcatel-Lucent support technicians to provide customers with a quick method to share files. The Data Drop Box allows a technician to provide or receive a file from a customer quickly. These files remain in place for 7 days.

Documentation

The Documentation feature on the OLCS web site contains three areas: Manuals and Guides, Technical Notes, and Release Information.

- **Manuals and Guides**

This section contains the documents that are available in paper or electronic copy and are distributed with a new product. These are the documents that are available within the Alcatel-Lucent Product Documentation web site. The OLCS web site contains links to the actual documents at the Customer Information Center (CIC) web site. The following is a list of possible documents that are available from this site:

- Administration Guide
- Applications Planning Guide (APG)/Applications Planning and Ordering Guide (APOG)
- Getting Started Guide
- Installation Manual (IM)/Installation Guide (IG)

-
- Modification Implementation Procedure (MIP)
 - User Guide
 - Alarm Messaging and Trouble Clearing Guide (AMTCG)
 - Framework User Guide
 - Graphical User Interface (GUI) Guide
 - Maintenance Guide, Provisioning Guide
 - User Operations Guide (UOG)
 - Technical Notes

This section contains documents that are specific to the product and are technical in nature. Most of these documents will provide information in product data sheets or white papers, which are technical documents that explain the operation of a particular part of the system. The following documents are available in this section:

 - Change Notice (CN)
 - Ethernet Management Guide
 - Method of Procedure (MOP)
 - Planning Guide
 - Service Assurance Guide
 - Engineering Change Procedure (ECP)
 - Feature Contents
 - Operations Interworking (OI) Guide
 - Screen Help
 - White Papers

These documents will vary from product to product.

- Release Information

This section contains documents that are specific to the release of a product. The following documents are available in this section:

 - Acceptance Documents
 - Software Release Descriptions (SRD)
 - Specific SRD sections
 - White Papers (release specific)
 - Software Compatibility
 - Upgrade Paths

Downloads

Note: This may not apply to all products.

The Downloads area allows Alcatel-Lucent support technicians to provide access to software downloads that are specific to a customer's contract. This feature is only allowed through negotiation with the Account Team and the Product Manager of the product.

Alcatel-Lucent Alerts

The Alcatel-Lucent Alerts tool is a subscription-based tool that provides the same information that our Product Notifications (PNs) did previously provide. This new method of communication is a vehicle to share product and support issues that are of informational, maintenance, or preventive nature. Alcatel-Lucent Alerts contain detailed text descriptions and urgency of Alcatel-Lucent product issues that need to be quickly communicated to customers after the deployment of a release or product.

Product Change Notices

The Product Change Notices (PCN) area provides information on hardware changes for a product. There is a selection of choices to help you search for Change Notices (CNs) or Customer Change Notices (CCNs).

Return Material Authorization (RMA) (Repair and Exchange)

Note: This may not apply to all products.

The RMA area provides a list of contact information on all Alcatel-Lucent products. There is a "request an RMA number" on-line for most Alcatel-Lucent products. An RMA number is required for all returned parts and this feature provides you with an easy method to obtain the RMA number. Please check the warranty status before submitting a request.

Accessing and navigating the on-line customer support (OLCS) web site

Description

This section provides the method to access the On-Line Customer Support (OLCS) web site, obtain a login (if necessary), and navigate to each feature listed in this document.

Accessing the OLCS web site

To access the Alcatel-Lucent OLCS web site, enter: www.alcatel-lucent.com/support. Once you are at this web page, select **Lucent Global Support**. This will bring you to the web site where you can log in to gain access to the entitled products.

Obtaining a login for OLCS

To request a login, a customer must register, and then an email confirmation is sent within 2 business days. The following steps tell you how to register for a login:

1. Select "Register Here" on the top right (just below the Login and Password boxes) of the [Online Customer Support \(https://support.lucent.com/portal/olcsHome.do\)](https://support.lucent.com/portal/olcsHome.do) web site.
2. Follow this registration process:
 - Select the role and accept the terms of use.
 - Provide a business identification, and enter in all of the required information.
 - Validate your email address.
 - Confirm your business identity and set a password.
 - Select content. (This will be verified against the current contract agreements.)
 - Register for the selected content.
3. An email confirmation of the registration and the site access privileges is sent within 2 business days.
4. Customize the web view once you have gained access to the OLCS web site.
 - After logging in, a personalized view of the Customer Support Home page displays. This view is based on the user's and company support entitlements.

Need Help while registering?

From the U.S.	1 (866) 582 3688, prompt 7
From outside the U.S.	+1 (630) 218 7688
In Asia/Pacific	Please contact the in-country technical support hotline.
Via email	Use the email address: olcshelp@alcatel-lucent.com or use the site's "Contact Us" form
Use the OLCS help desk number for OLCS access problems, registration questions, password resets, navigation questions, etc.	

View an OLCS website


After you have logged into the OLCS web site, a personalized view of the Customer Support Home page is displayed. This view is based on the user's and company support entitlements.

To set Customer Support as the default, if it is the primary destination on the www.alcatel-lucent.com website, click "Select default home page" on the left column. The "My Products" section provides you with quick navigation to the entitled products and also quick access to the CARES tool. While navigating through the various tools, you can establish bookmarks to certain tools, documents, or web pages (within OLCS) by clicking "Add to Bookmarks."

The Customer Support home page can be customized by selecting "Customize page layout" and adjusting the fields to be displayed (uncheck the boxes to de-select those elements). These fields can be adjusted at any time. The changes take effect immediately.

There are two methods to find product information. Click "My Products" to choose a product, or click "Documentation" or "Downloads" to display a complete product listing. When the full product list is displayed, use the alphabetic listing (default) or the category list, whichever you prefer. Once a product is selected, a "Product Summary Page" is displayed, which describes all of the tools and features available for this product.

Note: If content has been posted, but contract entitlements do not allow access, then the following padlock icon is displayed:

 Currently, you are not entitled to access these item(s). For access requirements, please review your [Support options](#).

Ask AL Knowledgebase

The Ask AL web page can be accessed from the left column on the Customer Support homepage (unless you changed the view), from the "Technical Support" section in the center of the page, or from the "My Bookmarks" section (if it was added there). Once at

the Ask AL Knowledgebase web page, enter a question or phrase using natural language, and click the check boxes for only the products that should be searched; otherwise, all products checked will be searched.

The results that return show a percentage weight or percent match based on the search criteria. To refine a search, add more details to the question or phrase and answer the other questions displayed. Once you find a solution of interest, select that solution, and the complete solution will display.

Many of the solutions are based on generated ARs or Known Problems from the SRD. To provide quality information, solutions go through a review process before being posted. Content can grow daily as solutions move through the review cycle.

CARES

CARES ARs are accessed from the left column on the Customer Support homepage (unless this view was changed), under the “Technical Support” section in the center of the page, from the “My Bookmarks” section (if CARES was added there), or from the Quick Link section “CARES Assistance Requests,” at the bottom of the Customer Support homepage. Product Notifications and Solutions can also be selected in this section. These are both legacy tools. The new tools, Alcatel-Lucent Alerts and Ask AL Knowledgebase, are discussed in other sections of this document.

When you select CARES, a general web page displays. From that page, a particular function can be selected from the left column. To provide more information on the selected tool, select “More” from the center column.

ARs can be viewed (using “Find an AR” or “Advanced query”), created (using “Create an AR”), or used to report a warranty defect (using “Report a warranty defect”). The CARES web interface has features that keep you informed about the progress of ARs. With the flexible AR Notification subscriptions, CARES can email or send text messages on a variety of activities regarding an AR. A notification is sent when the AR state is changed to Created, Resolved, Closed, or Pending Customer Action. Other conditions that generate notifications are if the following fields are updated: Investigation, Short Description, Current Summary, Description, and Resolution. You can set up (subscribe), remove (unsubscribe), or change these conditions at any time.

Data Drop Box

You can access the Data Drop Box from the left column on the Customer Support homepage (unless your view was changed), from the “Technical Support” menu in the center of the page, or from the “My Bookmarks” section (if Data Drop Box has been added there). Click the “Upload a file” button in the Data Drop Box window to send a file to the Alcatel-Lucent support technician. An email address can also be entered so that the

Alcatel-Lucent technician will be notified when the file has been sent. Click the “Download a file” button from the Data Drop Box if the Alcatel-Lucent technician has sent a file to be downloaded. These files will remain on the site for 7 days.

Documentation

You can access documentation by selecting a product from the “My Products” area. Alternatively, documentation can also be accessed from the left column on the Customer Support home page (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if Documentation has been added there). If accessing Documentation by means other than the “My Products” area, choose the product whose documentation you wish to access by selecting the product from the alphabetical listing or the category list.

Once you are on the product web page, select “Manuals and Guides” from the list under the “Documentation and downloads” section. The “Manuals and Guides” link brings you to the Library of Manuals and Guides for the product you have chosen. The document links bring you to the document stored in the Alcatel-Lucent Customer Information Center (CIC) web site or to another OLCS webpage that contains the product documentation.

Within the “Documentation and Downloads” area, the “Technical Notes” link brings you to a web page which contains documents that are not release specific and are technical in nature.

Also, within the “Documentation and Downloads” area, the Release Information link brings you to a Library of Release Notes web page that contains documents which are release specific and are listed by release.

Click on these links to download or open a PDF file.

Downloads

Important! This may not apply to all products.

You can access downloads by selecting a product from the “My Products” section. Downloads can also be accessed from the left column on the Customer Support homepage (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if Downloads was added there). If accessing Downloads by means other than the “My Products” area, choose the product whose Downloads you wish to access by selecting the product from the alphabetical listing or the category list.

Once you are on the product web page, click the “Downloads: Electronic Delivery” link from the list under the “Documentation and Downloads” area. Select the appropriate release to be downloaded from the drop-down list, and click “Next.” Select the file to be downloaded and click “Next.” On the next web page, enter the path where the file should be downloaded and click “Download.”

Alcatel-Lucent Alerts

You can access Alcatel-Lucent Alerts from the left column on the Customer Support homepage (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if Alcatel-Lucent Alerts is added there).

Once you are on the Alcatel-Lucent Alerts web page, a list of products are displayed. Click on a product to see a list of Alerts for that product. Alternatively, use the “Enter the number of the Alert” field to find a specific Alert, or use the text search to search for Alerts with certain words.

To subscribe to Alcatel-Lucent Alerts, click the “Alerts Subscription Page” link. Once at the “Alcatel-Lucent Alerts Subscription” page, fill out the form and choose the product whose alerts you would like to subscribe to.

You have the option to click “Modify Subscription” or “Cancel Subscription.” Modify Subscription allows you to modify the Urgency, Type, and/or Products selected. “Cancel Subscription” will stop future Alcatel-Lucent Alerts email messages.

Product Change Notices (PCNs)

You can access Product Change Notices (PCNs) from the left column on the Customer Support home page (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if PCNs were added there).

Once on the PCN web page, a list of PCNs is displayed. You can search PCNs by clicking one of the following links:

- PCN cross-reference
- Search for specific text in Class A PCNs
- PCNs added or updated within the past 30 day
- Change Notice summary report

Return Material Authorization (RMA) (Repair and Exchange)

Important! This may not apply to all products.

Return Material Authorization (RMA) can be accessed from the left column on the Customer Support home page (unless this view has been changed), from the “Technical Support” section in the center of the page, or from the “My Bookmarks” section (if it was added there).

Once on the RMA web page, a table with contact information is displayed. Use the contact information provided or choose to fill in the online RMA request form at the bottom of that web page.

Other technical support services

The technical support services expert workshop series

Audience: Technicians, installers, maintenance engineers, technical support personnel, product evaluators, and anyone who has a working knowledge of the products involved and is interested in a hands-on workshop covering advanced troubleshooting issues.

Description: The same engineers that resolve the Assistance Requests (ARs) have developed a series of advanced, hands-on workshops that can be customized to the unique network applications. Individual product modules will provide the knowledge and skills to perform troubleshooting and fault-finding activities at the equipment site or from a remote operations center. There are lab exercises using Alcatel-Lucent network management systems to simulate real-world provisioning and troubleshooting scenarios. In addition, general technology modules will round out the understanding of the network element (NE) troubleshooting performed.

Objectives: Each module has specific objectives. Some overall series objectives are listed below:

- Understand advanced network element security features
- Setup and understand interworking between Alcatel-Lucent network elements
- Perform provisioning operations and remote trouble-shooting using CIT, EMS and TL1 interfaces.
- Analyze Performance Monitoring Data
- Understand alarm handling / alarm management
- Provision and understand system synchronization techniques
- Provision and understand protection schemes (BLSR, UPSR, 1+1 APS)
- Understand network communication issues (OSI and TCP/IP interfacing)

Length: Product Modules are scheduled for 3 days. Technology Modules are scheduled for 1 day.

Expected Foundation Knowledge: Suggested prerequisites are listed on each module's workshop description. Generally, customers should have a basic understanding of digital fundamentals and lightwave transmission systems. In addition, customers should have taken a previous Alcatel-Lucent Operating & Maintenance course or have equivalent experience with operations and maintenance issues related to the product

Activities Prior to Workshop Delivery: The effectiveness of this workshop series relies on the fact that it allows a customer to address the issues experienced in their network today. To achieve this, prior to the workshop, a conference call will be set up with the engineers that will facilitate the workshop. During this call, the logistics of simulating the customer's network environment will be discussed.

Workshop Location: This workshop will be delivered in the Customer Advocate System Test Labs in Westford, MA. The format is 75% hands-on lab exercises, reinforced with 25% classroom instruction.

How to Sign Up:

To enroll in the training course:

- Within the United States,
 - Visit <https://training.lucent.com>
 - Call **1 (888) 582 3688**: *Prompt 2.*
- Outside the continental United States,
 - Visit <https://training.lucent.com>
 - Contact your in-country training representative
 - Call: **+1 (407) 767 2798**
 - Fax: **+1 (407)767 2677**
- Enter “Advanced Workshops” in the search menu and click “Go.”
- Choose which Advanced Maintenance Workshop you’d like to register for by clicking on the link.
- Read the workshop description(s) and follow the links to register.

Glossary



Symbols

?

A wild card character used to represent any character.

Numerics

5E-XC

Applications that provide the capacity and converged networking capabilities that existing networks need to implement Accelerate Voice over IP solutions to rapidly deliver next-generation services that enterprises and consumers want.

A

API

Application Programming Interface.

