Alarms

This chapter provides information about alarms supported for SONET and SDH, and their maintenance.

Alarms are triggered when a component fails or does not perform as expected. Alarms are triggered by the chassis.

Alarms can be defined using the following two terms:

- Alarm State—It is the state the chassis enters when a certain event occurs. For example, the state of the chassis when the ambient temperature is beyond the specified limits.
- Alarm Indication—It is a visual signal to indicate the alarm state. For example, the TEMP LED glows red if the ambient temperature is beyond the specified limits, and it turns green if the ambient temperature is within specified limits.

  Typically, a failure condition detected by a chassis results in one or more error conditions sent both upstream and downstream on the network.

  - Alarm Indication Signal (AIS)—AIS alarms are reported downstream from a detecting device, and to prevent consequential downstream failures or alarms from being raised.
  - Remote Defect Indicator (RDI)—RDI alarms are always reported upstream from the detecting device.

Note Even when the controller is in the down state with alarms, the cross connection between the controllers is up.

Restrictions for Alarms

- In T3, an AIS alarm is supported only in the framed mode and not supported in the unframed mode.

SONET Alarms

Alarms at SONET Layers

SONET equipment detects events and alarms at each of the three layers — section, line and path. A SONET chassis sends alarms in both upstream and downstream directions in order to notify other devices of the problem condition.

The interface of an active alarm or defect is maintained in a down/down state. The process used to troubleshoot down/down SONET interfaces is similar to that of digital interfaces, such as T1 and T3.

The following table lists the types and sub types of SONET Alarms.

Table 1: SONET Supported Alarms

Alarm Type	Sub Alarm Type
Section Alarms	• LOS — Loss of Signal • LOF — Loss of Frame • SEF — Severely Error Frame
Line Alarms	• AIS-L — Line AIS • REI-L — Line Remote Error Indication • RDI-L — Line Remote Defect Indication • B2 — Line BIP Error (SF/SD) • TCA for B2
Path Alarms	• AIS-P — STS Path AIS • LOP-P — STS Path Loss of Pointer • B3 (SF/SD) — STS Path BIP Error • UNEQ-P — STS Path unequipped • REI-P — STS Path Remote Error • RDI-P — STS Path Remote Defect Indication • PLM-P — STS path Payload Label Mismatch • LOM — Loss of MultiFrame • TCA for B3

Alarm Type	Sub Alarm Type
VT Alarms	• AIS-V — VT Path AIS • LOP-V — VT Loss of Pointer • V-BIP (SF/SD) — VT Path BIP error • UNEQ-V — VT Path Unequipped • REI-V — VT Path Remote Error • RDI-V — VT Path Remote Defect Indication • PLM-V — VT path Payload Label Mismatch • TCA for VT Level BIP
T1 Alarms	• LOS — DS1/E1 Line loss of Signal • AIS — DS1/E1 Path Alarm Indication Signal • AIS-CI — DS1/E1 Path Alarm Indication Signal Customer Installation • LOF — DS1/E1 Path Loss of Frame • RDI/RAI — Remote Defect Indication or Remote Alarm Indication • RAI-CI — Remote Alarm Indication Customer Installation • TCA for Line and Path DS1
T3 Alarms	• LOS — DS3/E3 Line Loss of Signal • OOF — DS3/E3 Path Loss of Frame • SEF — DS3/E3 Path Severely Errored Frame • AIS — DS3/E3 Path Alarm Indication Signal • SEF/AIS-FE — Far End SEF/AIS • TCA for Line and Path DS3

SDH Alarm

The following table lists the types and sub types of SDH Alarms.

Table 2: SDH Supported Alarms

Alarm Type	Sub Alarm Type
Section Alarms	• LOS — Loss of Signal • LOF — Loss of Frame • RS-BIP — Bit Interleaved Parity
Line Alarms	• MS-BIP — Multiplex Section-Bit Interleaved Parity • MS-REI — Multiplex Section-Remote Error Indication • MS-AIS — Multiplex Section-Alarm Indication Signal • MS-RDI — Multiplex Section-Remote Defect Indication • AU-AIS — Administrative Unit-Alarm Indication Signal • AU-LOP — Administrative Unit-Loss of Pointer
STS Path Alarms	• HP-UNEQ — High order Path-Unequipped • HP-PLM — High order Path-Payload Label Mismatch • HP-RDI — High order Path-Remote Defect Indication • HP-BIP — High order Path-Bit Interleaved Parity • HP-REI — High order Path-Remote Error Indication • TU-LOM — Tributary Unit-Loss of Multiframe • TU-AIS — Tributary Unit-Alarm Indication Signal • TU-LOP — Tributary Unit-Loss of Pointer

Alarm Type	Sub Alarm Type
VT Path Alarms	• LP-UNEQ — Low order Path-Unequipped • LP-PLM — Low order Path-Payload Label Mismatch • LP-RDI — Low order Path-Remote Defect Indication • LP-RFI — Low order Path-Remote Failure Indication • LP-BIP — Low order Path-Bit Interleaved Parity • LP-REI — Low order Path-Remote Error Indication

Note TIM alarms are not supported.