

1663 Add Drop Multiplexer-universal (ADMu)

Release 6.1

Alarm Messages and Trouble-Clearing Guide

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License information for Open Source software

1663 ADMu software contains open source software. For further details about handling/usage and licensing of the contained/used open source software, please check 1663 ADMu open source declaration files which are available on the 1663 ADMu SW CD-ROMs.

Overview EMC/ESD Safety

The EMC/ESD boundary has been defined at Rack/Subrack level. The principle is based on the "Faraday Cage" theory. If there are doors, then the doors must be closed. With every rack/subrack an ESD (electrostatic discharge) earth socket and an ESD sticker are supplied. On the Rack frame ETSI an ESD bonding point for an ESD wrist strap is present. It is mounted in a way that it's always accessible for installation, normal operation and maintenance activity.

Wrist Strap

The wrist strap must be worn when opening the Subrack doors.

Electrostatic Sensitive Devices

The equipment described in this guide contains static sensitive devices. Electrostatic Discharge Precautions should be taken when operating or working on this equipment.

Special handling precautions apply whenever installing or removing parts of the equipment include:

- Leaving components or equipment in original packaging until required for use.
- Removing plug-in units with previously discharged hands (e.g. using grounded wrist straps connected to the ESD Bonding Point on the Cabinet).
- Returning items for repair in suitable antistatic packaging.

Ordering information

The order number of this document is 365-312-843R6.1 (Issue 1).

Technical support

Please contact your Alcatel-Lucent Local Customer Support Team (LCS) for technical questions about the information in this document.

Information product support

To comment on this information product online, please go to <http://www.lucent-info.com/comments> or email your comments to comments@alcatel-lucent.com.

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About this information product

Purpose

The purpose of this Alarm Messages and Trouble Clearing Guide (AMTCG) is to provide the maintenance personnel with all information necessary to solve the alarms in a specific Network Element (NE).

The Alarm Messages and Trouble Clearing Guide (AMTCG) is a network oriented manual and will be shipped together with the NEs. The philosophy behind the maintenance of NEs within a network is that the network is already installed, configured and service has been provided to the network after first installation.

Reason for reissue

This is the first issue of the Alarm Messages and Trouble Clearing Guide for the 1663 ADMu Release 6.1.

Safety information

This information product contains hazard statements for your safety. Hazard statements are given at points where safety consequences to personnel, equipment, and operation may exist. Failure to follow these statements may result in serious consequences.

Intended audience

This document is intended for maintenance personnel who take care of the daily activities on Network Elements, using the *Navis*[®] OMS.

Maintenance personnel have to perform the following tasks

- Identify alarms and/or performance degradation.
- Gather information about the alarms and/or performance degradation.
- Interpret alarm information:
 - alarm location
 - alarm priority (service affecting)
 - correlate alarm priorities in case of multiple alarms.

- Resolve alarms:
 - determine strategies for correcting alarms and the consequences of these strategies
 - determine when best time to correct problems (depending on alarm severity)
 - make an action plan to correct alarms or performance degradations.
- Request to re-route traffic when sources are not available.
- Instruction to replace system parts.
- Instructions to perform specific measurements that can be used for analyzing the problem.
- Check the results of the action plan and instructions.
- Restore the original network configuration when re-routing was necessary to correct the problem.
- - Perform preventive maintenance:
 - gather performance data for preventive maintenance
 - schedule tests/self-tests
 - switch to protection parts if necessary to take corrective action.

How to use this information product

The Alarm Messages and Trouble Clearing Guide (AMTCG) is divided into a number of chapters.

This guide is divided into the following chapters:

- About this guide: Brief description over how to use this guide.
- Alarm Messages: This chapter holds an alphabetic list of all alarms for the related network element.
- Glossary: In this chapter all the special terms and all the abbreviations and acronyms, used in this manual, are listed.

Conventions used

The samples of windows shown in this guide are examples of typical windows. The contents (text) on a window as well as the window itself may differ from the window displayed on the *Navis*® OMS.

This guide will use the following notations





WARNING

Suggests the possibility of equipment damage or software corruption



CAUTION

Suggests the possibility of service interruption

CAUTION

Suggests the possibility of equipment damage or service interruption

Important! Gives supplementary information

Approval mark

The following CE approval mark applies to this product.



CE Marking is the indicator for products conform with relevant European Community (EC) Directives. CE stands for Conformité Européenne. The CE-marked transmission equipment is compliant with one EC Directive: 89/336/EEC - Electro-magnetic compatibility (EMC). In this manual you will find several chapters in relation with the CE-marking, for example the use of EMC closed connector Hoods, filtered connectors, and warnings to use a wrist strap when handling equipment.

Related documentation

This section briefly describes the documents that are included in the 1663 ADMu documentation set.

- **Applications and Planning Guide**
The 1663 ADMu Applications and Planning Guide (APG) is for use by network planners, analysts and managers. It is also for use by the Alcatel-Lucent Account Team. It presents a detailed overview of the system, describes its applications, gives planning requirements, engineering rules, ordering information, and technical specifications.
- **User Operations Guide**
The 1663 ADMu User Operations Guide (UOG) provides step-by-step information for use in daily system operations. The manual demonstrates how to perform system provisioning, operations, and administrative tasks by use of ITM Craft Interface Terminal (ITM-CIT).

- Alarm Messages and Trouble Clearing Guide
The 1663 ADMu Alarm Messages and Trouble Clearing Guide (AMTCG) gives detailed information on each possible alarm message. Furthermore, it provides procedures for routine maintenance, troubleshooting, diagnostics, and component replacement.
- The Lucent OMS Provisioning Guide (Application 1663 ADMu)
The Lucent OMS Provisioning Guide (Application 1663 ADMu) gives instructions on how to perform system provisioning, operations, and administrative tasks by use of Lucent OMS.

The following table lists the documents included in the 1663 ADMu documentation set.

Document title	Document code
1663 ADMu Release 6.1 Applications and Planning Guide	109649467 (365-312-841R6.0)
1663 ADMu Release 6.1 User Operations Guide	109649509 (365-312-842R6.0)
1663 ADMu Release 6.1 Alarm Messages and Trouble Clearing Guide	109649459 (365-312-843R6.0)
1663 ADMu Release 6.1 Installation Guide	109649483 (365-312-844R6.0)
Lucent OMS Provisioning Guide (Application 1663 ADMu)	109649491 (365-312-875R6.0)
1663 ADMu Safety Guide	109640631 (365-312-879)
CD-ROM Documentation 1663 ADMu Release 6.1 (all manuals on a CD-ROM)	109649475 (365-312-845R6.0)

How to comment

To comment on this information product, go to the [Online Comment Form](http://www.lucent-info.com/comments/enus/) (<http://www.lucent-info.com/comments/enus/>) or e-mail your comments to the Comments Hotline (comments@alcatel-lucent.com).

1 General information

Overview

Purpose

This chapter provides general information concerning the structure of this information product.

Contents

Structure of hazard statements	1-2
Structure of alarm descriptions	1-4
1663 ADMu operation modes	1-7
Alarming of equipment failures in protected and unprotected configurations	1-10



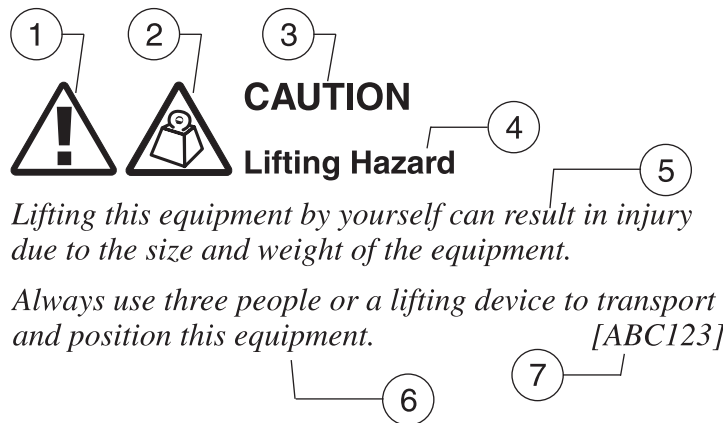
Structure of hazard statements

Overview

Hazard statements describe the safety risks relevant while performing tasks on Alcatel-Lucent products during deployment and/or use. Failure to avoid the hazards may have serious consequences.

General structure

Hazard statements include the following structural elements:



Item	Structure element	Purpose
1	Personal-injury symbol	Indicates the potential for personal injury (optional)
2	Hazard-type symbol	Indicates hazard type (optional)
3	Signal word	Indicates the severity of the hazard
4	Hazard type	Describes the source of the risk of damage or injury
5	Damage statement	Consequences if protective measures fail
6	Avoidance message	Protective measures to take to avoid the hazard
7	Identifier	The reference ID of the hazard statement (optional)

Signal words

The signal words identify the hazard severity levels as follows:

Signal word	Meaning
DANGER	Indicates an imminently hazardous situation (high risk) which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potentially hazardous situation (medium risk) which, if not avoided, could result in death or serious injury.
CAUTION	<i>When used with the personal injury symbol:</i> Indicates a potentially hazardous situation (low risk) which, if not avoided, may result in personal injury. <i>When used without the personal injury symbol:</i> Indicates a potentially hazardous situation (low risk) which, if not avoided, may result in property damage, such as service interruption or damage to equipment or other materials.



Structure of alarm descriptions

Alarm descriptions

Each alarm message is described using a tabular overview. The alarm descriptions are alphabetically ordered according to the alarm text. To find the alarm description related to a specific alarm short designation (for example “TU3cAIS” or “MS16cLIVM”), please refer to the alphabetical index.

The information provided for each alarm includes the meaning of the alarm, the alarm’s short designation (alarm identifier), the alarm category, the alarm’s default severity etc.

Alarm identifier

The “Alarm identifier” entry in the alarm overview table gives the alarm short designation as displayed in the list of current alarms.

Alphabetical index

Please refer to the alphabetical index provided with this information product to find information concerning alarms of which you only know the alarm short designation.

Alarm category

The “Alarm category” entry in the alarm overview table indicates the functional area to which the alarm belongs.

The alarms that can be reported by 1663 ADMu can be divided into these alarm categories:

- Environment
Environment alarms are caused by defects detected in external devices which can be monitored.
- Equipment
Equipment alarms are caused by hardware defects.
- Processing error
Processing alarms are caused by inconsistencies in the internal data processing.
- Quality of service (performance monitoring)
Performance alarms (quality of service alarms) are caused by threshold crossings of performance counters.
- Transmission
Transmission alarms are caused by defects detected in the transmission signal.

ASAP

The “ASAP” entry in the alarm overview table indicates the type of alarm severity assignment profile to which the alarm belongs.

For a detailed description of ASAPs, please refer to the *1663 ADMu User Operations Guide*.

Alarm severity

The “Alarm severity (default setting)” entry in the alarm overview table indicates the factory settings of the corresponding alarm’s severity. This is the alarm severity as it is defined in the default ASAP.

Each alarm can be assigned one of the following severities:

Alarm severity	Meaning
Prompt	Prompt maintenance alarm: Urgent alarm that requires immediate (prompt) maintenance action.
Deferred	Deferred maintenance alarm: Non-urgent alarm that requires deferred maintenance action.
Information	Informational alarm.

Reporting state

The “Reporting state (default setting)” entry in the alarm overview table indicates the factory settings of the corresponding alarm’s reporting state, i.e. whether an alarm is reported towards the management systems or not.

Each alarm can be assigned one of the following reporting states:

Alarm severity	Meaning
Reported	The alarm - when raised - will be reported towards the management systems (<i>Navis</i> [®] OMS and ITM-CIT), and displayed on the graphical user interfaces.
Not Reported	The alarm - when raised - will <i>not</i> be reported.

Please note that changing the alarm reporting state does not affect the display of currently present and history alarms. Especially the display of already present alarms cannot be removed if their reporting state is changed from “Reported” to “Not Reported”.

Local indications

Local indications are indications directly at the network element, typically via light-emitting diodes (LEDs), especially via the red fault LED.

Please note that the local indications via the red fault LED are *controlled by defects*, not alarms.

User panel LEDs

Important! The signalling of alarms by means of the user panel LEDs or the office alarm interfaces is *not* taken into consideration in this *Alarm Messages and Trouble Clearing Guide* because the signalling of alarms by means of the user panel LEDs or the office alarm interfaces depends on the actual value of the alarm severity and the reporting state. Provided that the reporting state is “Monitored”, on the user panel the alarm LED corresponding to the actual alarm severity is lit, and the corresponding station alarm loop is closed.



1663 ADMu operation modes

Slot modes

The slots of a 1663 ADMu system can be occupied by a “unit”. A unit is either a main unit or a tributary unit. Usually, a unit occupies a single slot. However, some tributary units (i.e. legacy option boards, mounted on an adapter card) occupy two slots.

These slot modes exist:

ASSIGNED	<p>The slot is configured to contain a unit of a specified type. If a unit of a compatible type¹ is present in the slot, then the unit provides service, except for transmission ports. Transmission ports are controlled by the port mode configuration, see “Monitoring modes” (p. 1-8).</p> <p>Assigned slots are monitored for equipment defects, and corresponding alarm messages will be reported.</p>
AUTO	<p>The slot may still be empty, but is <i>pre-configured</i> to contain a unit of a specific type.</p> <p>This slot mode corresponds to the UNASSIGNED mode as long as no unit is present. As soon as the presence of a compatible unit is detected the slot mode is automatically changed to ASSIGNED. Note that if a unit of an incompatible type is detected, a “Wrong Unit Present” alarm (UNITcWUP) will be reported.</p>
UNASSIGNED	<p>The slot is configured to be empty. If a unit is present in an UNASSIGNED slot then the unit does <i>not</i> provide service; if there are ports on the unit, then incoming signals will not be processed, and will not be monitored for defects.</p> <p>No alarms will be generated in case of a fault or error condition on a unit in an UNASSIGNED slot; only its presence will be signaled as a fault condition (“Unit present in unassigned slot”, UPUS).</p>

Notes:

1. A compatible unit is a unit which is permissible for the respective slot. Please refer to the *1663 ADMu Applications and Planning Guide* for compatibility information.

Configuration rules

The main slot 1 (MAIN-1) is a “mandatory slot”, i.e. the slot mode is restricted to ASSIGNED.

The operational mode of the remaining slots (MAIN-2, TRIB-1, TRIB-2, TRIB-3 and TRIB-4) can be configured for each slot individually to any of the available slot modes.

The default slot mode is ASSIGNED for the MAIN-1 slot, and UNASSIGNED for all other slots.

The applicable units are release-dependent. For further information on the applicable units, please refer to the *1663 ADMu Applications and Planning Guide*.

Monitoring modes

Monitoring modes are applicable to physical ports, trail termination points and non intrusive monitoring (NIM) points. Monitoring modes can be provisioned for each type of physical port or termination point (TP) individually.

The setting of the monitoring mode determines whether an incoming signal will be processed, including alarm supervision and performance monitoring.

These monitoring modes exist:

“Monitored” (MON)	Monitoring is enabled. The port or termination point provides service, and the incoming port or termination point signal is monitored for defects. This means that receive and transmit side signals are processed according to the provisioning of the port or termination point, including alarm supervision and performance monitoring.
“Automatic” (AUTO)	A port or termination point can be put into this mode when the signal source in the remote system is not (yet) operational. Monitoring is disabled as long as no receive- and transmit-side signals are applied. However, the monitoring mode is automatically switched to monitored as soon as a signal is continuously applied.
“Not monitored” (NMON)	A port or termination point can be put into this mode when it is not used. Monitoring is disabled, the incoming port or termination point signal is <i>not</i> monitored for defects.

Port monitoring mode

The monitoring mode of a physical port can be set for each port individually to:

- “Automatic” (AUTO),
- “Monitored” (MON), or
- “Not monitored” (NMON).

RS and MS termination point monitoring mode

Regenerator Section (RS) and Multiplex Section (MS) termination points have the same monitoring modes as their associated physical interface (= physical port).

VC trail termination point monitoring mode

The monitoring mode of a VC trail termination point (TTP) can be set for each TTP individually to:

- “Monitored” (MON), or
- “Not monitored” (NMON).

VC-Xv path termination point monitoring mode

The monitoring mode of a VC-Xv trail termination point (TTP) can be set for each TTP individually to:

- “Monitored” (MON), or
- “Not monitored” (NMON).

P11s and P12s path termination point monitoring mode

The monitoring mode of a P11s or P12s trail termination point (TTP) can be set for each TTP individually to:

- “Monitored” (MON), or
- “Not monitored” (NMON).

VC non intrusive monitoring (NIM) mode

The monitoring mode of a VC connection termination point (CTP) for non intrusive monitoring of a VC path can be set for each CTP individually to:

- “Monitored” (MON), or
- “Not monitored” (NMON).



Alarming of equipment failures in protected and unprotected configurations

Fundamental types of equipment fault conditions

The following fundamental types of equipment fault conditions are defined for various system components (“...” represents the respective system component):

- ...cUNI: Unit not present
- ...cWUP: Wrong unit present
- ...cUPF: Unit failure
- ...cEQF: Equipment failure

A special case is the ...cUPF alarm. The meaning of this alarm depends on whether the affected system component is protected or not.

Equipment-protected configuration

A ...cUPF alarm will always be reported for the active unit in an equipment-protected configuration which detects at least one of the equipment fault conditions ...cUNI, ...cWUP, or ...cEQF. At the same time, the corresponding fault condition (...cUNI, ...cWUP, ...cEQF) will also be alarmed.

Unprotected configuration

A ...cUPF alarm will be reported for each unprotected unit that detects at least one of the equipment fault conditions ...cUNI, ...cWUP, or ...cEQF. At the same time, the corresponding fault condition (...cUNI, ...cWUP, ...cEQF) will also be alarmed.

The ...cUPF alarm is reported in order to draw attention to the fact that the equipment fault condition is very serious, because no equipment protection is available.



2 Operations interfaces

Overview

Purpose

This chapter describes how the operations interfaces can be used to convey operational information to and from the system.

Two types of operations interfaces can be distinguished:

- Internal operations interfaces
- External operations interfaces

Internal operations interfaces

This type of operations interfaces has its human-machine-interface built within the equipment and it encompasses unit LEDs and user panel.

The primary role of the Internal Operations Interfaces is to offer the possibility to check the system without the need for connecting any external equipment. If there is a fault which was located automatically these Operations Interfaces will show the location down to a specific circuit board. In addition, the severity of the fault is shown and whether any new failures have occurred since the most recent fault acknowledgment by the operator.

External operations interfaces

This type of operations interfaces offers a more or less sophisticated interface to non-transmission equipment outside the equipment shelf. It encompasses connections for the station alarm grid, miscellaneous station alarm devices and various external control devices (e.g. Element Management System).

Two types of external operations interfaces are recognized:

- Lower level external operations interfaces with simple devices like lamps and relay contacts
- Higher level external operations interfaces with PCs and operations systems.

The external equipment that has to be connected to make use of these interfaces, has to comply with standards which are described in this document.

Design

The system has been designed mainly for operation in not staffed stations. This implies that the system has to be able to signal events to a centralized Operations and Maintenance Centre (OMC). It is assumed that the *Navis*[®] OMS is located in the OMC.

Fault detection

The information presented in the OMC will be detailed enough to assess which service is faulted, what the fault condition is, which type of unit(s) is (are) involved and what the location is where the field personnel has to go to.

When maintenance personnel is at the equipment location, the station alarm interface, user panel and unit LEDs will guide him to the location of the fault.

If the system is used in a staffed station these operations interfaces are also used. However it should be clear that the extent of the usage of the station alarm interface depends on the physical size of the equipment housing, that is there is no point in having end-of-suite lamps in a street cabinet.

Function alarm devices

The mentioned alarm devices do mainly three things:

- they alert (if this was not already done by other means)
- they aid in the localization of the failure
- they signal (if possible) the nature of the failure.

Fault localization

The first thing that draws the attention is the audible station alarm. The different station alarm loops can be used e.g. to drive differently pitched audible devices so that the severity of the fault can be assessed immediately.

The next step in the localization of the malfunction is supported by the suite lamps. They show the suite in which more information can be obtained.

Entering the suite the bay-top lamp (or rack lamps) shows where more information can be obtained. Standing in front of the equipment an illuminated LED on the user panel shows that a failure has occurred.

Contents

Unit LEDs	2-4
User panel LEDs and keys	2-6
Lower-level operations interfaces	2-9
Operations interfaces in a local station	2-15
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Unit LEDs

Each of the plug-in units is equipped with a red Unit LED. The Core Unit has two LEDs, the red unit LED and the green power on LED. The power on LED is lit when the battery input to that Core Unit is present.

The Unit LEDs are controlled by the on-Board Controller (BC). There is a redundantly fed LED power line available from which the LEDs will be lit in case of an on-board power converter fault.

Operation

The Unit LED indicates configuration, hardware and transmission faults with respect to the unit.

Configuration faults

When the unit is inserted into a shelf which is already powered up, or when power is applied to a shelf which contains units, the Unit LED will be lit immediately. After that the control system takes into account the mode of operation of the slot and, if applicable, the mode of operation of the port(s) on the unit and controls the Unit LED accordingly. In case of a failure of the on-Board Controller the LED will remain lit.

Hardware faults

A permanently lit LED on a unit indicates a hardware fault on that particular unit and the unit should be replaced by a spare one.

Transmission faults

A flashing LED means that there is something wrong with the transmission signals which are terminated on that unit (fibre break e.g.). The Integrated Transport Management-Craft Interface Terminal (ITM-CIT) should be used to determine the type of failure.

When the control system determines that a fault in a received transmission signal can only be caused by a fault inside upstream equipment and not by cabling or connector problems the unit LEDs will not be lit.

Flashing LED

Three different types of flashing LEDs can be distinguished:

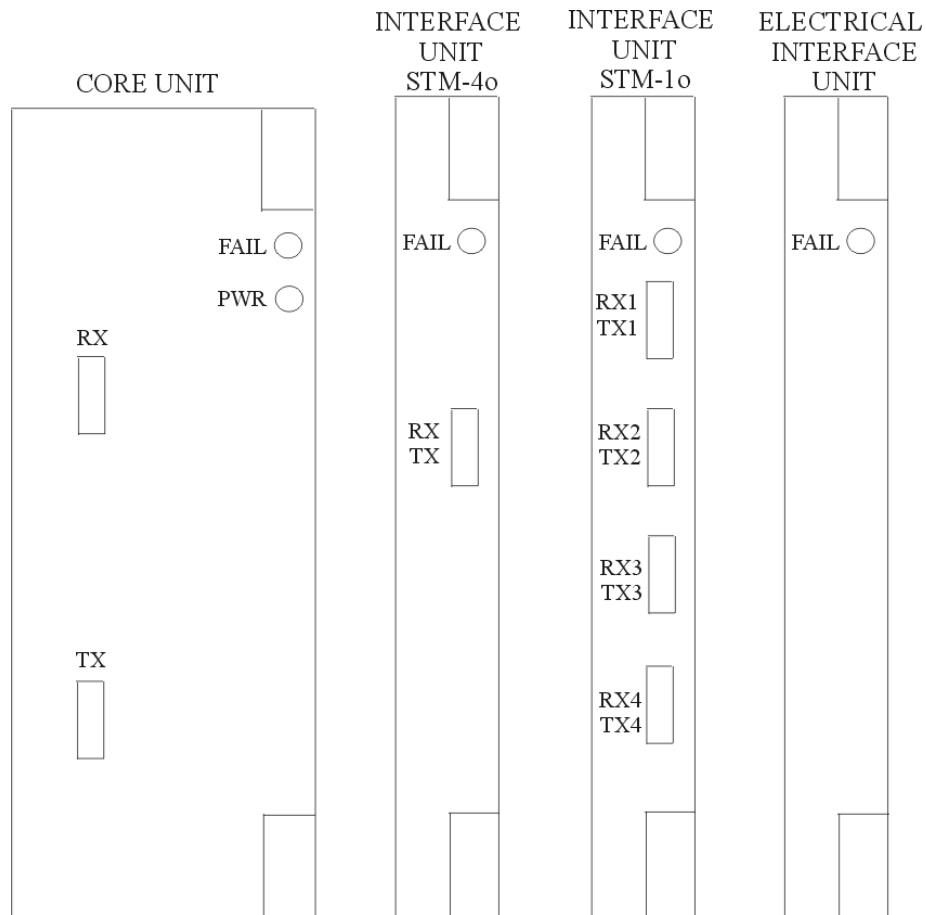
- a flashing LED on an interface unit indicates an incoming signal to that unit pack has failed this can be a transmission signal or an external timing reference failure
- a flashing LED on the System Controller (SC) indicates loss of communication with the Element Management System..

Backplane

The backplane is considered to be a unit and the control system is able to assign a hardware fault to it but it has no Unit LED. Therefore locating a fault on the backplane cannot be done without a workstation or alike. To repair faults on the backplane the system has to be taken out of service.

LEDs on front plate

The next figure shows the position of the LEDs on the Core Unit and on the Interface Units (not to scale). The front plate of the System Controller is shown in the next paragraph “User Panel LEDs and keys”.



User panel LEDs and keys

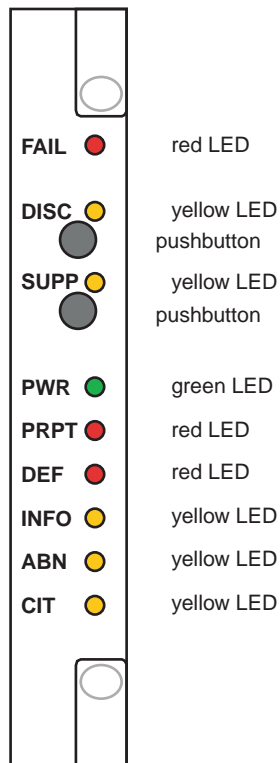
The User Panel LEDs are the primary means of assessing the system state; the keys are the primary user input devices towards the system. The User Panel also contains the Workstation connection point.

Operation

The User Panel of the 1663 ADMu is integrated in the faceplate of the System Controller. Light-guides are used to make the alarm and status indicators on the System Controller visible. The door must be opened to operate the keys on the User Panel. The User Panel provides system level information.

User panel lay-out

The following picture shows the user panel lay-out (not to scale).



FAIL LED

This is the red unit LED of the System Controller.

PWR LED

The green indicator is lit when at least one of the internal 48 V power feeds has its voltage. The LED is powered from internal redundant power feeds.

PRPT LED

The red indicator will be lit when any new Prompt Maintenance Alarm exists or when the unit which controls it fails.

DEF LED

The red indicator will be lit when any new Deferred Maintenance Alarm exists.

INFO LED

The yellow indicator will be lit when any new Maintenance Event Information exists. If only this indicator is illuminated, no immediate maintenance action is required. It does indicate however that maintenance information is available that may be retrieved through the ITM-CIT or *Navis*[®] OMS, this can be information on latched alarms, for example.

ABN LED

The yellow ABN LED indicates manually initiated abnormal operational states. The following states can be distinguished:

State	Description
<i>ABN LED is off</i>	Normal operating conditions
<i>ABN LED is continuously on</i>	Indicates the existence of abnormal conditions initiated in the network element, for example a protection lockout, a forced switch, a manual switch, protection line in use, alarms disconnected, or a local self test failed.
<i>ABN LED is flashing</i>	A local system test is running.

Important! In the case of a local system test, no abnormal condition is reported to the management system because the communication to the management system is interrupted during a local system test.

SUPP LED

The yellow indicator indicates the existence of any suppressed alarm, e.g. by means of push-button SUPP on the front of the user panel. If one of the severity indicating LEDs is lit the suppress key can be pressed. This releases the station alarm loops, the end of suite loops and the bay top loops in order to make the station alarm system

available for the signaling of new failures. The suppressed alarm loops are then closed. If the controller fails, the suppress function cannot be performed. Then the disconnect key may be used to silence the station alarms. However, this is a non-preferable action because the system can no longer indicate alarms. That is why this key has its own LED and loop. However, use can be made of the non-disconnectable station alarm loops if wanted.

DISC LED

The yellow indicator indicates disconnected alarm loops towards the station alarm interface, disconnection being determined by non-locking switch DISC on the front of the user panel.

CIT LED

This LED is currently not supported.

Power for LEDs

All LEDs other than the DISCONNECT LED are powered from the + 5 volts from the System Controller and are controlled by its software.

The DISCONNECT LED is also powered from the station alarm voltage.

SUPP key

This is a non-locking push button which, if activated, changes the state of all new alarms to suppressed. Alarms arriving after the button was activated are treated as new alarms. The key is read by the Controller software.

DISC key

This is a toggle switch which, if activated, disconnects the alarm loops which are required to be disconnectable towards the station alarm interface. The switch is read by the Controller software.



Lower-level operations interfaces

The lower level operations interfaces consist of the classical station alarm interfaces, bay top alarm interfaces and the interfaces for miscellaneous discretetes.

In this paragraph, each of these operation interfaces is described.

Station alarm interface

The station alarm interface is intended to drive the various alarm devices which are found at the equipment location. The electrical characteristics of this interface allows the connection of a wide range of audible and/or visible alarm devices.

Physical aspects

The station alarm interface will consist of a number of loops which are closed via contacts. Five groups can be distinguished (see also the next Figure).

Group I

The first group (I) consists of two contacts; one side of each is connected to a common return; the other sides are connected to the appropriate connector pins on the connecting panel. These loops are used to drive bay top lamps. One of the contacts is normally closed; the other one is normally open.

Group II

The second group (II) consists of two contacts; one side of each is connected to a common return. The return is connected to the connecting panel via a normally closed contact on the disconnect key. The other sides of the contacts are connected to the appropriate connector pins on the connecting panel. These loops are used to drive end of suite alarm devices. One of the contacts is normally closed; the other one is normally open.

Group III

The third group (III) consists of two contacts; one side of each is connected to a common return; the other sides are connected to the appropriate connector pins on the connecting panel. These loops are used to drive station alarm devices. One of the contacts is normally closed; the other one is normally open.

Group IV

The fourth group (IV) consists of two contacts; one side of each is connected to a common return; the other sides are connected to the appropriate connector pins on the connecting panel. The return is connected to the connecting panel via a normally closed contact on the disconnect key. These loops are used to drive station alarm devices. One of the contacts is normally closed; the other one is normally open.

Group V

The fifth group (V) consists of three contacts; one side of each is connected to a common return; the other sides are connected to the appropriate connector pins on the connecting panel. These loops are used to drive station alarm devices. Two contacts are normally open. The third one is driven by a shorting contact on the back panel.

Electrical ratings

The nominal electrical ratings of the contacts are:

A closed loop behaves as a voltage free resistance of less than 10 Ω between the alarm contact and its associated return. It is capable of carrying currents of not more than 0.5 A DC. An open loop behaves as a voltage free resistance of more than 500 k Ω between the alarm contact and its associated return. It is capable of withstanding voltages of not more than 72 V DC. The alarm loop contacts are capable of sustaining the product of above mentioned current and voltage during transitions.

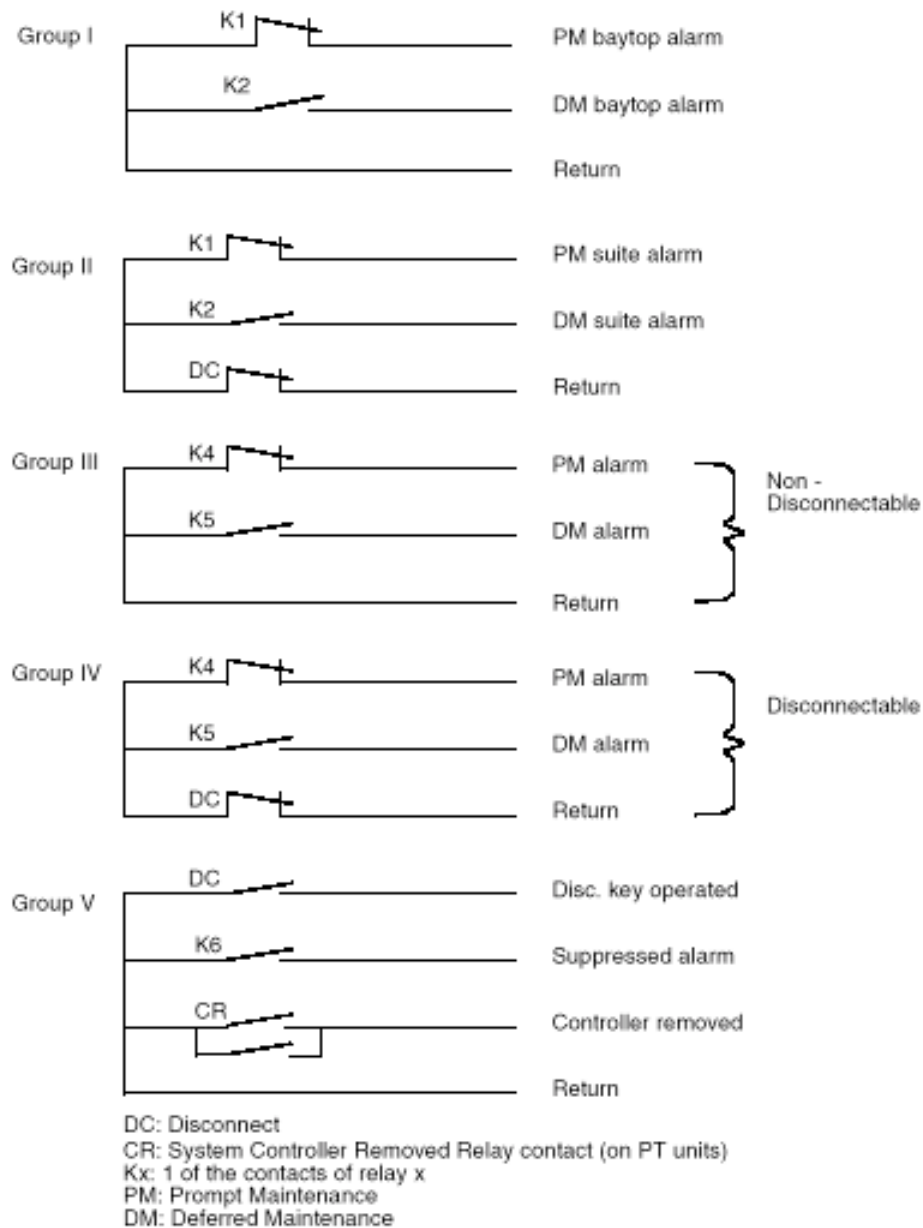
Non-alarm state

The non-alarm state of a loop is open. Relays 1 and 4 will thus be energized in the non-alarm state. When there is a catastrophic power failure these relays will be de-energized and their contacts closed.

Controller Removed Alarm

When the System Controller is removed from the subbay no alarm can be signalled to the station. To signal this situation a Controller Removed alarm is given by the closure of the third loop in group V, see Figure Station Alarm Interface.

Figure 2-1 Station Alarm Interface Overview



Overview alarms and visual indicators

Note that many more causes for closing an alarm loop and illuminating a LED exist. The implementation is focussed on the highest priority failure.

The following table lists various failure conditions and the expected behavior of the alarm loops and indicator.

Failure	LEDs on UPL			SC	Alarm Loops		Core Unit 1 LEDs		Core Unit 2 LEDs	
	POWER	PM	DM	FAIL	PM	DM	GREEN	RED	GREEN	RED
No failures	on	off	off	off	open	open	on	off	on	off
No BATT I input	on	off	on	off	open	closed	off	off	on	off
No BATT II input	on	off	on	off	open	closed	on	off	off	off
No BATT input	off	off	off	off	closed	open	off	off	off	off
PSU on Core Unit 1 fail	on	off	on	off	open	closed	on	on	on	off
PSU on Core Unit 2 fail	on	off	on	off	open	closed	on	off	on	on
2 PSUs fail	off	off	off	off	closed	open	on	on	on	on
SC failure (HW and/or SW)	on	on	off	on	closed	open	on	off	on	off
SC removed ¹	n/a	n/a	n/a	n/a	open	open	on	off	on	off

Notes:

1. The System Controller removed alarm loop closes and will alarm this abnormal situation.

Miscellaneous Discretes and System Discretes

The system provides 2 sets of miscellaneous discrete inputs and outputs:

Miscellaneous discretes inputs (MDIs) and outputs (MDOs). System discretes inputs (SDIs) and outputs (SDOs)

MDIs and MDOs

MDIs and MDOs are intended for customer usage. The inputs can be used to collect status information from other transmission equipment or non-transmission equipment like power supply systems, intruder detectors or fire detectors. The outputs may be used to drive signalling devices or to influence the behavior of equipment external to the system.

SDIs and SDOs

SDIs and SDOs are for internal and system related use. An example is the monitoring of fan alarms.

For the connections of the Miscellaneous Discrete Inputs and Outputs, see the Cable Layout Manual.

The electrical characteristics of all inputs are the same and the electrical characteristics of all outputs are the same for all discretetes.

Miscellaneous Discrete Inputs (MDIs)

The system offers 8 unassigned miscellaneous discrete inputs, and 4 unassigned system discrete inputs. The next figure depicts the configuration for one set of 8 discrete inputs.

The MDIs are not floating with respect to system ground. An MDI is considered active when resistance between input and ground is less than 10 Ω or when the input it is held at a voltage between 0 and 0.4 volts with respect to system ground. An MDI is considered inactive when resistance between input and ground is more than 500 k Ω or when the input is held at a voltage between of 2.4 and 5 volts with respect to system ground. An MDI behaves as a voltage source of 3.3 volts $\pm 5\%$ with respect to system ground in series with a resistor of 50 k $\Omega \pm 20\%$.

The MDIs are floating with respect to system ground. Activation of an MDI requires an external voltage in the range of 18–72 V. An MDI is considered active when resistance between external voltage source and input is less than 10 Ω . An MDI is considered inactive when resistance between external voltage source and input is more than 500 k Ω .

The signals on the MDIs are processed as externally generated defects.

The system will only notify a change in the logical state of an MDI input when it lasts for at least 1 second. The system will process the events on these inputs as anomalies. When such an anomaly exists for at least 3 seconds it is considered to be a defect and a fault.

Rack Head Power Fail Input

The system can, as a customer option, be powered via a power distribution Rack Head. The system will use two MDI inputs that can be used to read the status of two failure indicating outputs on the Rack Head. The first output is active when the Rack Head detects the absence of one or more Battery Voltages on its inputs; the second output is active when the Rack Head detects that one or more of its fuses are blown.

The Rack Head has its own LEDs to indicate which Battery Voltage or fuse fails but it depends on the transmission equipment mounted on the rack to drive Rack and Station Alarms and to convey the fault information to the Network Management. When a Rack Head failure is present, the respective MDI is inactive. When no failure is present, the respective MDI is active.

Miscellaneous Discrete Outputs (MDOs)

The system offers 4 unassigned miscellaneous discrete outputs, and 4 system discrete outputs. The next figure depicts the configuration for one set of 4 discrete outputs.

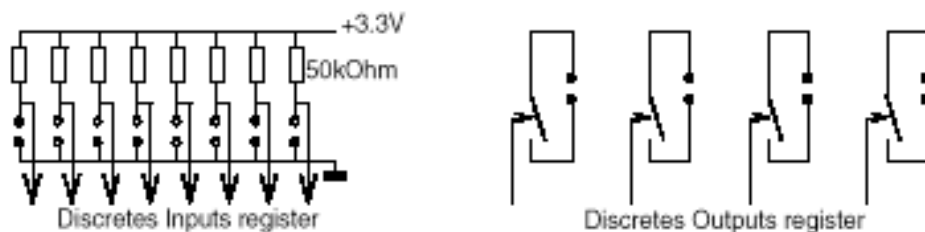
The MDOs are floating with respect to system ground.

An active MDO behaves as a voltage free resistance of less than 10 Ω between the output connection and its associated return. It is capable of carrying currents of not more than 0.5 A DC.

An inactive MDO behaves as a voltage free resistance of more than 500 k Ω between the output connection and its associated return. It is capable of withstanding voltages of not more than 72 V DC.

The MDO contacts are capable of sustaining the product of above mentioned current and voltage during transitions.

MDOs are driven on command from a management system (*Navis*[®] OMS or ITM-CIT).



System Discretes Inputs (SDI) and Outputs (SDO)

The system is provided with 8 system discrete inputs (SDI) and 4 system discrete outputs (SDO).

The electrical specification of SDI interfaces is the same as for the MDI interfaces. The electrical specification of SDO interfaces is the same as for the MDO interfaces.

The SDIs and SDOs are used to support application or customer specific, system internal, features.

Fan alarm inputs

The System Discrete Inputs are used to collect fan alarms.

Fan 1 alarm is reported on input SDI.1. Fan 2 alarm is reported on input SDI.2. Fan 3 alarm is reported on input SDI.3. Fan power alarm is reported on input SDI.4

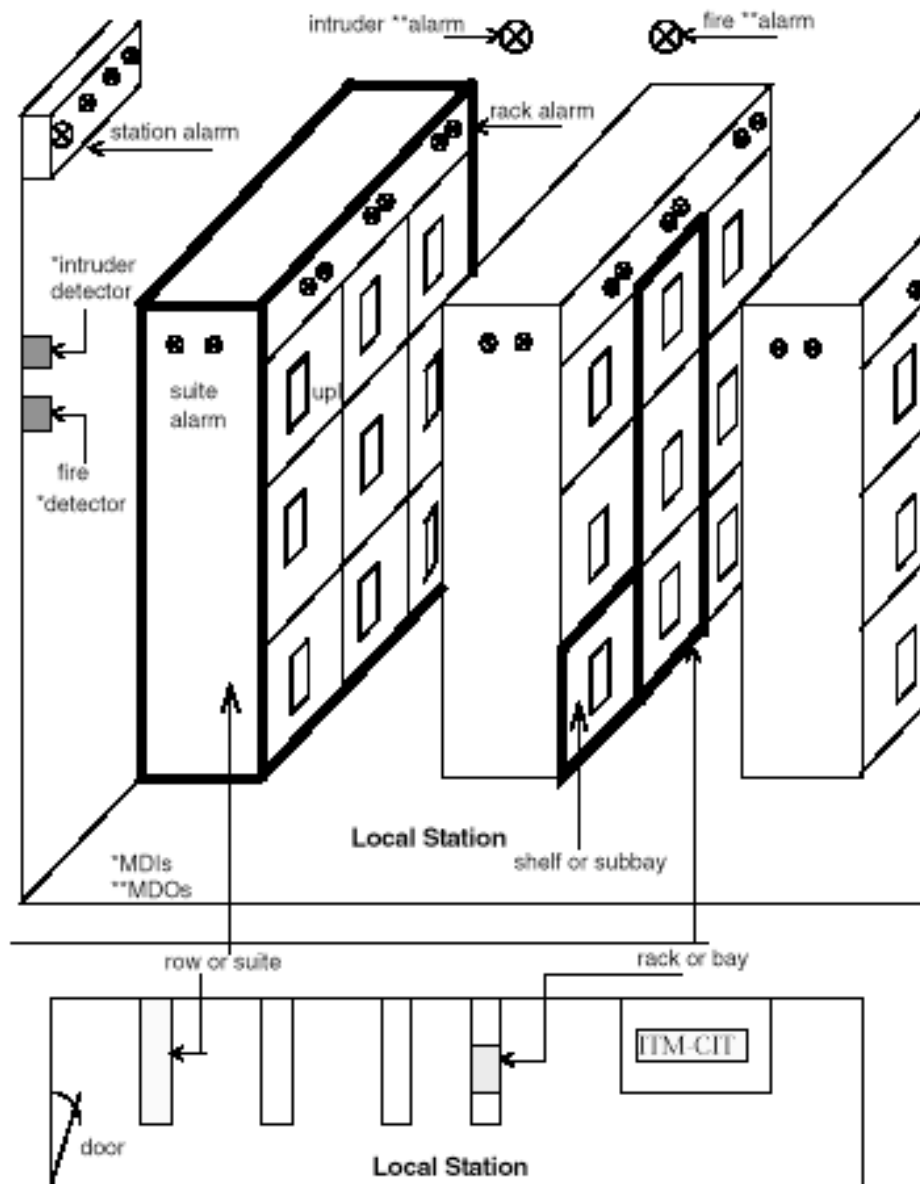
□

Operations interfaces in a local station

The next figure gives an example of a station containing the operations interfaces.

- The UPL on the front of the System Controller.
- The MDIs (e.g. intruder and fire detector) and MDOs (e.g. intruder and fire alarm).
- The station alarms.
- The Integrated Transport Management Craft Interface Terminal.

Station Alarming



Higher-level operations interfaces

The higher level operations environment consists of management via a local workstation (ITM-CIT) or via *Navis*[®] OMS. For the connections of the Higher Level Operation Interfaces, see the Network Element Installation Guide.

Management functions

The major functions of the *Navis*[®] OMS and/or ITM-CIT are:

- It contains copies of the NE's databases (MIB images) and hence contains the configuration and provisioning data of the systems. Therefore it maintains management associations with the NEs.
- It contains copies of the NE software load and provides means to download new loads to the NEs.
- It performs a mediation function between the Operations Systems and the NEs.
- It collects failure and performance data of the NEs.
- Configuration changes can be established via workstation interfaces at the ITM or by the TMN's Operations Systems.

Navis[®] OMS

At the sub-network level, a *Navis*[®] Optical Management System (*Navis*[®] OMS) is available to carry out management functions on a network element or on a sub-network basis. The *Navis*[®] OMS can be located in a central area and is permanently connected to the network element. This offers the possibility to have consecutive sessions with a number of network elements without having to change physical connections.

Q-LAN interface

Each system is provided with a G.773-A2 compatible interface (Q-LAN) which gives the *Navis*[®] OMS access to a co-located NE and, from this NE via the Embedded Control Channels, to NEs at other locations.

Maximum number of nodes

The maximum number of nodes that can be connected to the Q-LAN is 50.

Physical Q-LAN interface

The physical Q-LAN interface, located on the input/output area of the subrack, is the physical interface to the *Navis*[®] OMS.

The physical Q-LAN interface is a 10BASE-T LAN interface as per ISO/IEC 8802.3, also referred to as switched Ethernet[®] (twisted pair, 10 Mbit/s).

CIT-F interface

The CIT-F is intended for maintenance, installation and testing operations local to a system and for temporary use, e.g. to localize a fault. For the connections to the ITM-CIT , see the Network Element Installation Guide

Physical CIT-F interface

The system provides one physical interface for a CIT-F. This physical connection point is located on the input/output area of the subrack.

The electrical interface complies with V.10.

The transmission parameters are, asynchronous; full duplex; 8 bits; no parity; 1 stop bit; 4800, 9600, 19200 and 38400 auto baudrate selection. For this release the 38400 baudrate is the desired rate.



3 Alarm messages

Overview

Purpose

This chapter contains information about the alarm messages that can be reported by 1663 ADMu.

It gives suggestion for solving problems, and provides the maintenance procedures for tracing the faults.

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1 Gigabit Ethernet interface Auto Negotiation Mismatch

Alarm identifier	1GEcANM
Information	A mismatch has been detected between the technology used for the local and remote Ethernet equipment.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The auto-negotiation function has failed to find a common technology with the remote Ethernet equipment.
Actions	Force manually either or both ends of the link into a specific common technology mode.



1 Gigabit Ethernet interface Loss of input signal

Alarm identifier	1GEcLOS
Information	There is no incoming signal on the Gigabit Ethernet port. This is detected by the absence of transitions in the signal, that is, only zeros are received.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the Gigabit Ethernet unit is flashing.
Cause	<p>The alarm was generated because of:</p> <ul style="list-style-type: none"> • Interconnecting cabling contacts have a problem. • Receiver fault in indicated Gigabit Ethernet unit. • Transmitter fault in the upstream equipment (not the Transmission System). • Discontinuity in the intermediate cabling. • Erroneous routing of intermediate cabling.
Actions	<p>Check connections between the indicated tributary unit, the connecting panel, and the DDF (Digital Distribution Frame).</p> <p>Check the tributary receiver port of the indicated tributary unit by looping the data at the DDF.</p> <p>Check upstream equipment (not part of the transmission system).</p> <p>Check intermediate cabling.</p>
Note(s)	The remote alarm indication (Remote Defect Indicator) is activated towards the upstream equipment.



1 Gigabit Ethernet interface Not expected input signal

Alarm identifier	1GEcNES
Information	An incoming signal has been detected on a Gigabit Ethernet port although the port is provisioned “Not Monitored”.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned “Not Monitored”, but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned “Not Monitored”.
Actions	Put the port “Monitored”, or check the cabling (and re-arrange if necessary).



1 Gigabit Ethernet Phy Remote Failure Indication

Alarm identifier	PHY_GEcRDI
Information	The GFP-encapsulated receive signal contains RDI.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In a Link Pass Through (LPT) configuration, a Server Signal Fail (SSF) condition has been detected at the remote end (WAN port) of the transmission line. As a consequent action, RDI has been inserted into the opposite direction in order to inform the sending Ethernet equipment about the failure.
Actions	Identify and clear the higher order transmission alarm(s) which caused the SSF condition.
Note(s)	As a consequent action, the LAN egress port will be switched off.



1.5 Mbit/s AIS

Alarm identifier	E11cAIS
Information	The 1.5 Mbit/s receive signal contains AIS.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Analyze the alarm state of the upstream equipment and take appropriate measures.



1.5 Mbit/s Loss of input signal

Alarm identifier	E11cLOS
Information	There is no incoming signal on a 1.5 Mbit/s tributary port. This is detected by the absence of transitions in the signal.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is flashing.
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Interconnecting cabling contacts have a problem. • Receiver fault in the DS1 unit. • Fault in the transmitting equipment (for example wrong configuration of the output power level). • Discontinuity in the intermediate cabling. • Erroneous routing of intermediate cabling.
Actions	<ul style="list-style-type: none"> • Check tributary connections between the DS1 unit, the connecting panel, and the DDF (Digital Distribution Frame). • Check the tributary receiver port of the DS1 unit by looping the data at the DDF. • Check the transmitting equipment, including the configuration of the output power level. • Check intermediate cabling.
Note(s)	<p>Depending on the provisioning:</p> <p>A Tributary Timing Reference Switch Request is generated to switch over to another timing source.</p>



1.5 Mbit/s Not expected input signal

Alarm identifier	E11cNES
Information	An incoming signal has been detected on a 1.5-Mbit/s tributary port although the port is provisioned “Not Monitored”.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned “Not Monitored”, but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned “Not Monitored”.
Actions	Change the port monitoring mode to “Monitored”, or check the cabling (and re-arrange if necessary).



2 Mbit/s Alarm indication signal received

Alarm identifier	P12ScAIS
Information	The entire 2 Mbit/s signal received, including timeslot 0, contains AIS.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Locally no actions need to be taken. Analyze the alarm state of the upstream equipment and take appropriate measures.
Note(s)	<p>If tributary timing mode is provisioned, then a Tributary Timing Reference Switch Request is generated to switch over to another timing source.</p> <p>If the 2 Mbit/s signal is byte-synchronously mapped into the VC-12 and timeslot 0 is terminated, then AIS is inserted in the downstream direction.</p> <p>If the port is operated in ISDN mode, then RDI is inserted in the upstream direction.</p>



2 Mbit/s Loss of frame alignment

Alarm identifier	P12ScLOF
Information	At least three consecutive odd or three consecutive even frames contained frame alignment signal errors. As a result, the frame structure is no longer recognized at the tributary port of the indicated tributary unit.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LEDs on the tributary unit and on the paddle board are flashing.
Cause	Possible causes are: <ul style="list-style-type: none"> • Receiver fault in the indicated tributary unit • Transmitter fault in the upstream equipment.
Actions	Check the upstream equipment generating the 2 Mbit/s frame alignment signal. <ul style="list-style-type: none"> • If a hardware failure is reported by that equipment then solve that problem first. • If no failure is reported by the upstream equipment then loop the 2 Mbit/s signal at the transmitting equipment and at the receiving equipment. The node reporting 2 Mbit/s Loss of frame alignment contains the faulty unit.
Note(s)	If tributary timing mode is provisioned, then a Tributary Timing Reference Switch Request is generated to switch over to another timing source. If the 2 Mbit/s signal is byte-synchronously mapped into the VC-12 and timeslot 0 is terminated, then AIS is inserted in the downstream direction. If the port is operated in ISDN mode, then RDI is inserted in the upstream direction.



2 Mbit/s Loss of input signal

Alarm identifier	E12cLOS
Information	There is no incoming signal on the 2 Mbit/s tributary port. This is detected by the absence of transitions in the signal, that is, only zeros are received.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LEDs on the port unit and on the paddle board are flashing.
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Interconnecting cabling contacts have a problem. • Receiver fault in indicated unit. • Fault in the transmitting equipment (for example wrong configuration of the output power level). • Discontinuity in the intermediate cabling. • Erroneous routing of intermediate cabling.
Actions	<ul style="list-style-type: none"> • Check tributary connections between the indicated unit, the connecting panel, and the DDF (Digital Distribution Frame). • Check the tributary receiver port of the indicated unit by looping the data at the DDF. • Check the transmitting equipment, including the configuration of the output power level. • Check intermediate cabling.
Note(s)	<p>If tributary timing mode is provisioned, then a Tributary Timing Reference Switch Request is generated to switch over to another timing source.</p> <p>If the 2 Mbit/s signal is byte-synchronously mapped into the VC-12 and timeslot 0 is terminated, then AIS is inserted in the downstream direction.</p> <p>If the port is operated in ISDN mode, then RDI is inserted in the upstream direction.</p>



2 Mbit/s Moderate block error rate

Alarm identifier	P12cDEG
Information	The signal quality of the incoming 2 Mbit/s signal is degraded (PDH → SDH transmission direction).
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red “FAIL” LED on the port unit is flashing.
Cause	The block error rate of the 2 Mbit/s signal exceeds a provisionable signal degrade threshold.
Actions	Check upstream external cabling and equipment (PDH side).



2 Mbit/s Moderate block error rate egress

Alarm identifier	P12gcDEG
Information	The signal quality of the 2 Mbit/s signal is degraded in the egress direction (SDH → PDH transmission direction).
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The block error rate of the 2 Mbit/s signal exceeds a provisionable signal degrade threshold.
Actions	Check upstream cabling and equipment (SDH side).



2 Mbit/s No CRC-4 Multiframe alignment signal

Alarm identifier	P12ScNCM
Information	For the 2 Mbit/s signal in the ingress direction (PDH → SDH transmission direction), basic frame alignment could be achieved, but CRC-4 multiframe alignment could <i>not</i> be achieved.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red “FAIL” LED on the port unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Receiver fault in indicated tributary unit • Transmitter fault in the upstream equipment.
Actions	Check the upstream equipment generating the 2 Mbit/s frame alignment signal. If a hardware failure is reported by that equipment then solve that problem first. If no failure is reported by the upstream equipment then loop the 2 Mbit/s signal at the transmitting equipment and at the receiving equipment. The node reporting 2 Mbit/s No CRC-4 Multiframe alignment signal contains the faulty unit.
Notes	Depending on the provisioning a Tributary Timing Reference Switch Request is generated to switch over to another timing source. The remote alarm indication P12ScRNCM (2 Mbit/s Remote No CRC-4 Multiframe alignment signal) is activated towards the upstream equipment.



2 Mbit/s No CRC-4 Multiframe alignment signal egress

Alarm identifier	P12SgcNCM
Information	For the 2 Mbit/s signal in the egress direction (SDH → PDH transmission direction), basic frame alignment could be achieved, but CRC-4 multiframe alignment could <i>not</i> be achieved.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red “FAIL” LED on the port unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Receiver fault in indicated tributary unit • Transmitter fault in the upstream equipment.
Actions	Check the upstream equipment generating the 2 Mbit/s frame alignment signal. If a hardware failure is reported by that equipment then solve that problem first. If no failure is reported by the upstream equipment then loop the 2 Mbit/s signal at the transmitting equipment and at the receiving equipment. The node reporting 2 Mbit/s No CRC-4 Multiframe alignment signal contains the faulty unit.
Notes	Depending on the provisioning a Tributary Timing Reference Switch Request is generated to switch over to another timing source. The remote alarm indication P12ScRNCM (2 Mbit/s Remote No CRC-4 Multiframe alignment signal) is activated towards the upstream equipment.



2 Mbit/s Not expected input signal

Alarm identifier	E12cNES
Information	An incoming signal has been detected on a 2-Mbit/s tributary port although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Change the port monitoring mode to "Monitored", or check the cabling (and re-arrange if necessary).



2 Mbit/s output timing mode change

Alarm identifier	P12OTMcSW
Information	The quality level of the clock used for retiming the 2 Mbit/s output signal has no longer sufficient quality.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	The quality of the system clock is not sufficient for re-timing purposes.
Actions	Restore the original timing source, or reconfigure the most reliable timing source to improve the quality of the system clock, or change the threshold quality alarm level.
Note(s)	The consequent action of this alarm is user provisionable (including but not limited to switching from the re-timed to the self-timed mode).



2 Mbit/s Remote defect indicator

Alarm identifier	P12ScRDI
Information	<p>A Remote Defect Indication (RDI) is being received.</p> <p>The upstream equipment has detected a failure at its receive side, such as no signal received or excessive error rate.</p> <p>This is reported to the transmitting equipment via the “Remote Defect Indicator” message. RDI is used to draw local attention to the remote failure.</p>
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • The problem may be in the indicated tributary unit, failing to transmit data. • The cabling may be broken or disconnected. • The upstream equipment receive interface may be faulty.
Actions	<p>Check upstream equipment (not part of the transmission system).</p> <p>Check the tributary transmitter port of the indicated tributary unit by looping the data at the DDF.</p> <p>Check upstream cabling or upstream equipment interface.</p>



2 Mbit/s Remote defect indicator egress

Alarm identifier	P12SgcRDI
Information	<p>A Remote Defect Indication (RDI) is being received in the egress direction (SDH → PDH transmission direction).</p> <p>The upstream equipment has detected a failure at its receive side, such as no signal received or excessive error rate.</p> <p>This is reported to the transmitting equipment via the “Remote Defect Indicator” message. RDI is used to draw local attention to the remote failure.</p>
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • The problem may be in the indicated tributary unit, failing to transmit data. • The cabling may be broken or disconnected. • The upstream equipment receive interface may be faulty.
Actions	Check upstream cabling and equipment.



2 Mbit/s Remote No CRC-4 Multiframe alignment Signal

Alarm identifier	P12ScRNCM
Information	In the ingress direction (PDH → SDH transmission direction): A far-end 2 Mbit/s tributary port has achieved basic frame alignment, but is unable to achieve CRC-4 multiframe alignment.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the port unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Receiver fault in indicated tributary unit • Transmitter fault in the upstream equipment.
Actions	Check the local equipment generating the 2 Mbit/s frame alignment signal. If a hardware failure is reported by that equipment then solve that problem first. If no failure is reported by the local equipment then loop the 2 Mbit/s signal at the transmitting equipment and at the receiving equipment. The node reporting 2 Mbit/s No CRC- 4 Multiframe alignment signal contains the faulty unit.
Notes	Depending on the provisioning in the far-end station a Tributary Timing Reference Switch Request is generated to switch over to another timing source. The alarm indication P12ScRNCM (2 Mbit/s No CRC-4 Multiframe alignment signal) is active in the far-end equipment.



2 Mbit/s Remote No CRC-4 Multiframe alignment Signal egress

Alarm identifier	P12SgcRNCM
Information	In the egress direction (SDH → PDH transmission direction): A far-end 2 Mbit/s tributary port has achieved basic frame alignment, but is unable to achieve CRC-4 multiframe alignment.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the port unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Receiver fault in indicated tributary unit • Transmitter fault in the upstream equipment.
Actions	Check the local equipment generating the 2 Mbit/s frame alignment signal. If a hardware failure is reported by that equipment then solve that problem first. If no failure is reported by the local equipment then loop the 2 Mbit/s signal at the transmitting equipment and at the receiving equipment. The node reporting 2 Mbit/s No CRC- 4 Multiframe alignment signal contains the faulty unit.
Notes	Depending on the provisioning in the far-end station a Tributary Timing Reference Switch Request is generated to switch over to another timing source. The alarm indication P12ScNCM (2 Mbit/s No CRC-4 Multiframe alignment signal) is active in the far-end equipment.



34 Mbit/s AIS

Alarm identifier	E31cAIS
Information	The 34 Mbit/s receive signal contains AIS.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Analyze the alarm state of the upstream equipment and take appropriate measures.



34 Mbit/s Loss of input signal

Alarm identifier	E31cLOS
Information	There is no incoming signal on the 34 Mbit/s tributary port. This is detected by the absence of transitions in the signal, that is, only zeros are received.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LEDs on the port unit and on the paddle board are flashing.
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Interconnecting cabling contacts have a problem. • Receiver fault in indicated unit. • Fault in the transmitting equipment (for example wrong configuration of the output power level). • Discontinuity in the intermediate cabling. • Erroneous routing of intermediate cabling.
Actions	<ul style="list-style-type: none"> • Check tributary connections between the indicated unit, the connecting panel, and the DDF (Digital Distribution Frame). • Check the tributary receiver port of the indicated unit by looping the data at the DDF. • Check the transmitting equipment, including the configuration of the output power level. • Check intermediate cabling.



34 Mbit/s Not expected input signal

Alarm identifier	E31cNES
Information	An incoming signal has been detected on a 34-Mbit/s tributary port although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Change the port monitoring mode to "Monitored", or check the cabling (and re-arrange if necessary).



45 Mbit/s Loss of input signal

Alarm identifier	E32cLOS
Information	There is no incoming signal on the 45-Mbit/s tributary port. This is detected by the absence of transitions in the signal, that is, only zeros are received.
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LEDs on the port unit and on the paddle board are flashing.
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Interconnecting cabling contacts have a problem. • Receiver fault in indicated unit. • Fault in the transmitting equipment (for example wrong configuration of the output power level). • Discontinuity in the intermediate cabling. • Erroneous routing of intermediate cabling.
Actions	<ul style="list-style-type: none"> • Check tributary connections between the indicated unit, the connecting panel, and the DDF (Digital Distribution Frame). • Check the tributary receiver port of the indicated unit by looping the data at the DDF. • Check the transmitting equipment, including the configuration of the output power level. • Check intermediate cabling.



45 Mbit/s Not expected input signal

Alarm identifier	E32cNES
Information	An incoming signal has been detected on a 45-Mbit/s tributary port although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	pdhPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Change the port monitoring mode to "Monitored", or check the cabling (and re-arrange if necessary).



802.3ah OAM partner is not available for FE port

Alarm identifier	FEcODNC
Information	The IEEE 802.3ah OAM discovery is not complete. At a Fast Ethernet LAN port, the OAM Administration State is enabled, but no IEEE 802.3ah OAM partner is responding.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the LKA412 is flashing.
Cause	Either the link partner is not capable of performing the OAM protocol, or is not responding for whatever reason.
Actions	Verify the OAM capabilities and/or the status of the link partner.



802.3ah OAM partner is not available for GE port

Alarm identifier	GEcODNC
Information	The IEEE 802.3ah OAM discovery is not complete. At a Gigabit Ethernet LAN port, the OAM Administration State is enabled, but no 802.3ah OAM partner is responding.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the LKA53 is flashing.
Cause	Either the link partner is not capable of performing the OAM protocol, or is not responding for whatever reason.
Actions	Verify the OAM capabilities and/or the status of the link partner.



Alarming inhibited

Alarm identifier	ALMcINH
Information	In one of the regenerators of the span the station alarms are inhibited.
Alarm category	Processing error
ASAP	–
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The station alarms were disabled via the regenerator CIT.
Actions	Enable the station alarms on the regenerator CIT.
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



AU-3 Alarm indication signal received

Alarm identifier	AU3cAIS
Information	The receive signal contains AU-3-AIS, i.e. the entire VC-3 payload signal including the AU-3 pointer has been replaced by an all-ones pattern. AU-3-AIS indicates that a more severe incoming signal failure has been detected in one of the network elements in the upstream direction.
Alarm category	Transmission
ASAP	ASAP-type
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Analyze the alarm state of the upstream equipment and take appropriate measures.



AU-3 Loss of pointer

Alarm identifier	AU3cLOP
Information	No valid AU-3 pointer interpretation obtained in received signal.
Alarm category	Transmission
ASAP	ASAP-type
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Unit failure in the upstream node that generated the AU-3 pointer or in the node that reported the alarm.
Actions	<p>Check on the management system if unit failure is reported for the unit generating the AU-3 pointer.</p> <p>In that case, remove the unit and replace it with a new one.</p> <p>When the unit failure is not reported, loop the STM-1 signal at the transmitting node and at the receiving node. In this condition, the node reporting AU-3 Loss of pointer contains the faulty unit.</p>
Note(s)	AU-AIS is inserted in the downstream direction.



AU-4 Alarm indication signal received

Alarm identifier	AU4cAIS
Information	The receive signal contains AU-4-AIS, i.e. the entire VC-4 payload signal including the AU-4 pointer has been replaced by an all-ones pattern. AU-4-AIS indicates that a more severe incoming signal failure has been detected in one of the network elements in the upstream direction.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Locally no actions need to be taken. Analyze the alarm state of the upstream equipment and take appropriate measures.



AU-4 Loss of pointer

Alarm identifier	AU4cLOP
Information	No valid AU-4 pointer interpretation obtained in the received signal.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Failure in line unit in the remote network element or local unit failure in the station that reported the alarm.
Actions	Check remote line unit. Check local unit.
Note(s)	AU-AIS is inserted in the downstream direction.



AU-4-4c Alarm indication signal received

Alarm identifier	AU4CcAIS
Information	<p>The receive signal contains AIS for the AU-4-4C, i.e. the entire VC-4-4C payload signal including the AU-4 pointers of all concatenated AU-4s has been replaced by an all-ones pattern.</p> <p>AU-4-4C-AIS indicates that a more severe incoming signal failure has been detected in one of the network elements in the upstream direction.</p>
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Analyze the alarm state of the upstream equipment and take appropriate measures.



AU-4-4c Loss of pointer

Alarm identifier	AU4CcLOP
Information	No valid AU-4-4C pointer interpretation obtained in received signal.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Failure in line unit in remote node, local tributary unit failure in the station that reported the alarm. • Line unit failure in the upstream far-end station.
Actions	Check remote line unit. Check local tributary unit.
Note(s)	AU-AIS is inserted in the downstream direction.



AU-4-16c Alarm indication signal received

Alarm identifier	AU16CcAIS
Information	The VC-4 payload signal is replaced by the alarm indication signal. This is detected by checking the AU-4 pointer bytes for an all 1s pattern.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	In the reporting Network Element: <ul style="list-style-type: none"> • The INFO LED on the user panel is lit. • In the upstream direction, “VC-4 Remote Defect Indicator” is activated. • In the downstream direction, the alarm indication signal is inserted into the next function.
Cause	In one of the upstream nodes a defect is detected and led to the insertion of the alarm indication signal.
Actions	None in the reporting node; the alarm indication signal is reported for information only.
Note(s)	The node containing the defect is the node reporting VC-4 Remote Defect Indicator without the AU-4 Alarm indication signal received alarm. Check this node for other alarms. When RDI node types are present, a VC Ring Protection Switch Request is given, if ring protection of one or more lower order VCs is provisioned via the management system. Consequent actions: <ul style="list-style-type: none"> • In the upstream direction, “VC-4 Remote Defect Indicator” is activated. • In the downstream direction, the alarm indication signal is inserted into the next function.



AU-4-16c Loss of pointer

Alarm identifier	AU16CcLOP
Information	No valid AU-4 pointer interpretation obtained in received signal.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Failure inline unit in remote node, local tributary unit failure in the station that reported the alarm. • Line unit failure in the upstream far-end station.
Actions	Check remote line unit. Check local tributary unit.
Note(s)	AU-AIS is inserted in the downstream direction.



Average round trip delay threshold crossing 15min

Alarm identifier	ARTDcTHR15
Information	The average round-trip delay measurement counter exceeded the provisioned threshold during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The value for the average round trip delay exceeded the provisioned threshold value.
Actions	Check the topology of the network and the load of Ethernet traffic over the links.



Average round trip delay threshold crossing 24hrs

Alarm identifier	ARTDcTHR24
Information	The average round-trip delay measurement counter exceeded the provisioned threshold during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The value for the average round trip delay exceeded the provisioned threshold value.
Actions	Check the topology of the network and the load of Ethernet traffic over the links.



BC LAN failure

Alarm identifier	BCLANcUPF
Information	In one of the regenerators in the span, the internal bus fails or is unavailable.
Alarm category	Equipment
ASAP	–
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>The alarm was generated because of:</p> <ul style="list-style-type: none"> • One or more failing regenerator units present, the corresponding unit failure alarm is raised. • Two or more “wrong unit” alarms are raised simultaneously.
Actions	Respond to any regenerator unit failure or “wrong unit” alarm.
Note(s)	<p>The replacing actions could effect the transmission services provided by the system.</p> <p>A replaced system controller must be provided with a database that correctly describes the current configuration of the node.</p> <p>This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.</p>



Booster amplifier laser failure

Alarm identifier	OBALSRcFLR
Information	For the optical booster amplifier, a pump laser failure has been detected.
Alarm category	Equipment
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the booster amplifier is lit.
Cause	The pump laser bias current or the pump laser temperature is too high.
Actions	Replace the 10G core unit including the optical booster amplifier.



Circuit provisioning error

Alarm identifier	VC4cPPE
Information	Provisioned path is pass-through in all nodes.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Source and destination of a path are inconsistent.
Actions	Check the provisioned cross-connections for the path(s).
Note(s)	This alarm is only valid for MS-SPRing configurations.



CP reset in progress

Alarm identifier	UPcRST
Information	In one of the regenerators of the span an CP (circuit pack) reset is in progress.
Alarm category	Equipment
ASAP	–
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	At regenerator site, a reset was initiated on the CIT.
Actions	None
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



Cross-connect inconsistency

Alarm identifier	XCCcINC
Information	Inconsistent cross-connect.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The local cross-connection is incompatible with the current operational Non-preemptable Unprotected Traffic (NUT) configuration.
Actions	Compare the current NUT with the local cross-connect.



Cross connect unit failure

Alarm identifier	CCcUPF
Information	CC (cross-connect unit) alarm. Due to the lack of a protection unit the service failed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the cross-connect unit is lit.
Cause	Possible causes are: <ul style="list-style-type: none"> • A hardware failure of the cross-connect unit is detected. • The cross-connect unit is starting up.
Actions	If the alarm is still present after 1 minute, then remove the cross-connect unit and replace it with another one.
Note(s)	Both cross-connect units failed.



Cross connect unit failure - protected

Alarm identifier	CCcEQF
Information	A hardware failure of the CC (cross-connect unit) in the shelf of the indicated node is detected.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red fault LED on the cross-connect unit is lit.
Cause	The on board self-test circuitry indicates that an essential function of the cross-connect unit fails.
Actions	Replace the cross-connect unit.



Cross connect unit removed

Alarm identifier	CCcUNI
Information	CC (Cross Connect unit) removed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	CC not present.
Actions	Reinstall the unit into its slot position.



DCN-Tunnel auto provisioning configuration error

Alarm identifier	DCNTAPcCONF
Information	DCN-Tunnel auto provisioning configuration error.
Alarm category	Processing error
ASAP	dcn
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	DCN-Tunnel is not set for this network element.
Actions	Provision the correct DCN tunnel parameters. Check intermediate tributary cabling.
Note(s)	IP Tunneling is a DCN feature which supports the transport of IP traffic from the Ethernet interface of one NE to the Ethernet interface of another NE using the DCN as the transport medium. As the DCN is using OSI the IP PDUs will be embedded in OSI PDUs.



DS3 Line BER degraded

Alarm identifier	DS3cDEG
Information	<p>The bit error ratio (BER) in the DS3 line has exceeded the provisionable Degraded Signal Threshold. The alarm is detected in the ingress direction (PDH → SDH transmission direction).</p> <p>The alarm detection is based on the number of DS3 code violations of the B3ZS line code.</p>
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>Code violations occurred in the DS3 signal. The number of code violations detected during a defined measurement period exceeds the provisioned Degraded Signal Threshold.</p> <p>Possible causes of the alarm are a defective transmitter at the far end of the DS3 link, connectors that are not or not properly connected, a defective receiver, or too high a cable attenuation.</p>
Actions	<p>Check all cable connections of the entire DS3 link, from the transmit to the receive side.</p> <p>If necessary, measure the output signal at the transmitter, and the receiver input signal.</p>



DS3 Line BER degraded egress

Alarm identifier	DS3gcDEG
Information	The bit error ratio (BER) in the DS3 line has exceeded the provisionable Degraded Signal Threshold. The alarm is detected in the egress direction (SDH → PDH transmission direction). The alarm detection is based on the number of DS3 code violations of the B3ZS line code.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Code violations occurred in the DS3 signal. The number of code violations detected during a defined measurement period exceeds the provisioned Degraded Signal Threshold. Possible causes of the alarm are a defective transmitter at the far end of the DS3 link, connectors that are not or not properly connected, a defective receiver, or too high a cable attenuation.
Actions	Check all cable connections of the entire DS3 link, from the transmit to the receive side. If necessary, measure the output signal at the transmitter, and the receiver input signal.



Duplicate node name

Alarm identifier	TIDcFLR
Information	The node name for this network element is not unique in the network, so network maintenance is not available for this node.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The DSNE-node refuses to register the local network element because another node with the same node name has already been registered.
Actions	Change one of the duplicate node names to a name which is unique in the network.



Encapsulated-MAC loss of frame alignment

Alarm identifier	EMACcLOF
Information	Encapsulated Medium Access Control loss of frame alignment
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit. The WAN connection cannot operate successfully.
Cause	The alarm is raised when the GFP (or LAP-S, or EoS, depending on the provisioning) frame synchronization is lost.
Actions	Check whether the VC cross-connection and/or mapping method are correct.



Ethernet interface Auto Negotiation Mismatch

Alarm identifier	LANcANM
Information	A mismatch has been detected between the technology used for the local and remote Ethernet equipment.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The auto-negotiation function has failed to find a common technology with the remote Ethernet equipment. This common technology can be 10Base-T half duplex, 10Base-T full duplex, 100Base-T half duplex, 100Base-T full duplex, 1000Base-T half duplex, 1000Base-T full duplex, or 1000Base-X full duplex.
Actions	Force manually either or both ends of the link into a specific common technology.
Note(s)	When the auto-negotiation function is disabled, then the common technology used is 10Base-T half duplex. The common technology also depends on the type of Ethernet interface. On optical Ethernet interfaces for example, always Gigabit Ethernet in full duplex mode (1000Base-X full duplex) is assumed.



Ethernet interface Loss of input signal

Alarm identifier	LANcLOS
Information	There is no incoming signal on the affected Ethernet interface (E/FE, or GbE). This is detected by the absence of transitions in the signal, that is, only zeros are received.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is flashing. The green LED associated to the affected Ethernet interface is off.
Cause	Possible causes are: <ul style="list-style-type: none"> • Interconnecting cabling contacts have a problem. • Receiver fault in indicated unit. • Transmitter fault in the upstream equipment (not the transmission system). • Discontinuity in the intermediate cabling. • Erroneous routing of intermediate cabling.
Actions	Check connections between the indicated unit, the connecting panel, and the Digital Distribution Frame (DDF). Check upstream equipment (not part of the transmission system). Check intermediate cabling.



Ethernet interface Not expected input signal

Alarm identifier	LANcNES
Information	An incoming signal has been detected on an Ethernet interface although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Change the port monitoring mode to "Monitored", or check the cabling (and re-arrange if necessary).



Ethernet OAM-indicated Critical Link Event

Alarm identifier	OAMcCLE
Information	A “Critical Link Event” (CLE) has occurred which is indicated by means of one of the bits in the OAM flags field in the received Information OAMPDU. A received CLE can be “Link Fault”, “Dying Gasp” or “Critical Event”.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	There is a critical event, i.e. a link failure or other fault condition, on the OAM-monitored link.
Actions	Analyse the status of the OAM-monitored link, and take appropriate measures.
Note(s)	Please also refer to the description of the IEEE 802.3ah OAM parameters in the <i>1663 ADMu User Operations Guide</i> .



Extension EEPROM Configuration Issue or Read Write Failure

Alarm identifier	EEPROMcUNI
Information	The provisioned and the actually present extension EEPROM on the backplane do not match, or the extension EEPROM cannot be accessed. Reading from or writing to the EEPROM is not possible.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>A possible cause is an “incomplete” upgrade, that is, the system has been upgraded to release 6.0 in order to make use of 128 DCC channels, a system controller of type LKA20 and/or core units of type LKA62, but the provisioned EEPROM size has not yet been adapted.</p> <p>Another possible cause of the alarm is that the extension EEPROM is either not or not correctly partitioned, does not hold data, or that the hardware is defective.</p>
Actions	<p>Make sure that the provisioned and the actually present extension EEPROM match.</p> <p>Otherwise, please contact your next level of support.</p>



Extra traffic preempted

Alarm identifier	ATPcPRM
Information	Traffic in timeslots 9 - 16 is preempted due to a high-speed protection switch.
Alarm category	Transmission
ASAP	sdhMSR
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	A protection switch caused rerouting of traffic.
Actions	None; informational only.
Note(s)	This alarm is only valid for MS-SPRing configurations.



FAN unit failure

Alarm identifier	FANcEQF
Information	Fan unit failure. Proper cooling cannot be assured.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none">• Cable rupture to fan.• Fan is defective.
Actions	Check cable. Replace fan.



FAN unit power failure

Alarm identifier	FANcPWR
Information	The fan unit has no sufficient power supply.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The fan unit LED is lit.
Cause	Possibly the power connector is not connected properly.
Actions	Check the power supply cabling and connector.



FAN unit removed

Alarm identifier	FANcUNI
Information	A previously configured fan unit is not installed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	Also a fan unit is configured for the corresponding fan unit slot, no fan unit is installed.
Actions	Install the fan unit, or change the configuration.
Note(s)	Fan unit mounting is described in the Metropolis® <i>ADM (Universal shelf) Installation Guide</i> .



Far End Client Signal Failure

Alarm identifier	EMACcRCF
Information	In Link Pass Through mode, a GFP Client Signal Fail (CSF) indication has been received on the WAN port. At the remote ingress LAN port, the GFP CSF indication has been inserted as a consequent action due to a failure of the incoming client signal.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	-
Cause	Fault in the LAN input signal at the remote end resulting in loss of signal or loss of character synchronization.
Actions	Repair the upstream signal interface.



Far-end errored second threshold crossing 15min

Alarm identifier	fEEScTHR15
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end errored seconds exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is degraded.
Actions	



Far-end errored second threshold crossing 24-hrs

Alarm identifier	fEEScTHR24
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end errored seconds exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is degraded.
Actions	



Far-end errored symbol threshold crossing 15min

Alarm identifier	fEBSYEcTHR15
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end errored symbols exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	An error in the line coding occurred for the affected IEEE 802.3ah OAM link.
Actions	



Far-end errored symbol threshold crossing 24-hrs

Alarm identifier	fEBSYEcTHR24
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end errored symbols exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	An error in the line coding has been detected for the affected IEEE 802.3ah OAM link.
Actions	



Far-end severely errored second threshold crossing 15min

Alarm identifier	fESES _c THR15
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end severely errored seconds exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



Far-end severely errored second threshold crossing 24-hrs

Alarm identifier	fESES _c THR24
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end severely errored seconds exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



Far-end unavailable second threshold crossing 15min

Alarm identifier	fEUAScTHR15
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end unavailable seconds exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



Far-end unavailable second threshold crossing 24-hrs

Alarm identifier	fEUAScTHR24
Information	The IEEE 802.3ah OAM performance monitoring counter for far-end unavailable seconds exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



From backplane received AU-type does not match expected AU-type

Alarm identifier	BAUcTYM
Information	From the backplane received AU-type does not match the expected AU-type.
Alarm category	Processing error
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In the reporting Network Element: <ul style="list-style-type: none"> • The PROMPT LED on User Panel is lit. • The PROMPT station alarm loop is closed.
Cause	The signal from the backplane is connected to the wrong port or the port is not provisioned.
Actions	Check the connection to the port, or provision the port.



GBE link aggregation partner configuration error

Alarm identifier	GEcPLCFT
Information	GBE link aggregation partner configuration error.
Alarm category	Transmission
ASAP	ethLAG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the LKA53 is flashing.
Cause	A problem exists in the Link Aggregation Control Protocol (LACP). The partner configuration information <i>cannot</i> be derived from received Link Aggregation Control Protocol Data Units (LAC PDUs). Therefore, the default settings for the partner configuration are used.
Actions	Check the configuration of the GBE link aggregation partner (for example regarding the parameters “LACP Aggregation” and “LACP Activity State”).



GBE Local Link Aggregation partial link loss

Alarm identifier	GEcPLL
Information	Only one of the two aggregated GbE ports of a link aggregation group (LAG) is available for transmission.
Alarm category	Transmission
ASAP	ethLAG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	One of the associated links is unavailable, due to an autonegotiation mismatch or a loss of signal for example, which is indicated by corresponding alarms. Furthermore, the alarm will also be reported when one of the two links is configured to be deactivated.
Actions	Make sure that both links are activated. Verify if primary alarms are reported, Ethernet interface Auto Negotiation Mismatch (LANcANM) or Ethernet interface Loss of input signal (LANcLOS) for example, and clear these alarms first.



GBE Local Link Aggregation total link loss

Alarm identifier	GEcTLL
Information	None of the two aggregated GbE ports of a link aggregation group (LAG) is available for transmission.
Alarm category	Transmission
ASAP	ethLAG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The associated links are unavailable, due to an autonegotiation mismatch or a loss of signal for example, which is indicated by corresponding alarms. Furthermore, the alarm will also be reported when both links are configured to be deactivated.
Actions	Make sure that both links are activated. Verify if primary alarms are reported, Ethernet interface Auto Negotiation Mismatch (LANcANM) or Ethernet interface Loss of input signal (LANcLOS) for example, and clear these alarms first.



I2C-bus failure

Alarm identifier	I2CcUPF
Information	I2C (Inter-IC) bus fails or is unavailable.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • One or more failing units (SC, PT1, PT2, TI1 or TI2) present, the corresponding unit failure alarm is raised. • Two or more “wrong unit” alarms are raised simultaneously.
Actions	Respond to any unit failure or “wrong unit” alarm.
Note(s)	<p>The replacing actions could affect the transmission services provided by the system.</p> <p>A replaced system controller must be provided with a database that correctly describes the current configuration of the node.</p>



Internal communication interface fault protected

Alarm identifier	INTCOMcRPF
Information	The internal data communication is not possible between the System Controller and the circuit pack for which the alarm is reported. The alarm is reported for a circuit pack that is protected by equipment protection switching.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED is lit on that circuit pack on which the defect was detected, that led to the alarm.
Cause	A protocol failure occurred in the internal data communication. This failure condition is usually not service affecting.
Actions	Replace the circuit pack for which the alarm is reported.
Note(s)	The alarm corresponds to inter-board communication failures related to operation management communication with no direct traffic impact.



Internal communication interface fault unprotected

Alarm identifier	INTCOMcRXF
Information	The internal data communication is not possible between the System Controller and the circuit pack for which the alarm is reported. The alarm is reported for an unprotected circuit pack.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED is lit on that circuit pack on which the defect was detected, that led to the alarm.
Cause	A protocol failure occurred in the internal data communication. This failure condition is usually not service affecting.
Actions	Replace the circuit pack for which the alarm is reported.
Note(s)	The alarm corresponds to inter-board communication failures related to operation management communication with no direct traffic impact.



Internal unprotected transmission interface receive side fault

Alarm identifier	INTIFcRXF
Information	The internal communication is not possible between two port units. The alarm is reported for an unprotected port unit.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED is lit on that port unit on which the defect, that led to the alarm, was detected.
Cause	A protocol failure occurred on an internal transmission interface.
Actions	Replace either the alarm reporting circuit pack or its counterpart. The alarm details contain the information which circuit pack is the counterpart.
Note(s)	The alarm corresponds to inter-board interface faults, related to TXI channels, clock signals (CLK), or auxiliary channels (AUX).



IS-IS configuration error

Alarm identifier	DCNcCONF
Information	IS-IS configuration error.
Alarm category	Processing error
ASAP	dcn
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	IS-IS is not set on this network element.
Actions	Provision the correct IS-IS parameters.



IS-IS Level-2 Area repair, transmission/configuration error

Alarm identifier	DCNcREPAIR
Information	IS-IS Level-2 Area repair, due to transmission or configuration error (invalid state).
Alarm category	Processing error
ASAP	dcn
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	IS-IS Level-2 Area is not supported due to transmission or configuration errors.
Actions	Check the transmission and configuration data. If wrong, provision the correct IS-IS parameters.



LAN Dropped packets threshold crossing 15-min

Alarm identifier	LANDPcTHR15
Information	The counter for the number of dropped packets at the LAN side exceeded the provisioned threshold at a LAN port during a 15-minutes monitoring period..
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s) • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The counter only includes packets dropped due to errors. It does not include packets dropped due to congestion.



LAN Dropped packets threshold crossing 24-hrs

Alarm identifier	LANDPcTHR24
Information	The counter for the number of dropped packets at the LAN side exceeded the provisioned threshold at a LAN port during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s) • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The counter only includes packets dropped due to errors. It does not include packets dropped due to congestion.



LAN Green traffic class 2 Ethernet Output Congested Sec Thr 15min

Alarm identifier	LANG2EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) in a medium priority traffic (traffic class 2) exceeded the provisioned threshold during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



LAN Green traffic class 2 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	LANG2EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) and traffic class 2 exceeded the provisioned threshold during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



LAN Green traffic class 3 Ethernet Output Congested Sec Thr 15min

Alarm identifier	LANG3EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a LAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



LAN Green traffic class 3 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	LANG3EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a LAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



LAN Loaded Sec for incoming traffic with class 3 green traffic Thr 15min

Alarm identifier	LANI3GEILScTHR15
Information	The loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load planned for link utilization.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	A loaded second indicates the traffic overload in the network and therefore, is a monitoring parameter for planning the network traffic.



LAN Loaded Sec for incoming traffic with class 3 green traffic Thr 24-hrs

Alarm identifier	LANI3GEILScTHR24
Information	The loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load planned for link utilization.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	A loaded second indicates the traffic overload in the network and therefore, is a monitoring parameter for planning the network traffic.



LAN Loaded Sec for inc Tr with class 3 or 2 green traffic Thr 15min

Alarm identifier	LANI32GEILScTHR15
Information	The loaded seconds counter for incoming Ethernet traffic of class 3 or 2 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the incoming Ethernet traffic of class 3 or 2 with green frames is above the load planned for link utilization for traffic class 3 or 2.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the traffic classes 3 or 2 with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



LAN Loaded Sec for inc Tr with cl 3 or 2 green traffic Thr 24-hrs

Alarm identifier	LANI32GEILScTHR24
Information	The loaded seconds counter for incoming Ethernet traffic of class 3 or 2 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the incoming Ethernet traffic of class 3 or 2 with green frames is above the load planned for link utilization for traffic class 3 or 2.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the traffic classes 3 or 2 with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



LAN Severely Loaded Sec for inc Tr with class 3 green traffic Thr 15min

Alarm identifier	LANI3GEISLScTHR15
Information	The severely loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Traffic congestion for the high priority traffic with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



LAN Severely Loaded Sec for inc Tr with class 3 green traffic Thr 24-hrs

Alarm identifier	LANI3GEISLScTHR24
Information	The severely loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Traffic congestion for the high priority traffic with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



LAN Severely Loaded Sec for inc Tr with Cl 3 or 2 green traffic Thr 15min

Alarm identifier	LANI32GEISLScTHR15
Information	The severely loaded seconds counter for incoming Ethernet traffic of class 3 or 2 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the incoming Ethernet traffic of class 3 or 2 with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the traffic classes 3 or 2 with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



LAN Severely Loaded Sec for inc Tr with cl 3 or 2 green traffic Thr 24-hrs

Alarm identifier	LANI32GEISLScTHR24
Information	The severely loaded seconds counter for incoming Ethernet traffic of class 3 or 2 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a LAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the incoming Ethernet traffic of class 3 or 2 with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the traffic classes 3 or 2 with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



LAN unit failure

Alarm identifier	IPcUPF
Information	The <i>TransLAN</i> [®] card (LKA4) is defective.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	<ul style="list-style-type: none"> The red fault LED on the <i>TransLAN</i>[®] card is lit.
Cause	A hardware failure of the <i>TransLAN</i> [®] card has been detected. The <i>TransLAN</i> [®] card is starting up.
Actions	If the alarm is still present after 1 minute, then replace the <i>TransLAN</i> [®] card.
Note(s)	As no equipment protection exists for <i>TransLAN</i> [®] cards, IPcEQF and IPcUPF are always reported simultaneously as a reminder that a hardware failure is service affecting. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



LAN unit failure - protected

Alarm identifier	IPcEQF
Information	The <i>TransLAN</i> [®] card (LKA4) is defective.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red fault LED on the <i>TransLAN</i> [®] card is lit.
Cause	A hardware failure of the <i>TransLAN</i> [®] card has been detected.
Actions	Replace the <i>TransLAN</i> [®] card.
Note(s)	As no equipment protection exists for <i>TransLAN</i> [®] cards, IPcEQF and IPcUPF are always reported simultaneously as a reminder that a hardware failure is service affecting. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



LAN unit removed

Alarm identifier	IPcUNI
Information	The <i>TransLAN</i> [®] card (LKA4) is missing.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Although the respective slot is provisioned to be equipped with a <i>TransLAN</i> [®] card, no <i>TransLAN</i> [®] card is present.
Actions	Install a <i>TransLAN</i> [®] card, or change the provisioning (i.e. unassign the slot).
Note(s)	An IPcUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



LAN Yellow traffic class 2 Ethernet Output Congested Sec Thr 15min

Alarm identifier	LANY2EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a medium priority traffic (traffic class 2) exceeded the provisioned threshold at a LAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



LAN Yellow traffic class 2 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	LANY2EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a medium priority traffic (traffic class 2) exceeded the provisioned threshold at a LAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



LAN Yellow traffic class 3 Ethernet Output Congested Sec Thr 15min

Alarm identifier	LANY3EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a LAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



LAN Yellow traffic class 3 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	LANY3EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a LAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



Laser degradation

Alarm identifier	LSRcDEG
Information	Laser optical power is below a certain threshold value.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the line unit is lit.
Cause	This alarm occurs if one or more of the following faults are detected: <ul style="list-style-type: none"> • The laser bias current is higher than a certain threshold. • The laser modulation current is higher than a certain threshold
Actions	Replace the indicated line unit.
Note(s)	This alarm is accompanied with a line unit alarm. Transmission may still be possible when this alarm occurs.



Laser failure

Alarm identifier	LSRcFLR
Information	A laser fault condition has been detected.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	<ul style="list-style-type: none">• The laser bias current is too high, and/or• The laser modulation current is too high.
Actions	Replace the indicated line unit.
Note(s)	This alarm is accompanied by a line unit alarm.



Latch of Unit Open

Alarm identifier	UNITcLATCHOPEN
Information	The latches of the respective STM-64 core unit (LKA60, LKA61, LKA62) are open.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the respective STM-64 core unit is lit.
Cause	The latch open sensor of the respective STM-64 core unit detected the latch open state.
Actions	<p>Close the latch.</p> <p>Important:</p> <p>After the Latch of Unit Open alarm condition has been cleared, the unit will perform a recovery.</p>
Note(s)	<p>The following consequent actions result from the Latch of Unit Open alarm condition:</p> <ul style="list-style-type: none"> • The unit will be considered “failed” for any equipment protection group (for example 1+1 core unit equipment protection) • All ports of the unit will be considered “failed” if a port is a member of one of the following protection schemes or groups: <ul style="list-style-type: none"> – MSP – MS-SPRing – HO-SNCP – LO-SNCP – LCAS – STP/rSTP – Link Aggregation – Link Pass Through (LPT) – Timing Reference Switching



Loss of Q2-communications

Alarm identifier	MLQ2
Information	Communication between the network element and the <i>Navis</i> [®] OMS is lost.
Alarm category	Processing error
ASAP	dcn
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the System Controller is flashing or is off.
Cause	<p>The communication path between the <i>Navis</i>[®] OMS and the reporting network element is out of order. To pinpoint the reason one has to look into how the communication path has been or should be setup and if there are alarms reported on intermediary network elements in the path between the <i>Navis</i>[®] OMS and reporting network element. One would have to look for alarms such as Loss of Q2-communication (MLQ2),</p> <p>Q-LAN termination loopback failed (LANcTRM), transmission failures or unit failures reported within the complete communication path between the network element and the <i>Navis</i>[®] OMS. If there are none then the DCC path settings have to be checked between the network element and the first next associated network element in the communication path.</p>

<p>Actions</p>	<p>If the red fault LED on the System Controller is flashing, then the associated alarm is Q-LAN termination loopback failed (LANcTRM), and you should check that alarm for cause and action.</p> <p>If red fault LED on the System Controller is off:</p> <ul style="list-style-type: none"> • Check for relevant alarms on network elements in the communication path towards the management system, and repair those first. • If there are a few System Controllers reporting an MLQ2 alarm and they are all connected to one (single) Q-LAN then pull the System Controllers out one by one since one of them may have a LAN device failure. Pulling an SC does (should) not break the Q-LAN. • Connect the ITM-CIT to the reporting network element and check the AREA (Login → Area). The nearest, in the path towards the <i>Navis</i>[®] OMS, missing network element in the area list is most probably also the network element where the problem cause resides. • Check the DCC settings in the communication path. • If it is not possible to get association with the network element (after initial installation) then the network element state may be “Isolated”. Make local contact with the ITM-CIT to the network element involved and check and confirm the DCN settings: Management → Overlay Comms Network → DCN → Edit → OK. • It is also possible that the SEEPROM is defective, or the contents is corrupt.
<p>Note(s)</p>	<p>In general this alarm will only be reported on the ITM-CIT since the <i>Navis</i>[®] OMS will have lost association with the network element.</p>



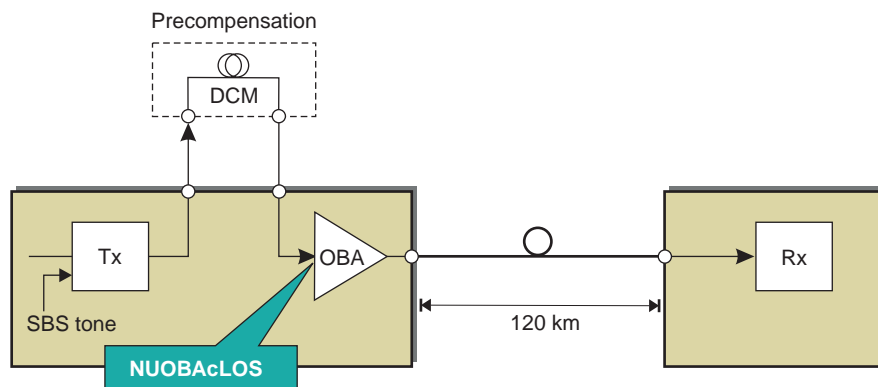
Loss of secondary input voltage

Alarm identifier	POW _c LSV
Information	No secondary voltage distribution to PT (Power and Timing circuit packs) unit present in the indicated node.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	<ul style="list-style-type: none"> • The green LED on the PT, indicating the presence of secondary voltage, is off. • The Power LED on the user panel and PT unit is on depending on the presence of the alarm voltage.
Cause	<p>The alarm was generated because of:</p> <ul style="list-style-type: none"> • The fuse of the primary (station) battery voltage is blown. • Other causes may be hidden in the connected systems.
Actions	Check the secondary voltage supply in the node that reported the alarm.
Note(s)	<p>This message is reported as a single power fault. No resulting unit faults are reported.</p> <p>The secondary voltage (-48V) is the fused primary (station) battery voltage.</p>



Loss of signal on booster amplifier

Alarm identifier	NUOBACLOS
Information	There is no optical input power at the optical booster amplifier of the STM-64 very long haul interface unit (LKA350). Please also refer to the diagram subsequent to this table.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the STM-64 very long haul interface unit (LKA350) is lit.
Cause	<ol style="list-style-type: none"> 1. Fault in the cabling to/from the Dispersion Compensation Module (DCM). This may be defective fibers or loose connectors. 2. Fault in the transmitter part (Tx) of the LKA350 unit. 3. Receive-side fault in the amplifier part (OBA) of the LKA350 unit. 4. Possibly the fibers inside the DCM are defective.
Actions	<ol style="list-style-type: none"> 1. Check the cabling (including the connectors) to/from the Dispersion Compensation Module (DCM). 2. Measure the optical power at the Tx output of the LKA350 unit. Replace the LKA350 unit if the optical output power is too low. 3. Measure the optical power at the OBA input of the LKA350 unit. Replace the LKA350 unit if the optical input power is <i>in</i> the nominal range. 4. Replace the DCM.





Loss of Synchronisation

Alarm identifier	GEcNOSYNC
Information	Link failure in the receive direction. Synchronization to code-group boundaries is <i>not</i> possible at the local end of the Gigabit Ethernet link.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The green link status LED associated to the affected LAN port is off.
Cause	The receive signal is not a 1-Gbit/s Ethernet signal, but a 10-Gbit/s Ethernet signal for example.
Actions	Make sure to apply a 1-Gbit/s Ethernet signal.
Note(s)	In the repeater mode or a repeater-like mode, a Client Signal Fail (CSF) indication is signalled to the remote end as a consequent action, if the Link Pass Through (LPT) mode is enabled. The LPT mode is only supported on LAN ports that operate in a one-to-one association with a WAN port using GFP encapsulation.



MAC address mismatch for LAN/WAN port

Alarm identifier	MACcMIS
Information	An unknown source MAC address has been detected in a frame received at a LAN/WAN port where the automatic MAC address learning mode is switched off. As a result, the frame is discarded.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	
Actions	Enable automatic MAC address learning, or make sure to only use a restricted set of MAC addresses.
Note(s)	



Mandatory IS-IS parameters missing

Alarm identifier	DCNBUCLOST
Information	The network element is isolated from the DCN because mandatory IS-IS parameters are missing.
Alarm category	Processing error
ASAP	dcn
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	Not all IS-IS parameters are correctly set for this mode.
Actions	Provision the IS-IS parameters correctly.



Maximum number of VLAN instances exceeded

Alarm identifier	MACcVLANOVFW
Information	Maximum number of VLAN instances exceeded.
Alarm category	Transmission
ASAP	ethPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the <i>TransLAN</i> [®] unit is lit.
Cause	Too many VLAN instances have been created.
Actions	Remove unused VLAN instances and re-plan the network to decrease the number of VLAN instances.
Note(s)	<p>In the MLAN operational mode, a maximum number of 64 VLAN instances can be created per <i>TransLAN</i>[®] unit.</p> <p>Otherwise, a maximum number of 247 VLAN instances can be created per <i>TransLAN</i>[®] unit when GVRP is enabled. When GVRP is disabled, then the maximum number of VLAN instances is limited by the number of <i>TransLAN</i>[®] units installed in combination with the maximum number of VLAN instances that can be stored in the management information base (MIB).</p>



Maximum number of VLAN instances exceeded in MIB

Alarm identifier	MIBcVLANOVFW
Information	The maximum number of VLAN instances that can be stored in the management information base (MIB) has been exceeded.
Alarm category	Transmission
ASAP	ethPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the <i>TransLAN</i> [®] unit is lit.
Cause	Too many VLAN instances per network element or too many VLAN/port associations have been created.
Actions	Remove unused VLAN instances and re-plan the network to decrease the number of VLAN instances.
Note(s)	A maximum number of 1024 VLAN instances per network element is supported. A maximum number of 5000 VLAN/port associations is supported.



Maximum round trip delay threshold crossing 15min

Alarm identifier	XRTDcTHR15
Information	
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	
Actions	
Note(s)	



Maximum round trip delay threshold crossing 24hrs

Alarm identifier	XRTDcTHR24
Information	
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	
Actions	
Note(s)	



MDI 1: <user entered string>

Alarm identifier	MDcIP1
Information	The Miscellaneous Discrete Input (MDI) number 1 indicates an environmental alarm condition.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Alarm condition of co-located equipment
Actions	The measures to be taken depend on the specific application of the respective MDI.
Note(s)	MDIs can be used to monitor co-located equipment, a temperature sensor for example. MDIs can thus be used to trigger the reporting of application-specific environmental alarms. Each MDI can be assigned a descriptive text identifying the type of environmental alarm condition in more detail.



MDI 2: <user entered string>

Alarm identifier	MDcIP2
Information	The Miscellaneous Discrete Input (MDI) number 2 indicates an environmental alarm condition.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Alarm condition of co-located equipment
Actions	The measures to be taken depend on the specific application of the respective MDI.
Note(s)	MDIs can be used to monitor co-located equipment, a temperature sensor for example. MDIs can thus be used to trigger the reporting of application-specific environmental alarms. Each MDI can be assigned a descriptive text identifying the type of environmental alarm condition in more detail.



MDI 3: <user entered string>

Alarm identifier	MDcIP3
Information	The Miscellaneous Discrete Input (MDI) number 3 indicates an environmental alarm condition.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Alarm condition of co-located equipment
Actions	The measures to be taken depend on the specific application of the respective MDI.
Note(s)	MDIs can be used to monitor co-located equipment, a temperature sensor for example. MDIs can thus be used to trigger the reporting of application-specific environmental alarms. Each MDI can be assigned a descriptive text identifying the type of environmental alarm condition in more detail.



MDI 4: <user entered string>

Alarm identifier	MDcIP4
Information	The Miscellaneous Discrete Input (MDI) number 4 indicates an environmental alarm condition.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Alarm condition of co-located equipment
Actions	The measures to be taken depend on the specific application of the respective MDI.
Note(s)	MDIs can be used to monitor co-located equipment, a temperature sensor for example. MDIs can thus be used to trigger the reporting of application-specific environmental alarms. Each MDI can be assigned a descriptive text identifying the type of environmental alarm condition in more detail.



MDI 5: <user entered string>

Alarm identifier	MDcIP5
Information	This alarm represents an external environment alarm: the Miscellaneous Discrete Input (MDI). There are two sets of MDI alarms: one for network element and another one, which is common, for all regenerators in a span. For each MDI alarm the name can be provisioned by the user.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	User defined external event.
Actions	Check the external equipment connected to the corresponding terminals on the connector area.
Note(s)	Miscellaneous discrete inputs can be provisioned by the user and can be used to scan the status of external, user definable, alarm points. This alarm could occur at the network element or could be reported by a “Regen fault location” mechanism (if enabled) to the network element.



MDI 6: <user entered string>

Alarm identifier	MDcIP6
Information	This alarm represents an external environment alarm: the Miscellaneous Discrete Input (MDI). There are two sets of MDI alarms: one for network element and another one, which is common, for all regenerators in a span. For each MDI alarm the name can be provisioned by the user.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	User defined external event.
Actions	Check the external equipment connected to the corresponding terminals on the connector area.
Note(s)	Miscellaneous discrete inputs can be provisioned by the user and can be used to scan the status of external, user definable, alarm points. This alarm could occur at the network element or could be reported by a “Regen fault location” mechanism (if enabled) to the network element.



MDI 7: <user entered string>

Alarm identifier	MDcIP7
Information	This alarm represents an external environment alarm: the Miscellaneous Discrete Input (MDI). There are two sets of MDI alarms: one for network element and another one, which is common, for all regenerators in a span. For each MDI alarm the name can be provisioned by the user.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	User defined external event.
Actions	Check the external equipment connected to the corresponding terminals on the connector area.
Note(s)	Miscellaneous discrete inputs can be provisioned by the user and can be used to scan the status of external, user definable, alarm points. This alarm could occur at the network element or could be reported by a “Regen fault location” mechanism (if enabled) to the network element.



MDI 8: <user entered string>

Alarm identifier	MDcIP8
Information	This alarm represents an external environment alarm: the Miscellaneous Discrete Input (MDI). There are two sets of MDI alarms: one for network element and another one, which is common, for all regenerators in a span. For each MDI alarm the name can be provisioned by the user.
Alarm category	Environment
ASAP	mdi
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	User defined external event.
Actions	Check the external equipment connected to the corresponding terminals on the connector area.
Note(s)	Miscellaneous discrete inputs can be provisioned by the user and can be used to scan the status of external, user definable, alarm points. This alarm could occur at the network element or could be reported by a “Regen fault location” mechanism (if enabled) to the network element.



MS-16 Ring comm. server network address protocol failure/version mismatch

Alarm identifier	MS16cLIVM
Information	A mismatch has been detected between the received and expected version number of two neighbour NE's in an STM-16 MS-SPRing configuration.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Neighbour NE's are present in the MS-SPRing configuration which cannot interwork with each other.
Actions	Update the NE in the MS-SPRing configuration that cannot interwork.
Note(s)	This alarm is only valid for MS-SPRing configurations.



MS-64 Ring comm. server network address protocol failure/version mismatch

Alarm identifier	MS64cLIVM
Information	A mismatch has been detected between the received and expected version number of two neighbour NE's in an STM-64 MS-SPRing configuration.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Neighbour NE's are present in the MS-SPRing configuration which cannot interwork with each other.
Actions	Update the NE in the MS-SPRing configuration that cannot interwork.
Note(s)	This alarm is only valid for MS-SPRing configurations.



Near-end errored second threshold crossing 15min

Alarm identifier	EScTHR15
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end errored seconds exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is degraded.
Actions	



Near-end errored second threshold crossing 24-hrs

Alarm identifier	EScTHR24
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end errored seconds exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is degraded.
Actions	



Near-end errored symbol threshold crossing 15min

Alarm identifier	BSYEcTHR15
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end errored symbols exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	An error in the line coding occurred for the affected IEEE 802.3ah OAM link.
Actions	



Near-end errored symbol threshold crossing 24-hrs

Alarm identifier	BSYE _c THR24
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end errored symbols exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	An error in the line coding has been detected for the affected IEEE 802.3ah OAM link.
Actions	



Near-end severely errored second threshold crossing 15min

Alarm identifier	SEScTHR15
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end severely errored seconds exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



Near-end severely errored second threshold crossing 24-hrs

Alarm identifier	SEScTHR24
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end severely errored seconds exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



Near-end unavailable second threshold crossing 15min

Alarm identifier	UAScTHR15
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end unavailable seconds exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



Near-end unavailable second threshold crossing 24-hrs

Alarm identifier	UAScTHR24
Information	The IEEE 802.3ah OAM performance monitoring counter for near-end unavailable seconds exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The signal quality on the affected Ethernet link is insufficient.
Actions	



Node ID conflict

Alarm identifier	NIDcFLR
Information	Inconsistent destination source node ID has been detected in the incoming data stream.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Node ID is not as expected.
Actions	Wait until all network elements have a correct ring map.
Note(s)	This alarm is only valid for MS-SPRing configurations.



Non-preemptable unprotected traffic switch request pending

Alarm identifier	NUTRcPND
Information	A non-preemptable unprotected traffic switch request is pending.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	An active Non-preemptable Unprotected Traffic (NUT) switch request is not reflected in the operational Non- preemptable Unprotected Traffic configuration.
Actions	Compare the operational NUT configuration with the active NUT.



Number of unsuccessful (timed out) round trip delay measurements Thr 15min

Alarm identifier	URTDMcTHR15
Information	The number of timed-out round trip delay measurement tests exceeded the provisioned threshold during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The connection for the round trip delay measurement test was timed-out.
Actions	Check the topology of the network and the load of ethernet traffic over the links.
Note(s)	



Number of unsuccessful (timed out) round trip delay measurements Thr 24hrs

Alarm identifier	URTDMcTHR24
Information	The number of timed-out round trip delay measurement tests exceeded the provisioned threshold during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The connection for the round trip delay measurement test was timed-out.
Actions	Check the topology of the network and the load of ethernet traffic over the links.



P12s Near-end background block errors thresh cross 15-min

Alarm identifier	P12SNBBEcTHR15
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end background block errors thresh cross 15-min egress

Alarm identifier	P12SNBBEgcTHR15
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end background block errors thresh cross 24-hrs

Alarm identifier	P12SNBBEcTHR24
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end background block errors thresh cross 24-hrs egress

Alarm identifier	P12SNBBEgcTHR24
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end errored seconds threshold crossing 15-min

Alarm identifier	P12SNEScTHR15
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end errored seconds threshold crossing 15-min egress

Alarm identifier	P12SNESgcTHR15
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	P12SNEScTHR24
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end errored seconds threshold crossing 24-hrs egress

Alarm identifier	P12SNESgcTHR24
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end severely ES threshold crossing 15-min

Alarm identifier	P12SNSEScTHR15
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end severely ES threshold crossing 15-min egress

Alarm identifier	P12SNSESGcTHR15
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end severely ES threshold crossing 24-hrs

Alarm identifier	P12SNSEScTHR24
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end severely ES threshold crossing 24-hrs egress

Alarm identifier	P12SNSESgcTHR24
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	P12SNUAScTHR15
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of a fiber cut or equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end unavailable seconds threshold crossing 15-min egress

Alarm identifier	P12SNUASgcTHR15
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of a fiber cut or equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	P12SNUAScTHR24
Information	In the ingress direction (PDH → SDH transmission direction), the P12s near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of a fiber cut or equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Near-end unavailable seconds threshold crossing 24-hrs egress

Alarm identifier	P12SNUASgcTHR24
Information	In the egress direction (SDH → PDH transmission direction), the P12s near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of a fiber cut or equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which no threshold crossing occurred.



P12s Network connection server signal fail

Alarm identifier	P12ScSSF
Information	The 2-Mbit/s connection is unavailable in the ingress direction (PDH → SDH transmission direction) due to faults in the server layer, resulting in the transmission of AIS to the client layer.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more VC-12 or MS faults in this or upstream network elements.
Actions	This message is always raised as a consequence of one or more equipment and/or transmission faults. Clear these alarms first.



P12s Network connection server signal fail egress

Alarm identifier	P12SgcSSF
Information	The 2-Mbit/s connection is unavailable in the egress direction (SDH → PDH transmission direction) due to faults in the server layer, resulting in the transmission of AIS to the client layer.
Alarm category	Transmission
ASAP	pdhPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more VC-12 or MS faults in this or upstream network elements.
Actions	This message is always raised as a consequence of one or more equipment and/or transmission faults. Clear these alarms first.



Paddle board failure

Alarm identifier	PBcUPF
Information	Paddle board (PB) failure. Due to the lack of a protection unit the service failed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • A hardware failure of the paddle board is detected. • The line unit is starting up.
Actions	If the alarm is still present after 1 minute, then replace the paddle board.



Paddle board failure - protected

Alarm identifier	PBcEQF
Information	A hardware failure of the paddle board (PB) in the shelf of the indicated node is detected.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The LED on the paddle board is lit.
Cause	The on board self-test circuitry indicates that an essential function of the unit fails.
Actions	Replace the paddle board.



Paddle board removed

Alarm identifier	PBcUNI
Information	Paddle board (PB) removed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	paddle board not present.
Actions	Reinstall the unit into its slot position.



Path integrity failure

Alarm identifier	VC4cPAF
Information	Provisioned path is not continuous, no source can be found.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>The alarm was generated because of:</p> <ul style="list-style-type: none"> • A check for circuit connectivity has failed. • For each unidirectional drop at the local node there must be a continuous path of 1-way cross-connections back to the source. • This source cannot be found.
Actions	Check the paths and cross-connections.
Note(s)	This alarm is only valid for MS-SPRing configurations.



Plesiochronous interface unit failure

Alarm identifier	PIcUPF
Information	PI (Plesiochronous Interface unit) failure. Due to the lack of a protection unit the service failed.
Alarm category	Equipment
ASAP	ASAP-type
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The unit LED on the PI is lit.
Cause	A hardware failure of the PI is detected.
Actions	If the alarm is still present after 1 minute, then replace the PI.
Note(s)	<p>As no equipment protection exists for Plesiochronous Interface units, PIcEQF and PIcUPF are always reported simultaneously as a reminder that a hardware failure is service affecting.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Plesiochronous interface unit failure - protected

Alarm identifier	PIcEQF
Information	A hardware failure of the PI (Plesiochronous Interface unit) in the shelf of the indicated node is detected.
Alarm category	Equipment
ASAP	ASAP-type
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The unit LED on the PI is lit.
Cause	The on-board selftest circuitry indicates that an essential function of the unit has failed.
Actions	Replace the PI unit.
Note(s)	As no equipment protection exists for Plesiochronous Interface units, PIcEQF and PIcUPF are always reported simultaneously as a reminder that a hardware failure is service affecting. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Plesiochronous interface unit removed

Alarm identifier	PIcUNI
Information	PI (Plesiochronous Interface unit) removed.
Alarm category	Equipment
ASAP	ASAP-type
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	PI not present.
Actions	Reinstall the unit into its slot position.
Note(s)	A PICUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Pluggable Module failure

Alarm identifier	PMcUPF
Information	The respective pluggable module failed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	<p>The red fault LED associated to the failed pluggable module is lit.</p> <p>If there is no separate red fault LED dedicated to the pluggable module then the red fault LED of the parent board is lit to draw the attention to the parent board that hosts the defective pluggable module. Which pluggable module is affected can be seen from the alarm list.</p>
Cause	Hardware failure of the pluggable module.
Actions	Replace the failed module.
Note(s)	<p>As no equipment protection exists for pluggable modules, PMcEQF and PMcUPF are always reported simultaneously as a reminder that a pluggable module failure is service affecting.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Pluggable Module failure - protected

Alarm identifier	PMcEQF
Information	The respective pluggable module failed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	<p>The red fault LED associated to the failed pluggable module is lit.</p> <p>If there is no separate red fault LED dedicated to the pluggable module then the red fault LED of the parent board is lit to draw the attention to the parent board that hosts the defective pluggable module. Which pluggable module is affected can be seen from the alarm list.</p>
Cause	Hardware failure of the pluggable module.
Actions	Replace the failed module.
Note(s)	<p>As no equipment protection exists for pluggable modules, PMcEQF and PMcUPF are always reported simultaneously as a reminder that a pluggable module failure is service affecting.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Pluggable Module removed

Alarm identifier	PMcUNI
Information	Although the respective socket has a pluggable module assigned, there is no pluggable module present.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red fault LED associated to the failed pluggable module is lit. If there is no separate red fault LED dedicated to the pluggable module then the red fault LED of the parent board is lit to draw the attention to the parent board that hosts the defective pluggable module. Which pluggable module is affected can be seen from the alarm list.
Cause	Pluggable module not present.
Actions	Either re-insert or unassign the pluggable module.
Note(s)	A PMcUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Power unit failure

Alarm identifier	PUcUPF
Information	Power unit failure. Due to the lack of a protection unit the service failed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The unit LED on the Power unit is lit.
Cause	A hardware failure of the Power unit is detected.
Actions	If the alarm is still present after 1 minute, then remove the Power unit and replace it with another one.
Note(s)	As no equipment protection exists for Power units, PUcEQF and PUcUPF are always reported simultaneously as a reminder that a pluggable module failure is service affecting. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Power unit failure - protected

Alarm identifier	PUcEQF
Information	A hardware failure of the Power unit in the shelf of the indicated node is detected.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The unit LED on the Power unit is lit.
Cause	The on board selftest circuitry indicates that an essential function of the unit fails.
Actions	Replace the Power unit.
Note(s)	<p>As no equipment protection exists for Power units, PUcEQF and PUcUPF are always reported simultaneously as a reminder that a pluggable module failure is service affecting.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Power unit removed

Alarm identifier	PUcUNI
Information	Power unit removed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Power unit not present.
Actions	Reinstall the unit into its slot position.
Note(s)	A PUcUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Pre-Equipment Failure

Alarm identifier	PREcEQF
Information	The Pre-Equipment Failure alarm is used for internal hardware surveillance <i>following an upgrade to a new software release.</i> For more detailed information, please refer to the description of the PreEQF alarm, subsequent to this alarm overview table.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	An internal hardware failure has been detected.
Actions	At a convenient time slot, replace the alarmed unit. Which unit is affected can be seen from the alarm details of the Pre-Equipment Failure alarm. <i>Additionally, please contact your next level of support.</i>

PreEQF alarm

In case the system detects an Equipment Failure (EQF) condition, the respective circuit pack is declared EQF and taken out of service (i.e. SF generation for all traffic).

In the present NE software release, new hardware surveillance points have been introduced to improve the EQF detection mechanisms. As these new hardware surveillance points were not monitored in previous software releases, an NE software upgrade might result in permanent and non-reversible unit failures which can only be cleared by exchanging the failed unit.

For unused parts of the units (for example unused cross-connection timeslots), a hidden (formerly undetected) hardware problem might exist which can now be detected by the improved EQF detection mechanism. During upgrade scenarios, this might result in the situation, that a unit with a hidden hardware problem is taken completely out of service during the upgrade, whilst no service was affected during the operation in the old release.

To avoid such a situation but still to gain the benefits of the improved EQF detection, the improved hardware surveillance points are not correlated into a permanent EQF situation but the raise of a so-called “PreEQF” alarm. The Pre-Equipment Failure alarm will be raised for the respective unit, but the unit remains operational as it was

before the upgrade. The PreEQF alarm does not cause any consequent actions and will not cause any equipment protection switching. This makes it possible to replace the alarmed unit at a convenient time slot, rather than during the upgrade process.



Protected internal transmission interface receive side fault

Alarm identifier	INTIFcRPF
Information	The internal communication is not possible between two port units. The alarm is reported for a protected port unit.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED is lit on that port unit on which the defect was detected, that led to the alarm.
Cause	A protocol failure occurred on an internal transmission interface.
Actions	Replace either the alarm reporting circuit pack or its counterpart. The alarm details contain the information which circuit pack is the counterpart.
Note(s)	The alarm corresponds to inter-board interface faults, related to TXI channels, or clock signals (CLK).



Reading or writing from/to backplane EEPROM failed

Alarm identifier	BCKPLEEPROMcFAIL
Information	The backplane EEPROM cannot be accessed. Reading from or writing to the EEPROM is not possible.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The backplane EEPROM is either not or not correctly partitioned, does not hold data, or the hardware is defective.
Actions	Please contact your next level of support.



Received AU-type does not match expected type AU4

Alarm identifier	AU4cTYM
Information	The received AU-type does not match the expected AU-type.
Alarm category	Processing error
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The provisioned signal structure and the actual structure of the incoming signal do not match. Supported signal structures are AU-3, AU-4, AU-4-4C, and AU-4-16C.
Actions	Make sure to provide a correctly structured incoming signal, or re-provision the expected AU-type.
Note(s)	If the incoming signal contains AU-AIS, then, after a loss of power and a subsequent recovery, it is not possible to determine the actual signal structure because the information about the signal structure is contained in the H1/H2 bytes of the AU-pointer, and the entire AU-pointer is replaced by an all-ones pattern in case of AU-AIS. Therefore, a type mismatch alarm will be reported instead of AU-AIS in such a situation.



Remote Client Failure between MRV and User Switch

Alarm identifier	MRVcRCF
Information	The link between the User Switch and the MRV <i>Fiber Driver</i> [®] module is down.
Alarm category	Transmission
ASAP	ethPS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the LKA53 is flashing.
Cause	A user port fault condition has been detected by the MRV <i>Fiber Driver</i> [®] module, and as a consequent action, a client signal fail (CSF) indication has been inserted into the link towards the 1663 ADMu system.
Actions	Repair the link between the User Switch and the MRV <i>Fiber Driver</i> [®] module.



Ring incomplete/open

Alarm identifier	RINGcOPEN
Information	The network element can not establish the ring topology.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Possibly a fiber is disconnected or damaged.
Actions	Close the ring.
Note(s)	This alarm is only valid for MS-SPRing configurations.



Ring startup in progress

Alarm identifier	RINGcSTART
Information	The network element is determining the ring topology.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	A system boot is in progress.
Actions	No action is required. This alarm is to be understood as an information rather than as an alarm. It will clear automatically as soon as ring startup has completed.
Note(s)	This alarm is only valid for MS-SPRing configurations.



Squelch map update suspended

Alarm identifier	SQcSUS
Information	An update of the squelch map is suspended.
Alarm category	Transmission
ASAP	sdhMSR
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	Not all squelch maps from the other nodes in the ring are obtained.
Actions	Wait for an autonomous update.
Note(s)	This alarm is only valid for MS-SPRing configurations.



Station alarms disconnected

Alarm identifier	DISCON
Information	In one of the regenerators in the span, the station alarms are physically disconnected.
Alarm category	Processing error
ASAP	–
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The “DISC” key on the user panel has been pressed.
Actions	Release the DISC-key on the user panel.
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



Station clock input Alarm indication signal

Alarm identifier	MTcAIS
Information	The station clock input signal contains AIS (all-ones signal).
Alarm category	Transmission
ASAP	timing
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	No valid timing source provided.
Actions	Provide the correct timing source.
Note(s)	A tributary timing switch request is generated to switch over to another timing source.



Station clock input Loss of frame alignment

Alarm identifier	MTcLOF
Information	<p>Loss of frame alignment is detected when:</p> <ul style="list-style-type: none"> • At least three consecutive odd or three consecutive even frames contained frame alignment signals with errors. • Therefore the frame structure is no longer recognized at the tributary port of the indicated Tributary unit.
Alarm category	Transmission
ASAP	timing
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The unit LED on the tributary unit is flashing
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Receiver fault in indicated tributary unit. • Transmitter fault in the timing source equipment.
Actions	<p>Check the upstream equipment generating the 2 Mbit/s frame alignment signal.</p> <p>If a hardware failure is reported by that equipment then solve that problem first.</p>
Note(s)	A tributary timing reference switch request is generated to switch over to another timing source.



Station clock input Loss of signal

Alarm identifier	MTcLOS
Information	No incoming signal on the indicated 2 Mbit/s station clock port. This is detected by the absence of pulses in the signal.
Alarm category	Transmission
ASAP	timing
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The unit LED on the PT (Power and Timing circuit packs) is flashing.
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Fault in the equipment producing the station clock. • Discontinuity in the cabling between the station clock supply equipment or erroneous routing.
Actions	<p>Check upstream equipment, such as the local exchange, producing the external clock reference.</p> <p>Check intermediate cabling connected to the related 2048 kHz station clock port</p>
Note(s)	<p>A 2048 kHz timing reference protection switching request is initiated.</p> <p>The working PT has switched over to the protection 2048 kHz station clock port for timing reference.</p>



Station clock input Not expected signal

Alarm identifier	MTcNES
Information	An incoming signal has been detected on a 2-MHz station clock input port although the port is provisioned out of service.
Alarm category	Transmission
ASAP	timing
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned out of service, but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is intentionally applied, the port is mistakenly provisioned out of service.
Actions	Change the port monitoring mode to “Monitored”, or check the cabling (and re-arrange if necessary).



Station clock output squelched

Alarm identifier	TSCOcSQ
Information	No station clock output available.
Alarm category	Processing error
ASAP	timing
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	The timing input reference signal is not available or the quality is too low.
Actions	Restore the timing input reference signal.



STM-1 Loss of frame alignment

Alarm identifier	STM1cLOF
Information	The position of the frame alignment bytes A1 and A2 in the Section Overhead of the receive signal cannot be detected correctly. Thus, alignment to the framing structure of the received signal is not possible, and as a result, overhead and payload data cannot be extracted.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the port unit is flashing.
Cause	<p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Unexpected signal structure in the receive signal (for example STM-4 instead of STM-1) • Dirty optical connector(s) • STM-1 not correctly formed in the upstream station • Equipment fault(s) in the upstream station
Actions	Check upstream external cabling and equipment.
Note(s)	<p>In the downstream direction, AIS is inserted.</p> <p>In the upstream direction, “Multiplex Section - Remote Defect Indicator” (MS-RDI) is inserted.</p>



STM-1 Loss of input signal

Alarm identifier	STM1cLOS
Information	The power level of the STM-1 receive signal (optical or electrical) is below a defined level and LOF is detected.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is flashing.
Cause	Possible causes of the alarm are: <ul style="list-style-type: none"> • Cable rupture • Dirty optical connector(s) • Equipment fault(s) in the upstream station
Actions	Check operation of the transmitter in the far-end station. Check for cable breaks or dirty connectors.
Note(s)	In the downstream direction, AIS is inserted. In the upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is inserted.



STM-1 MS Alarm indication signal received

Alarm identifier	MS1cAIS
Information	The STM-1 receive signal (optical or electrical) contains MS-AIS.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Locally no actions need to be taken. Analyze the alarm state of the upstream equipment and take appropriate measures.
Note(s)	In the upstream direction, “Multiplex Section - Remote Defect Indicator” (MS-RDI) is inserted.



STM-1 MS Excessive bit error rate

Alarm identifier	MS1cEXC
Information	The bit error ratio (BER) in the STM-1 Multiplex Section is very high and the signal received at an electrical or optical STM-1 interface is therefore subject to considerable interference.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>This alarm is initiated if the BER in the Multiplex Section, calculated using the B2 bytes of the Multiplex Section Overhead (MSOH), exceeds the Excessive Error Threshold (provisionable to 10^{-3} (default setting), 10^{-4} or 10^{-5}).</p> <p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Optical STM-1 interface: <ul style="list-style-type: none"> – Excessive attenuation of the optical signal (for example due to connectors featuring impurities) on the transmit and/or receive side – Incorrect formation of the STM signal at the far end – A defect in the optical transmitter at the far end – Considerable interference in the transmission path in the receive direction – Wrong cabling (for example STM-N signal ($N \neq 1$) connected instead of STM-1) • Electrical STM-1 interface: <ul style="list-style-type: none"> – Excessive attenuation of the electrical signal (for example due to using a wrong coaxial cable) – Incorrect formation of the STM signal at the far end – Considerable interference in the transmission path in the receive direction
Actions	Check optical connectors and/or the external cabling and equipment.



STM-1 MS Moderate block error rate

Alarm identifier	MS1cDEG
Information	The block error rate of the STM-1 receive signal (optical or electrical) exceeds a provisionable threshold.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check optical connectors and/or the external cabling and equipment.
Note(s)	The signal degrade threshold can be provisioned by using the management system.



STM-1 MS Near-end background block errors threshold crossing 15-min

Alarm identifier	MS1NBBEcTHR15
Information	The STM-1 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Near-end background block errors threshold crossing 24-hrs

Alarm identifier	MS1NBBEcTHR24
Information	The STM-1 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Near-end errored seconds threshold crossing 15-min

Alarm identifier	MS1NEScTHR15
Information	The STM-1 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	MS1NEScTHR24
Information	The STM-1 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Near-end severely ES threshold crossing 15-min

Alarm identifier	MS1NSEScTHR15
Information	The STM-1 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Near-end severely ES threshold crossing 24-hrs

Alarm identifier	MS1NSEScTHR24
Information	The STM-1 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	MS1NUAScTHR15
Information	The STM-1 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	MS1NUAScTHR24
Information	The STM-1 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-1 MS Network connection server signal fail

Alarm identifier	MS1cSSF
Information	The STM-1 network connection is unavailable due to faults in the active Multiplex Section. These faults are indicated by the reception of MS-AIS, STM-1 LOS, STM-1 LOF, or equipment failures of the STM-1 Synchronous Interface unit.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the STM-1 Synchronous Interface unit is lit.
Cause	One or more STM-1 or MS faults in this or upstream network elements, the effect of which could not be circumvented via protection.
Actions	Check for the failed section and repair it.
Note(s)	In the downstream direction, AIS is inserted. In the upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is inserted on STM-1 level.



STM-1 MS Protection switching protocol failure

Alarm identifier	MS1cFOP
Information	STM-1 multiplex section automatic protection switching (APS) protocol failure.
Alarm category	Processing error
ASAP	sdhMSP
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	Unstable APS protocol.
Actions	Check that the MSP group is correctly created at both ends of the line (both ends provisioned with the same MSP configuration). Check that interworking between the two MSP groups is possible.



STM-1 MS Remote defect indicator

Alarm identifier	MS1cRDI
Information	The STM-1 receive signal contains MS-RDI.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream equipment has detected a receive signal failure, and has inserted MS-RDI as a consequent action.
Actions	Locally no actions need to be taken. Analyze the alarm state of the downstream equipment and take appropriate measures.
Note(s)	<p>The downstream equipment has detected one of the following failure conditions at its receive side:</p> <ul style="list-style-type: none"> • STM-1 MS-AIS (Multiplex Section - Alarm Indication Signal) • STM-1 LOS (Loss of signal) or • STM-1 LOF (Loss of frame). <p>This is reported to the transmitting equipment via the Remote Defect Indication (RDI) which is used to draw local attention to the remote failure.</p>



STM-1 Not expected input signal

Alarm identifier	STM1cNES
Information	An incoming signal has been detected on an STM-1 port although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Change the port monitoring mode to "Monitored", or check the cabling (and re-arrange if necessary).



STM-1 RS Near-end background block errors thresh cross 15-min

Alarm identifier	RS1NBBEcTHR15
Information	The STM-1 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS Near-end background block errors thresh cross 24-hrs

Alarm identifier	RS1NBBEcTHR24
Information	The STM-1 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS Near-end errored seconds threshold crossing 15-min

Alarm identifier	RS1NEScTHR15
Information	The STM-1 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	RS1NEScTHR24
Information	The STM-1 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS Near-end severely ES threshold crossing 15-min

Alarm identifier	RS1NSEScTHR15
Information	The STM-1 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS Near-end severely ES threshold crossing 24-hrs

Alarm identifier	RS1NSEScTHR24
Information	The STM-1 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	RS1NUAScTHR15
Information	The STM-1 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	RS1NUAScTHR24
Information	The STM-1 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The alarm will be cleared automatically at the end of the first complete interval during which the counter value did not exceed the RTR threshold.



STM-1 RS trace identifier mismatch

Alarm identifier	RS1cTIM
Information	The received RS trace identifier, used to verify the continued connection to the intended transmitter, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Wrong routing somewhere in the network due to wrongly provisioned cross-connections or wrongly connected line cables. • Wrongly configured expected trace identifier filled in via the management system for the node that reported the alarm. • Wrongly configured transmitted trace identifier in the remote equipment.
Actions	<p>Check the correctness of the expected RS trace identifier in the local equipment.</p> <p>Check the correctness of the transmitted trace identifier in the remote equipment.</p> <p>Check the correctness of the cross-connections.</p> <p>Determine in which node(s) the line cables are wrongly connected by interpreting the received STM-1 RS trace identifiers.</p>



STM-4 Loss of frame alignment

Alarm identifier	STM4cLOF
Information	The position of the frame alignment bytes A1 and A2 in the Section Overhead of the receive signal cannot be detected correctly. Thus, alignment to the framing structure of the received signal is not possible, and as a result, overhead and payload data cannot be extracted.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the port unit is flashing.
Cause	<p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Unexpected signal structure in the receive signal (for example STM-1 instead of STM-4) • Dirty optical connector(s) • STM-4 not correctly formed in the upstream station • Equipment fault(s) in the upstream station
Actions	Check upstream external cabling and equipment.
Note(s)	<p>In the downstream direction, AIS is inserted.</p> <p>In the upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is inserted.</p>



STM-4 Loss of input signal

Alarm identifier	STM4cLOS
Information	The power level of the received signal is below a defined level and LOF is detected.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	<ul style="list-style-type: none"> • The red fault LED on the STM-4 Synchronous Interface unit is flashing. • In the upstream direction, MS-RDI is inserted. • In the assembly direction VC-4 path, AIS is inserted.
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Cable rupture. • Dirty optical connector(s). • Equipment fault(s) in the upstream far-end station of the network element that reported the alarm.
Actions	<p>Check operation of the transmitter in the far-end station.</p> <p>Check for cable breaks or dirty connectors.</p>
Note(s)	In the upstream direction, “MS - Remote Defect Indicator” is activated.



STM-4 MS Alarm indication signal received

Alarm identifier	MS4cAIS
Information	<p>When the Alarm Indication Signal (AIS) is received, then:</p> <ul style="list-style-type: none"> • The STM-4 MS contains all 1s (alarm indication signal). • The upstream equipment has detected a defect and responded to it.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	In the upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is inserted.
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Locally no actions need to be taken. Analyze the alarm state of the upstream equipment and take appropriate measures.
Note(s)	There are no actions needed concerning the indicated network element; alarm indication signal is only reported for information.



STM-4 MS Excessive bit error rate

Alarm identifier	MS4cEXC
Information	The bit error ratio (BER) in the STM-4 Multiplex Section is very high and the signal received at an optical STM-4 interface is therefore subject to considerable interference.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>This alarm is initiated if the BER in the Multiplex Section, calculated using the B2 bytes of the Multiplex Section Overhead (MSOH), exceeds the Excessive Error Threshold (provisionable to 10^{-3} (default setting), 10^{-4} or 10^{-5}).</p> <p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Excessive attenuation of the optical signal (for example due to connectors featuring impurities) on the transmit and/or receive side • Incorrect formation of the STM signal at the far end • A defect in the optical transmitter at the far end • Considerable interference in the transmission path in the receive direction • Wrong cabling (for example STM-N signal ($N \neq 4$) connected instead of STM-4)
Actions	Check optical connectors and/or the external cabling and equipment.



STM-4 MS Moderate block error rate

Alarm identifier	MS4cDEG
Information	STM-4 signal degrade. The block error rate of an incoming STM-4 signal exceeds an error threshold. The signal degrade threshold can be provisioned via the management system.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



STM-4 MS Near-end background block errors threshold crossing 15-min

Alarm identifier	MS4NBBEcTHR15
Information	The STM-4 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Near-end background block errors threshold crossing 24-hrs

Alarm identifier	MS4NBBEcTHR24
Information	The STM-4 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none">• Dirty optical connector(s).• Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Near-end errored seconds threshold crossing 15-min

Alarm identifier	MS4NEscTHR15
Information	The STM-4 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	MS4NEScTHR24
Information	The STM-4 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Near-end severely ES threshold crossing 15-min

Alarm identifier	MS4NSEScTHR15
Information	The STM-4 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Near-end severely ES threshold crossing 24-hrs

Alarm identifier	MS4NSEScTHR24
Information	The STM-4 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	MS4NUAScTHR15
Information	The STM-4 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	MS4NUAScTHR24
Information	The STM-4 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 MS Protection switching protocol failure

Alarm identifier	MS4cFOP
Information	STM-4 multiplex section automatic protection switching (APS) protocol failure.
Alarm category	Processing error
ASAP	sdhMSP
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red fault LED on the STM-4 Synchronous Interface unit is lit.
Cause	Unstable APS protocol.
Actions	Check that MSP group is correctly created at both ends of the line (both ends provisioned with the same MSP configuration). Check that interworking between the two MSP groups is possible.
Note(s)	



STM-4 MS Remote defect indicator

Alarm identifier	MS4cRDI
Information	The STM-4 receive signal contains MS- RDI.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream equipment has detected a receive signal failure, and has inserted MS-RDI as a consequent action.
Actions	Locally no actions can be taken. Analyze the alarm state of the downstream equipment and take appropriate measures.
Note(s)	<p>The downstream equipment has detected one of the following failure conditions at its receive side:</p> <ul style="list-style-type: none"> • STM-4 MS AIS (Multiplex Section Alarm Indication Signal) • STM-4 LOS (Loss Of Signal) or • STM-4 LOF (Loss Of Frame). <p>This is reported to the transmitting equipment via the Remote Defect Indication (RDI) which is used to draw local attention to the remote failure.</p>



STM-4 Network connection server signal fail

Alarm identifier	MS4cSSF
Information	<p>The network connection is unavailable due to faults in the active multiplex section.</p> <p>These faults are indicated by the reception of the MS - Alarm Indication Signal, STM-4 Loss of input signal, STM-4 Loss of frame alignment, or equipment failures of the STM-4 Synchronous Interface unit.</p>
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	<p>In the reporting Network Element:</p> <ul style="list-style-type: none"> • The red fault LED on the STM-4 Synchronous Interface unit is lit. • In the upstream direction, “Multiplex Section - Remote Defect Indicator” is activated. • In the assembly direction the alarm indication signal is inserted.
Cause	One of more STM-4 or MS faults in this or upstream network elements, the effect of which could not be circumvented via protection.
Actions	Check for the failed section and repair it.



STM-4 Not expected input signal

Alarm identifier	STM4cNES
Information	An incoming signal has been detected on an STM-4 port although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Change the port monitoring mode to "Monitored", or check the cabling (and re-arrange if necessary).



STM-4 RS Near-end background block errors thresh cross 15-min

Alarm identifier	RS4NBBEcTHR15
Information	The STM-4 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS Near-end background block errors thresh cross 24-hrs

Alarm identifier	RS4NBBEcTHR24
Information	The STM-4 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS Near-end errored seconds threshold crossing 15-min

Alarm identifier	RS4NEScTHR15
Information	The STM-4 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	RS4NEScTHR24
Information	The STM-4 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS Near-end severely ES threshold crossing 15-min

Alarm identifier	RS4NSEScTHR15
Information	The STM-4 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS Near-end severely ES threshold crossing 24-hrs

Alarm identifier	RS4NSEScTHR24
Information	The STM-4 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	RS4NUAScTHR15
Information	The STM-4 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	RS4NUAScTHR24
Information	The STM-4 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-4 RS trace identifier mismatch

Alarm identifier	RS4cTIM
Information	The received section trace identifier, used to verify the continued connection to the intended transmitter, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Wrong routing somewhere in the network due to wrongly provisioned cross-connections or wrongly connected line cables. • Wrongly configured expected trace identifier filled in via the management system for the node that reported the alarm. • Wrongly configured transmitted trace identifier in the remote equipment.
Actions	<p>Check the correctness of the expected RS trace identifier in the local equipment.</p> <p>Check the correctness of the transmitted trace identifier in the remote equipment.</p> <p>Check the correctness of the cross-connections.</p> <p>Determine in which node(s) the line cables are wrongly connected by interpreting the received STM-4 RS trace identifiers.</p>



STM-16 ALS disabled

Alarm identifier	LTX16cALS
Information	In one of the regenerators in the span, the STM-16 ALS (Automatic Laser Shutdown) is disabled.
Alarm category	Processing error
ASAP	–
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The STM-16 Automatic Laser Shutdown (ALS) is disabled.
Actions	If desired, enable the Automatic Laser Shutdown
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



STM-16 APS byte fail

Alarm identifier	MS16cBYF
Information	STM-16 automatic protection switching channel byte failure.
Alarm category	Transmission
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Unstable APS bytes.
Actions	Check other transmission alarms. Check upstream equipment.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-16 APS channel failure

Alarm identifier	MS16cCHF
Information	The APS channel is blocked (lockout of protection) or not properly supported on one or more nodes in the MS-SPRing. The alarm-reporting network element does not receive correct K-byte information.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	<ol style="list-style-type: none"> 1. One or more nodes in the MS-SPRing is not provisioned as MS-SPRing node which causes the miscommunication over the K-Bytes. 2. The APS controller in the next NE in the reported line section may be corrupt causing the APS protocol to fail. 3. The MS-SPRing protection may be locked out of protection.
Actions	<ol style="list-style-type: none"> 1. Make sure all nodes in the ring have MS-SPRing enabled. 2. Check for a proper K-byte communication between the reporting NE and the remote NE on the reported line. If failures are seen then try replacing the (working) CC unit in the remote NE. 3. Make sure there is no lockout of protection.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-16 Default K-bytes received

Alarm identifier	MS16cBYD
Information	Default K-bytes received from neighbor node.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Problems in the neighbor node, e.g. restart of the node.
Actions	Wait, or check the neighbor node.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-16 fault locate fails

Alarm identifier	REG16CONcFLR
Information	Supervisory alarm, regenerator fault locate mechanism fails.
Alarm category	Processing error
ASAP	–
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>The alarm was generated because of:</p> <ul style="list-style-type: none"> • Failure in the regenerator fault locate (FL) mechanism. • The optical line between two terminals is broken. • During an network element reset the fault locate provisioning is disrupted.
Actions	<p>Check if regenerator fault locate is “enabled” on both terminals using the CIT. Repair any defect in the regenerator site.</p>
Note(s)	This alarm could occur at the network element or could be reported by a “Regen fault location” mechanism (if enabled) to the network element.



STM-16 Fiber connection conflict

Alarm identifier	MS16cFIC
Information	Incoming, outgoing or both fiber connections are connected to the wrong optical connector (e.g. LS1 in node 1 with LS1 in node 2 instead of LS2).
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Fiber connections are interchanged by MS-SPRing network element.
Actions	Correct fiber connections.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-16 Laser switched off

Alarm identifier	MS16cLSROFF
Information	In one of the regenerators on the span, the STM-16 laser is switched off due to loss of incoming signal (if ALS is enabled).
Alarm category	Transmission
ASAP	–
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream transmission equipment.
Actions	Check in upstream transmission equipment.
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



STM-16 LOS and restart pulse detected

Alarm identifier	STM16cPLOS
Information	No incoming restart pulse detected resulting in ALS.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red LED on the line unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Cable rupture in downstream line. • Equipment fault(s) in the local station.
Actions	Check upstream external cabling or equipment.
Note(s)	In the upstream direction, “Multiplex Section - Remote Defect Indicator” is activated. In the disassembly direction VC-4 Path alarm indication signal is inserted (16 times).



STM-16 LOS and restart pulse detected - protected

Alarm identifier	STM16cPLOSP
Information	In one of the regenerators in the span, an STM-16 loss of signal pulse is detected. No incoming restart pulse detected resulting in ALS.
Alarm category	Transmission
ASAP	–
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Cable rupture in downstream line. • Equipment fault(s) in the regenerator site.
Actions	Check upstream external cabling or equipment.
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



STM-16 Loss of frame alignment

Alarm identifier	STM16cLOF
Information	Alignment to the frame structure of the received STM-16 signal is not possible. As a result, overhead and payload data cannot be extracted.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red "FAIL" LED on the port unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	In the downstream direction, AIS is inserted. In the upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is inserted.



STM-16 Loss of frame alignment - protected

Alarm identifier	STM16cLOFP
Information	In one of the regenerators in the span, an STM-16 loss of frame is detected: 29 consecutive frames with errors are received in a protected configuration (no synchronization to incoming signal possible).
Alarm category	Transmission
ASAP	–
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	In the downstream direction, AIS is inserted. In the upstream direction, “Multiplex Section - Remote Defect Indicator” (MS-RDI) is inserted.



STM-16 Loss of input signal

Alarm identifier	STM16cLOS
Information	STM-16 Loss Of Signal: LOF and LORC are detected. (If STM-16 signal is too low or too high also laser failure is detected.)
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red LED on the line unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Cable rupture. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	In the upstream direction, "Multiplex Section - Remote Defect Indicator" is activated. In the disassembly direction VC-4 Path alarm indication signal is inserted (16 times).



STM-16 Loss of input signal - protected

Alarm identifier	STM16cLOSP
Information	In one of the regenerators in the span, an STM-16 loss of signal is detected: the incoming STM-16 signal is too low or too high and LOF and LORC are detected.
Alarm category	Transmission
ASAP	–
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Cable rupture. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	In the upstream direction, “Multiplex Section - Remote Defect Indicator” is activated. This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



STM-16 MS Alarm indication signal received

Alarm identifier	MS16cAIS
Information	STM-16 alarm indication signal on multiplex section. The incoming MS-16 contains alarm indication signal (AIS).
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red LED on the line unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Fault in an upstream node. • Equipment fault(s) in the local station.
Actions	Check alarms in upstream nodes.
Note(s)	<ul style="list-style-type: none"> • For a Line Terminal, “AU-4 Path AIS” is injected in the tributary output signals. • In the opposite side upstream direction, “Multiplex Section - Remote Defect Indicator” (MS-RDI) is activated. • If a Regenerator is present, in the upstream direction STM-16 MS AIS is passed through.



STM-16 MS Excessive bit error rate

Alarm identifier	MS16cEXC
Information	The bit error ratio (BER) in the STM-16 Multiplex Section is very high and the signal received at an optical STM-16 interface is therefore subject to considerable interference.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>This alarm is initiated if the BER in the Multiplex Section, calculated using the B2 bytes of the Multiplex Section Overhead (MSOH), exceeds the Excessive Error Threshold (provisionable to 10^{-3} (default setting), 10^{-4} or 10^{-5}).</p> <p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Excessive attenuation of the optical signal (for example due to connectors featuring impurities) on the transmit and/or receive side • Incorrect formation of the STM signal at the far end • A defect in the optical transmitter at the far end • Considerable interference in the transmission path in the receive direction • Wrong cabling (for example STM-N signal ($N \neq 16$) connected instead of STM-16)
Actions	Check optical connectors and/or the external cabling and equipment.



STM-16 MS Moderate block error rate

Alarm identifier	MS16cDEG
Information	The block error rate of an incoming STM-16 signal exceeds an error threshold.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none">• Dirty optical connector(s).• Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end background block errors thresh cross 15-min

Alarm identifier	MS16NBBEcTHR15
Information	The STM-16 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end background block errors thresh cross 24-hrs

Alarm identifier	MS16NBBEcTHR24
Information	The STM-16 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end errored seconds threshold crossing 15-min

Alarm identifier	MS16NEScTHR15
Information	The STM-16 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	MS16NEScTHR24
Information	The STM-16 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end severely ES threshold crossing 15- min

Alarm identifier	MS16NSEScTHR15
Information	The STM-16 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end severely ES threshold crossing 24- hrs

Alarm identifier	MS16NSEScTHR24
Information	The STM-16 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end unavailable seconds threshold crossing 15- min

Alarm identifier	MS16NUAScTHR15
Information	The STM-16 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Near-end unavailable seconds threshold crossing 24- hrs

Alarm identifier	MS16NUAScTHR24
Information	The STM-16 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 MS Protection switching protocol failure

Alarm identifier	MS16cFOP
Information	STM-16 Multiplex Section automatic protection switching (APS) protocol failure.
Alarm category	Processing error
ASAP	sdhMSP
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Unstable APS protocol.
Actions	Check other transmission alarms. Check upstream equipment.



STM-16 MS Remote defect indicator

Alarm identifier	MS16cRDI
Information	Remote Defect Indicator on STM-16 Multiplex Section is being received.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In the upstream station, one of the following conditions is detected: <ul style="list-style-type: none"> • STM-16 MS AIS (Multiplex Section Alarm Indication Signal) • STM-16 LOS (Loss Of Signal) • STM-16 LOF (Loss Of Frame).
Actions	Check local transmitting equipment. Check cabling.



STM-16 Network connection server signal fail

Alarm identifier	MS16cSSF
Information	<p>The network connection is unavailable due to faults in the active multiplex section.</p> <p>These faults are indicated by the reception of the MS - Alarm Indication Signal, STM-16 Loss of input signal, STM-16 Loss of frame alignment, or equipment failures of the STM-16 Synchronous Interface unit.</p>
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the STM-16 Synchronous Interface unit is lit.
Cause	One or more STM-16 or MS faults in this or upstream network elements, the effect of which could not be circumvented via protection.
Actions	Check for the failed section and repair it.
Note(s)	<p>In the downstream direction, AIS is inserted.</p> <p>In the upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is inserted.</p>



STM-16 Not expected input signal

Alarm identifier	STM16cNES
Information	An incoming signal has been detected on an STM-16 port although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Put the port "Monitored", or check the cabling (and re-arrange if necessary).



STM-16 RS Near-end background block errors thresh cross 15-min

Alarm identifier	RS16NBBEcTHR15
Information	The STM-16 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS Near-end background block errors thresh cross 24-hrs

Alarm identifier	RS16NBBEcTHR24
Information	The STM-16 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS Near-end errored seconds threshold crossing 15-min

Alarm identifier	RS16NEScTHR15
Information	The STM-16 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	RS16NEScTHR24
Information	The STM-16 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS Near-end severely ES threshold crossing 15- min

Alarm identifier	RS16NSEScTHR15
Information	The STM-16 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS Near-end severely ES threshold crossing 24- hrs

Alarm identifier	RS16NSEScTHR24
Information	The STM-16 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS Near-end unavailable seconds threshold crossing 15- min

Alarm identifier	RS16NUAScTHR15
Information	The STM-16 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS Near-end unavailable seconds threshold crossing 24- hrs

Alarm identifier	RS16NUAScTHR24
Information	The STM-16 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-16 RS trace identifier mismatch

Alarm identifier	RS16cTIM
Information	The received RS trace identifier, used to verify the continued connection to the intended transmitter, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong routing somewhere in the network due to: <ul style="list-style-type: none"> • Wrong connected line cables. • Wrong expected trace identifier filled in via the management system for the node that reported the alarm.
Actions	Determine in which node(s) the line cables are wrongly connected by interpreting the received STM-16 RS trace identifiers. Check correctness of expected RS trace identifier.



STM-64 APS byte failure

Alarm identifier	MS64cBYF
Information	STM-64 automatic protection switching channel byte failure.
Alarm category	Transmission
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Unstable APS bytes.
Actions	Check other transmission alarms. Check upstream equipment.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-64 APS channel failure

Alarm identifier	MS64cCHF
Information	STM-64 automatic protection switching channel failure.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	On either line side, A or B, of the network element the MS-SPRing protection is locked out of protection.
Actions	Clear the MS-SPRing protection switch request on the related line of the node that reports the alarm. Check upstream equipment.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-64 Default K-bytes received

Alarm identifier	MS64cBYD
Information	Default K-bytes received from neighbor node.
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Problems in the neighbor node, e.g. restart of the node.
Actions	Wait, or check the neighbor node.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-64 Fiber connection conflict

Alarm identifier	MS64cFIC
Information	Incoming, outgoing or both fiber connections are connected to the wrong optical connector (e.g. LS1 in node 1 with LS1 in node 2 instead of LS2).
Alarm category	Processing error
ASAP	sdhMSR
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Fiber connections are interchanged by MS-SPRing network element.
Actions	Correct fiber connections.
Note(s)	This alarm is only valid for MS-SPRing configurations.



STM-64 LOS and restart pulse detected

Alarm identifier	STM64cPLOS
Information	No incoming restart pulse detected resulting in ALS.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red LED on the line unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Cable rupture in downstream line. • Equipment fault(s) in the local station.
Actions	Check upstream external cabling or equipment.
Note(s)	<ul style="list-style-type: none"> • In the upstream direction, “Multiplex Section - Remote Defect Indicator” is activated. • In the disassembly direction VC-4 Path alarm indication signal is inserted (64 times).



STM-64 LOS and restart pulse detected - protected

Alarm identifier	STM64cPLOSP
Information	In one of the regenerators in the span, an STM-64 loss of signal pulse is detected. No incoming restart pulse detected resulting in ALS.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Cable rupture in downstream line. • Equipment fault(s) in the regenerator site.
Actions	Check upstream external cabling or equipment.
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



STM-64 Loss of frame alignment

Alarm identifier	STM64cLOF
Information	Alignment to the frame structure of the received STM-64 signal is not possible. As a result, overhead and payload data cannot be extracted.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red "FAIL" LED on the port unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	In the downstream direction, AIS is inserted. In the upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is inserted.



STM-64 Loss of input signal

Alarm identifier	STM64cLOS
Information	STM-64 Loss Of Signal: LOF and LORC are detected. (If STM-64 signal is too low or too high also laser failure is detected.)
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red LED on the line unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Cable rupture. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	<ul style="list-style-type: none"> • In the upstream direction, “Multiplex Section - Remote Defect Indicator” is activated. • In the disassembly direction VC-4 Path alarm indication signal is inserted (64 times).



STM-64 MS Alarm indication signal received

Alarm identifier	MS64cAIS
Information	STM-64 alarm indication signal on multiplex section. The incoming MS-64 contains alarm indication signal (AIS).
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red LED on the line unit is flashing.
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Fault in an upstream node. • Equipment fault(s) in the local station.
Actions	Check alarms in upstream nodes.
Note(s)	<ul style="list-style-type: none"> • For a Line Terminal, "AU-4 Path AIS" is injected in the tributary output signals. • In the opposite side upstream direction, "Multiplex Section - Remote Defect Indicator" (MS-RDI) is activated. • If a Regenerator is present, in the upstream direction STM-64 MS AIS is passed through.



STM-64 MS Excessive bit error rate

Alarm identifier	MS64cEXC
Information	The bit error ratio (BER) in the STM-64 Multiplex Section is very high and the signal received at an optical STM-64 interface is therefore subject to considerable interference.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>This alarm is initiated if the BER in the Multiplex Section, calculated using the B2 bytes of the Multiplex Section Overhead (MSOH), exceeds the Excessive Error Threshold (provisionable to 10^{-3} (default setting), 10^{-4} or 10^{-5}).</p> <p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> • Excessive attenuation of the optical signal (for example due to connectors featuring impurities) on the transmit and/or receive side • Incorrect formation of the STM signal at the far end • A defect in the optical transmitter at the far end • Considerable interference in the transmission path in the receive direction • Wrong cabling (for example STM-N signal ($N \neq 64$) connected instead of STM-64)
Actions	Check optical connectors and/or the external cabling and equipment.



STM-64 MS Moderate block error rate

Alarm identifier	MS64cDEG
Information	STM-64 signal degrade. The block error rate of an incoming STM-64 signal exceeds an error threshold. The signal degrade threshold can be provisioned via the management system.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



STM-64 MS Near-end background block errors threshold cross 15- min

Alarm identifier	MS64NBBEcTHR15
Information	The STM-64 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Near-end background block errors thresh cross 24-hrs

Alarm identifier	MS64NBBEcTHR24
Information	The STM-64 Multiplex Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Near-end errored seconds threshold crossing 15-min

Alarm identifier	MS64NEScTHR15
Information	The STM-64 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	MS64NEScTHR24
Information	The STM-64 Multiplex Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Near-end severely ES threshold crossing 15- min

Alarm identifier	MS64NSEScTHR15
Information	The STM-64 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Near-end severely ES threshold crossing 24- hrs

Alarm identifier	MS64NSEScTHR24
Information	The STM-64 Multiplex Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Near-end unavailable seconds threshold crossing 15- min

Alarm identifier	MS64NUAScTHR15
Information	The STM-64 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Near-end unavailable seconds threshold crossing 24- hrs

Alarm identifier	MS64NUAScTHR24
Information	The STM-64 Multiplex Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 MS Protection switching protocol failure

Alarm identifier	MS64cFOP
Information	STM-64 multiplex section automatic protection switching (APS) protocol failure.
Alarm category	Processing error
ASAP	sdhMSP
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Unstable APS protocol.
Actions	Check other transmission alarms. Check upstream equipment.



STM-64 MS Remote defect indicator

Alarm identifier	MS64cRDI
Information	A Multiplex Section Remote Defect Indicator is being received.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In the upstream station, one of the following conditions is detected: <ul style="list-style-type: none"> • MS AIS (Multiplex Section Alarm Indication Signal). • STM-1 Exc BER (Excessive Bit Error rate). • LOS (Loss Of Signal). • LOF (Loss Of Frame).
Actions	Locally none. Clear the indicated receive side fault(s) in the far-end node. Check cabling.



STM-64 Network connection server signal fail

Alarm identifier	MS64cSSF
Information	This alarm signals that the network connection is unavailable due to faults in the serving higher order and/or section layers. These faults are indicated by the reception of the alarm indication signal.
Alarm category	Transmission
ASAP	sdhMS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In case of LOS or LOF the LED on the line unit is flashing.
Cause	One of more STM-64 faults in this or upstream nodes, the effect of which could not be circumvented via protection.
Actions	When there is an unprotected STM-64 line, select an alternative STM-64 line. When there is a protected STM-64 line, check for external switch commands locking the protection switch to a failed link connection.
Local indications	<ul style="list-style-type: none"> • In the upstream direction, “Multiplex Section - Remote Defect Indicator” is activated. • In the assembly direction the alarm indication signal is inserted.



STM-64 Not expected input signal

Alarm identifier	STM64cNES
Information	An incoming signal has been detected on an STM-64 port although the port is provisioned "Not Monitored".
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>There are two possible reasons:</p> <ol style="list-style-type: none"> 1. Either the port is intentionally not in use, and therefore is provisioned "Not Monitored", but mistakenly an input signal is applied (due to erroneous routing of intermediate cabling for example), or 2. although an input signal is applied, the port is mistakenly provisioned "Not Monitored".
Actions	Put the port "Monitored", or check the cabling (and re-arrange if necessary).



STM-64 RS Near-end background block errors thresh cross 15-min

Alarm identifier	RS64NBBEcTHR15
Information	The STM-64 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS Near-end background block errors thresh cross 24-hrs

Alarm identifier	RS64NBBEcTHR24
Information	The STM-64 Regenerator Section near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS Near-end errored seconds threshold crossing 15-min

Alarm identifier	RS64NEScTHR15
Information	The STM-64 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none">• Dirty optical connector(s).• Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	RS64NEScTHR24
Information	The STM-64 Regenerator Section near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS Near-end severely ES threshold crossing 15- min

Alarm identifier	RS64NSEScTHR15
Information	The STM-64 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS Near-end severely ES threshold crossing 24- hrs

Alarm identifier	RS64NSEScTHR24
Information	The STM-64 Regenerator Section near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS Near-end unavailable seconds threshold crossing 15- min

Alarm identifier	RS64NUAScTHR15
Information	The STM-64 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS Near-end unavailable seconds threshold crossing 24- hrs

Alarm identifier	RS64NUAScTHR24
Information	The STM-64 Regenerator Section near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Fiber cut. • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



STM-64 RS trace identifier mismatch

Alarm identifier	RS64cTIM
Information	The received RS trace identifier, used to verify the continued connection to the intended transmitter, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong routing somewhere in the network due to: <ul style="list-style-type: none"> • Wrong connected line cables. • Wrong expected trace identifier filled in via the management system for the node that reported the alarm.
Actions	Determine in which node(s) the line cables are wrongly connected by interpreting the received STM-64 RS trace identifiers. Check correctness of expected RS trace identifier.



SW version mismatch

Alarm identifier	SYSMEMcSWM
Information	In one of the regenerators of the span a volatile or nonvolatile software identification mismatch is detected.
Alarm category	Processing error
ASAP	–
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	At regenerator site, a system download procedure was executed. The software version of the active software does not match the downloaded software in the nonvolatile memory.
Actions	At regenerator site, execute a RESET command to make the downloaded software operational.
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



Synchronous interface unit failure

Alarm identifier	SIcUPF
Information	SI (Synchronous Interface unit) failure. Due to the lack of a protection unit the service failed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red LED on the SI is lit.
Cause	A hardware failure of the synchronous interface is detected.
Actions	If the alarm is still present after 1 minute, then remove the synchronous interface and replace it with another one.
Note(s)	As no equipment protection exists for Synchronous Interface units, SIcEQF and SIcUPF are always reported simultaneously as a reminder that the failure of a Synchronous Interface unit is service affecting. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Synchronous interface unit failure - protected

Alarm identifier	SIcEQF
Information	A hardware failure of the SI (Synchronous Interface unit) in the shelf of the indicated node is detected.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The red LED on the SI is lit.
Cause	The on board selftest circuitry indicates that an essential function of the unit fails.
Actions	Replace the synchronous interface unit.
Note(s)	As no equipment protection exists for Synchronous Interface units, SIcEQF and SIcUPF are always reported simultaneously as a reminder that the failure of a Synchronous Interface unit is service affecting. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Synchronous interface unit removed

Alarm identifier	SIcUNI
Information	SI (Synchronous Interface unit) removed.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Synchronous interface not present.
Actions	Reinstall the unit into its slot position.
Note(s)	An SIcUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



System temperature too high

Alarm identifier	SYScTMP
Information	The cooling is not sufficient. The temperature of one or more units is too high, while the fans are running on maximum speed.
Alarm category	Environment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	The alarm may be caused by inadequate heat dissipation (failure of the cooling system) or by an extremely high ambient temperature.
Actions	<p>Make sure that the ventilation plates of the fan units are not obstructed and/or verify that the dust filters are not clogged.</p> <p>If the ambient temperature is extremely high, then provide cooling at least in the direct vicinity of the network element.</p>



System timing in backup state

Alarm identifier	TBACKcUPM
Information	System timing switched to backup timing source.
Alarm category	Transmission
ASAP	timing
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	No timing sources with sufficient quality and/or priority are present.
Actions	Restore original timing source or reconfigure the most reliable timing source.



Test station alarms

Alarm identifier	SYScALMT
Information	In one of the regenerators of the span test station alarms is in progress.
Alarm category	Processing error
ASAP	–
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	At regenerator site, an alarm test was initiated on the CIT.
Actions	None.
Note(s)	This alarm is reported by a “Regen fault location” mechanism (if enabled) to the network element.



Timing interface unit failure

Alarm identifier	TlCUPF
Information	TI (Timing Interface unit) failure. Due to the lack of a protection unit the service failed.
Alarm category	Equipment
Alarm severity assignment profile	ASAP-name
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The unit LED on the Timing Interface unit is lit.
Cause	A hardware failure of the unprotected timing interface unit is detected.
Actions	Replace the indicated unit.
Note(s)	<p>As no equipment protection exists for Timing Interface units, TlCEQF and TlCUPF are always reported simultaneously as a reminder that the failure of a Timing Interface unit is service affecting.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Timing interface unit failure - protected

Alarm identifier	TicEQF
Information	Primarily, the TicEQF alarm indicates that a hardware failure of the TI (Timing Interface unit) in the shelf of the indicated node is detected. Moreover, the alarm may also be caused by an unstable timing reference signal.
Alarm category	Equipment
Alarm severity assignment profile	ASAP-name
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	The unit LED on the Timing Interface unit is lit.
Cause	The incoming timing reference signal is unstable, or the on board self test circuitry indicates that an essential function of the unit fails.
Actions	Check the stability of the incoming timing reference signal. If the incoming timing reference signal is unstable, then make sure to supply a stable signal. Otherwise, replace the Timing Interface unit.
Note(s)	As no equipment protection exists for Timing Interface units, TicEQF and TicUPF are always reported simultaneously as a reminder that the failure of a Timing Interface unit is service affecting. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Timing interface unit removed

Alarm identifier	TicUNI
Information	TI (Timing Interface unit) removed.
Alarm category	Equipment
Alarm severity assignment profile	ASAP-name
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	timing interface not present.
Actions	Reinstall the unit into its slot position.
Note(s)	A TicUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Timing link failed

Alarm identifier	TLINKcFLR
Information	The timing reference signal, incoming at a line timing port, is not acceptable as timing source.
Alarm category	Transmission
ASAP	timing
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>The alarm was generated because:</p> <ul style="list-style-type: none"> • Timing link may be failing. • Timing link reference signal is below an acceptable value. • The frequency deviation exceeds the tolerable limits.
Actions	<p>Check equipment in the upstream far end station.</p> <p>Check upstream cabling.</p>



Timing link unequipped

Alarm identifier	TLINKcUNEQ
Information	No timing link reference signal available.
Alarm category	Processing error
ASAP	timing
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	No timing source assigned to a timing port in monitored state.
Actions	Define or change the timing link output reference signal at the far end upstream station.



Trace tone detected (STM16cTTD)

Alarm identifier	STM16cTTD
Information	A trace tone from the line port unit of the reporting node is detected. This trace tone is initiated on user request for maintenance purpose on the connected Wavestar™ OLS400G.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	A trace tone is initiated on user request.
Actions	None
Note(s)	On the management system the user can activate a trace tone on the line port unit for maintenance purpose of the Wavestar™ OLS400G.



Trace tone detected (STM64cTTD)

Alarm identifier	STM64cTTD
Information	A trace tone from the line port unit of the reporting node is detected. This trace tone is initiated on user request for maintenance purpose on the connected Wavestar® OLS400G.
Alarm category	Transmission
ASAP	sdhPRS
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	A trace tone is initiated on user request.
Actions	None
Note(s)	On the management system the user can activate a trace tone on the line port unit for maintenance purpose of the Wavestar® OLS400G.



Traffic squelched

Alarm identifier	SQcAIS
Information	Traffic that can not be protected is squelched by replacing the signal with the alarm indication signal (all-ones pattern).
Alarm category	Transmission
ASAP	sdhMSR
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	A protection switch command caused rerouting of high priority traffic resulting in squelching low priority traffic.
Actions	Identify the cause of the protection switch command for the high priority traffic and take necessary actions to restore the original condition.
Note	This alarm is only valid for MS-SPRING configurations, and is accompanied by at least another message indicating a severe failure.



TU-12 Alarm indication signal received

Alarm identifier	TU12cAIS
Information	The VC-12 payload signal is replaced by the alarm indication signal. This is detected by checking the TU-12 pointer bytes for an all-ones pattern.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Locally no actions need to be taken. Analyze the alarm state of the upstream equipment and take appropriate measures.
Note(s)	In the upstream direction, “VC-12 Remote Defect Indicator” is activated.



TU-12 Loss of pointer

Alarm identifier	TU12cLOP
Information	No valid tributary unit pointer interpretation obtained in received signal.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Unit failure in the upstream node that generated the tributary unit pointer or in the node that reported the alarm.
Actions	<p>Check on the management system if unit failure is reported for the unit generating the tributary unit pointer.</p> <p>In that node, remove the unit and replace it with a new one.</p> <p>Otherwise (i.e. when no unit failure is reported), loop the STM-1 signal at the transmitting node and at the receiving node. In this condition, the node reporting TU-12 Loss of pointer contains the faulty unit.</p>
Note(s)	<p>In the downstream direction, AIS is inserted</p> <p>In the upstream direction, “VC-12 Remote Defect Indicator” is activated.</p>



TU-3 Alarm indication signal received

Alarm identifier	TU3cAIS
Information	The VC-3 payload signal is replaced by alarm indication signal. This is detected by checking the TU-3 pointer bytes for an all 1s pattern.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	In the upstream equipment a defect has been detected, and as a consequent action, AIS has been inserted in the downstream direction.
Actions	Locally no actions need to be taken. Analyze the alarm state of the upstream equipment and take appropriate measures.
Note(s)	In the upstream direction, “VC-3 Remote Defect Indicator” is activated.



TU-3 Loss of pointer

Alarm identifier	TU3cLOP
Information	No valid tributary unit pointer interpretation obtained in received signal.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Unit failure in the upstream node that generated the tributary unit pointer or in the node that reported the alarm.
Actions	<p>Check on the management system if unit failure is reported for the unit generating the tributary unit pointer.</p> <p>In that node, remove the unit and replace it with a new one.</p> <p>When unit failure is not reported, loop the STM-n signal at the transmitting node and at the receiving node. In this condition, the node reporting TU-3 Loss of pointer contains the faulty unit.</p>
Note(s)	In the upstream direction, “VC-3 Remote Defect Indicator” is activated.



Unit in initialisation

Alarm identifier	UNITcINIT
Information	A unit is detected in a slot which is still in the initialization phase.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	A unit is starting up.
Actions	Wait until the initialization of the unit has finished.
Note(s)	<p>When a unit is inserted into a slot, then the red fault LED on the unit is lit as long as unit-internal self tests are performed. The LED is turned off on the condition that the card is operational, which means that the quality of the unit is good.</p> <p>After this phase, the System Controller starts sending the configuration messages to the unit (which is indicated by the Unit in initialisation alarm). Once that is completed, traffic will be possible.</p> <p>The time interval between the time when the LED goes off after successful self test and the time when traffic is possible differs depending on the type of unit.</p>



Unit present in unassigned slot

Alarm identifier	UPUS
Information	A unit is detected in a slot which has not been provisioned.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	A unit is installed but it has not (yet) been provisioned.
Actions	Have the unit provisioned, or remove it from the indicated slot.
Note(s)	An empty slot, not configured, will not generate an alarm message.



VC-11 Moderate block error rate

Alarm identifier	VC11cDEG
Information	VC-11 signal degrade. The block error rate of an incoming VC-11 signal exceeds an error threshold. The signal degrade threshold can be provisioned via the management system.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-11 Near- end background block errors threshold crossing 15-min

Alarm identifier	VC11NBBEcTHR15
Information	The VC-11 near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Near- end background block errors threshold crossing 24-hrs

Alarm identifier	VC11NBBEcTHR24
Information	The VC-11 near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none">• Dirty optical connector(s).• Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Near- end errored seconds threshold crossing 15-min

Alarm identifier	VC11NEScTHR15
Information	The VC-11 near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Near- end errored seconds threshold crossing 24-hrs

Alarm identifier	VC11NEScTHR24
Information	The VC-11 near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Near- end severely ES threshold crossing 15-min

Alarm identifier	VC11NSEScTHR15
Information	The VC-11 near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Near- end severely ES threshold crossing 24-hrs

Alarm identifier	VC11NSEScTHR24
Information	The VC-11 near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Near- end unavailable seconds threshold crossing 15-min

Alarm identifier	VC11NUAScTHR15
Information	The VC-11 near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Near- end unavailable seconds threshold crossing 24-hrs

Alarm identifier	VC11NUAScTHR24
Information	The VC-11 near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-11 Network connection server signal fail

Alarm identifier	VC11cSSF
Information	This alarm signals that the network connection is unavailable due to faults in the serving higher order path and/or section layers.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more STM-1, MS or VC-4 faults in this or upstream nodes, the effect of which could not be circumvented via protection.
Actions	When the VC-11 is unprotected, then select an alternative VC-4 as server for the lower order VC. When the VC-11 is protected, then check for external switch commands locking the protection switch to a failed link connection.



VC-11 Path trace identifier mismatch

Alarm identifier	VC11cTIM
Information	Mismatch between the accepted (received) path trace identifier and the expected path trace identifier.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	A provisioned trace identifier inserted in a VC-11 path was received corrupted or not at all, due to a wrong provisioning of cross-connections, or due to hardware or transmission failures.
Actions	<p>Check cross-connections.</p> <p>Check upstream external cabling and equipment.</p> <p>Check trace identifier provisioning in VC-11 source and sink functions.</p>



VC-11 Payload mismatch

Alarm identifier	VC11cPLM
Information	The received V5 signal label, used to indicate the composition of the VC-11 payload, does not match the expected value.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The payload composition of the VC-11 is not as expected.
Actions	If the received V5 signal label (V5 [5-7]) has a value other than “000” or “001”, then check if the mapping mode of the local and far-end nodes is the same.
Note(s)	<p>When defining or changing a cross-connection this alarm will almost inevitably come up as it is practically impossible to issue the changes at both sides at the same moment.</p> <p>In the reporting Network Element:</p> <ul style="list-style-type: none"> • In the upstream direction VC-11 Remote Defect Indicator (RDI) is inserted. • In the downstream direction the alarm indication signal is inserted.



VC-11 Remote defect indicator

Alarm identifier	VC11cRDI
Information	A Remote Defect Indication (RDI) is being received.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream far end station of the node that reported the alarm detects a malfunction at its receive side: VC- 11 Path trace identifier mismatch or tributary unit alarm indication signal received.
Actions	No alarms in the reporting node. React on the far-end alarms. Follow the clearing actions for those alarm(s).



VC-11 Unequipped

Alarm identifier	VC11cUNEQ
Information	VC-11 in STM-N signal not in use.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Cross-connections not consistently defined at both sides (for example, at local and remote station) of a line section.
Actions	Define or change the cross-connections at the other side consistently with the local side.
Note(s)	When defining or changing cross-connections this alarm will almost inevitably come up as it is practically impossible to issue the changes at both sides exactly at the same time.



VC-12 Moderate block error rate

Alarm identifier	VC12cDEG
Information	VC-12 signal degrade. The block error rate of an incoming VC-12 signal exceeds an error threshold.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-12 Near-end background block errors threshold crossing 15-min

Alarm identifier	VC12NBBEcTHR15
Information	The VC-12 near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Near-end background block errors threshold crossing 24-hrs

Alarm identifier	VC12NBBEcTHR24
Information	The VC-12 near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Near-end errored seconds threshold crossing 15-min

Alarm identifier	VC12NEScTHR15
Information	The VC-12 near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	VC12NEScTHR24
Information	The VC-12 near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Near-end severely ES threshold crossing 15-min

Alarm identifier	VC12NSEScTHR15
Information	The VC-12 near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Near-end severely ES threshold crossing 24-hrs

Alarm identifier	VC12NSEScTHR24
Information	The VC-12 near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	VC12NUAScTHR15
Information	The VC-12 near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	VC12NUAScTHR24
Information	The VC-12 near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-12 Network connection server signal fail

Alarm identifier	VC12cSSF
Information	This alarm signals that the lower order network connection is unavailable due to faults in the serving higher order and/or section layers.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more STM-1, MS or VC-4 faults in this or upstream network elements, the effect of which could not be circumvented via protection.
Actions	When there is an unprotected lower order VC, select an alternative VC-4 as server for the lower order VC. When there is a protected lower order VC, check for external switch commands locking the protection switch to a failed link connection.



VC-12 Path trace identifier mismatch

Alarm identifier	VC12cTIM
Information	Mismatch between the accepted (received) path trace identifier and the expected path trace identifier.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	A provisioned trace identifier inserted in a VC-12 path was received corrupted or not at all, due to a wrong provisioning of cross-connections, or due to hardware or transmission failures.
Actions	Check cross-connections. Check upstream external cabling and equipment.



VC-12 Payload mismatch

Alarm identifier	VC12cPLM
Information	The received payload value, used to indicate the composition of the VC-12 payload, does not match the expected value.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In the reporting Network Element: <ul style="list-style-type: none"> • In the downstream direction the alarm indication signal is inserted. • In the upstream direction VC-12 Remote Defect Indicator (RDI) is inserted.
Cause	The payload composition of the VC-11 is not as expected.
Actions	If the received V5 signal label (V5 [5-7]) has a value other than “000” or “001”, then check if the mapping mode of the local and far-end nodes is the same.



VC-12 Remote defect indicator

Alarm identifier	VC12cRDI
Information	A Remote Defect Indication (RDI) is being received.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream far end station of the network element that reported the alarm detects a malfunction at its receive side: VC-12 Excessive error rate, VC-12 Path signal label mismatch, or tributary unit alarm indication signal received.
Actions	No alarms in the reporting network element. React on the far-end alarms. Follow the clearing actions for those alarm(s).



VC-12 Unequipped

Alarm identifier	VC12cUNEQ
Information	VC-12 in STM-N signal not in use.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Cross-connection not consistently defined at both sides (for example, at local and remote station) of a line section.
Actions	Define or change the cross-connection at the other side consistently with the local side.
Note(s)	When defining or changing a cross-connection this alarm will almost inevitably come up as it is practically impossible to issue the changes simultaneously at both sides.



VC-12 Virtual concatenated failure of protocol received

Alarm identifier	VC12VcFOPR
Information	A protocol failure in the receive direction occurred in the Link Capacity Adjustment Scheme (LCAS) protocol.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Inconsistent sequence numbers or CRC errors in control packets.
Actions	Check the provisioning of the source side. Make sure that LCAS is enabled at both sides, and that the used equipment can interwork.



VC-12 Virtual concatenated failure of protocol transmitted

Alarm identifier	VC12VcFOPT
Information	A protocol failure in the transmit direction occurred in the Link Capacity Adjustment Scheme (LCAS) protocol.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Inconsistent member status received.
Actions	Check the provisioning of the source side. Make sure that the used equipment can interwork.



VC-12 virtual concatenated group member differential delay out of range

Alarm identifier	VC12VcMND
Information	The differential delay between the VC-12s of a VC-12-Xv VCG exceeds the maximum permitted value.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The lengths of the individual VC-12 paths differ to such an extent that the different propagation delays cannot be compensated by buffering.
Actions	Re-route the VC-12 paths in order to adjust the propagation delays of the individual VC-12 paths.



VC-12 Virtual concatenated Loss of alignment

Alarm identifier	VC12VcLOA
Information	The virtually concatenated payload cannot be aligned to a common multiframe start.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	The delay difference between the VC-12s in the Virtual Concatenation Group (VCG) exceeds the range that can be compensated by buffering.
Actions	Check the cross connect structure.
Note(s)	Re-plan the path of each VC-12 channel.



VC-12 Virtual concatenated Loss of multiframe

Alarm identifier	VC12VcLOM
Information	An unexpected, unsequential pattern has been detected in either the multiframe 1 (MF1) or multiframe 2 (MF2) of at least one VC-12 in a Virtual Concatenation Group (VCG).
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	Unit failure in the upstream node that generated the K4 multiframe alignment signal or in the node that reported the alarm.
Actions	<p>Check on the management system if unit failure is reported for the unit generating the multiframe alignment signal.</p> <p>In that node, remove the unit and replace it with a new one.</p> <p>If the unit failure is not reported, loop the transport signal of the VC-12 at the transmitting node and at the receiving node. In this condition, the node reporting VC-12 Virtual concatenated Loss of multiframe contains the faulty unit.</p>
Note(s)	AIS is inserted in the downstream direction.



VC-12 Virtual concatenated loss of partial capacity

Alarm identifier	VC12VcLOPC
Information	The transport capacity of the VC-12 Virtual Concatenation Group (VCG) is partially unavailable. This alarm will only be reported when LCAS is enabled.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more VC-12s of the VCG have failed.
Actions	Identify the affected VC-12s by means of the alarms that are reported for these individual VC-12s (VC12cEXC, VC12cDEG, VC12cTIM or VC12cUNEQ for example), and clear these alarms.



VC-12 Virtual concatenated loss of total capacity

Alarm identifier	VC12VcLOTC
Information	Total transmission bandwidth lost because all members of the Virtual Concatenation Group (VCG) have failed. This alarm will only be reported when LCAS is enabled.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	All members of the VCG have failed.
Actions	If there are higher order alarms (such as Loss of signal or Loss of frame for example) at the same time, then clear these alarms first. Make sure that the same mapping scheme (GFP or LAP-S encapsulation for example) is applied at both ends of the connection. Otherwise repair the individual members (VC-12s) of the VCG.
Note(s)	Generally it is recommended to have LCAS enabled, and apply “diverse routing”, i.e. to route the members of the VCG via physically diverse routes.



VC-12 Virtual concatenated Sequence mismatch

Alarm identifier	VC12VcSQM
Information	A mismatch has been detected between the received sequence number and an inherently provisioned expected sequence number for this Virtual Concatenation Group (VCG).
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	One or more received VC-12-Xv group members have equal sequence numbers.
Actions	Verify that the connections in the preceding network element(s) have been provisioned correctly.



VC-12 Virtual concatenated server signal degrade

Alarm identifier	VC12VcSSD
Information	The block error rate of an incoming VC-12 Virtual concatenated server signal exceeds an error threshold.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-12 Virtual concatenated server signal fail

Alarm identifier	VC12VcSSF
Information	The VC-12-Xv group has failed due to irrecoverable failures of all members or an irrecoverable failure of the group itself.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	Irrecoverable failures of all members of the VC-12-Xv group, or irrecoverable failure of the group itself, indicated by the alarms on the constituent members or on the VC-12-Xv group termination function.
Actions	Clear the alarms that are reported for the members of the VC-12-Xv group, or for the VC-12-Xv group itself. Please refer to the corresponding alarm descriptions.



VC-12-Xv Payload mismatch

Alarm identifier	VC12VcPLM
Information	The received signal label in the K4 byte, used to indicate the composition of the VC-12 payload, does not match the expected value.
Alarm category	Transmission
Alarm severity assignment profile	ASAP-name
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The payload composition of the VC-12-Xv is not as expected.
Actions	Check whether all source (far end) and sink payload composition labels of all VC-12-Xv group members are equal.



VC-3 Moderate block error rate

Alarm identifier	VC3cDEG
Information	VC-3 signal degrade. The block error rate of an incoming VC-3 signal exceeds an error threshold. The signal degrade threshold can be provisioned via the management system.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-3 Near-end background block errors threshold crossing 15-min

Alarm identifier	VC3NBBEcTHR15
Information	The VC-3 near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Near-end background block errors threshold crossing 24-hrs

Alarm identifier	VC3NBBEcTHR24
Information	The VC-3 near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Near-end errored seconds threshold crossing 15-min

Alarm identifier	VC3NEScTHR15
Information	The VC-3 near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	VC3NEScTHR24
Information	The VC-3 near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Near-end severely ES threshold crossing 15-min

Alarm identifier	VC3NSEScTHR15
Information	The VC-3 near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Near-end severely ES threshold crossing 24-hrs

Alarm identifier	VC3NSEScTHR24
Information	The VC-3 near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	VC3NUAScTHR15
Information	The VC-3 near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	VC3NUAScTHR24
Information	The VC-3 near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-3 Network connection server signal fail

Alarm identifier	VC3cSSF
Information	<p>This alarm signals that the lower order network connection is unavailable due to faults in the serving higher order path and/or section layers.</p> <p>These faults are indicated by the reception of the alarm indication signal at the lower order path layer.</p>
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>One or more faults in the serving higher order path and/or section layers (VC-4, or STM-1 Multiplex Section for example) in this or upstream network elements, the effect of which could not be circumvented via protection.</p> <p>Please note that on GbE units this alarm will also be reported for VC-3s which are not (yet) assigned to a WAN port, i.e. which are not (yet) cross-connected.</p>
Actions	<p>When there is an unprotected lower order VC, select an alternative VC-4 as the server layer for the lower order VC.</p> <p>When there is a protected lower order VC, check for external switch commands locking the protection switch to a failed link connection.</p> <p>In the case of a GbE unit, verify that all VC-3s are cross-connected (assigned to a WAN port).</p>



VC-3 Path trace identifier mismatch

Alarm identifier	VC3cTIM
Information	Mismatch between received trace ID and expected trace ID.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	A provisioned trace string inserted in a VC- 3 path was received corrupted or not at all, due to wrong configuration, hardware failures or transmission failures.
Actions	Check cross-connections. Check tributary cables and tributary interfaces of the unit.



VC-3 Payload mismatch

Alarm identifier	VC3cPLM
Information	The received payload value, used to indicate the composition of the VC-3 payload, does not match the expected value.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In the reporting Network Element: <ul style="list-style-type: none"> • The red fault LED on the unit is lit. • In the downstream direction the alarm indication signal is inserted. • In the upstream direction VC-3 Remote Defect Indicator (RDI) is inserted.
Cause	Payload composition of VC-3 at the network element that reported the alarm is not the same as the payload composition of VC-3 at its far-end station.
Actions	If the received payload is ≥ 1 , check if the mapping mode of the local and far-end network elements is the same.



VC-3 Remote defect indicator

Alarm identifier	VC3cRDI
Information	A Remote Defect Indication (RDI) is being received.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream far end station of the network element that reported the alarm detects a malfunction at its receive side: VC-3 Excessive error rate, VC-3 Path signal label mismatch, or tributary unit alarm indication signal received.
Actions	No alarms in the reporting network element. React on the far-end alarms. Follow the clearing actions for those alarm(s).



VC-3 Unequipped

Alarm identifier	VC3cUNEQ
Information	VC-3 in STM-1 signal not in use.
Alarm category	Transmission
ASAP	sdhLOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	Cross-connection not consistently defined at both sides (for example, at local and remote station) of a line section.
Actions	Define or change the cross-connection at the other side consistently with the local side.
Note(s)	When defining or changing a cross-connection this alarm will almost inevitably come up as it is practically impossible to issue the changes at both sides at the same moment.



VC-3 Virtual concatenated failure of protocol received

Alarm identifier	VC3VcFOPR
Information	A protocol failure in the receive direction occurred in the Link Capacity Adjustment Scheme (LCAS) protocol.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Inconsistent sequence numbers or CRC errors in control packets.
Actions	Check the provisioning of the source side. Make sure that LCAS is enabled at both sides, and that the used equipment can interwork.



VC-3 Virtual concatenated failure of protocol transmitted

Alarm identifier	VC3VcFOPT
Information	A protocol failure in the transmit direction occurred in the Link Capacity Adjustment Scheme (LCAS) protocol.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Inconsistent member status received.
Actions	Check the provisioning of the source side. Make sure that the used equipment can interwork.



VC-3 virtual concatenated group member differential delay out of range

Alarm identifier	VC3VcMND
Information	The differential delay between the VC-3s of a VC-3-Xv VCG exceeds the maximum permitted value.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The lengths of the individual VC-3 paths differ to such an extent that the different propagation delays cannot be compensated by buffering.
Actions	Re-route the VC-3 paths in order to adjust the propagation delays of the individual VC-3 paths.



VC-3 Virtual concatenated Loss of alignment

Alarm identifier	VC3VcLOA
Information	The virtually concatenated payload cannot be aligned to a common multiframe start.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	The delay difference between the VC-3s in the Virtual Concatenation Group (VCG) exceeds the range that can be compensated by buffering.
Actions	Check the cross connect structure.
Note(s)	Re-plan the path of each VC-3 channel.



VC-3 Virtual concatenated Loss of multiframe

Alarm identifier	VC3VcLOM
Information	The receiver of the corresponding Ethernet port has detected an unexpected, unsequential pattern in either the multiframe 1 (MF1) or multiframe 2 (MF2) of at least one VC-3 in a Virtual Concatenation Group (VCG).
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In the reporting Network Element: <ul style="list-style-type: none"> • The red fault LED on the unit is lit. • In the downstream direction, the alarm indication signal is inserted into the next function.
Cause	Unit failure in the upstream node that generated the H4 multiframe alignment signal or in the node that reported the alarm.
Actions	Check on the management system if unit failure is reported for the unit generating the multiframe alignment signal. In that node, remove the unit and replace it with a new one. Otherwise (i.e. when no unit failure is reported), loop the STM-1 signal at the transmitting node and at the receiving node. In this condition, the node reporting VC-3 Loss of multiframe contains the faulty unit.



VC-3 Virtual concatenated loss of partial capacity

Alarm identifier	VC3VcLOPC
Information	The transport capacity of the VC-3 Virtual Concatenation Group (VCG) is partially unavailable. This alarm will only be reported when LCAS is enabled.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more VC-3s of the VCG have failed.
Actions	Identify the affected VC-3s by means of the alarms that are reported for these individual VC-3s (VC3cDEG, VC3cTIM or VC3cUNEQ for example), and clear these alarms.



VC-3 Virtual concatenated loss of total capacity

Alarm identifier	VC3VcLOTC
Information	Total transmission bandwidth lost because all members of the Virtual Concatenation Group (VCG) have failed. This alarm will only be reported when LCAS is enabled.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	All members of the VCG have failed.
Actions	If there are higher order alarms (such as Loss of signal or Loss of frame for example) at the same time, then clear these alarms first. Make sure that the same mapping scheme (GFP or LAP-S encapsulation for example) is applied at both ends of the connection. Otherwise repair the individual members (VC-3s) of the VCG.
Note(s)	Generally it is recommended to have LCAS enabled, and apply “diverse routing”, i.e. to route the members of the VCG via physically diverse routes.



VC-3 Virtual concatenated Sequence mismatch

Alarm identifier	VC3VcSQM
Information	A mismatch has been detected between the received sequence number and an inherently provisioned expected sequence number for this Virtual Concatenation Group (VCG).
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	One or more received VC-3-Xv group members have equal sequence numbers.
Actions	Verify that the connections in the preceding network element(s) have been provisioned correctly.
Note(s)	<p>The sequence number is used to check that the ordering of the VC-3s within the VC-3-Xv group has not been altered during transport.</p> <p>In the case of the LKA12 <i>TransLAN</i>[®] unit, and if there are one or more sequence mismatch defects for a VCG, and the corresponding path termination functions have not detected any signal fail condition, then VC-3 Virtual concatenated Sequence mismatch alarms are raised against all pathes of the VCG, not only against the pathes which actually have a sequence mismatch.</p>



VC-3 Virtual concatenated server signal degrade

Alarm identifier	VC3VcSSD
Information	The block error rate of an incoming VC-3 Virtual concatenated server signal exceeds an error threshold.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-3 Virtual concatenated server signal fail

Alarm identifier	VC3VcSSF
Information	The VC-3-Xv group has failed due to irrecoverable failures of all members or an irrecoverable failure of the group itself.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED on the unit is lit.
Cause	Irrecoverable failures of all members of the VC-3-Xv group, or irrecoverable failure of the group itself, indicated by the alarms on the constituent members or on the VC-3-Xv group termination function.
Actions	Clear the alarms that are reported for the members of the VC-3-Xv group, or for the VC-3-Xv group itself. Please refer to the corresponding alarm descriptions.



VC-3-Xv Payload mismatch

Alarm identifier	VC3VcPLM
Information	The received C2 signal label, used to indicate the composition of the VC-3 payload, does not match the expected value (which is "0x1B" in the case of a VC-3-Xv signal).
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The payload composition of the VC-3-Xv is not as expected.
Actions	Check whether all source (far end) and sink payload composition labels of all VC-3-Xv group members are equal.



VC-4 Excessive BIP8 bit error rate

Alarm identifier	VC4cEXC
Information	The bit error ratio (BER) in the VC-4 path is very high (B3 errors).
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>This alarm is initiated if the BER in the VC-4 path, calculated using the B3 bytes of the Path Overhead (POH), exceeds the Excessive Error Threshold (provisionable to 10^{-3} (default setting), 10^{-4} or 10^{-5}).</p> <p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> Existing alarms related to the Multiplex Section (in the upstream direction) Hardware failure of the respective core unit in the local node or in the next node in the upstream direction.
Actions	In the upstream direction along the VC-4 path, check the transmission path for Multiplex Section (MS) alarms. If there are no MS alarms, then check the core unit in the local node and/or in the next node in the upstream direction, identify the defective unit, and replace it.



VC-4 Loss of multiframe

Alarm identifier	VC4cLOM
Information	Alignment to the multiframe structure of the received (TUG substructured) VC-4 signal is not possible. Therefore, overhead and payload data of lower order VCs cannot be extracted.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In the downstream direction, the alarm indication signal is inserted into the next function.
Cause	Unit failure in the upstream network element that generated the H4 multiframe alignment signal or in the network element that reported the alarm.
Actions	<p>Check on the management system if a unit failure is reported for the unit generating the H4 multiframe alignment signal.</p> <p>In that network element, replace the unit with a new one.</p> <p>If no unit failure is reported, loop the STM-1 signal at the transmitting network element and at the receiving network element. In this condition, the network element reporting VC-4 Loss of multiframe contains the faulty unit.</p> <p>Please also consider the case when the substructured VC-4 is generated on an LKA53; see below.</p>

Note(s)	<p>While the generation of the H4 byte is compliant to the ITU-T Rec. G.707 on all core units, on LKA53 units, the default value of the first six bits of the H4 byte is '000000' instead of '111111' as requested by the ITU-T Rec. G.707. Although for the detection of LOM these bits have to be ignored acc. to ITU-T Rec. G.783, there may be a potential interworking problem with peer network elements that do not ignore these bits.</p> <p>In order to avoid such interworking problems, you can run substructured VC-4s generated on an LKA53 unit over the lower order cross-connect (LO-XC) function of a core unit in order to generate a correct H4 byte:</p> <p>Lower order TTPs → LKA53 (VC4TTP with improper H4 generation) → CC1,X (core unit without H4 sensitivity) → VC-3/VC-12 lower order cross-connections → CC1,Y (core unit with proper H4 generation) → STM-N</p> <p>Thus, the VC-4 with the improper H4 byte is terminated on the local CC1,X, and the VC-4 to be transmitted is generated with a proper H4 byte on the CC1,Y on the local core unit. Of course, the CC1,X and CC1,Y must have the same lower order substructure as the VC4TTP on the LKA53.</p>
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VC-4 Moderate block error rate

Alarm identifier	VC4cDEG
Information	VC-4 signal degrade. The block error rate of an incoming VC-4 signal exceeds an error threshold. The signal degrade threshold can be provisioned via the management system.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-4 Near-end background block errors threshold crossing 15-min

Alarm identifier	VC4NBBEcTHR15
Information	The VC-4 near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4 Near-end background block errors threshold crossing 24-hrs

Alarm identifier	VC4NBBEcTHR24
Information	The VC-4 near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4 Near-end errored seconds threshold crossing 15-min

Alarm identifier	VC4NEScTHR15
Information	The VC-4 near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4 Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	VC4NEScTHR24
Information	The VC-4 near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4 Near-end severely ES threshold crossing 15-min

Alarm identifier	VC4NSEScTHR15
Information	The VC-4 near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4 Near-end severely ES threshold crossing 24-hrs

Alarm identifier	VC4NSEScTHR24
Information	The VC-4 near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4 Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	VC4NUAScTHR15
Information	The VC-4 near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station. • VC-4 is not reported.
Actions	Check upstream external cabling or equipment.



VC-4 Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	VC4NUAScTHR24
Information	The VC-4 near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station. • VC4 is not reported.
Actions	Check upstream external cabling or equipment.



VC-4 Network connection server signal fail

Alarm identifier	VC4cSSF
Information	This alarm signals that the VC-4 Connection is unavailable due to faults in the serving section layer, as indicated by the reception of the alarm indication signal at the high order path layer. This can occur when the section layer and higher order path layer are managed separately.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more STM-1 or MS faults in this or upstream nodes.
Actions	This alarm message is always raised as a consequence of one or more equipment and/or transmission faults. Refer to the description of the corresponding alarm messages.



VC-4 Path trace identifier mismatch

Alarm identifier	VC4cTIM
Information	The received path trace identifier, used to verify the continued connection to the intended transmitter, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In the reporting Network Element: <ul style="list-style-type: none"> • In the upstream direction, “VC-4 Remote Defect Indicator” is activated. • In the downstream direction, the alarm indication signal is inserted into the next function.
Cause	Wrong routing somewhere in the network due to: <ul style="list-style-type: none"> • Wrong connected line cables. • Wrong Expected Trace Identifier filled in via the management system for the network element that reported the alarm.
Actions	Determine in which network element(s) the line cables are wrongly connected by interpreting the received VC-4 path trace identifiers. Check correctness of expected path trace identifier.



VC-4 Payload mismatch

Alarm identifier	VC4cPLM
Information	The received payload value, used to indicate the composition of the VC-4 payload, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	In the reporting Network Element: <ul style="list-style-type: none"> • In the upstream direction, “VC-4 Remote Defect Indicator” is activated. • In the downstream direction, the alarm indication signal is inserted into the next function.
Cause	Payload composition of VC-4 at the network element that reported the alarm is not the same as the payload composition of VC-4 at its far-end station.
Actions	If the received payload label is ≥ 1 , check if the mapping mode of the local and far-end network elements is the same.



VC-4 Remote defect indicator

Alarm identifier	VC4cRDI
Information	A Remote Defect Indication (RDI) is being received.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream far end station of the network element that reported the alarm detects a malfunction at its receive side: VC-4 Excessive error rate, VC-4 Path signal label mismatch, or AU-4 Alarm indication signal received.
Actions	No alarms in the reporting network element. React on the far-end alarms. Follow the clearing actions for those alarm(s).



VC-4 Unequipped

Alarm identifier	VC4cUNEQ
Information	VC-4 in STM-1 signal not in use.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Cross-connection not consistently defined at both sides (for example, at local and remote station) of a line section.
Actions	Define or change the cross-connection at the other side consistently with the local side.
Note(s)	When defining or changing a cross-connection this alarm will almost inevitably come up as it is practically impossible to issue the changes at both sides at the same moment.



VC-4 Virtual concatenated failure of protocol received

Alarm identifier	VC4VcFOPR
Information	A protocol failure in the receive direction occurred in the Link Capacity Adjustment Scheme (LCAS) protocol.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Alarm indications	–
Cause	Inconsistent sequence numbers or CRC errors in control packets.
Actions	Check the provisioning of the source side. Make sure that LCAS is enabled at both sides, and that the used equipment can interwork.



VC-4 Virtual concatenated failure of protocol transmitted

Alarm identifier	VC4VcFOPT
Information	A protocol failure in the transmit direction occurred in the Link Capacity Adjustment Scheme (LCAS) protocol.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Alarm indications	–
Cause	Inconsistent member status received
Actions	Check the provisioning of the Sink side.



VC-4 virtual concatenated group member differential delay out of range

Alarm identifier	VC4VcMND
Information	The differential delay between the VC-4s of a VC-4-Xv VCG exceeds the maximum permitted value.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The lengths of the individual VC-4 paths differ to such an extent that the different propagation delays cannot be compensated by buffering.
Actions	Re-route the VC-4 paths in order to adjust the propagation delays of the individual VC-4 paths.



VC-4 Virtual concatenated Loss of alignment

Alarm identifier	VC4VcLOA
Information	The individual VC-4s cannot be aligned to a common multi-frame start.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The difference of transmission delay for each VC-4 connection are too high. Wrong VC-4 connected to the VC-4 group.
Actions	Check the cross connect structure
Note(s)	Re-plan the path of each VC-4 channel.



VC-4 Virtual concatenated Loss of multiframe

Alarm identifier	VC4VcLOM
Information	Alignment to the multiframe structure of the received VC-4/VC-3 signal is not possible.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>Unit failure in the upstream node that generated the H4 multiframe alignment signal or in the node that reported the alarm.</p> <p>In the downstream direction, the alarm indication signal is inserted into the next function.</p>
Actions	<p>Check on the management system if unit failure is reported for the unit generating the multiframe alignment signal.</p> <p>In that node, remove the unit and replace it with a new one.</p> <p>Otherwise (i.e. when no unit failure is reported), loop the STM-1 signal at the transmitting node and at the receiving node. In this condition, the node reporting VC-12 Loss of multiframe contains the faulty unit.</p>



VC-4 Virtual concatenated loss of partial capacity

Alarm identifier	VC4VcLOPC
Information	No valid AU-4 pointer interpretation obtained in received signal.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Alarm indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Failure in line unit in remote node, local tributary unit failure in the station that reported the alarm. • Line unit failure in the upstream far-end station.
Actions	<p>Check remote line unit.</p> <p>Check local tributary unit.</p>



VC-4 Virtual concatenated loss of total capacity

Alarm identifier	VC4VcLOTC
Information	Total transmission bandwidth lost because all members of the Virtual Concatenation Group (VCG) have failed. This alarm will only be reported when LCAS is enabled.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Alarm indications	–
Cause	All members of the VCG have failed.
Actions	If there are higher order alarms (such as Loss of signal or Loss of frame for example) at the same time, then clear these alarms first. Make sure that the same mapping scheme (GFP or LAP-S encapsulation for example) is applied at both ends of the connection. Otherwise repair the individual members (VC-4s) of the VCG.
Note(s)	Generally it is recommended to have LCAS enabled, and apply “diverse routing”, i.e. to route the members of the VCG via physically diverse routes.



VC-4 Virtual concatenated Sequence mismatch

Alarm identifier	VC4VcSQM
Information	A mismatch has been detected between the received sequence number and an inherently provisioned expected sequence number for this VC-4-Xv group.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more received VC-4-Xv group members have equal sequence numbers.
Actions	Verify that the connections in the preceding network element(s) have been provisioned correctly.
Note(s)	<p>The sequence number is used to check that the ordering of the VC-4s within the VC-4-Xv group has not been altered during transport.</p> <p>In the case of the LKA12 <i>TransLAN</i>[®] unit, and if there are one or more sequence mismatch defects for a VCG, and the corresponding path termination functions have not detected any signal fail condition, then VC-4 Virtual concatenated Sequence mismatch alarms are raised against all pathes of the VCG, not only against the pathes which actually have a sequence mismatch.</p>



VC-4 Virtual concatenated server signal degrade

Alarm identifier	VC4VcSSD
Information	The block error rate of an incoming VC-4 Virtual concatenated server signal exceeds an error threshold.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Alarm indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-4 Virtual concatenated server signal fail

Alarm identifier	VC4VcSSF
Information	The VC-4-Xv group has failed due to irrecoverable failures of all members or an irrecoverable failure of the group itself.
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Irrecoverable failures of all members of the VC-4-Xv group, or irrecoverable failure of the group itself, indicated by the alarms on the constituent members or on the VC-4-Xv group termination function.
Actions	Clear the alarms that are reported for the members of the VC-4-Xv group, or for the VC-4-Xv group itself. Please refer to the corresponding alarm descriptions.



VC4-4C Excessive BIP8 bit error rate

Alarm identifier	VC4CcEXC
Information	The bit error ratio (BER) in the VC-4-4C path is very high (B3 errors).
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>This alarm is initiated if the BER in the VC-4-4C path, calculated using the B3 bytes of the Path Overhead (POH), exceeds the Excessive Error Threshold (provisionable to 10^{-3} (default setting), 10^{-4} or 10^{-5}).</p> <p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> Existing alarms related to the Multiplex Section (in the upstream direction) Hardware failure of the respective core unit in the local node or in the next node in the upstream direction.
Actions	In the upstream direction along the VC-4-4C path, check the transmission path for Multiplex Section (MS) alarms. If there are no MS alarms, then check the core unit in the local node and/or in the next node in the upstream direction, identify the defective unit, and replace it.



VC-4-4c Moderate block error rate

Alarm identifier	VC4CcDEG
Information	VC-4-4C signal degrade. The block error rate of an incoming VC-4-4C signal exceeds an error threshold. The signal degrade threshold can be provisioned via the management system.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-4-4c Near-end background block errors thresh cross 15-min

Alarm identifier	VC4CNBBEcTHR15
Information	The VC-4-4C near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Near-end background block errors thresh cross 24- hrs

Alarm identifier	VC4CNBBEcTHR24
Information	The VC-4-4C near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Near-end errored seconds threshold crossing 15- min

Alarm identifier	VC4CNEScTHR15
Information	The VC-4-4C near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Near-end errored seconds threshold crossing 24-hrs

Alarm identifier	VC4CNEScTHR24
Information	The VC-4-4C near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Near-end severely ES threshold crossing 15-min

Alarm identifier	VC4CNSEScTHR15
Information	The VC-4-4C near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Near-end severely ES threshold crossing 24-hrs

Alarm identifier	VC4CNSEScTHR24
Information	The VC-4-4C near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	VC4CNUAScTHR15
Information	The VC-4-4C near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	VC4CNUAScTHR24
Information	The VC-4-4C near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-4c Network connection server signal fail

Alarm identifier	VC4CcSSF
Information	This alarm signals that the server signal fails due to faults in the serving higher order and/or section layers.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more VC-4-4C faults in this or upstream nodes, the effect of which could not be circumvented via protection.
Actions	<p>When there is an unprotected lower order VC, select an alternative VC-4-4C as server for the lower order VC.</p> <p>When there is a protected lower order VC, check for external switch commands locking the protection switch to a failed link connection.</p>



VC-4-4c Path trace identifier mismatch

Alarm identifier	VC4CcTIM
Information	The received path trace identifier, used to verify the continued connection to the intended transmitter, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong routing somewhere in the network due to: <ul style="list-style-type: none"> • Wrong connected line cables. • Wrong expected trace identifier filled in via the management system for the node that reported the alarm.
Actions	Determine in which node(s) the line cables are wrongly connected by interpreting the received VC-4-4C path trace identifiers. Check correctness of expected path trace identifier.
Local indications	<ul style="list-style-type: none"> • In the upstream direction, “VC-4-4C Remote Defect Indicator” is activated. • In the downstream direction, the alarm indication signal is inserted into the next function.



VC-4-4c Remote Defect Indicator

Alarm identifier	VC4CcRDI
Information	A Remote Defect Indicator indication is received.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream far end station of the node that reported the alarm detects a malfunction at its receive side: VC- 4-4C Path signal label mismatch, or AU-4-4C Alarm indication signal received.
Actions	No alarms in the reporting node. React on the far-end alarms. Follow the clearing actions for those alarm(s).



VC-4-4c Unequipped

Alarm identifier	VC4CcUNEQ
Information	VC-4-4C in STM-N signal not in use.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Cross-connections not consistently defined at both sides (for example, at local and remote station) of a line section.
Actions	Define or change the cross-connections at the other side consistently with the local side.
Note(s)	When defining or changing a cross-connections this alarm will almost inevitably come up as it is practically impossible to issue the changes at both sides exactly at the same time.



VC4-16C Excessive BIP8 bit error rate

Alarm identifier	VC16CcEXC
Information	The bit error ratio (BER) in the VC-4-16C path is very high (B3 errors).
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	<p>This alarm is initiated if the BER in the VC-4-16C path, calculated using the B3 bytes of the Path Overhead (POH), exceeds the Excessive Error Threshold (provisionable to 10^{-3} (default setting), 10^{-4} or 10^{-5}).</p> <p>Possible causes of the alarm are:</p> <ul style="list-style-type: none"> Existing alarms related to the Multiplex Section (in the upstream direction) Hardware failure of the respective core unit in the local node or in the next node in the upstream direction.
Actions	In the upstream along the VC-4-16C path, check the transmission path for Multiplex Section (MS) alarms. If there are no MS alarms, then check the core unit in the local node and/or in the next node in the upstream direction, identify the defective unit, and replace it.



VC-4-16c Moderate block error rate

Alarm identifier	VC16CcDEG
Information	VC-4-16C signal degrade. The block error rate of an incoming VC-4-16C signal exceeds an error threshold. The signal degrade threshold can be provisioned via the management system.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	Fault(s) in upstream external cabling or equipment.
Actions	Check upstream external cabling and equipment.



VC-4-16c Near-end background block errors thresh cross 15-min

Alarm identifier	VC16CNBBEcTHR15
Information	The VC-4-16C near-end background block errors counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Near-end background block errors thresh cross 24-hrs

Alarm identifier	VC16CNBBEcTHR24
Information	The VC-4-16C near-end background block errors counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Near-end errored seconds threshold crossing 15- min

Alarm identifier	VC16CNEScTHR15
Information	The VC-4-16C near-end errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Near-end errored seconds threshold crossing 24- hrs

Alarm identifier	VC16CNEScTHR24
Information	The VC-4-16C near-end errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Near-end severely ES threshold crossing 15-min

Alarm identifier	VC16CNSEScTHR15
Information	The VC-4-16C near-end severely errored seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Near-end severely ES threshold crossing 24-hrs

Alarm identifier	VC16CNSEScTHR24
Information	The VC-4-16C near-end severely errored seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ASAP-type
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Near-end unavailable seconds threshold crossing 15-min

Alarm identifier	VC16CNUAScTHR15
Information	The VC-4-16C near-end unavailable seconds counter exceeded the provisioned threshold during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Near-end unavailable seconds threshold crossing 24-hrs

Alarm identifier	VC16CNUAScTHR24
Information	The VC-4-16C near-end unavailable seconds counter exceeded the provisioned threshold during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The alarm was generated because of: <ul style="list-style-type: none"> • Dirty optical connector(s). • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.



VC-4-16c Network connection server signal fail

Alarm identifier	VC16CcSSF
Information	This alarm signals that the server signal fails due to faults in the serving higher order and/or section layers.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	One or more VC-4-16C faults in this or upstream nodes, the effect of which could not be circumvented via protection.
Actions	<p>When there is an unprotected lower order VC, select an alternative VC-4-16C as server for the lower order VC.</p> <p>When there is a protected lower order VC, check for external switch commands locking the protection switch to a failed link connection.</p>



VC-4-16c Path trace identifier mismatch

Alarm identifier	VC16CcTIM
Information	The received path trace identifier, used to verify the continued connection to the intended transmitter, does not match the provisioned value.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong routing somewhere in the network due to: <ul style="list-style-type: none"> • Wrong connected line cables. • Wrong expected trace identifier filled in via the management system for the node that reported the alarm.
Actions	Determine in which node(s) the line cables are wrongly connected by interpreting the received VC-4-16C path trace identifiers. Check correctness of expected path trace identifier.
Local indications	<ul style="list-style-type: none"> • In the upstream direction, “VC-4-16C Remote Defect Indicator” is activated. • In the downstream direction, the alarm indication signal is inserted into the next function.



VC-4-16c Remote Defect Indicator

Alarm identifier	VC16CcRDI
Information	A Remote Defect Indicator indication is received.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	The downstream far end station of the node that reported the alarm detects a malfunction at its receive side: VC- 4-16C Path signal label mismatch, or AU-4-16C Alarm indication signal received.
Actions	No alarms in the reporting node. React on the far-end alarms. Follow the clearing actions for those alarm(s).



VC-4-16c Unequipped

Alarm identifier	VC16CcUNEQ
Information	VC-4-16C in STM-N signal not in use.
Alarm category	Transmission
ASAP	sdhHOPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Cross-connection not consistently defined at both sides (for example, at local and remote station) of a line section.
Actions	Define or change the cross-connection at the other side consistently with the local side.
Note(s)	When defining or changing a cross-connection this alarm will almost inevitably come up as it is practically impossible to issue the changes at both sides at the same moment.



VC-4-Xv Payload mismatch

Alarm identifier	VC4VcPLM
Information	The received C2 signal label, used to indicate the composition of the VC-4 payload, does not match the expected value (which is "0x1B" in the case of a VC-4-Xv signal).
Alarm category	Transmission
ASAP	sdhVCG
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	The payload composition of the VC-4-Xv is not as expected.
Actions	Check whether all source (far end) and sink payload composition labels of all VC-4-Xv group members are equal.



VLAN configuration mismatch

Alarm identifier	MACcVCM
Information	VLAN configuration mismatch
Alarm category	Transmission
ASAP	ethPath
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Different customers on one unit have the same customer ID, or the same VLAN ID is being used on different virtual switches in one unit.
Actions	Re-plan the network to avoid this configuration mismatch. <i>It is not permitted to provision a VLAN which is currently in use in another virtual switch on the same data unit.</i>
Note(s)	The required service cannot operate successfully.



WAN Dropped packets threshold crossing 15-min

Alarm identifier	WANDPcTHR15
Information	The counter for the number of dropped packets at the WAN side exceeded the provisioned threshold at a WAN port during a 15-minutes monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	<p>Possible causes are:</p> <ul style="list-style-type: none"> • Dirty optical connector(s) • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The counter only includes packets dropped due to errors. It does not include packets dropped due to congestion.



WAN Dropped packets threshold crossing 24-hrs

Alarm identifier	WANDPcTHR24
Information	The counter for the number of dropped packets at the WAN side exceeded the provisioned threshold at a WAN port during a 24-hours monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Information
Reporting state (default setting)	Not Reported
Local indications	–
Cause	Possible causes are: <ul style="list-style-type: none"> • Dirty optical connector(s) • Equipment fault(s) in the upstream station.
Actions	Check upstream external cabling or equipment.
Note(s)	The counter only includes packets dropped due to errors. It does not include packets dropped due to congestion.



WAN Green traffic class 2 Ethernet Output Congested Sec Thr 15min

Alarm identifier	WANG2EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) in a medium priority traffic (traffic class 2) exceeded the provisioned threshold during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



WAN Green traffic class 2 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	WANG2EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) and traffic class 2 exceeded the provisioned threshold during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



WAN Green traffic class 3 Ethernet Output Congested Sec Thr 15min

Alarm identifier	WANG3EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a WAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



WAN Green traffic class 3 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	WANG3EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a low dropping precedence (green frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a WAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for green frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



WAN Loaded Sec for incoming traffic with class 3 green traffic Thr 15min

Alarm identifier	WANI3GEILScTHR15
Information	The loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load planned for link utilization.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	A loaded second indicates the traffic overload in the network and therefore, is a monitoring parameter for planning the network traffic.



WAN Loaded Sec for incoming traffic with class 3 green traffic Thr 24-hrs

Alarm identifier	WAN13GEILScTHR24
Information	The loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load planned for link utilization.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	A loaded second indicates the traffic overload in the network and therefore, is a monitoring parameter for planning the network traffic.



WAN Loaded Sec for inc Tr with class 3 or 2 green traffic Thr 15min

Alarm identifier	WANI32GEILScTHR15
Information	The loaded seconds counter for incoming Ethernet traffic of class 3 or 2 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the incoming Ethernet traffic of class 3 or 2 with green frames is above the load planned for link utilization for traffic class 3 or 2.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the traffic classes 3 or 2 with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



WAN Loaded Sec for inc Tr with cl 3 or 2 green traffic Thr 24-hrs

Alarm identifier	WANI32GEILScTHR24
Information	The loaded seconds counter for incoming Ethernet traffic of class 3 or 2 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the incoming Ethernet traffic of class 3 or 2 with green frames is above the load planned for link utilization for traffic class 3 or 2.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the traffic classes 3 or 2 with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



WAN Severely Loaded Sec for inc Tr with class 3 green traffic Thr 15min

Alarm identifier	WANI3GEISLScTHR15
Information	The severely loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Traffic congestion for the high priority traffic with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



WAN Severely Loaded Sec for inc Tr with class 3 green traffic Thr 24-hrs

Alarm identifier	WAN13GEISLScTHR24
Information	The severely loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Traffic congestion for the high priority traffic with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



WAN Severely Loaded Sec for inc Tr with Cl 3 or 2 green traffic Thr 15min

Alarm identifier	WANI32GEISLScTHR15
Information	The severely loaded seconds counter for incoming Ethernet traffic of class 3 or 2 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the incoming Ethernet traffic of class 3 or 2 with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the traffic classes 3 or 2 with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



WAN Severely Loaded Sec for inc Tr with cl 3 or 2 green traffic Thr 24-hrs

Alarm identifier	WANI32GEISLScTHR24
Information	The severely loaded seconds counter for incoming Ethernet high priority traffic class 3 with green frames (frames having a low dropping precedence) exceeded the provisioned threshold at a WAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The current load of the high priority traffic with green frames is above the load handled by the link bandwidth.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Traffic congestion for the high priority traffic with green frames is detected at the egress port of the upstream equipment. An equal number of severely loaded seconds and loaded seconds indicate that the rate control has not been provisioned correctly.



WAN Yellow traffic class 2 Ethernet Output Congested Sec Thr 15min

Alarm identifier	WANY2EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a medium priority traffic (traffic class 2) exceeded the provisioned threshold at a WAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



WAN Yellow traffic class 2 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	WANY2EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a medium priority traffic (traffic class 2) exceeded the provisioned threshold at a WAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 2 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that the bandwidth is more evenly used.
Note(s)	Congested seconds should not happen for a service-guaranteeing low Frame Drop Rate (FDR) traffic class 2. In case of an absolute and a moderate number of dropped bytes (congested seconds), the link bandwidth is permanently and moderately overloaded.



WAN Yellow traffic class 3 Ethernet Output Congested Sec Thr 15min

Alarm identifier	WANY3EOCScTHR15
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a WAN port during a 15-minute monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



WAN Yellow traffic class 3 Ethernet Output Congested Sec Thr 24-hrs

Alarm identifier	WANY3EOCScTHR24
Information	The Ethernet output congested seconds counter for Ethernet frames with a high dropping precedence (yellow frames) in a high priority traffic (traffic class 3) exceeded the provisioned threshold at a WAN port during a 24-hour monitoring period.
Alarm category	Quality of service (performance monitoring)
ASAP	ethPath
Alarm severity (default setting)	Deferred
Reporting state (default setting)	Reported
Local indications	–
Cause	The link bandwidth for yellow frames with traffic class 3 is overloaded.
Actions	Install additional TransLAN cards in order to increase the available bandwidth, and reengineer the flow provisioning such that sufficient bandwidth is available at any time for traffic class 3 frames.
Note(s)	Congested seconds must never happen for a service-guaranteeing low latency traffic class 3.



Wrong CC present

Alarm identifier	CCcWUP
Information	A wrong unit is present in an assigned slot, or the present unit cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong unit inserted, or the inserted unit is defective.
Actions	Replace the unit, and insert a unit of the provisioned type.
Note(s)	A CCcUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Wrong LAN unit present

Alarm identifier	IPcWUP
Information	<p>A <i>TransLAN</i>[®] card (LKA4) is configured, but a card of a different type is present, or the present card cannot be identified.</p> <p>A proper downloading of the software will <i>not</i> be possible.</p>
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong circuit pack inserted, or the inserted circuit pack is defective.
Actions	<p>Insert a <i>TransLAN</i>[®] card, or change the provisioning.</p> <p>If a <i>TransLAN</i>[®] card is actually present when the alarm is reported, then the <i>TransLAN</i>[®] card is defective and has to be replaced.</p>
Note(s)	<p>An IPcUPF alarm will be reported at the same time.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Wrong or failed FAN unit present

Alarm identifier	FANcWFUP
Information	A wrong or failed fan unit is present, or the present fan unit cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Information
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong fan unit installed, or the installed fan unit is defective.
Actions	Replace the fan unit.



Wrong Paddle board present

Alarm identifier	PBcWUP
Information	A wrong paddle board (PB) is present in an assigned slot, or the present paddle board cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The LED on the paddle board is lit.
Cause	Wrong paddle board inserted, or the inserted paddle board is defective.
Actions	<p>Insert a paddle board of the correct type, or change the provisioning.</p> <p>If a paddle board of the correct type is already present in the respective slot when the alarm is reported, then the paddle board is defective and has to be replaced.</p>



Wrong Plesiochronous interface unit present

Alarm identifier	PIcWUP
Information	A wrong Plesiochronous Interface unit is present in an assigned slot, or the present Plesiochronous Interface unit cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong Plesiochronous Interface unit inserted, or the inserted Plesiochronous Interface unit is defective.
Actions	<p>Insert a Plesiochronous Interface unit of the correct type, or change the provisioning.</p> <p>If a Plesiochronous Interface unit of the correct type is already present in the respective slot when the alarm is reported, then the Plesiochronous Interface unit is defective and has to be replaced.</p>
Note(s)	<p>A PIcUPF alarm will be reported at the same time.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Wrong Pluggable Module present

Alarm identifier	PMcWUP
Information	A wrong pluggable module is present in an assigned pluggable module socket, or the present pluggable module cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	The red fault LED associated to the failed pluggable module is lit. If there is no separate red fault LED dedicated to the pluggable module then the red fault LED of the parent board is lit to draw the attention to the parent board that hosts the defective pluggable module. Which pluggable module is affected can be seen from the alarm list.
Cause	Wrong pluggable module inserted, or the inserted pluggable module is defective.
Actions	Insert a pluggable module of the correct type, or change the provisioning. If a pluggable module of the correct type is already present in the respective socket when the alarm is reported, then the pluggable module is defective and has to be replaced.
Note(s)	A PMcUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Wrong Power unit present

Alarm identifier	PUcWUP
Information	A wrong unit is present in an assigned slot, or the present unit cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong unit inserted, or the inserted unit is defective.
Actions	Replace the unit, and insert a unit of the provisioned type.
Note(s)	A PUcUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Wrong SC Unit present

Alarm identifier	SCcWUP
Information	A wrong System Controller (SC) unit is present, or the present SC unit cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong unit inserted, or the inserted unit is defective.
Actions	<p>Insert an SC unit of the correct type, or change the provisioning.</p> <p>If an SC unit of the correct type is already present in the respective slot when the alarm is reported, then the unit is defective and has to be replaced.</p>



Wrong Synchronous interface unit present

Alarm identifier	SIcWUP
Information	A wrong Synchronous interface unit is present in an assigned slot, or the present unit cannot be identified.
Alarm category	Equipment
ASAP	equipment
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong unit inserted, or the inserted unit is defective.
Actions	<p>Insert a unit of the correct type, or change the provisioning.</p> <p>If a unit of the correct type is already present in the respective slot when the alarm is reported, then the unit is defective and has to be replaced.</p>
Note(s)	<p>An SIcUPF alarm will be reported at the same time.</p> <p>Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).</p>



Wrong Timing interface unit present

Alarm identifier	TlCWUP
Information	A wrong unit is present in an assigned slot, or the present unit cannot be identified.
Alarm category	Equipment
Alarm severity assignment profile	ASAP-name
Alarm severity (default setting)	Prompt
Reporting state (default setting)	Reported
Local indications	–
Cause	Wrong unit inserted, or the inserted unit is defective.
Actions	Replace the unit, and insert a unit of the provisioned type.
Note(s)	A TICUPF alarm will be reported at the same time. Please also refer to “Alarming of equipment failures in protected and unprotected configurations” (p. 1-10).



Glossary

Numerics

5ESS

Number 5 Electronic Switching System

5TAD

Five Tributary Add-Drop subrack

9TAD

Nine Tributary Add-Drop subrack

12 digit Numerical Code (12NC)

Used to as the unique identifier of an item or product. The first ten digits identify an item. The eleventh digit specifies the particular variant of the item. The twelfth digit indicates the revision issue. Items for which the first eleven digits are the same are functionally equal and may be exchanged.

A AAU

Alarm Adapter Unit. Radio Relay circuit pack that is used for the collection of external alarms and remote control of external equipment.

AC

Alternating Current

Acknowledged Information Transfer Service (AITS)

The confirmed mode of operation of the LAPD protocol.

ACU

Alarm Collection Unit. Radio Relay circuit pack that collects of equipment alarms, analogue measurements from internal monitoring points and calculation data.

ADM

Add-Drop Multiplexer

Administrative Unit (AU)

Carrier for TUs

Administrative-Unit Pointer (AU PTR)

Indicates the phase alignment of the VC-n with respect to the STM-N frame. The pointer position is fixed with respect to the STM-N frame.

AIMS

→ “Acknowledged Information Transfer Service” (p. GL-1)

Alarm

The notification (audible or visual) of a significant event. See also Event.

Alarm Indication Signal (AIS)

Code transmitted downstream in a digital network that shows that an upstream failure has been detected and also alarmed if the upstream alarm has not been suppressed.

Alarm Severity

An attribute that defines the priority of the alarm message. The way in which alarms are processed depends on their severity.

Aligning

Using a pointer to indicate the head of a virtual container, e.g. to create an Administrative Unit (AU) or a Tributary Unit (TU).

ALS

Automatic Laser Shutdown

Alternate Mark Inversion (AMI)

A line code that employs a ternary signal to convert binary digits. In this line code successive binary ones are represented by signal elements that are normally of alternately positive and negative polarity but are equal in amplitude, binary zeros are represented by signal elements that have zero amplitude.

American Standard Code for Information Interchange (ASCII)

A standard 8-bit code that is used to exchange information among data processing systems and associated equipment.

Anomaly

A difference between the actual and the desired operation of a function.

ANSI

American National Standards Institute

APS

Automatic Protection Switching

AS

Alarm Suppression assembly

Assembly

Gathering together of payload data with overhead and pointer information (an indication of the direction of the signal).

Association

A logical connection between manager and agent through which management information can be exchanged.

Asynchronous

See Non-synchronous.

ATC

Auxiliary Transmission Channel

ATM

Asynchronous Transfer Mode

ATPC

Automatic Transmit-Power Control

AU

Administrative Unit

AU4AD

Administrative Unit 4 Assembler/Disassembler

AUG

Administrative Unit Group

AUTO

Automatic

Automatic Transmit Power Control (ATPC)

Reduces the power output from the transmitter during normal propagation conditions and increases the power output to maximum during fading periods to try to maintain the nominal level of receiver input.

Autonomous Message

A message transmitted from the controlled network element to the *Navis*[®] OMS that was not a response to a command that originated in the *Navis*[®] OMS.

B B3ZS

Bipolar 3-Zero Substitution

B8ZS

Bipolar 8-Zero Substitution

BBTR

Backplane Bus TRansceiver

BC

Board Controller

BCC

Board Controller Complex

BIN

BINary

BIP

Bit-Interleaved Parity

BISDN

Broadband Integrated Services Digital Network

Bit Error Ratio (BER)

The ratio of bits received in error to bits sent.

Bit Interleaved Parity (BIP)

A method of error monitoring that uses a specified number of bits (BIP-8)

BLD OUT LG

Build-Out Lightguide

Board Controller Local Area Network (BC-LAN)

The internal local area network that provides communications between the Line Controller circuit pack and board controllers on the circuit packs that are associated with a high-speed line.

Branching

Interconnection of independent line systems.

Broadband Communication

Voice, data, and/or video communication at greater than 2 Mbit/s rates.

Broadband Service Transport

STM-1 concatenation transport over the SLM for ATM applications.

BUSTR

BUS Transmitter and Receiver

C CAS

Channel Associated Signaling

CAT

CATastrophic

CC

Cross-Connection, Cross-Connect

CCS

Common Channel Signaling

CEPT

Conférence Européenne des Administrations des Postes et des Télécommunications

Channel

A sub-unit of transmission capacity within a defined higher level of transmission capacity, e.g. a CEPT-4 (140 Mbit/s) within a 565 Mbit fiber system.

CIR

Committed Information Rate

Circuit

A combination of two transmission channels that permits bidirectional transmission of signals between two points to support a single communication.

CIT

Craft Interface Terminal

Clear Channel (Cl. Ch.)

A provisionable mode for the 34 and 140 Mbit/s tributary outputs that causes parity violations not to be monitored or corrected before the 34 and 140 Mbit/s outputs are encoded.

Client

Computer in a computer network that generally offers a user interface to a server. See also Server.

CMI

Coded Mark Inversion

CO

Central Office

Common Object Request Broker Architecture (CORBA)

CORBA allows applications to communicate with one another no matter where they are located or who has designed them.

Concatenation

A procedure whereby a multiplicity of Virtual Containers are associated with each other with the result that their combined capacity can be used as a single container across which bit-sequence integrity is maintained.

Configuration Management (CM)

Subsystem of the *Navis*[®] OMS that, among other things, configures the network and processes messages from the network.

CONN PCB

Connector Printed Circuit Board

Container (C)

Carries plesiochronous signal, the "payload".

CP

Circuit Pack

Craft Interface Terminal (CIT)

Local manager for SDH network elements.

CRC

Cyclic Redundancy Check

Cross-Connect Map

Connection map for an SDH network element; contains information about how signals are connected between high speed time slots and low speed tributaries. See also Squelch Map.

Cross-Polarization Interference Cancellation

This feature permits both orthogonal polarizations of one Radio Frequency carrier to be used simultaneously, which provides greater spectral efficiency.

CTP

Connection Termination Point

CV

Code Violation

D DACS

Digital Access & Cross-connect System

DACScan-T

See Integrated Transport Management Network Manager.

Data Communication Channel (DCC)

The embedded overhead communication channel in the SDH line. The DCC is used for end-to-end communication and maintenance. It carries alarm, control, and status information between network elements in an SDH network.

Data Communication Equipment (DCE)

Provides the signal conversion and coding between the data terminating equipment and the line. The DCE may be separate equipment or a part of the data terminating equipment.

Data Terminating Equipment (DTE)

Originates data for transmission and accepts transmitted data.

Database Administrator

A user who administers the database of the *Navis*[®] OMS application. See also User Privilege.

DC

Direct Current

DCF

Data Communications Function

DCN

Data Communications Network

DCS

Digital Cross-connect System

DDF

Digital Distribution Frame

Dedicated Protection Ring (DP-Ring)

A protection method used in some network elements.

Default Value Provisioning

The original values are preprogrammed at the factory. These values can be overridden using local or remote provisioning.

Defect

A limited interruption of the ability of an item to perform a required function. The defect may or may not lead to maintenance action this depends on the results of additional analysis.

Demultiplexing

A process applied to a multiplexed signal to recover signals combined within it and restore the distinct individual channels of these signals.

Digital Link

A transmission span such as a point-to-point 2 Mbit/s, 34 Mbit/s, 140 Mbit/s, VC12, VC3 or VC4 link between controlled network elements. The channels within a digital link are insignificant.

Digital Section

A transmission span such as an STM-N or 565 Mbit/s signal. A digital section may contain multiple digital channels.

DIL

Dual In Line

Directory-Service Network Element (DSNE)

A designated network element that is responsible for administering a database that maps network element names (node names) to addresses (node Id). There can be one DSNE per (sub)network.

Disassembly

Splitting up of a signal into its constituents as payload data and overhead (an indication of the direction of a signal).

Downstream

At or towards the destination of the considered transmission stream, i.e. in the direction of transmission.

DPLL

Digital Phase-Locked Loop

DPS

Data communication Packet Switch

DR

Digital Radio

DRI

Dual-Ring Interworking

DS-n

Digital Signal, Level n

DTMF

Dual-Tone Multi-Frequency

Dual Homing

An STM-1/STM-4 ring with *Metropolis*[®] AM/*Metropolis*[®] AMS equipment can be dual homed on a ring consisting of *Metropolis*[®] ADM (Universal shelf), *Metropolis*[®] ADM (Compact shelf), or WaveStar[®] ADM 16/1. Also STM-16 rings can be dual homed with the *Metropolis*[®] ADM (Universal shelf).

Dual-Node Interworking

Dual Node Interworking (DNI) is a configuration of two ring networks that share two common nodes. DNI allows a circuit with one termination in one ring and one termination in another ring to survive a loss-of-signal failure of the shared node that is currently carrying service for the circuit.

DUS

Do not Use for Synchronization

DWDM

Dense-Wavelength Division Multiplexing

E

EC-n

Electrical Carrier, Level n

ECC

Embedded Control Channel

EDFE

Ethernet Dropped Frames Errors

EH&S

Environmental Health and Safety

EINB

Ethernet Incoming Number of Mbytes

Electronic Industries Association (EIA)

A trade association of the electronic industry that establishes electrical and functional standards.

Element Management System (EMS)

See Integrated Transport Management Subnetwork Controller.

EMC

ElectroMagnetic Compatibility

EMI

ElectroMagnetic Interference

EONB

Ethernet Outgoing Number of Mbytes

EOW

Engineering Order Wire

Equivalent Bit Error Ratio (EBER)

The calculated average bit error rate over a data stream.

Errored Second (ES)

A performance monitoring parameter.

ES

End System

ESD

ElectroStatic Discharge

ESPG

Elastic Store & Pointer Generator

ETSI

European Telecommunication Standardisation Institute

Event

A significant change. Events in controlled network elements include signal failures, equipment failures, signals exceeding thresholds, and protection switch activity. When an event occurs in a controlled network element, the controlled network element will generate an alarm or status message and send it to the *Navis*[®] OMS.

Event Management (EM)

Subsystem of the *Navis*[®] OMS that processes and logs event reports of the network.

Externally Timed

An operating condition of a clock in which it is locked to an external reference and uses time constants that are altered to quickly bring the local oscillator's frequency into approximate agreement with the synchronization reference frequency.

Extra Traffic

Unprotected traffic that is carried over the protection channels when that capacity is not used for the protection of service traffic.

F FAS

Frame Alignment Signal

FAW

Frame Alignment Word

FC

Full contact Connector

FCC

Federal Communications Commission

FDDI

Fiber Distributed Data Interface

FEP

Front End Processor

Free Running

An operating condition of a network element in which its local oscillator is not locked to any synchronization reference and uses no storage techniques to sustain its accuracy.

G GARP

Generic Attribute Registration Protocol

Gateway Network Element (GNE)

Passes information between other network elements and management systems via a Data Communications Network.

GFP

Generic Framing Procedure

Global Wait to Restore Time

The time to wait before switching back to the timing reference occurs after a timing link failure has cleared. This time applies for all timing sources in a system hence the name global. This can be between 0 and 60 minutes, in increments of one minute.

GNE

Gateway network element - A network element that passes information between other network elements and operations systems via a data communications network.

GUI

Graphical User Interface

GVRP

GARP VLAN Registration Protocol

H HE

Host Exchange

High Density Bipolar 3 code (HDB3)

Line code for e.g. 2 Mbit/s transmission systems.

High level Data Link Control (HDLC)

Protocol in the data-link layer of the OSI reference model.

Higher order Path Adaptation (HPA)

Function that adapts a lower order Virtual Container to a higher order Virtual Container by processing the Tributary Unit pointer which indicates the phase of the lower order Virtual Container Path Overhead relative to the higher order Virtual-Container Path Overhead, and assembling/disassembling the complete higher order Virtual Container.

Higher order Path Connection (HPC)

Function that provides for flexible assignment of higher order Virtual Containers within an STM-N signal.

Higher order Path Termination (HPT)

Function that terminates a higher order path by generating and adding the appropriate Virtual-Container Path Overhead to the relevant container at the path source and removing the Virtual-Container Path Overhead and reading it at the path sink.

HMI

Human Machine Interface

HO

High Order

Holdover

An operating condition of a clock in which its local oscillator is not locked to an external reference but uses storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronized reference.

HP-UX

Unix Operating System for a Hewlett Packard platform.

HS

High Speed

I I/O

Input/Output

ICB

Interconnection Box

ICP

InterConnection Panel

IEC

International Electrotechnical Committee

IEEE

Institute of Electrical and Electronic Engineers

IF

Intermediate Frequency

IFT

InterFace Terminal

Integrated Transport Management Craft Interface Terminal (ITM-CIT)

Local manager for SDH network elements in a subnetwork. Also called the to as Craft Interface Terminal.

Intelligent Synchronous Multiplexer (ISM)

A network multiplexer that is designed to flexibly multiplex plesiochronous and STM-1 tributary port signals into STM-1 or STM-4 line port signals.

Intermediate System (IS)

A system that routes/relays management information. An SDH network element may be a combined Intermediate and end system.

IPS

Inter Processor Status

IS

In-Service

IS-IS Routing

The network elements in a management network route packets (data) between each other using an IS-IS level protocol. The size of a network that is running IS-IS Level 1 is limited, and therefore certain mechanisms are employed to facilitate the management of larger networks. For STATIC ROUTING, it is possible to disable the protocol over the LAN connections and thereby effectively cause the management network to be partitioned into separate IS-IS Level 1 areas. In order for the *Navis*[®] OMS to communicate with a specific network element in one of these areas, the *Navis*[®] OMS must identify the Gateway network element through which this specific network element is connected to the LAN. All packets to this specific network element are routed directly to the Gateway network element by the *Navis*[®] OMS, before being re-routed (if necessary) within the Level 1 area. For DYNAMIC ROUTING an IS-IS Level 2 routing protocol is used that allows a number of Level 1 areas to interwork. The network elements that connect an IS-IS area to another area are set to run the IS-IS Level 2 protocol within the network element and on the connection to other network elements. Packets can now be routed between IS-IS areas and the *Navis*[®] OMS does not have to identify the Gateway network elements.

ISDN

Integrated Services Digital Network

ISDN PRI

ISDN Primary Rate Interface

ISO

International Standards Organisation

ITU

International Telecommunications Union

ITU-R

International Telecommunications Union - Radio standardization sector. Formerly known as CCIR: Comité Consultatif International Radio; International Radio Consultative Committee.

ITU-T

International Telecommunications Union - Telecommunication standardization sector. Formerly known as CCITT: Comité Consultatif International Télégraphique & Téléphonique; International Telegraph and Telephone Consultative Committee.

J Jitter

Short term variations of amplitude and frequency components of a digital signal from their ideal position in time.

L LAN

Local Area Network

LAP-S (Link Access Procedure SDH)

A mechanism for the encapsulation of Ethernet MAC frames acc. to the ITU-T Rec. X.85/X.86.

LAPD (Link Access Procedure in the D channel)

Protocol used on the data link layer (OSI layer two) according to the ITU-T Rec. Q.921.

LBA

Lightwave Booster Amplifier.

LBO

Line Build Out - An optical attenuator that guarantees the proper signal level and shape at the receiver input.

LCAS

→ [“Link Capacity Adjustment Scheme”](#) (p. GL-15)

LCN

Local Communications Network

LDI

Linear Drop/Insert (Add-Drop)

LED
Light Emitting Diode

LEN
Local Exchange Node

LF
Low Frequency

LH
Long Haul

License key

An encrypted code that is required to enable the use of specific modules in the *Navis*[®] OMS. Valid license keys can be obtained from your provider.

Line

Transmission line; refers to a transmission medium, together with the associated high speed equipment, that are required transport information between two consecutive network elements, one of which originates the line signal and the other terminates the line signal.

Line Build Out (LBO)

An optical attenuator that guarantees the proper signal level and shape at the receiver input.

Line Overhead Controller (LOC)

SLM circuit pack that accesses the overhead bytes from the high speed line.

Link Capacity Adjustment Scheme (LCAS)

The Link Capacity Adjustment Scheme is a protocol that allows to dynamically change the number of payload carrying VC-n's in a Virtual Concatenation Group (VCG). Under management control a VC-n can in-service be added to or deleted from a VCG. Furthermore, VC-n's for which a Trail Signal Fail (TSF) condition is present can be removed autonomously from the VCG and added to the group again as soon as the TSF condition is no longer present.

LO
Low Order

LOF
Loss Of Frame

LOM
Loss Of Multiframe

Loop Timing

A timing mode in which the terminal derives its transmit timing from the received line signal.

LOP

Loss of pointer

LOS

Loss of signal

Lower order Path Adaptation (LPA)

Function that adapts a PDH signal to a synchronous network by mapping the signal into or de-mapping the signal out of a synchronous container.

Lower order Path Connection (LPC)

Function that provides for flexible assignment of lower order VCs in a higher order VC.

Lower order Path Termination (LPT)

Function that terminates a lower order path by generating and adding the appropriate VC POH to the relevant container at the path source and removing the VC POH and reading it at the path sink.

LPU

Line Port Unit

LPU155

Line Port Unit 155 Mbit/s

LRX

Line Receiver

LS

Low Speed

LTU

Line Termination Unit

LTX

Line Transmitter

LTX/EML

Line Transmitter with Electro-absorption Modulated Laser

M MAF

Management Application Function

Management Connection

Identifies the type of routing used (STATIC or DYNAMIC). If STATIC is selected, Management Connection allows the gateway network element to be identified. See also IS-IS Routing.

Management Information Base (MIB)

The database in the network element. Contains the configuration data of the network element. A copy of each MIB is available in the *Navis*® OMS and is called the the MIB image. Under normal circumstances the MIB and MIB image of one Network Element are synchronized.

Manager

Is capable of issuing network management operations and receiving events

Manager

Capable of issuing network management operations and receiving events. The Manager communicates with the Agent in the controlled network element.

Manufacturer Executable Code (MEC)

Network element system software in binary format that is downloaded to one of the stores can be executed by the system controller of the network element.

Mapping

Gathering together of payload data with overhead, i.e. packing the PDH signal into a Virtual Container.

MDI

Miscellaneous Discrete Input

MDO

Miscellaneous Discrete Output

Mediation Device (MD)

Allows for exchange of management information between Operations System and network elements.

MEF

Maintenance Entity Function (in NE)

MEM

System MEMory unit

Message Communications Function (MCF)

Function that provides facilities for the transport and routing of Telecommunications Management Network messages to and from the Network Manager.

Metropolis® ADM MultiService Mux

A network multiplexer that is designed to flexibly multiplex plesiochronous and/or STM-1 tributary port signals into STM-4 or STM-16 line port signals.

MF

Mediation Function

MFS

Multi Frame Synchronization signal

MIB

The Management Information Base is the database in the node. The MIB contains the configuration data of the node. A copy of each MIB is available in the EMS and is called the MIB image. Under normal circumstances, the MIB and MIB image of one node are synchronized.

MIB image

See Management Information Base.

Midspan Meet

The capability to interface between two lightwave network elements of different vendors. This applies to high speed optical interfaces.

MLAN

MultiLAN

MMI

Man-Machine Interface Also called Human Machine Interface (HMI)

MO

Managed Object

Motif

X-Windows System supplied by Open Software Foundation.

MS

Multiplexer Section

MSOH

Multiplex Section Overhead. Part of the SOH (Section Overhead). Is accessible only at line terminals and multiplexers.

MSP

Multiplex Section Protection. Provides capability of switching a signal from a working to a protection section.

MTBF

Mean Time Between Failures

MTBMA

Mean Time Between Maintenance Activities

MTIE

Maximum Time Interval Error

MTPI

Multiplexer Timing Physical Interface

MTTR

Mean Time To Repair

Multiplexer Section OverHead (MSOH)

Part of the Section Overhead. Is accessible only at line terminals and multiplexers.

Multiplexer Section Protection (MSP)

Provides capability of switching a signal from a working to a protection section.

Multiplexer Section Shared Protection Ring (MS-SPRING)

A protection method used in multiplex line systems.

Multiplexer Section Termination (MST)

Function that generates the Multiplexer Section Overhead in the transmit direction and terminates the Multiplexer Section Overhead in the receive direction.

Multiplexer Timing Source (MTS)

Function that provides the timing reference to the relevant component parts of the multiplex equipment and represents the SDH network element clock.

Multiplexing

A procedure by which multiple lower order path layer signals are adapted into a higher order path, or by which the multiple higher order path layer signals are adapted into a multiplex section.

N NE

Network element. The NE is comprised of telecommunication equipment (or groups/parts of telecommunication equipment) and support equipment that performs network element functions. A Network Element has one or more standard Q-type interfaces.

NEF

Network element function

NEM

Network element manager

Network Element (NE)

A network element is comprised of telecommunication equipment (or groups/parts of telecommunication equipment) and support equipment that performs network element functions. A Network Element has one or more standard Q-type interfaces. A network element can be directly managed by a management system. See also Node.

Network Element Equivalent (NEE)

The functionality, database size and processing power that are required from the *Navis*[®] OMS are different for each type of network element that is supported. Therefore each type represents a certain amount of Network Element Equivalent.

Network Mediation Unit (NMU)

Collects fault and alarm events from transmission equipment. The *Navis*[®] OMS can forward alarms to the NMU. The NMU can forward alarms to an Operations System.

Network Service Access Point (NSAP)

An end system address of the System Controller according to ISO 8348 AD2. The format is ISO_DCC_LUCENT, which has the following structure:



NMC

Network Maintenance Center

NMS

Network Management System

NNE

Non-SDH network element

NNI

Network Node Interface

Node

A node or network element is defined as all equipment that is controlled by one system controller.

Node

Defined as all equipment that is controlled by one system controller. A node can not always be directly managed by a management system. See also network element.

NOMC

Network Operation Maintenance Channel

Non-revertive switching

In non-revertive switching, there is an active and standby high-speed line, circuit pack, etc. When a protection switch occurs, the standby line, circuit pack, etc., is selected causing the old standby line, circuit pack, etc., to be used for the new active line, circuit pack, etc. The original active line, circuit pack, etc., becomes the standby line, circuit

pack, etc. This status remains in effect when the fault clears. Therefore, this protection scheme is “non-revertive” in that there is no switch back to the original status in effect before the fault occurred.

Non-revertive switching

In non-revertive switching there is an active and a standby high speed line, circuit pack, etc. When a protection switch occurs, the standby line, circuit pack, etc. is selected which causes the old standby line, circuit pack, etc. to be used for the new active line, circuit pack, etc. The original active line, circuit pack, etc. becomes the standby line, circuit pack, etc. This status remains in effect when the faults clears. Therefore, this protection scheme is non-revertive in that there is no switch back to the original status that was in effect before the fault occurred.

Non-synchronous

The essential characteristic of timescales or signals such that their significant instants do not necessarily occur at the same average rate.

NPI

Null Pointer Indication

NRZ

Non-Return to Zero

NSA

Non-Service Affecting

NTU

Network Termination Unit

NUT

Non pre-emptible Unprotected Traffic

NVM

Non-Volatile Memory

O

OA

Optical Amplifier

OAA case tools

A software package/tool to aid the process of requirements, analysis, design and implementation of object orientated systems.

OAM&P

Operations, Administration, Maintenance and Provisioning

OC-n

Optical Carrier, Level n

ODF
Optical Distribution Frame

ODU
Optical Demultiplexer Unit

OFS
Out of Frame Second

OI
Optical Interface

OMU
Optical Multiplexer Unit

ON
Operations Network

OOF
Out Of Frame

OOS
Out Of Service

Operations System (OS)

The Operations System is the system that provides operations, administration and maintenance functions.

Operator

A user of the *Navis*[®] OMS application with Operator privileges. See also User Privilege.

Optical Line System (OLS)

A high-capacity lightwave system that is designed to multiplex eight optical signals with different wavelengths into one combined signal through an optical fiber. There is a difference of 1.5 micrometer in wavelength between two multiplexed signals.

OS
Operations System - A central computer-based system that is used to provide operations, administration and maintenance functions.

OSB
Optical Splice Box

OSF
Open Software Foundation Operations System Function

OSI
Open Systems Interconnection

OW

(Engineering) Order Wire

P

P11s

DS-1 framed, 1554 kbit/s

P12s

PDH framed, 2,048 Mbit/s (E1); synchronous 2048-kbit/s PDH path layer

PABX

Private Automatic Branch eXchange

Paddle Board - Peripheral Control and Timing link (PB-PCT)

A small circuit board used in a 5ESS exchange for protection switching and optical to electrical conversion of the PCT-link.

Path

A logical connection between one termination point at which a standard format for a signal at the given rate is assembled and from which the signal is transmitted, and another termination point at which the received standard frame format for the signal is disassembled.

Path AIS

Path Alarm Indication Signal - A path-level code that is sent downstream in a digital network as an indication that an upstream failure has been detected and alarmed.

Path Overhead (POH)

The Virtual-Container Path Overhead provides integrity of communication between the point of assembly of a Virtual Container and its point of disassembly.

Path Terminating Equipment

Network elements in which the path overhead is terminated.

PC

Personal Computer

PCB

Printed Circuit Board

PCM

Pulse Code Modulation

PCT-link

Peripheral Control and Timing-link

PDH

Plesiochronous Digital Hierarchy

Performance Monitoring (PM)

Measures the quality of service and identifies degrading or marginally operating systems (before an alarm is generated).

Peripheral Control and Timing Facility Interface (PCTFI)

A proprietary physical link interface that supports the transport of 21 * 2 Mbit/s signals.

PI

Physical Interface, Plesiochronous Interface

PIR

Peak Information Rate

PJE

Pointer Justification Event

Platform

Family of equipment and software configurations that are designed to support a particular Application.

Plesiochronous Network

A network that contains multiple subnetworks, each of which is internally synchronous and operates at the same nominal frequency, but the timing of any of the subnetworks may be slightly different at any particular instant.

PLL

Phase Lock Loop

PM

Performance Monitoring - Measures the quality of service and identifies degrading or marginally operating systems (before an alarm is generated).

PMA

Performance Monitoring Application

Pointer

An indicator whose value defines the frame offset of a virtual container with respect to the frame reference of the transport entity on which the Virtual Container is supported.

POTS

Plain Old Telephone Service

PP

Pointer Processing

PPC

Pointer Processor and Cross-connect

PRI

Primary Rate Interface

Primary Reference Clock (PRC)

The main timing clock reference in SDH equipment.

Protection

Extra capacity (channels, circuit packs) in transmission equipment that is not intended to be used for service, but rather to serve as backup against equipment failures.

Provisioning

Assigning a value to a system parameter.

PSA

Partially Service Affecting

PSDN

Public Switched Data Network

PSF

Power Supply Filter

PSF-SIP

Power Supply Filter; originally designed for an Italian customer.

PSN

Packet-Switched Network

PSTN

Public Switched Telephone Network

PT

Protected Terminal Power-supply filter and Timing circuit pack

PVID

Port VLAN ID

Q

Q-LAN

Thin Ethernet LAN (10BaseT) that connects the manager to gateway network elements so that management information can be exchanged between network elements and management systems.

QAF

Q-Adapter Function (in NE)

QOS

Quality Of Service

Quality Level (QL)

The quality of the timing signal(s) that are provided to clock a network element. The level is provided by the Synchronization Status Marker which can accompany the timing signal. If the System and Output Timing Quality Level mode is “Enabled”, and if the signal selected for the Station-Clock Output has a quality level below the Acceptance Quality Level, the network element “squelsches” the Station-Clock Output Signal, which means that no signal is forwarded at all. Possible levels are: - PRC (Primary Reference Clock) - SSU_T (Synchronization Supply Unit - Transit) - SSU_L (Synchronization Supply Unit - Local) - SEC (SDH Equipment Clock) - DUS (Do not Use for Synchronization).

R RA

Regenerator Application

Radio Protection Switching system (RPS)

The main function of the RPS is to handle the automatic and manual switching from a main channel to a common protection channel in an N+1 system.

Radio Relay (RR)

A point-to-point Digital Radio system to transport STM-1 signals via microwaves.

RCU

Rigid Connect Unit

RCVR Data Distribution Unit (RCVR)

Radio Relay circuit pack that distributes of the protection channel and the low-priority traffic in the receiver side.

RDDU

RCVR Data Distribution Unit

RDSV

Running Digital Sum Violations

Receive-direction

The direction towards the cross-connect.

REGEN

Regenerator

Regenerator Loop

Loop in a network element between the Station Clock Output(s) and one or both Station Clock Inputs, which can be used to dejitterize the selected timing reference in network applications.

Regenerator Overhead Controller (ROC)

SLM circuit pack that provides user access to the SDH overhead channels at repeater sites.

Regenerator Section Termination (RST)

Function that generates the Regenerator Section Overhead (RSOH) in the transmit direction and terminates the RSOH in the receive direction.

Relay Unit (RU)

Radio Relay circuit pack whose main function is to perform protection switching when the Alignment Switch in the demodulator unit is unable to perform protection switching.

Remote Defect Indication (RDI)

(formerly → FERF)

An indication returned to a transmitting network element that the receiving network element has detected an incoming section failure.

Remote Error Indication (REI)

(formerly → FEBE)

An indication returned to the transmitting node that an errored block has been detected at the receiving node.

Restore Timer

Counts down the time (in minutes) during which the switch waits to let the worker line recover before switching back to it. This option can be set to prevent the protection switch continually switching if a line has a continual transient fault. This field is greyed out if the mode is non-revertive.

Revertive Switching

In revertive switching, there is a working and protection high speed line, circuit pack, etc. When a protection switch occurs, the protection line, circuit pack, etc. is selected. When the fault clears, service reverts back to the original working line.

RF

Radio Frequency

RFI

Remote-Failure Indicator

RGU

ReGenerator Unit

Route

A series of contiguous digital sections.

RPS

Ring Protection Switching

RSM

Remote Switching Module

RSOH

Regenerator-Section OverHead; part of the SOH.

RSTTP

Regenerator Section Trail Termination Point

RZ

Return to Zero

S

SA

Service Affecting Synchronous Adapter

SAI

Station Alarm Interface

SC

System Controller

SD

Signal Degrade

SDH

Synchronous Digital Hierarchy. Definition of the degree of control of the various clocks in a digital network over other clocks.

SDH-TE

SDH - Terminal Equipment

SEC

SDH Equipment Clock

Section

A transport entity in the transmission media layer that provides integrity of information transfer across a section layer network connection by means of a termination function at the section layer.

Section Adaptation (SA)

Function that processes the AU-pointer to indicate the phase of the VC-3/4 POH relative to the STM-N SOH and assembles/disassembles the complete STM-N frame.

Section Overhead (SOH)

Capacity added to either an AU-4 or to an assembly of AU-3s to create an STM-1. Always contains STM-1 framing and can contain maintenance and operational functions. SOH can be subdivided into MSOH (multiplex section overhead) and RSOH (regenerator

section overhead).

SEF

Support Entity Function (in NE)

Self-healing

A network's ability to automatically recover from the failure of one or more of its components.

Server

Computer in a computer network that performs dedicated main tasks that require generally sufficient performance. See also Client.

Service

The operational mode of a physical entity that indicates that the entity is providing service. This designation will change with each switch action.

Severely Errored Second (SES)

A second that has a binary error ratio. SES is used as a performance monitoring parameter.

Severity

See Alarm Severity

SFP

Small Formfactor Pluggable

SH

Short Haul

SI

Synchronous Interface

SIB

Subrack Interface Box

SLC

Subscriber Loop Carrier

SLM

Signal Label Mismatch

Smart Communication Channel (SCC)

An HDLC messaging channel between the SDH-TE and the 5ESS host node. Similar to the DCC messaging channels that are located in the STM-N section overhead.

SML

Service Management Level

SMN

SDH Management Network

SMS

SDH Management Subnetwork

SNC/I

SubNetwork Connection (protection) / Inherent monitoring

SNC/NI

SubNetwork Connection / Non Intrusive monitoring

SNR

Signal to Noise Ratio

Soft Windows

PC emulator package for HP platforms.

SOH

Section Overhead. Capacity added to either an AU-4 or to an assembly of AU-3s to create an STM-1. Always contains STM-1 framing and can contain maintenance and operational functions. SOH can be subdivided in MSOH (Multiplex Section OverHead) and RSOH (Regenerator Section OverHead).

SONET

Synchronous Optical Network

Space Diversity (SD)

Reception of the Radio signal via mirror effects on Earth.

SPB2M

Subrack Protection for 2 Mbit/s Board

SPI

SDH Physical Interface Synchronous-Plesiochronous Interface

Squelch Map

Traffic map for SLM Add-Drop Multiplexer network elements that contains information for each cross-connection in the ring and indicates the source and destination network elements for the low-speed circuit to which the cross-connection belongs. This information is used to prevent traffic misconnection in rings that have isolated network elements or segments. See also Cross-Connect Map.

SSM

Synchronization Status Message

Standby

The operational mode of a physical entity that indicates that the entity is not providing service, but standby. This designation changes with each switch action.

Standby

The operational mode of a physical entity that indicates that the entity is not providing service but is on standby. This designation will change with each switch action.

Station Clock Input (SCI)

An external clock may be connected to a Station Clock Input.

Station Clock Output (SCO)

A clock signal that can be used for other systems.

STM

Synchronous Transport Module

STM

Synchronous Transport Module building block of SDH

STP

Spanning Tree Protocol

Stretched Ring (STRING)

An open ring in which each node is an Add-Drop Multiplexer. The end nodes operate with one equipped high-speed line.

STS

Synchronous Transport Signal; used in SONET.

STVRP

Spanning Tree with VPN Registration Protocol

Subnetwork

A group of interconnected/interrelated network elements. The most common connotation is an SDH network in which the network elements have Data Communications Channels (DCC) connectivity.

Supervisory Unit (SU)

Radio Relay circuit pack that gives comprehensive supervision and control facilities to the user by collecting information from the Alarm Collection Units and Alarm Adapter Units.

SVCE

Service

Switch Receive Unit (SWR)

SLM circuit pack that provides the cross-connect in the receive direction between high speed line timeslots and low speed tributaries.

Switch Transmit Unit (SWT)

SLM circuit pack that provides the cross-connect in the transmit direction between high speed line timeslots and low speed tributaries.

Switching Module (SM)

An access module from the 5ESS switch.

Synchronization Supply Unit (SSU)

A circuit pack that recovers and reshapes the clock signal in order to filter out jitter. Local (SSU_L) and Transit (SSU_T) types are available.

Synchronous

The essential characteristic of time-scales or signals such that their corresponding significant instants occur at precisely the same average rate.

Synchronous Digital Hierarchy (SDH)

A hierarchical set of digital transport structures that is standardized for the transport of suitably adapted payloads over transmission networks.

Synchronous Equipment Management Function (SEMF)

Function that converts performance data and implementation-specific hardware alarms into object-oriented messages for transmission over the DCC and/or the Q-interface. The SEMF also converts object-oriented messages that are related to other management functions so that they can pass across the S reference points.

Synchronous Network

The synchronization of synchronous transmission systems with synchronous payloads to a master Network clock that can be traced to a single reference clock.

Synchronous Transport Module (STM)

The information structure that is used to support (section layer) connections in SDH.

System Controller (SC)

A circuit pack that controls and provisions all units. It also contains the data communication packet switch functionality that is necessary for routing of management information between network elements and their management system.

T TAP

Tunnel auto provisioning protocol

TCA

Threshold Crossing Alert

TCP/IP

Transmission Control Protocol/Internet Protocol

TDEV

Timing Deviation

TDM

Time Division Multiplexing

Template

A collection of parameters that define a specific network element configuration. A template gives the user the opportunity to configure parameters in a network element with a single operation. The template is re-usable and allow the user to configure the parameters in many Network Elements in the same way. A set of default templates is provided, and the user can create new templates and edit or delete user-created ones. Note that a template is always associated with one specific network element type and can not be used for other network element types.

TERM

Terminal Multiplexer

TGU

Timing Generator Unit

TI

Timing Interface

TLM

TeLeMetry Unit

TLP

Terminal with Line Protection

TMN

Telecommunications Management Network

TPU

Tributary Port Unit

TPU-PCT

Tributary Port Unit - Peripheral Control and Timing link

TPU155

Tributary port Unit 155 Mbit/s

TPU2

Tributary port Unit 2 Mbit/s

TPU34/45

Tributary port Unit 34/45 Mbit/s

Transmit-direction

The direction outwards from the cross-connect.

Trellis Code Modulation

A combined coding and modulation scheme for improving the reliability of a digital transmission system without increasing the transmitted power or the required bandwidth.

TRF

TRansFer unit

Tributary

A signal of a specific rate (2 Mbit/s, 34 Mbit/s, 140 Mbit/s, VC12, VC3, VC4, STM-1 or STM-4) that may be added to or dropped from a line signal.

Tributary Overhead Controller (TOC)

SLM circuit pack that allows access to the overhead bytes of the incoming tributary signal.

Tributary Overhead Controller (TOHCTL)

OLS circuit pack that allows access to the overhead bytes of the Supervisory channel.

Tributary Unit (TU)

An information structure that provides adaptation between the lower order path layer and the higher path layer. Consists of a VC-n plus a tributary unit pointer TU PTR.

Tributary Unit Pointer (TU PTR)

Indicates the phase alignment of the VC with respect to the TU in which it resides. The pointer position is fixed with respect to the TU frame.

TSA

Time Slot Assignment

TSI

Time Slot Interchange

TTP

Trail Termination Point

TUG

Tributary Unit Group

U UAS

UnAvailable Seconds

ULDT

Ultra Long Distance Transmission

Unacknowledged Information Transfer Service (UITS)

The unconfirmed mode of operation of the LAPD protocol.

Unavailable Seconds

A performance monitoring parameter.

Uninterruptable Power Supply (UPS)

Allows connected computer equipment to gracefully shutdown and therefore prevents damage in the case of a power failure. Also absorbs dips in the power supply.

Universal Co-ordinated Time (UTC)

An indication of the time of an event that is independent of the time-zone in which the event occurred. The local time can be calculated from the Universal Co-ordinated Time.

Upgrade

An upgrade is the addition of new capabilities (feature). An upgrade requires new software and may require new hardware.

UPL

User PaneL

Upstream

At or towards the source of the considered transmission stream, i.e. in the direction that is opposite to the direction of transmission.

User Privilege

A permission of a user that allows to perform actions on the computer system on which the *Navis*[®] OMS application runs. There are the following different types of users:



V Value

A number, text string, or other menu selection that is associated with a parameter.

VF

Voice Frequency

Virtual Container (VC)

Container with a path overhead.

VLAN

Virtual LAN

VPN

Virtual Privat Network

W Wait to Restore Time (WRT)

The time to wait before switching back after a failure has cleared in a revertive protection scheme. This time can be between 0 and 15 minutes, in increments of one minute.

WAN

Wide Area Network

Wander

Long term variations of amplitude frequency components (below 10 Hz) of a digital signal from their ideal position in time. Wander can result in buffer problems at a receiver.

WDM

Wavelength Division Multiplexing

What You See Is What You Get (WYSIWYG)

Information as displayed on the screen will appear in the same way on printed output.

Wideband Communications

Voice, data, and/or video communication at digital rates from 64 kbit/s to 2 Mbit/s.

Windows

Graphical User Interface on PC systems.

Working

Label attached to a physical entity. In the case of revertive switching the working line or unit is the entity that carry service under normal operation. In the case of non-revertive switching this label has no particular meaning.

WS

WorkStation

WSF

Work Station Facility

X X-Terminal

Workstation that can support an X-Windows interface

X-Windows

Graphical User Interface on Unix Systems.

XMTR

Transmitter

XMTR Switch Unit

Radio Relay circuit pack that performs connections for protection switching and transmission of low priority traffic on the protection channel.

XPIC

Cross Polarization Interference Cancellation

XSU

XMTR Switch Unit

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