Fault Detection Procedure

All the alarm messages are listed in this section.

They are organized according to the alarm source order as they are shown in the Control Application.
Besides each alarm message the source is shown.
Moreover the cause (**Problem**) of the alarm and the procedure to face it (**Action**) are described: at the cause *n* will correspond the Action *n*

See Also:

Alarm Attributes

SPI - Signal Physical Interface Alarms

In the following all the alarms detected at the SPI (Signal Physical Interface) level are reported.

LaserPwrOut   (SPI)

Transmit Laser Power Out Of Range.

Problem:

1. Unit Internal failure.
   Low laser Tx is a consequence of a LOS.

Action:

1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

LaserBiasOut   (SPI)

Laser Bias Out Of Range.

Problem:

1. Unit Internal failure.

Action:

1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

ALSDisabled   (SPI)

The Automatic Laser shutdown has been disabled.

Problem:

   1. This is not a problem but a warning message.

Action:

   1. If necessary, enable the ALS by local operator software

LOS   (SPI)

Loss of signal.

Problem:

   1. Consequence of a line loopback.

   2. Consequence of far-end equipment transmitter failure or line interruption

   3. Unit Internal Failure

Action:

   1. Remove, if necessary, the line loopback

   2. Disconnect the Tx and Rx connectors and loop output to input using a test patch cord. If the alarm goes OFF, check the status of the far-end equipment and the line.

   3. Disconnect the Tx and Rx connectors and loop output to input using a test patch cord. If the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

ScramblerFail   (SPI)

Scrambler Failure.

Problem:

   1. Failure on the scrambler circuit.
        Unit internal failure.

Action:

   1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

DescramblerFail   (SPI)

Descrambler Failure.

Problem:

    1. Failure on the descrambler circuit.
        Unit internal failure.

Action:

    1. Proceed as indicated in:

        Unit Internal Fault Trouble-Shooting Procedure

TxClockFail   (SPI)

Transmit Line Clock Failure.

Problem:

    1. Unit Internal failure.

    2. Consequence of a Unit internal failure on master Most Unit

Action:

    1. Proceed as indicated in:

        Unit Internal Fault Trouble-Shooting Procedure

    2. Proceed as indicated in:

        Unit Internal Fault Trouble-Shooting Procedure

RxClockFail   (SPI)

Received Recovered Clock Failure.

Problem:

    1. Consequence of a LOS or MS-AIS on the line.

    2. S1 quality check not acceptable

    3. Unit Internal failure

Action:

1. Follow the procedure for LOS or MS-AIS recovery.

2. Check with the Control Application the timing marker configuration

3. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

RST - Regenerator Section Terminal

In the following all the alarms detected at the RST level are reported.

LOF   (RST)

Loss Of Frame.

Problem:

1. Consequence of far-end equipment transmitter failure or line interruption

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx connectors and loop output to input using a test patch cord. If the alarm goes OFF, check the status of the far-end equipment and the line.

2. Disconnect the Tx and Rx connectors and loop output to input using a test patch cord. If the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

RS-TIM   (RST)

Trace Identifier Mismatch (J0).

Problem:

1. Transmitter on the far-end equipment configured with a different path trace

Action:

1. Check the local and far-end configuration

DCCrLAPDDisc   (RST)

DCCr LAPD Disconnected.

Problem:

1. Wrong LAPD configuration for DCCr

Action:

1. Check, with Control Application, the LAPD configuration for DCCr
    (USER must be connected to NETWORK)

MST - Multiplex Section Termination Alarms

In the following all the alarms detected at the MS (Multiplex Section Alarms) level
are reported.

MS-AIS   (MST)

AIS on bits 6, 7, 8 of byte K2.

Problem:

1. Failure on the far-end equipment

Action:

1. Check the status of the far-end equipment

MS-RDI   (MST)

RDI on bits 6, 7, 8 of byte K2.

Problem:

1. Consequence of the following alarms, detected on the far-end equipment:
    LOS
    LOF
    MS-AIS
    MS-EXC

Action:

1. Check the status of the far-end equipment and follow the trouble-shooting
    procedure for the detected alarm.

MS-EXC   (MST)

BER >10^{-3} on bytes B2.

Problem:

1. Excessive degradation of the optical fibre
    Coupling attenuation
    Failure of the far-end transmitter
    Unit internal failure

Action:

1. Proceed as indicated in:

    Bit Error Rate Trouble-Shooting Procedure

MS-DEG   (MST)

BER >10^{-5} on bytes B2.

Problem:

1. Degradation of the optical fibre
    Coupling attenuation
    Failure of the far-end transmitter
    Unit internal failure

Action:

1. Proceed as indicated in:

    Bit Error Rate Trouble-Shooting Procedure

DCCmLAPDDisconnected   (MST)

DCCm LAPD Disconnected.

Problem:

1. Wrong LAPD configuration for DCCm

Action:

1. Check, with Control Application, the LAPD configuration for DCCm
    (USER must be connected to NETWORK).

MSP Alarms - Multiplex Section Protection

In the following all the alarms detected at the MSP level are reported.

MSP-INV   (MSP)

Mismatch of received and transmitted K2 bytes.

Problem:

1. Transmitter on the far-end equipment configured with a different type of MSP protection

Action:

1. Check the local and far-end MSP configuration through Control Application

MSP-PAM   (MSP)

Mismatch of transmitted K1 and received K2 bytes.

Problem:

1. Consequence of a LOS detected on the protection line

2. Internal failure of far-end equipment

3. Unit internal failure

Action:

1. Check the status of the far-end equipment and follow the trouble-shooting procedure for the detected alarm

2. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

3. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

MSA Alarms - Multiplex Section Adaptation

In the following all the alarms detected at the MSA level are reported.

AU-LOP   (MSA)

Loss Of AU4 Pointer.

Problem:

1. Transmitter of the far end equipment is configured for a different multiplexing path (AU-3/AU-4) or standard (SONET/SDH)

2. Consequence of far-end equipment transmitter failure

3. Unit Internal Failure

Action:

1. Use the Local Controller to check the local configuration, check the remote configuration.

2. Check the status of the far-end equipment and the local and far-end configuration

3. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

AU-AIS   (MSA)

AIS on AU4.

Problem:

1. Fault on the far-end equipment

Action:

1. Check the status of the far-end equipment

TxRejustFail   **(MSA)**

Tx Rejustifier Underflow / Overflow Dynamic Failure.

Problem:

    1. Consequence of an internal failure on the master MOST Unit

    2. Unit internal failure

Action:

    1. Proceed as indicated in:

        Unit Internal Fault Trouble-Shooting Procedure

    2. Proceed as indicated in:

        Unit Internal Fault Trouble-Shooting Procedure

RxRejustFail   **(MSA)**

Rx Rejustifier Underflow / Overflow Dinamic Failure.

Problem:

    1. Consequence of far-end transmitter failure

    2. Consequence of an internal failure on the master MOST Unit

    3. Unit internal failure

Action:

    1. Check the status of the far-end equipment

    2. Proceed as indicated in:

        Unit Internal Fault Trouble-Shooting Procedure

    3. Proceed as indicated in:

        Unit Internal Fault Trouble-Shooting Procedure

HPT Alarms - Higher order Path overhead termination

In the following all the alarms detected at the HPT level are reported.

HP-TIM   (HPT)

Trace Identifier Mismatch (on byte J1).

Problem:

1. Transmitter on the far-end equipment configured with a different path trace

Action:

1. Check the local and far-end configuration

HP-PLM   (HPT)

Payload Label Mismatch (on byte C2).

Problem:

1. Transmitter on the far-end equipment configured to work with a different payload

Action:

1. check the local and far-end configuration

HP-RDI   (HPT)

RDI on bits 5, 6, 7 of G1 byte.

Problem:

1. Consequence of the following alarms, detected on the far-end equipment:
   LOF
   MS-AIS
   MS-EXC
   AU-LOP
   AU-AIS
   HP-TIM
   HP-PLM
   HP-LOM
   detected on the received side of the far-end equipment

Action:

1. Check the status of the far-end equipment and follow the trouble-shooting procedure for the detected alarm

HP-DEG   (HPT)

BER $>10^{-5}$ on bytes B3.

Action:

1. Check if the same alarm is detected at the termination of the path. If the alarm is DETECTED, follow the procedure for the path termination alarm

2. Check if the same alarm is detected at the termination of the path. If the alarm is NOT DETECTED, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

HP-EXC   (HPT)

BER $>10^{-3}$ on bytes B3.

Action:

1. Check if the same alarm is detected at the termination of the path. If the alarm DETECTED, follow the procedure for the path termination alarm

2. Check if the same alarm is detected at the termination of the path. If the alarm NOT DETECTED, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

HP-UNEQ   (HPT)

Payload Unequipped (byte C2=0).

Action:

1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

HPA_3 - Higher order Path Adaptation

In the following all the alarms detected at the HPA_3 level are reported.

TU-LOP   (HPA_3)

Loss Of TU3 Pointer.

Problem:

1. Alarm active on the far-end transmitter

2. Consequence of far-end equipment transmitter failure

3. Unit Internal Failure

Action:

1. Check the alarms of the far-end equipment

2. Delete the VC connection on the far-end equipment where the path is terminated, and create on the remote STM-1 Interface a unidirectional connection between Tx and Rx of the alarmed VC. If the alarm goes OFF, check the status of the far-end equipment

3. Delete the VC connection on the far-end equipment where the path is terminated, and create on the remote STM-1 Interface a unidirectional connection between Tx and Rx of the alarmed VC. If the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

TU-AIS   (HPA_3)

AIS on TU-3.

Problem:

1. Fault on the far-end equipment

Action:

1. Check the status of the far-end equipment

LPOM_3 - Lower order Path Overhead

In the following all the alarms detected at the LPOM_3 level are reported.

LP-TIM   (LPOM_3)

Trace Identifier Mismatch.

Problem:

  1. Transmitter on the far-end equipment configured with a different path trace

Action:

  1. Check the local and far-end configuration

LP-RDI   (LPOM_3)

Low order VC far-end receive failure.

Problem:

  1. Consequence of the following alarms, detected on the far-end equipment:
      LOF
      MS-AIS
      MS-EXC
      AU-LOP
      AU-AIS
      HP-TIM
      HP-PLM
      HP-LOM
      TU-LOP
      LP-PLM
      LP-TIM
      LP-EXC
      detected on the received side of the far-end equipment

Action:

  1. Check the status of the far-end equipment and, for the detected alarm,
      proceed as indicate in:

      Unit Internal Fault Trouble-Shooting Procedure

LPOM-DEG (LPOM_3)

BER $>10^{-5}$ on the received TU3.

Action:

1. Check if the same alarm is detected at the termination of the path. If the alarm is DETECTED, follow the procedure for the path termination alarm

2. Check if the same alarm is detected at the termination of the path. If the alarm is NOT DETECTED, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

LPOM-EXC (LPOM_3)

BER $>10^{-3}$ on the received TU3.

Action:

1. Check if the same alarm is detected at the termination of the path. If the alarm is DETECTED, follow the procedure for the path termination alarm

2. Check if the same alarm is detected at the termination of the path. If the alarm is NOT DETECTED, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

LP-UNEQ (LPOM_3)

Payload Unequipped (all 0's received on byte C2).

Problem:

1. Transmitter on the far-end equipment not configured

Action:

1. Check the far-end configuration

HPA_2 - Higher order Path Adaptation

In the following all the alarms detected at the HPA_2 level are reported.

HP-LOM   (HPA_2)

Loss of the TU multiframe alignment.

Problem:

1. Consequence of far-end equipment transmitter failure

2. Unit internal failure

Action:

1. Use the local terminal to create a local loopback on the unit. If the alarm goes OFF, check the status of the far-end equipment

2. Use the local terminal to create a local loopback on the unit. If the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

TU-LOP   (HPA_2)

Loss Of TU2 Pointer.

Problem:

1. Alarm active on the far-end transmitter

2. Consequence of far-end transmitter failure

3. Unit Internal Failure

Action:

1. Check the alarm of the far-end transmitter

2. Delete the VC connection on the far-end equipment where the path is terminated, and create on the remote STM-1 interface a unidirectional connection between Tx and Rx of the alarmed VC. If alarm is OFF, check status of the far-end equipment

3. Delete the VC connection on the far-end equipment where the path is terminated, and create on the remote STM-1 interface a unidirectional connection between Tx and Rx of the alarmed VC. If alarm is ON, proceed as indicate in:

   Unit Internal Fault Trouble-Shooting Procedure

TU-AIS   (HPA_2)

AIS on TU2.

Problem:

1. Fault on the far-end equipment

Action:

1. Check the status of the far-end equipment

LPOM_2 - Lower order Path Overhead

In the following all the alarms detected at the LPOM_2 level are reported.

LP-TIM   (LPOM_2)

Trace Identifier Mismatch.

Problem:

1. Transmitter on the far-end equipment configured with a different path trace

Action:

1. Check the local and far-end configuration

LP-RDI   (LPOM_2)

Low order VC far-end receive failure.

Problem:

1. Consequence of the following alarms, detected on the far-end equipment:
    LOF
    MS-AIS
    MS-EXC
    AU-LOP
    AU-AIS
    HP-TIM
    HP-PLM
    HP-LOM
    TU-LOP
    LP-PLM
    LP-TIM
    LP-EXC
    detected on the received side of the far-end equipment

Action:

1. Check the status of the far-end equipment and, for the detected alarm, proceed as indicate in:

    Unit Internal Fault Trouble-Shooting Procedure

LPOM-DEG   (LPOM_2)

BER $>10^{-5}$ on the received TU2.

Action:

1. Check if the same alarm is detected at the termination of the path. If the alarm is DETECTED, follow the procedure for the path termination alarm

2. Check if the same alarm is detected at the termination of the path. If the alarm is NOT DETECTED, proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

LPOM-EXC   (LPOM_2)

BER $>10^{-3}$ on the received TU2.

Action:

1. Check if the same alarm is detected at the termination of the path. If the alarm is DETECTED, follow the procedure for the path termination alarm

2. Check if the same alarm is detected at the termination of the path. If the alarm is NOT DETECTED, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

LP-UNEQ   (LPOM_2)

Payload Unequipped.

Problem:

1. Transmitter on the far-end equipment not configured

Action:

1. Check the far-end configuration

HPA_12 - Higher order Path Adaptation

In the following all the alarms detected at the HPA_12 level are reported.

TU-LOP   (HPA_12)

Loss Of TU-12 Pointer.

Problem:

1. Alarm active on the far-end transmitter

2. Consequence of far-end transmitter failure

3. Unit Internal Failure

Action:

1. Check the alarm of the far-end transmitter

2. Delete the VC connection on the far-end equipment where the path is terminated, and create on the remote interface an unidirectional connection between Tx and Rx of the alarmed VC. If alarm is OFF, check status of the far-end equipment

3. Delete the VC connection on the far-end equipment where the path is terminated, and create on the remote interface an unidirectional connection between Tx and Rx of the alarmed VC. If alarm is ON, proceed as indicate in:

    Unit Internal Fault Trouble-Shooting Procedure

TU-AIS   (HPA_12)

AIS on TU12.

Problem:

1. Fault on the far-end equipment

Action:

1. Check the status of the far-end equipment

LPOM_12 - Lower order Path Overhead Monitor

In the following all the alarms detected at the LPOM_12 level are reported.

LP-TIM   (LPOM_12)

Trace Identifier Mismatch (byte J2).

Problem:

    1. Transmitter on the far-end equipment configured with a different path trace

Action:

    1. Check the local and far-end configuration

LP-RDI   (LPOM_12)

Low order VC-12 far-end receive failure.

Problem:

    1. Consequence of the following alarms, detected on the far-end equipment:
LOF
MS-AIS
MS-EXC
AU-LOP
AU-AIS
HP-TIM
HP-PLM
HP-LOM
TU-LOP
LP-PLM
LP-TIM
LP-EXC
detected on the received side of the far-end equipment

Action:

    1. Check the status of the far-end equipment and, for the detected alarm, proceed as indicate in:

    Unit Internal Fault Trouble-Shooting Procedure

LPOM-DEG (LPOM_12)

BER from 10^{-5} to 10^9 on the received TU-12 (byte V5). Threshold settable via software.

Problem:

1. Degradation of the optical fibre
   Coupling attenuation
   Malfunction on the far-end transmitter
   Unit internal failure

Action:

1. Proceed as indicated in:

   Bit Error Rate Trouble-Shooting Procedure

LPOM-EXC (LPOM_12)

BER higher than 10^{-3} on the received TU-12 (byte V5).

Problem:

1. Degradation of the optical fibre
   Coupling attenuation
   Malfunction on the far-end transmitter
   Unit internal failure

Action:

1. Proceed as indicated in:

   Bit Error Rate Trouble-Shooting Procedure

LP-UNEQ (LPOM_12)

Payload Unequipped (all 0's received on bits 5, 6, 7 of byte V5).

Action:

1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PPI_140Mb - 140Mbit/s PDH Physical Interface Alarms

In the following all the alarms detected at the PDH physical Interface level are reported.

PDH-LOS   (PPI_140Mb)

Loss of signal.

Problem:

1. Unit Internal Failure

2. Consequent action of connected PDH equipment failure or line interruption

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

PDH-AIS   (PPI_140Mb)

AIS on PDH Tributary Module.

Problem:

1. Failure on the connected PDH equipment

Action:

1. Check the status of PDH equipment

PDH-EXC   (PPI_140Mb)

BER >10-3.

Problem:

1. Consequent action of connected PDH equipment failure or line attenuation

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PDH-DEG   (PPI_140Mb)

BER >10^{-5}

Problem:

1. Consequent action of connected PDH equipment failure or line attenuation

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PDH-LOF   (PPI_140Mb)

Loss Of Frame (only for structured streams).

Problem:

1. Consequent action of connected PDH equipment failure or problems along the line

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the PDH equipment status and the line

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

PDH-RDI   (PPI_140Mb)

Remote Defect indication on PDH Tributary (only for structured streams).

Problem:

1. Failure on connected PDH equipment

Action:

1. check the status of the PDH equipment

TxPulseLoss   (PPI_140Mb)

Loss of transmitted pulses.

Problem:

1. Unit internal failure

Action:

1. Proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

TxBufferCont   (PPI_140Mb)

Tx Buffer Contention.

Problem:

1. Incoming signal is out of bit rate tolerance (″ 50 p.p.m) or jitter value is too high. Probable failure on the connected PDH equipment

Action:

1. Check the quality of the signal and the status of the PDH equipment

RxBufferCont   (PPI_140Mb)

Rx Buffer Contention.

Problem:

1. Problem on the synchronisation quality of the 140Mbit/s incoming on the far-end equipment

2. Mismatch in the network synchronisation configuration

3. Consequence of internal unit failure on the master MOST Unit

4. Consequence of internal unit failure on the master MOST Unit of the far-end equipment

5. Internal unit failure

Action:

1. Check the quality on the input signal on the far-end equipment

2. Check with the Control Application the sync. configuration for the local and far-end equipment

3. Proceed as indicated in:

Unit Internal Fault Trouble-Shooting Procedure

4. Proceed as indicated in:

Unit Internal Fault Trouble-Shooting Procedure

5. Proceed as indicated in:

Unit Internal Fault Trouble-Shooting Procedure

PPI_34_45 - 34 and 45Mbit/s PDH Physical Interface Alarms

In the following all the alarms detected at the PDH physical Interface level are reported.

PDH-LOS   (PPI_34_45)

Loss of signal.

Problem:

1. Unit Internal Failure

2. Consequent action of connected PDH equipment failure or line interruption

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

PDH-AIS   (PPI_34_45)

AIS on PDH Tributary Module.

Problem:

1. Failure on the connected PDH equipment

Action:

1. Check the status of PDH equipment

PDH-EXC   (PPI_34_45)

BER $>10^{-3}$

Problem:

1. Consequent action of connected PDH equipment failure or line attenuation

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PDH-DEG   (PPI_34_45)

BER $>10^{-5}$

Problem:

1. Consequent action of connected PDH equipment failure or line attenuation

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PDH-LOF   (PPI_34_45)

Loss Of Frame (only for structured streams).

Problem:

1. Consequent action of connected PDH equipment failure or problems along the line

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the PDH equipment status and the line

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PDH-RDI   (PPI_34_45)

Remote Defect indication on PDH Tributary (only for structured streams).

Problem:

1. Failure on connected PDH equipment

Action:

1. check the status of the PDH equipment

TxPulseLoss   (PPI_34_45)

Loss of transmitted pulses.

Problem:

1. Unit internal failure

Action:

1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

TxBufferCont   (PPI_34_45)

Tx Buffer Contention.

Problem:

1. Incoming signal is out of bit rate tolerance (±50 p.p.m) or jitter value is too high. Probable failure on the connected PDH equipment

Action:

1. Check the quality of the signal and the status of the PDH equipment

RxBufferCont   (PPI_34_45)

Rx Buffer Contention.

Problem:

1. Problem on the synchronisation quality of the 34 or 45Mbit/s incoming on the far-end equipment

2. Mismatch in the network synchronisation configuration

3. Consequence of internal unit failure on the master MOST Unit

4. Consequence of internal unit failure on the master MOST Unit of the far-end equipment

5. Internal unit failure

Action:

1. Check the quality on the input signal on the far-end equipment

2. Check with the Control Application the sync. configuration for the local and far-end equipment

3. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

4. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

5. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

LPT_VC-3 - Lower order Path Termination

In the following all the alarms detected at the LPT_VC-3 level are reported.

LP-PLM   (LPT_VC-3)

Mismatch between the received and expected C2 byte.

Problem:

1. Transmitter at the far-end equipment configured to work with a different payload

Action:

1. Check the local and far-end configuration

LP-RDI   (LPOM_VC-3)

Low order VC-3 far-end receive failure.

Problem:

1. Consequence of the following alarms, detected on the far-end equipment:
   LOF
   MS-AIS
   MS-EXC
   AU-LOP
   AU-AIS
   HP-TIM
   HP-PLM
   HP-LOM
   TU-LOP
   LP-PLM
   LP-TIM
   LP-EXC
   detected on the received side of the far-end equipment

Action:

1. Check the status of the far-end equipment and, for the detected alarm, proceed as indicate in:

Unit Internal Fault Trouble-Shooting Procedure

LPOM-DEG   (LPOM_VC-3)

BER from 10^{-5} to 10^{-9} on the received VC-3 (byte B3). Threshold settable via software.

Problem:

1. Degradation of the optical fibre
   Coupling attenuation
   Malfunction on the far-end transmitter
   Unit internal failure

Action:

1. Proceed as indicated in:

   Bit Error Rate Trouble-Shooting Procedure

LP-TIM   (LPOM_VC-3)

Trace Identifier Mismatch (byte J1).

Problem:

1. Transmitter on the far-end equipment configured with a different path trace

Action:

1. Check the local and far-end configuration

LPOM-EXC   (LPOM_VC-3)

BER higher than 10^{-3} on the received VC-3 (byte B3).

Problem:

1. Degradation of the optical fibre
   Coupling attenuation
   Malfunction on the far-end transmitter
   Unit internal failure

Action:

1. Proceed as indicated in:

   Bit Error Rate Trouble-Shooting Procedure

LP-UNEQ   (LPOM_VC-3)

Payload Unequipped (all 0's received on byte C2).

Action:

1. Proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

<u>PPI_2Mb-1.5 and 2Mbit/s PDH Physical Interface Alarms</u>

In the following all the alarms detected at the PDH physical Interface level are reported.

PDH-LOS   (PPI_2Mb)

Loss of signal.

Problem:

1. Consequent action of connected PDH equipment failure or line interruption

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

PDH-AIS   (PPI_2Mb)

AIS on PDH Tributary Module.

Problem:

1. Failure on the connected PDH equipment

Action:

1. Check the status of PDH equipment

PDH-EXC   (PPI_2Mb)

BER $>10^{-3}$

Problem:

1. Consequent action of connected PDH equipment failure or line attenuation

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PDH-DEG   (PPI_2Mb)

BER $>10^{-5}$

Problem:

1. Consequent action of connected PDH equipment failure or line attenuation

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the line and the PDH equipment status

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2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

Unit Internal Fault Trouble-Shooting Procedure

PDH-LOF   (PPI_2Mb)

Loss Of Frame (only for structured streams).

Problem:

1. Consequent action of connected PDH equipment failure

2. Unit Internal Failure

Action:

1. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm goes OFF, check the PDH equipment status

2. Disconnect the Tx and Rx coaxial cables and loop output with input using a test patch cord and if the alarm stays ON, proceed as indicated in:

Unit Internal Fault Trouble-Shooting Procedure

PDH-RDI   (PPI_2Mb)

Remote Defect indication on PDH Tributary (only for structured streams)

Problem:

1. Failure on connected PDH equipment

Action:

1. check the status of the PDH equipment

TxPulseLoss   (PPI_2Mb)

Loss of transmitted pulses

Problem:

1. Unit internal failure

Action:

1. Proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

TxBufferCont   (PPI_2Mb)

Tx Buffer Contention

Problem:

1. 2Mbit/s incoming signal is out of bit rate tolerance (±50 p.p.m) or jitter value is too high. Probable failure on the connected PDH equipment

Action:

1.   Check the quality of the signal and the status of the PDH equipment

RxBufferCont   (PPI_2Mb)

Rx Buffer Contention

Problem:

1. Problem on the synchronisation quality of the 2Mbit/s incoming on the far-end equipment

2. Mismatch in the network synchronisation configuration

3. Consequence of internal unit failure on the master MOST Unit

4. Consequence of internal unit failure on the master MOST Unit of the far-end equipment

5. Internal unit failure

Action:

1. Check the quality on the input signal on the far-end equipment

2. Check with the Control Application the sync. configuration for the local and far-end equipment

3. Proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

4. Proceed as indicated in:

    Unit Internal Fault Trouble-Shooting Procedure

5. Proceed as indicated in:

Unit Internal Fault Trouble-Shooting Procedure

LPT_VC-12 - Lower order Path Termination

In the following all the alarms detected at the LPT_VC-12 level are reported.

LP-PLM   (LPT_VC-12)

Mismatch between the received and expected on bits 5, 6, 7 of V5 byte.

Problem:

1. Transmitter at the far-end equipment configured to work with a different payload

Action:

1. Check the local and far-end configuration

LP-RDI   (LPOM_VC-12)

Low order VC-12 far-end receive failure.

Problem:

1. Consequence of the following alarms, detected on the far-end equipment:
LOF
MS-AIS
MS-EXC
AU-LOP
AU-AIS
HP-TIM
HP-PLM
HP-LOM
TU-LOP
LP-PLM
LP-TIM
LP-EXC

detected on the received side of the far-end equipment

Action:

1. Check the status of the far-end equipment and, for the detected alarm, proceed as indicate in:

    Unit Internal Fault Trouble-Shooting Procedure

LPOM-DEG   (LPOM_VC-12)

BER from 10^{-5} to 10^{-9} on the received VC-12 (bits 1, 2 of byte V5).
Threshold settable via software.

Problem:

1. Degradation of the optical fibre
    Coupling attenuation
    Malfunction on the far-end transmitter
    Unit internal failure

Action:

1. Proceed as indicated in:

    Bit Error Rate Trouble-Shooting Procedure

LP-TIM   (LPOM_VC-12)

Trace Identifier Mismatch (byte J2).

Problem:

1. Transmitter on the far-end equipment configured with a different path trace

Action:

1. Check the local and far-end configuration

LPOM-EXC   (LPOM_VC-12)

BER higher than 10^{3} on the received VC-12 (bits 1, 2 of byte V5).

Problem:

1. Degradation of the optical fibre
    Coupling attenuation
    Malfunction on the far-end transmitter
    Unit internal failure

Action:

1. Proceed as indicated in:

   Bit Error Rate Trouble-Shooting Procedure

LP-UNEQ   (LPOM_VC-12)

Payload Unequipped (all 0's received on bits 5, 6, 7 of V5 byte)

Problem:

1. Transmitter on the far-end equipment not configure

Action:

1. Check the far-end configuration

LPT_VC-2 - Lower order Path Termination

In the following all the alarms detected at the LPT_VC-2 level are reported.

LP-PLM   (LPT_VC-2)

Mismatch between the received and expected on bits 5, 6, 7 of V5 byte.

Problem:

1. Transmitter at the far-end equipment configured to work with a different payload

Action:

1. Check the local and far-end configuration

LP-RDI   (LPOM_VC-2)

Low order VC-12 far-end receive failure.

Problem:

1. Consequence of the following alarms, detected on the far-end equipment:
   LOF
   MS-AIS
   MS-EXC
   AU-LOP
   AU-AIS

HP-TIM
HP-PLM
HP-LOM
TU-LOP
LP-PLM
LP-TIM
LP-EXC
detected on the received side of the far-end equipment

Action:

1. Check the status of the far-end equipment and, for the detected alarm, proceed as indicate in:

   Unit Internal Fault Trouble-Shooting Procedure

LPOM-DEG   (LPOM_VC-2)

BER from 10^{-5} to 10^{-9} on the received VC-12 (bits 1, 2 of byte V5). Threshold settable via software.

Problem:

1. Degradation of the optical fibre
   Coupling attenuation
   Malfunction on the far-end transmitter
   Unit internal failure

Action:

1. Proceed as indicated in:

   Bit Error Rate Trouble-Shooting Procedure

LP-TIM   (LPOM_VC-2)

Trace Identifier Mismatch (byte J2).

Problem:

1. Transmitter on the far-end equipment configured with a different path trace

Action:

1. Check the local and far-end configuration

LPOM-EXC   (LPOM_VC-2)

BER higher than 10^{-3} on the received VC-12 (bits 1, 2 of byte V5).

Problem:

1. Degradation of the optical fibre
   Coupling attenuation
   Malfunction on the far-end transmitter
   Unit internal failure

Action:

1. Proceed as indicated in:

   Bit Error Rate Trouble-Shooting Procedure

LP-UNEQ   (LPOM_VC-2)

Payload Unequipped (all 0's received on bits 5, 6, 7 of V5 byte)

Action:

1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

PORT - Unit Alarms

In the following all the alarms detected at the PORT level are reported.

Missing   (PORT)

Unit not fitted.

Problem:

1. A configured unit is not fitted.

Action:

1. Check whether the unit is well inserted.

Wrong   (PORT)

Wrong unit fitted

Problem:

  1. A wrong unit type is fitted.

Action:

  1. Check whether the configured and the fitted unit are the same.

Fail   (PORT)

Failure in the internal circuit of the unit.

Problem:

  1. Unit internal failure.

Action:

  1. Proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

Comm   (PORT)

Control bus failure

Problem:

  1. Unit internal failure.

  2. Failure on a connected unit.

Action:

  1. Proceed as: indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

MatrixAFail   (PORT)

Switch on MOST A failure

Problem:

  1. Unit internal failure on MOST A.

Action:

1. Proceed as indicated in:

Unit Internal Fault Trouble-Shooting Procedure

MatrixBFail   (PORT)

Switch on MOST B failure.

Problem:

1. Unit internal failure on MOST B.

Action:

1. Proceed as: indicated in:

Unit Internal Fault Trouble-Shooting Procedure

TimexAFail   (PORT)

Timex on MOST A failure

Problem:

1. Unit internal failure on MOST A.

Action:

1. Proceed as: indicated in:

Unit Internal Fault Trouble-Shooting Procedure

TimexBFail   (PORT)

Timex on MOST B failure

Problem:

1. Unit internal failure on MOST B.

Action:

1. Proceed as: indicated in:

Unit Internal Fault Trouble-Shooting Procedure

TxOHBusFail   (PORT)

Transmit Overhead Bus Disparity Failure

Problem:

  1. Mismatch during parity check on the overhead bus .Unit internal failure

Action:

  1. Proceed as: indicated in:

  Unit Internal Fault Trouble-Shooting Procedure

Sync Alarm

In the following all the alarms detected at the Sync level are reported

OutOfFreq   (Sync)

Out of the frequency equipment synchronisation source.

Problem:

  1. Both PLL circuits are unable to lock to the synchronisation source

Action:

  1. Check the synchronisation source

QL Invalid   (Sync)

The synchronisation source quality level is invalid.

Problem:

  1. The synchronisation source quality level is DNU (all 1's on byte S1)

  2. The synchronisation source is lower than the setted threshold

  3. A not valid value is received on byte S1

Action:

1. Check the provider of the synchronisation source

2. Check the provider of the synchronisation source and the correct value of the setted threshold

3. Check the provider of the synchronisation source

SystemSyncFail   (Sync)

Loss of synchronisation signal.

Action:

1. Check the provider of the synchronisation source

ExtOutSyncFail   (Sync)

Loss of outgoing synchronisation signal.

Action:

1. Check the provider of the synchronisation source used to lock outgoing synchronisation signal

SyncSrcFail   (Sync)

Failure of selected the synchronisation source.

Action:

1. Check the provider of the synchronisation source

Power Alarm

In the following all the alarms detected at the Power level are reported.

Or Battery   (Power)

Failure of one of the two battery voltages.

Problem:

1. Power cable damaged, fuse or external thermal-magnetic breakers activated

Action:

1. Check power supply source

Ground Contacts Alarms

GC_n

--------- The equipment can accept up to four incoming ground contacts (**n** from **1** to **4**).

Problem:

1. Alarm active on the external device that uses the incoming ground contact (if any)

2. Wrong software presettings

Action:

1. Check external device (if any)

2. Check software presettings

Unit Internal Fault Trouble-Shooting Procedure

When a unit internal fault condition is detected proceed in the following way:

1. Perform a restart of the controller, by closing with a proper tool, the contact (creating a short-circuit) accessible from the MOST front panel.

2. If the alarm condition remains active perform a unit hardware reset (pull out and re-insert the faulty unit)

3. If the alarm condition still remains active replace the Unit

Bit Error Rate Trouble-Shooting Procedure

When a bit error rate $\varepsilon \geq 10^{-3}$ (EXC) or $\varepsilon \geq 10^{-5}$ (DEG) is detected proceed in the following way:

Bit error rate on the STM-1 optical signal (MS-EXC/DEG)

IMPORTANT   The following procedure will set out of service the line traffic.
Proceed therefore only if it is actually necessary or if the traffic is protected

1. Set with the Control Application a Back-end loopback. If the alarm stays ON proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

2. Set on the far-end multiplexer a Front-end loopback. If the alarm stays OFF there is a failure on the far-end equipment

3. Disconnect the Tx and Rx optical fibre cables.

4. Using a proper optical cable connect the Tx side with the Rx side of an optical adjustable attenuator.

5. Press the MOST front panel push-button for the long laser restart (for test).

6. Set the attenuator to measure on its Tx side an optical power of -34dBm (S-1.1, L-1.1, L-1.2) (minimum sensitivity).

7. Using a proper optical cable connect the Tx side of the attenuator with the Rx side of the STM-1 Optical Module.

8. Press the MOST front panel push-button for the short laser restart. If the alarm stays ON proceed as indicated in:

   Unit Internal Fault Trouble-Shooting Procedure

9. If the alarm goes OFF an excessive degradation of the optical fibre or fault on the far-end transmitter exist.

10. Check if the received optical power is between 0dBm and -34dBm (S-1.1, L-1.1, L-1.2).
    (to measure the received optical power in the remote equipment must be disabled the optical protection device, by means of Control Application).
    If the measured level is between the range, follow the:

    Unit Internal Fault Trouble-Shooting Procedure

11. Check if the measured value is below -34dBm or above 0dBm (S-1.1, L-1.1, L-1.2).If the measured value is below -34 dBm (S-1.1, L-1.1, L-1.2) a probable signal attenuation due to poor connector coupling or to the optical fibre line or faulty far-end equipment exist.

12. Check if the measured value is below -34dBm or above 0dBm (S-1.1, L-1.1, L-1.2). If the measured value is above 0dBm (S-1.1, L-1.1, L-1.2), the optical power transmitted from the far-end equipment is higher than the acceptable one or faulty optical output power regulation loop on the far-end transmitter

Bit error rate on the STM-1 electrical signal (MS- EXC/DEG)

IMPORTANT   The following procedure will set the line traffic out of service.
Proceed therefore only if it is actually necessary or if the traffic is protected

1. Set with the Control Application a Back-end loopback . If the alarm stays ON follow the:

Unit Internal Fault Trouble-Shooting Procedure

2. Set on the far-end multiplexer a Front-end loopback . If the alarm goes OFF there is a failure on the far-end equipment.

3. If the alarm stays ON there are problems on the connectors or on the coaxial cable.

Bit error rate on the VC payload (PPI-EXC/DEG)

IMPORTANT   The following step will set out of service the VC.
Proceed therefore only if it is actually necessary or if the traffic is protected

1. Delete, on the far-end equipment where the path is terminated, the VC connection and create on the STM-1 Interface a unidirectional connection between TX and RX of the alarmed VC . If the alarm is OFF there is a failure on the far-end equipment.

2. Check if on the equipment a protection for the faulty unit is available. If the PROTECTION UNIT is AVAILABLE then proceed with the step **3.** If the PROTECTION UNIT is NOT AVAILABLE then proceed with the step **5.**

IMPORTANT   The following step will insert transient errors on all the VCs terminated on the relevant unit.
Proceed therefore only if it is actually necessary.

3. Set with the Control Application a manual switch to the protection unit. If the alarm goes OFF follow the :

   Unit Internal Fault Trouble-Shooting Procedure

4. Set with the Control Application a manual switch to the protection unit. If the alarm stays ON: degradation of the optical power, problems in connector coupling or failure in transit equipment. Check the connections and the status of the transit equipment.

IMPORTANT   The following procedure will put the line traffic out of service.
Proceed therefore only if it is actually necessary or if the traffic is protected

5. Set with the Control Application a Back-end loopback . If the alarm goes OFF follow the:

   Unit Internal Fault Trouble-Shooting Procedure

6. Set with the Control Application a Back-end loopback .If the alarm stays ON: degradation of the optical power, problems in connector coupling or failure in transit equipment. Check the connections and the status of the transit equipment.

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