NOKIA

C33525.90_H0
Nokia MetroHub Transmission Node Rel. C3

Troubleshooting Nokia MetroHub

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Contents

1 Overview of trouble management

Purpose

Troubleshooting instructions give some advice on how to locate possible faults in the operation of FXC E1, FXC E1/T1, FXC STM-1, FXC Bridge, and FXC RRI units. The primary means of finding the source of a problem in a live transmission network is to investigate alarms, interface statistics, and bit error rates. You can use loopbacks to detect where the problem occurs, if it is between two connected interfaces (FXC E1/T1) or platform interfaces (if FXC RRI is used) by investigating the interface statistics and looping the signal back to the interface from different points on the signal path.

If an external analyser is used to find the problem, the whole signal path (including cross-connections) can also be checked by looping the signal back from different points on the signal path.

You can also troubleshoot the network by checking the MCB/LCB or protected cross-connection condition bits. Cross-connection loops (and bypass loops with FXC RRI) can also be used to find faults in the network.

Steps

1. **Use forced indications to test the FXC STM transmission unit LEDs.**
2. **Use timeslot monitoring to locate faults.**
3. **Use MCB/LCB bits to locate faults.**
4. **Use the condition bits of protected cross-connections to locate faults.**
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8. **What to do if the transmission node is powered, but a manager connection cannot be established.**

9. What to do if there is a -48 DC or +55V DC output failure in the power interface unit of Nokia MetroHub.

10. What to do if the cross-connection test of a transmission unit fails in the manager.

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17. What to do if the battery capacity test fails in the manager.

2 Using forced indications to test the FXC STM transmission unit LEDs

Purpose

The FXC STM-1 and FXC Bridge cards have three-colour unit status LEDs. In the **Forced Indications** windows, you can test the LEDs by forcing them into different states.

Steps

1. **Click FXC STM-1 → Forced Indications to open the FXC STM window, or FXC Bridge → Forced Indications to open the FXC Bridge window.**

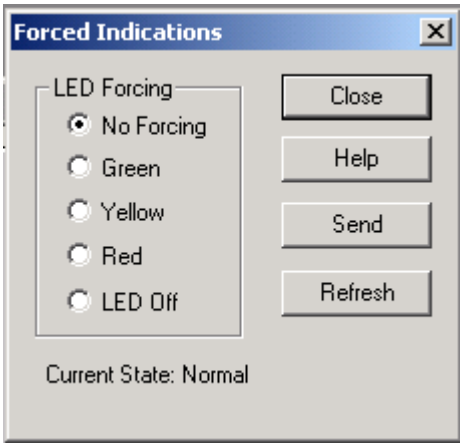

Figure 1. FXC STM-1 or FXC Bridge Forced Indications

2. **View the Current State of the LED; usually, this is Normal or No Forcing.**

3. **Select the state you want to force the LED to (No Forcing, Green, Yellow, Red, or LED Off).**

4. **Click Send.**

5. **Click Refresh to read the current state of the LED from the unit.**

3 Using timeslot monitoring to locate faults

Purpose

The **Timeslot Monitoring** page displays monitored timeslot data in bits (1-8). Monitoring timeslots is restricted to those interfaces in which there have been either cross-connections or control bits created. The platform interface connected to the selected channel is also displayed. It is possible to monitor the contents of individual timeslots.

Steps

1. **Click Maintenance → Timeslot Monitoring to access the Timeslot Monitoring dialogue box.**

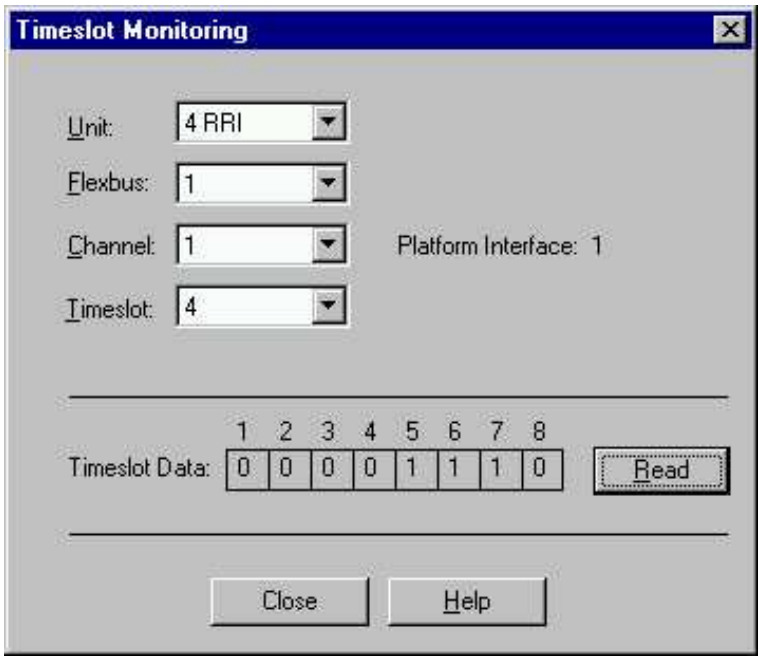

Figure 2. Timeslot Monitoring dialogue box

2. Select the monitored Unit and Interface (or Flexbus and Channel with the FXC RRI unit), and the Timeslot.

Note

The selected timeslot has to be active, that is, have a cross-connection or control bit created.

3. Click Read to read the 8 bits of the monitored timeslot.

4 Using MCB/LCB bits to locate faults

Purpose

The status of MCB/LCB bits gives you information on the synchronisation in the loop network. The status of these bits can be monitored in the **Loop Bits** tab of the **Synchronization** dialogue box. Only the received MCB/LCB bits are shown.

Steps

1. **Connect to the node or open a file.**
2. **Select Configuration → Synchronization.**
3. **Select the Loop Bits tab.**

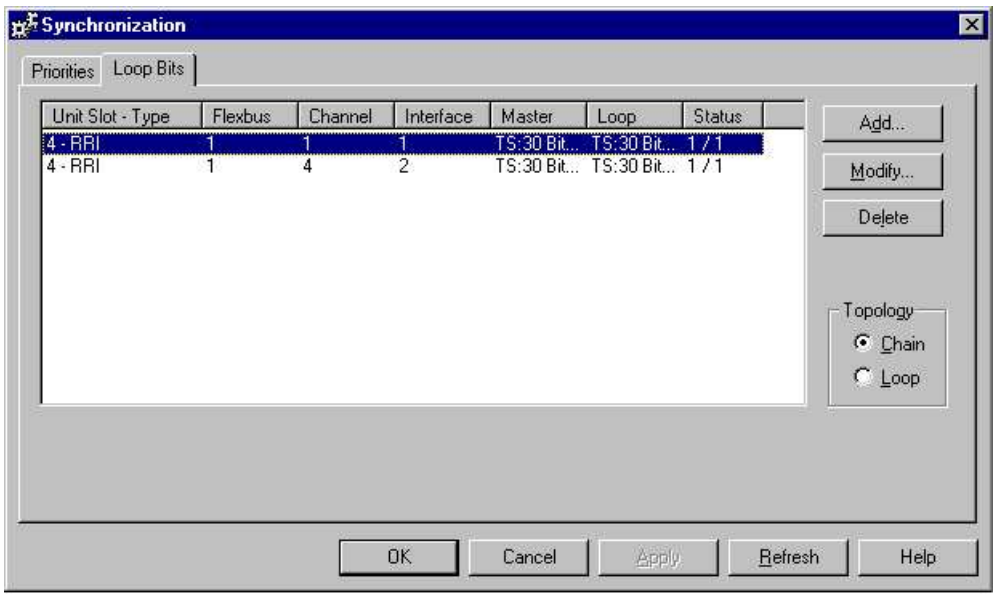

Figure 3. MCB/LCB status in the Synchronization dialogue box

4. **Locate any faults using the MCB/LCB bit statuses.**

Locate faults using the MCB/LCB bit statuses. In all good situations, the incoming master bit is 0. If the master bit is 1, it indicates that the incoming signal from that direction is not synchronised from the loop master. The loop bit is used to detect any breaks or loopbacks in the synchronisation chain.

Note

Only the received MCB/LCB bits are shown.

Table 1. MCB/LCB bit statuses

MCB	LCB	Conditions in the sending node (B), based on receiving MCB/LCB bits in the receiving node (A)
0	0	The connection from the loop master to node B is acceptable. Node B is getting its synchronisation from the loop master. Node A can use this interface as a synchronisation source.
0	1	Node B gets it synchronisation from the loop master. Node A should not use this as its synchronisation source, because the synchronisation is coming from node A direction in order to prevent a synchronisation loop back.
1	0	Not applicable.
1	1	The connection from the loop master to node B is not acceptable. Node A should not use this interface as its synchronisation source.

5 Using the condition bits of protected cross-connections to locate faults

Purpose

Condition bits of protected cross-connections give information on the status of the protected/protecting cross-connection directions. If a received pilot bit is 1 the connection is faulty, if 0 the connection is functioning. The status information is shown in the **Condition Information** frame of the **Cross-connection Properties** dialogue box.

Steps

1. **Connect to the node.**
2. **Select Configuration → Cross Connections.**

   The **Cross-connections** window opens.

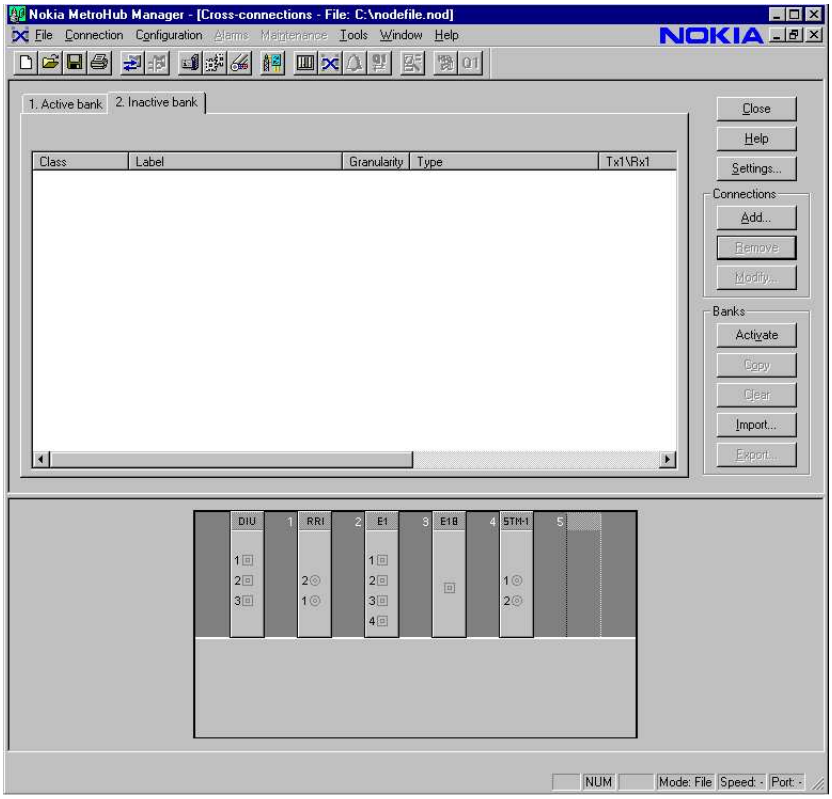

Figure 4. The Cross-connections window

3. Click the Settings button in the Cross-connections window.

4. Select Condition Type, Condition 1 and Condition 2.

5. Click OK.

6. Select a cross-connection, right click on it, and click Properties to access the Cross-connection Properties dialogue box.

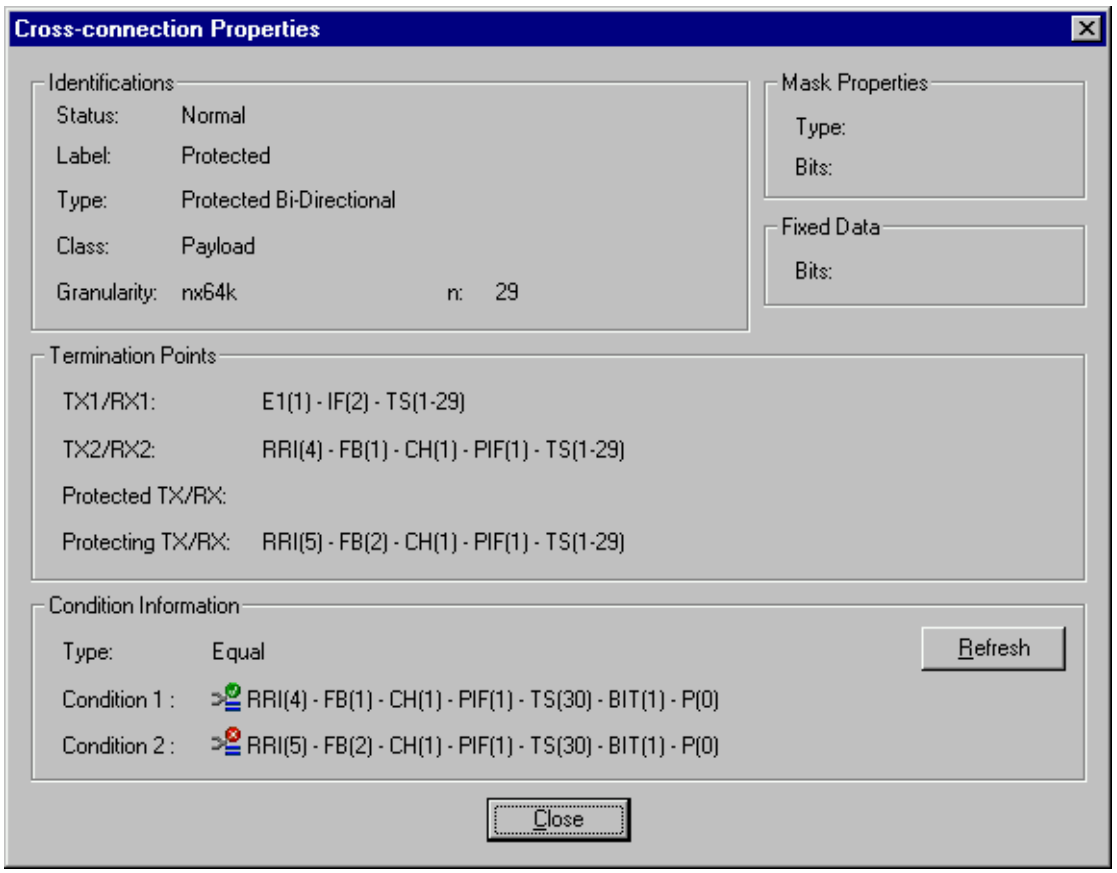

Figure 5. Condition information in the Cross-connection Properties dialogue box

7. Assess if the connection is faulty by viewing the condition bits of the protected cross-connections, in the Condition Information frame.

View the condition bits of the protected cross-connections in the **Condition Information** frame. If a received pilot bit is 1, the connection is faulty. If a received pilot bit is 0, the connection is functioning.

Further information

For more information, see *Technical description of PDH transmission network protection using loop topology.*

6 Using pending cross-connections to locate faults

Purpose

If a traffic cut has occurred, and there is an active pending cross-connections alarm ('*20 Blocked from use*'), check the status of the cross-connections, especially if the node settings have been changed.

Steps

1. **Connect to the node.**
2. **Select Configuration → Cross-connections.**
3. **View the pending cross-connections.**

   Pending cross-connections are displayed in the **Cross-connections** window with the colour red. Cross-connections are in the pending state when something is preventing them from working normally. See the following diagram.

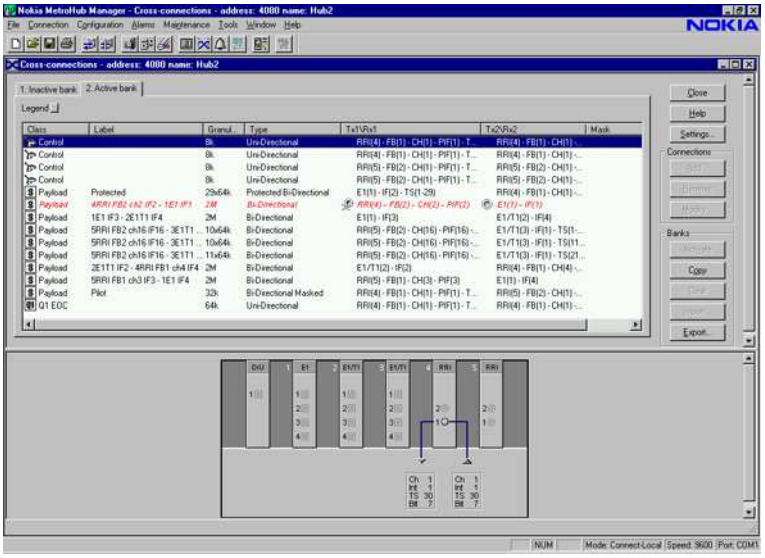

Figure 6. Pending cross-connections because of disabled interface 1 of the FXC E1/T1 unit in slot 2

Reasons for the pending state can be that one end (termination point) of the cross-connection is an interface that is not in use. Another reason is that it is not operational, because of an active alarm. The responsible end (termination point) for each pending cross-connection is shown by the icon next to the termination point. Click the **Legend** button to see an explanation of the symbols, as shown in the figure below.

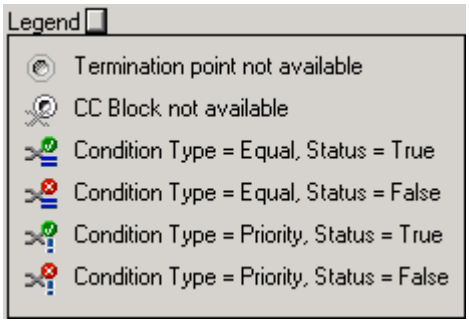

Figure 7. Symbols used in the cross-connections window

Once the reason for the pending state is removed, the cross-connection is reactivated automatically.

Note

To see the actual status of the cross-connections, you need to refresh the **Cross-connections** view.

7 Using loopbacks to test the transmission node

7.1 Overview of using loopbacks to test the transmission node

Purpose

The units contain several loopback points that you can set to test the node. These loopbacks are accessed through Nokia FXC E1/(T1) Manager or FXC RRI Manager or FXC STM-1 Manager (standalone or embedded in MetroHub Manager or UltraSite BTS Hub Manager).

The loopback status can change without the user changing it, for example when the timeout has been reached (alarms '*21 Loop to interface*' and '*22 Loop to equipment*').

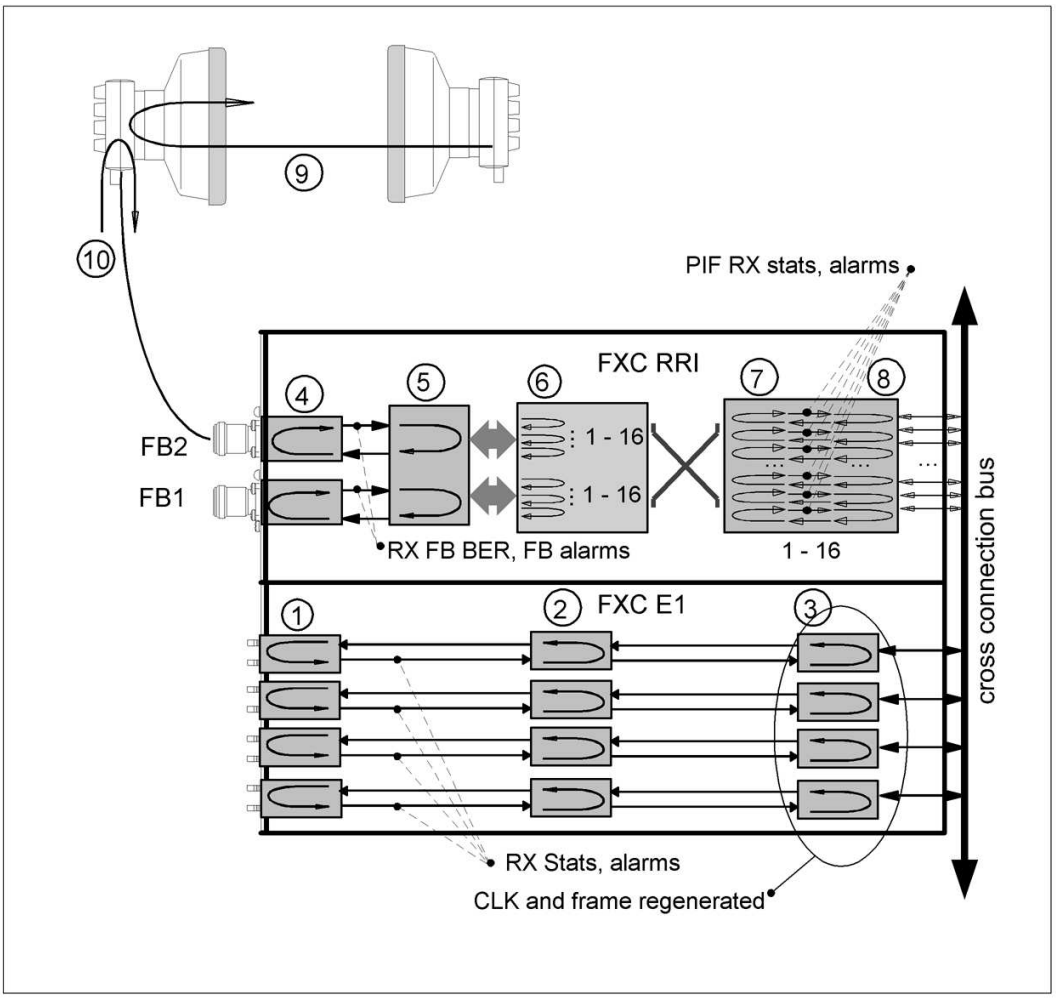

Figure 8. Loopbacks in FXC E1 unit, FXC RRI unit, Nokia FlexiHopper and Nokia MetroHopper

The following loops are supported by the FXC E1 unit, FXC RRI unit, Nokia FlexiHopper, and Nokia MetroHopper:

1. Loop to equipment
2. Loop to interface (line)
3. Loop to interface (payload)
4. Flexbus loop to equipment
5. Flexbus loop to interface

6. Flexbus channel loop to interface
7. Platform interface loop to equipment
8. Platform interface loop to interface
9. Outdoor unit loop to interface
10. Outdoor unit loop to equipment

Steps

1. Configure the unit loopback settings as required.

Configure the unit loopback settings as required. See the following sections for details:

- *Using loopbacks to test the FXC E1(T1) transmission unit*
- *Using loopbacks to test the FXC RRI transmission unit*
- *Using loopbacks to test the FXC STM-1 transmission unit*

2. Define the control time out, which sets how long the loops are active.

When the defined time has expired, the loops are automatically removed. The control time out is set in the **Configuration → Service Interface** menu in FXC units and node managers.

7.2 Using loopbacks to test the FXC E1(/T1) transmission unit

Purpose

Three integrated loopback tests are available in FXC E1(/T1) units for testing and diagnostics purposes. You can verify the operation of the signal path with the help of external BER analyser equipment.

Steps

1. Click FXC E1/T1 → Interface Loops to open the Interface Loops dialogue box.

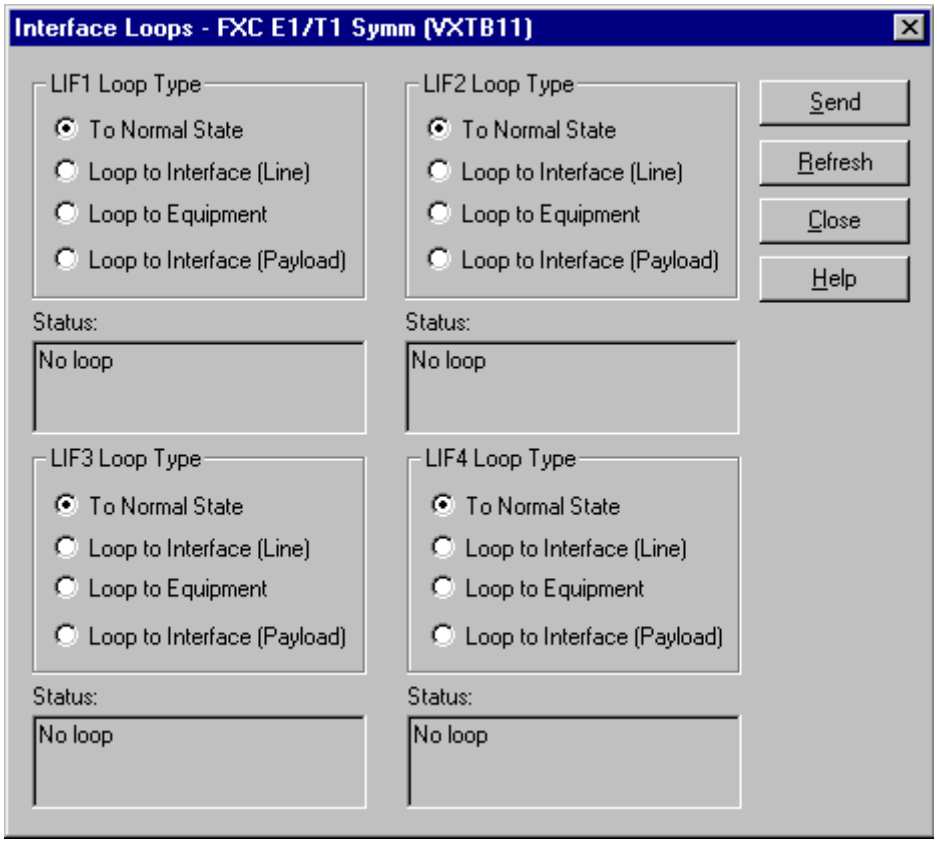

Figure 9. Interface loops dialogue box in the FXC E1/T1 manager

2. Select loop types for particular Line Interfaces (LIFs) as required.

Select loop types for a particular **LIF** (**1**, **2**, **3**, **4**) **Loop Type**, as required:

- **Loop to Equipment** is a near-end loop. The signal is looped back from the interface to the node cross-connection section. The TX direction is forwarded as AIS. This loopback can be used to test the FXC E1 interface framer.
- **Loop to Interface (Line)** is a far-end loop. The signal to the 2M interface from another interface (NE) is looped back. The whole signal in the unit's 2Mbit/s interface is looped back, synchronising it to the incoming signal. The RX direction is forwarded as AIS.
- **Loop to Interface (payload)** is a far-end loop. The signal to the 2M interface from another interface (NE) is looped back. The reframed signal in the unit's 2Mbit/s interfaces is looped back, synchronising it to the node clock. The RX direction is forwarded as AIS.

3. Click Send to apply the loop(s).

Note

Traffic is cut when you apply loops in the related interfaces, channels or Flexbuses.

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4. Use the Refresh button to view the current information.

7.3 Using loopbacks to test the FXC RRI transmission unit

Purpose

Seven integrated loopback tests are available in FXC RRI units for testing and diagnostics purposes. You can verify the operation of the signal path with the help of external BER analyser equipment.

Steps

1. Click FXC RRI → Interface Loops.

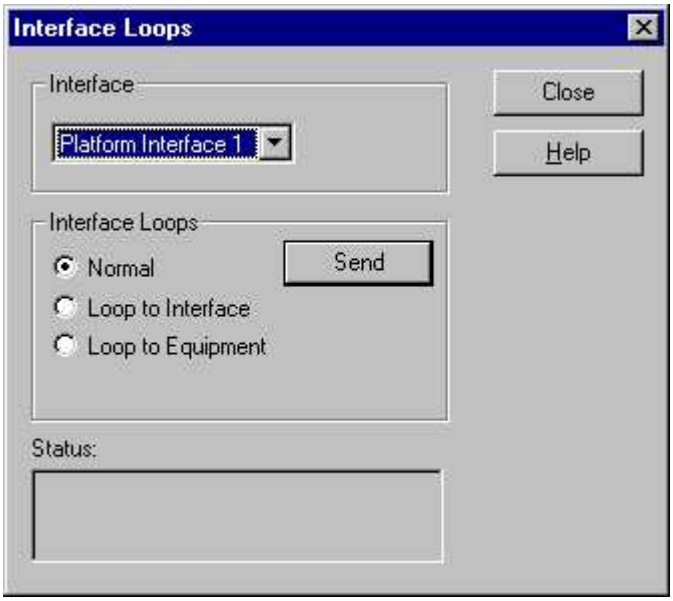

Figure 10. Interface loops dialogue box in the FXC RRI manager

2. In the Interface Loops window, select loop types for particular Flexbus, Flexbus Channel, Platform Interface, or Outdoor Unit, as required.

Select loop types for a particular **Flexbus** interface as required:

- Flexbus **Loop to Equipment** is a near-end loop. The signal is looped back from the Flexbus interface to the cross-connection section. In the TX direction the signal is passed through.
- Flexbus **loop to interface** is a far-end loop. The signal to the 2M Flexbus channel from another interface (NE) is looped back. The whole signal in the Flexbus channel is looped back, synchronising it to the incoming signal. The RX direction is forwarded as AIS. This loop does not work with a direct Flexbus cable connection.

Note

The connection to the outdoor unit is cut when 'Flexbus loop to interface' is activated. The Flexbus BER measurement does not work and this generates the following irrelevant Flexbus alarms: *99 Error rate E-3*' and '*81 Loss of frame alignment*'.

Caution

Setting a Flexbus loop cuts the connection to the outdoor unit until the loop is cancelled or it expires. This includes all data and management information. The interface loopback in FlexiHopper stays active until the loopback timeout expires.

Select loop types for a particular **FB Channel** interface as required:

- Flexbus channel **loop to interface** is a far-end loop. The signal to the 2M Flexbus channel from another interface (NE) is looped back. The whole signal in the Flexbus channel is looped back, synchronising it to the incoming signal. The RX direction is forwarded as AIS.

Select loop types for a particular **Platform Interface** as required:

- Platform interface **loop to equipment** is a near-end loop. The signal from the platform interface to the node cross-connection section is looped back. The TX direction is forwarded as AIS.
- Platform interface **loop to interface** is a far-end loop. The signal to the platform interface from another interface (NE) is looped back. The whole signal in the unit's interfaces is looped back, synchronising it to the incoming signal. The RX direction is forwarded as AIS.

Select loop types for a particular **OU Radio Interface** as required:

- Outdoor unit **loop to interface** is a far-end loop. The incoming radio signal is looped back to the other end of the radio hop. In the RX direction the signal is passed through.

Note

The connection to the outdoor unit is cut, when 'Outdoor unit loop to interface' is activated.

- Outdoor unit **loop to equipment** is a near-end loop. The incoming Flexbus signal is looped back to the indoor unit. In the TX direction the signal is passed through.

Note

This loop may cause an irrelevant alarm: '*60 No incoming radio signal*' or '*59 Incoming signal level incorrect*'.

3. Click Send to apply the loop(s).

Note

Traffic is cut when you apply loops in the related interfaces, channels or Flexbuses.

7.4 Using loopbacks to test the FXC STM-1 transmission unit

Purpose

You can set interface loops manually to test the FXC STM node interface loops. These are 2M loops to SDH or PDH.

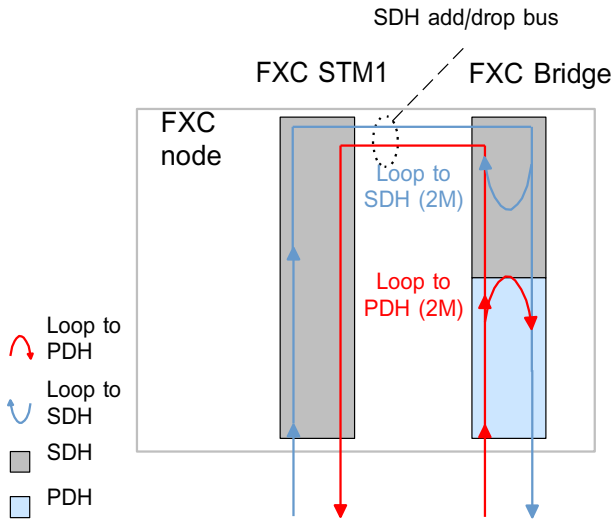

Figure 11. FXC STM node 2M loops

Through the **Loops** window, you can view and modify FXC STM node interface loops for SDH-PDH channels. You can modify one or several channels at a time.

Steps

1. **Click FXC STM-1 → Loops to open the Loops window.**

   The **Loops** window opens, showing the SDH-PDH Channels.

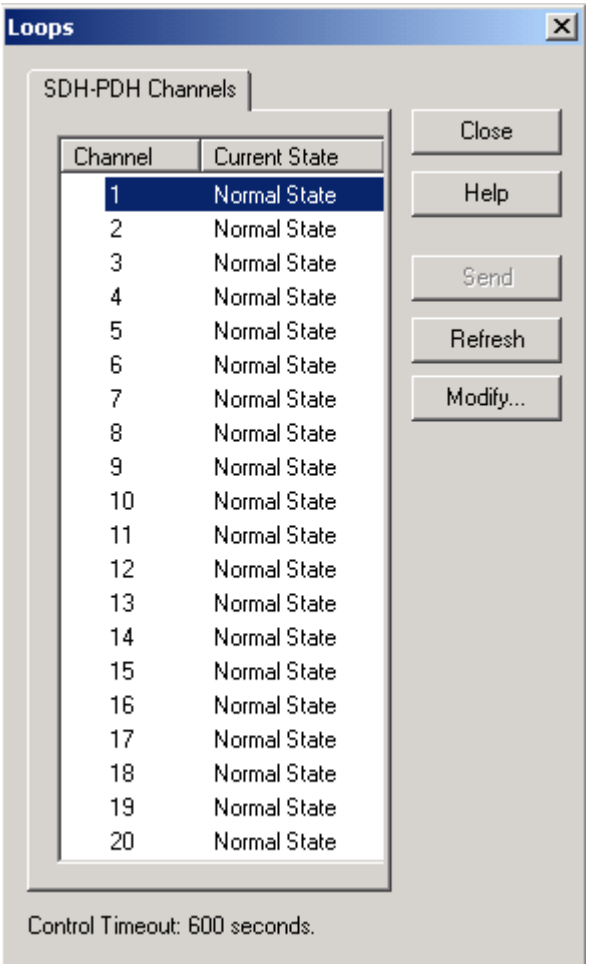

Figure 12. The Loops window, SDH-PDH Channels

2. **Select a channel from the list by clicking on it.**

3. **Click Modify.**

   The **Modify** dialogue box opens.

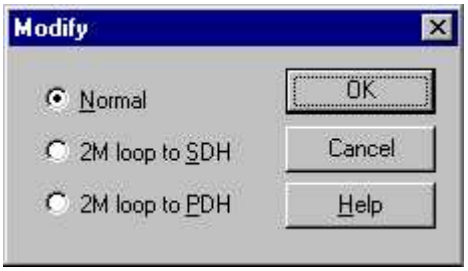

Figure 13. The Modify dialogue box

4. Select/clear the desired states.

Select/clear the desired states. **2M loop to SDH** means that the channel is looped to the SDH part of the STM-1. **2M loop to PDH** means that the channel is looped to the PDH part of the STM-1.

5. Click OK.

Further information

Control Timeout shows the time for which the loops will be sustained unless you set them manually back to normal state. You can change the FXC STM-1 Control Timeout value in the **Service Interface** dialogue box.

7.5 An example of loopback usage during a traffic cut

Purpose

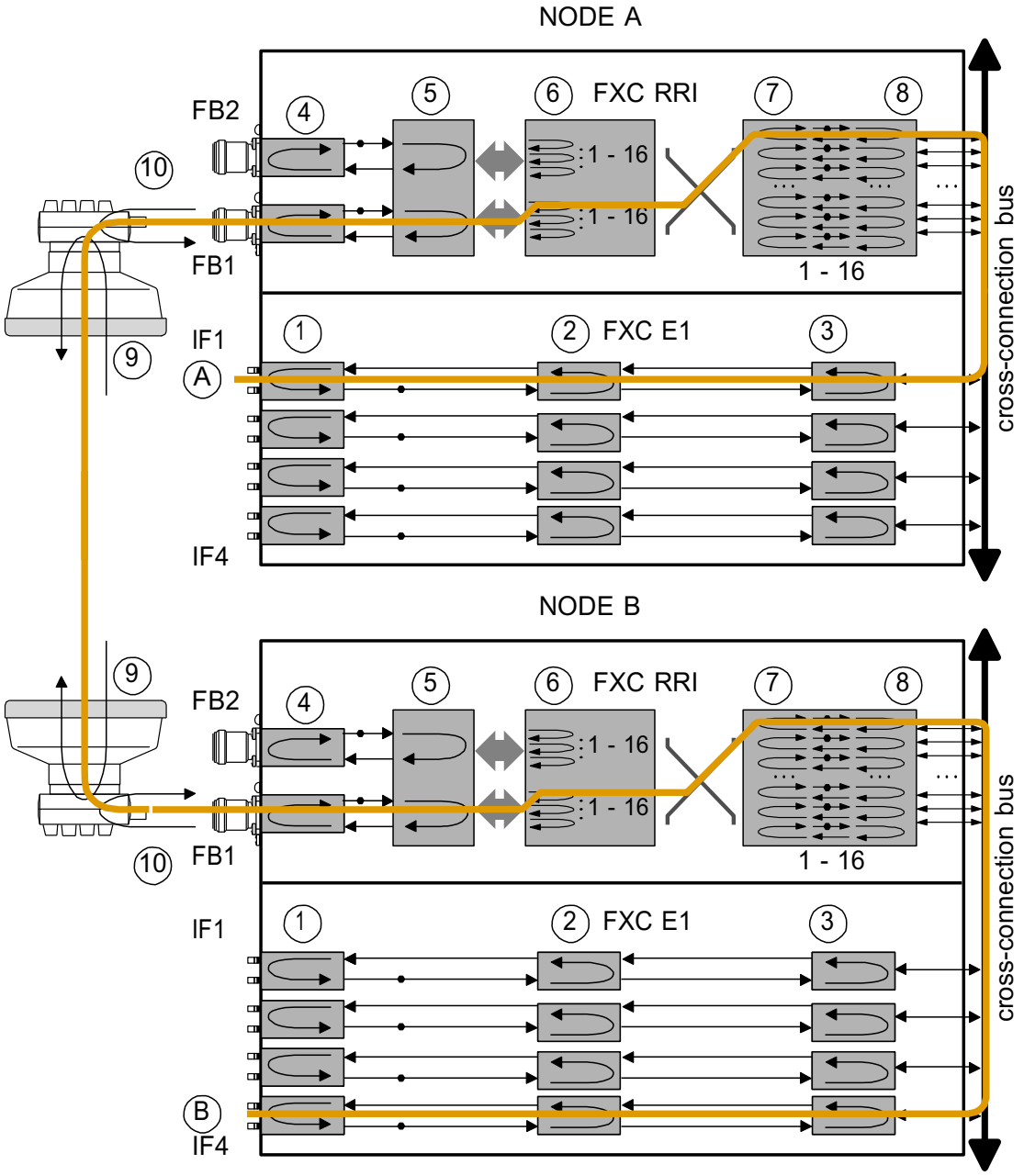

Figure 14. Example of loopback usage during a traffic cut

Let us assume that there is traffic cut between interface (A) in node A and interface (B) in node B. The signal path is presented in the figure *Example of loop usage during a traffic cut*. Loopbacks can be used to find where the cut is located. There are several approaches to the problem, but the principle is the same in all of them, which is looping the signal back at different positions in the signal path and thus ensuring that the signal is acceptable from the measurement point to the loop position. One possible approach is presented below.

Steps

1. **Connect an external BER tester to the IF 4 in node B, FXC E1, denoted here as (B).**

2. **Activate FlexiHopper loop to equipment in node B (10).**

3. **Check the value on the BER meter.**

   If the signal is acceptable, the traffic cut is not located inside node B or in the Flexbus connection between the FXC RRI unit and Nokia FlexiHopper in node B. Let us assume here that the signal is acceptable.

4. **Remove the loop to equipment in Nokia FlexiHopper, in node B.**

5. **Activate FXC E1 loop to equipment in node A (1).**

   Let us assume that the signal is not acceptable, which indicates that the break is between FlexiHopper in node B and the FXC E1 in node A.

6. **Remove the loop to equipment in FXC E1, in node A.**

7. **Activate FlexiHopper loop to interface, in node A (9).**

   Let us assume that the signal is acceptable, which indicates that the signal path up to that point is working.

Note

Adjust the timeout to a sensible value before activating the FlexiHopper loop to interface, see *Adjusting service interface settings*.

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8. **Wait for the control timeout to expire, after which the FlexiHopper loop to interface, in node A, is removed.**

9. Activate FXC RRI Flexbus loop to interface, in node A (5).

Let us assume that the signal is not acceptable, which indicates that the break is between FlexiHopper in node A and the Flexbus interface of FXC RRI, in node A. This indicates that the failure is in the FXC RRI unit in node A, the Flexbus cable or in FlexiHopper in node A.

8 Troubleshooting software licensing

8.1 Change of unit

Description

When replacing an existing FlexiHopper Plus unit there are two situations related to software licensing if a licensed feature is being used.

- The unit being replaced is still under warranty.
- The warranty period for the unit being replaced has expired.

Symptoms

- The replacement unit has been installed and is currently using a time-limited license instead of the previous non-time limited license.

Recovery procedures

The replacement unit is using a licensed feature and was replaced under warranty.

Steps

1. **The replacement unit should come with the licences that were purchased for the unit being replaced.**
2. **If the replacement unit does not contain the correct license then contact Nokia. The existing time-limited license will allow use of the feature for 60 days.**
3. **When the correct license is received, install the license using the license manager.**

The replacement unit is using a licensed feature and the warranty has expired.

Steps

1. **Purchase the required licence and install them using the licence manager. The existing time limited license will allow use of the feature for 60 days.**

8.2 Software licence key is not available

Description

If the software licence key is not available, an error dialogue box is displayed.

Symptoms

An error dialogue box is displayed

If the licences to be activated have not been installed or if the licence installation was not successful, an error message is displayed.

Recovery procedures

Installing the software licence

Steps

1. *If* the licences to be activated have not been installed,
   Then

   install the required licence(s) by clicking Yes in the error message dialogue box.

   The following error message is displayed if the licences to be activated have not been installed:

Figure 15. Licence not installed

After you have clicked **Yes**, the required licence is searched in the system and installed if found.

2. *If* the licence is not found in the system,
   Then

   verify and correct the licence file folder through the licence manager.

   The following error message is displayed if the licence is not found in the system:

Figure 16. The licence installation was not successful

8.3 Typographic errors in the licence key

Description

If there are typographic errors or other problems with the licences, an error dialogue box is displayed.

Symptoms

An error dialogue box is displayed

Recovery procedures

Checking the licence file folder

Steps

1. **Check that the licence file folder path is correct in the licence manager.**

   The following error message is displayed if there are typographic errors or other problems with the licences:

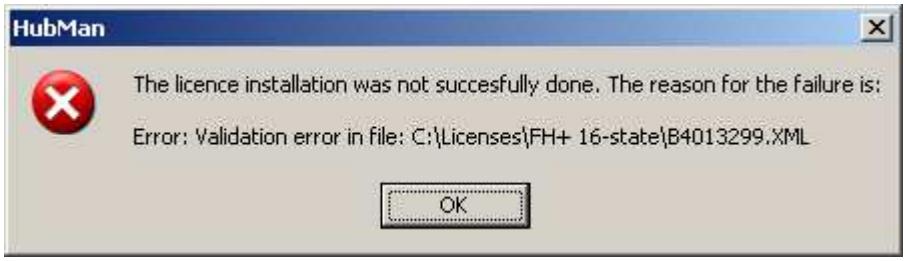

Figure 17. Error message: validation error in a file

Note

The file path displayed in the error message is just an example. It will change with the actual location that the user has specified through the license manager.

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9 Troubleshooting setting up Nokia MetroHub

9.1 No power to the transmission node

Description

If there are no LEDs activated in any of the FXC units in the hub, check the hub power system. Start from the mains power supply side and move on to check the MetroHub cabinet (if applicable).

Possible causes are:

- fault in the site mains power supply
- broken power cable
- power supply unit switch in stand-by position
- loose fixing screws in the power interface unit or the power supply unit
- active cold start
- overheated power supply unit

Symptoms

Power supply in stand-by position

Blinking yellow LED in the power supply unit.

Cold start active

Steady yellow LED in the power supply unit.

Overheated power supply unit

Steady yellow LED in in the power supply unit.

Power supply unit broken

Alarm ‘Fault in power supply’ may be acivated. No lights in the power supply unit, or the LED is red.

Recovery procedures

Fault in the site mains power supply

Steps

1. **Check the site mains power source and fuses. Replace if needed.**
2. **Measure with a multimeter that the DIPx has operating voltage.**
3. **Make sure the polarity is correct if using DC mains.**

Broken power cable

Steps

1. **Replace the power cable.**

Power supply unit switch in stand-by position

Steps

1. **Turn the switch ON.**

Power interface unit's or power supply unit's fixing screws are loose

Steps

1. **Tighten the loose screws.**

Cold start active

Steps

1. **Wait until the units have been warmed up to the operational temperature range and the power supply unit LED switches from yellow to green.**

Overheated power supply unit

Steps

1. **Wait for the power supply unit to cool down.**

2. **Check that the fan is functioning correctly.**

Power supply unit broken

Steps

1. **Replace the power supply unit.**

Power interface unit broken

Steps

1. **Replace the unit.**

Short circuit in one of the units

Steps

1. **Pull the units out, one by one, until the power comes back on.**

   Start from the FXC units and proceed to the fan, and finally replace the interface unit.

2. **Re-install the units, one by one, and replace the faulty unit(s).**

9.2 Transmission node powered but a manager connection cannot be established

Description

The problem situation when a transmission node is powered, but a connection to the manager cannot be established can be caused by:

1. a bad or poorly connected LMP cable
2. the wrong COM port settings in UltraSite BTS Hub or MetroHub Manager
3. SW problems in the PC
4. a broken FXC master unit
5. a broken DIUx interface unit

Symptoms

FXC master unit broken

The transmission unit LED is off.

Recovery procedures

Bad or poorly connected LMP cable

Check the cable and verify that it is properly connected.

Check that the pins are not broken in the DIUx and that the sockets are fine in the LMP connector. Replace the DIUx interface unit or the cable if the connections are bad.

Wrong COM port settings in UltraSite BTS Hub or MetroHub Manager

Select the right COM port settings in the Tools → Options menu. The default settings are: port: COM1, and speed: 9600.

SW problems in the PC

Restart the PC. It might be useful to restart the UltraSite BTS Hub or MetroHub as well by turning the power switch off and after a few seconds back on if you are setting up a new node.

Note

Do not restart a UltraSite BTS Hub or MetroHub which is already operating in a network, as you may cause severe traffic cuts.

FXC master unit is broken

Replace the FXC master unit.

DIUx interface unit is broken

Check that the DIUx interface unit has been correctly installed. Restart the UltraSite BTS Hub or MetroHub by turning the power switch off. Wait a few seconds, then turn the power switch back on. If the LED is still red, restart the DIUx unit by removing it for a few seconds and putting it back in. If the LED is still red, replace the DIUx interface unit.

9.3 -48V DC or +55V DC output failure in the power interface unit of Nokia MetroHub

Description

-48V DC or +55V DC output failure in the power interface unit. This problem may be caused by:

1. -48V DC or +55V DC fuse has blown in the power interface unit
2. -48V DC or +55V DC wire is loose on the screw type connector in the power interface unit
3. Power interface unit is broken

Symptoms

No DC voltage from the output connector

No DC voltage from the output connector.

Recovery procedures

-48V DC or +55V DC fuse has blown in the power interface unit

Replace the fuse.

-48V DC or +55V DC wire is loose on the screw type connector in the power interface unit

Reassemble loose wires.

Power interface unit is broken

Replace the unit.

10 Troubleshooting Nokia MetroHub's internal tests

10.1 Cross-connections test of a transmission unit fails in the manager

Description

Cross-connections test fails in the Commissioning Wizard. This may be caused by a fault in an FXC unit.

Symptoms

The cross-connections test fails

The cross-connections test fails in the Commissioning Wizard.

Recovery procedures

Fault in an FXC unit

Steps

1. **Remove the unit, starting from the right-hand side.**
2. **Redo the test until you find the faulty unit.**
3. To test the master FXC unit

Steps

a. **Remove the master unit and plug it into slot 2 of the node.**

b. **Plug-in an already tested unit in slot 1 acting temporarily as a master unit.**

c. Redo the test.

d. If the test is not passed, the original master unit now plugged into slot 2 is faulty.

10.2 Fan test fails in the manager

Description

If the fan test fails, it may be caused by one of the following:

1. the fan is not rotating
2. the fan is not rotating at correct speed
3. a fault in the power supply unit, which causes some output to be out of range
4. a short circuit in the supply voltage of the fan

Symptoms

Fan is not rotating

Fan LED is red during the test.

Fan is not rotating at correct speed

Fan LED is red and blinking during the test.

Fault in the power supply unit, which causes some output to be out of range

The alarm ‘Fault in power supply’ activated in the power supply unit.

Short circuit in the supply voltage of the fan

The alarm ‘Fault in power supply’ activated in the power supply unit. If there are two power supply units, both ‘Fault in power supply unit’ and ‘Loss of backup power supply’ alarms are oscillating.

Recovery procedures

Fan is not rotating

Remove obstacles that are blocking the fan or change the fan.

Fan is not rotating at correct speed

Remove obstacles that are blocking the fan or change the fan.

Fault in the power supply unit, which causes some output to be out of range

Replace the unit.

Short circuit in fan supply voltage with one power supply

Steps

1. **Remove the fan.**

   Expected outcome

   The alarm disappears. Install a new fan as the old one is faulty.

   Unexpected outcome

   The alarm is still active. Replace the power supply unit.

Short circuit in fan supply voltage with two power supplies

Steps

1. **Remove the fan.**

   Expected outcome

   The alarm disappears. Install a new fan as the old one is faulty.

   Unexpected outcome

   The alarm is still active. Replace the first power supply unit.

   Unexpected outcome

   If replacing the first power supply unit does not help, reinstall it. Remove and replace the second power supply unit.

2. **Remove and replace a broken power supply unit.**

10.3 Heating test fails in the manager

Description

If the heating test fails, it may be caused by one of the following:

1. the heating element of (one) FXC unit is broken
2. a fault in the power supply unit
3. short circuit in the heating circuitry

Symptoms

The alarm126 Unit function degradedis active

The heating element of (one) FXC unit is broken.

The alarm0 Fault in power supplyis active

Indicates a fault in the power supply.

The alarms0 Fault in power supplyand2 Loss of backup power supplyare active

If there are two power supply units, both *0 Fault in power supply* and *2 Loss of backup power supply* alarms are oscillating. Indicates that a short circuit has taken place in the heating circuitry.

Recovery procedures

The heating element of (one) FXC unit is broken

If repeated tests do not cancel the alarm, replace the unit.

If the temperature of the unit in question is much colder than the other units, replace the unit.

Fault in power supply unit

Change the broken power supply unit.

Short circuit in the heating circuitry

Remove the FXC units one by one and redo the test in between. When you find the shorted FXC unit, replace it. If you have two power supply units, check if either one of them work on its own. Replace the shorted power unit.

10.4 External alarm test fails in the manager

Description

If the external alarm test fails, it may be caused by the following:

1. A fault in the internal circuitry of the DIUx interface unit.

Symptoms

The alarm126 Unit function degradedis active in the DIUx interface unit

A fault in the internal circuitry of the DIUx interface unit.

Recovery procedures

Fault in the internal circuitry of the DIUx interface unit

Steps

1. Replace the DIUx interface unit

10.5 External control test fails in the manager

Description

If the external alarm test fails, it may be caused by one of the following:

1. A fault in the internal circuitry.
2. External circuits have been connected to the EAC connector.

Symptoms

The alarm126 Unit function degradedis active in the DIUx interface unit

Fault in internal circuitry, or external circuits have been connected to the EAC connector.

Recovery procedures

Fault in internal circuitry or the user has connected external circuits to the EAC connector

Before you start

Note

The external alarm test should be performed without external circuitry connected to the EAC connector.

Steps

1. **Remove external alarm connections from the EAC connector.**
2. **Redo the test.**

   Expected outcome

   The test is passed. Reinstate the external alarm connections.

   Unexpected outcome

   The test fails. Replace the DIUx interface unit.

10.6 Battery connection test fails with one power supply

Description

If the battery connection test fails with one power supply it may be caused by one of the following:

1. the battery is not connected or it is damaged
2. the battery fuse has blown or it is missing
3. the battery type sensor or temperature sensor are not connected
4. high temperatures in the battery
5. a break in AC supply

6. a fault in the power supply unit
7. a fault in the power interface unit

Symptoms

The alarm0 Fault in power supplyis active

Indicates a fault in the power supply unit.

Recovery procedures

Battery is not connected or it is damaged

Connect the battery or replace it if it is damaged.

Battery fuse has blown or it is missing

Install a fresh fuse in the battery.

Battery type sensor or temperature sensor are not connected

Measure that the sensors are connected and repair the connections if needed. The expected resistance for the type sensor is 10k, and for the temperature sensor about 2k.

High battery temperature

It is not possible to perform tests on the battery when the battery temperature is out of range, for example, if the ambient temperature is near +50°C (122°F). High battery temperatures can also be caused by the battery discharging itself because of damaged cells.

If the battery is faulty, replace it.

Break in AC supply

Wait until AC is available and the battery is recharged.

Fault in the power supply unit

Replace the power interface unit.

Fault in the power interface unit

Check that the battery connector and the power interface unit have been correctly installed. If they are correctly installed, replace the power interface unit.

10.7 Battery connection test fails with two power supplies

Description

If the battery connection test fails with two power supplies it may be caused by one of the following:

1. the battery is not connected or it is damaged
2. the battery fuse has blown or it is missing
3. the battery type sensor or temperature sensor are not connected
4. high temperatures in the battery
5. a break in AC supply
6. a fault in the power supply unit
7. a fault in the power interface unit

Symptoms

The alarm0 Fault in power supplyis active

Indicates a fault in one of the power supplies.

Recovery procedures

Battery is not connected or it is damaged

Connect the battery or replace it if it is damaged.

Battery fuse has blown or it is missing

Install a fresh fuse in the battery.

Battery type sensor or temperature sensor are not connected

Measure that the sensors are connected and repair the connections if needed.The expected resistance for the type sensor is 10k, and for the temperature sensor about 2k.

High battery temperature

t is not possible to perform tests on the battery when the battery temperature is out of range, for example, if the ambient temperature is near +50°C (122°F). High battery temperatures can also be caused by the battery discharging itself because of damaged cells.

If the battery is faulty, replace it.

Break in AC supply

Wait until AC is available and the battery has been recharged.

Fault in one of the power supply units

Steps

1. **Remove the redundant power supply.**
2. **Redo the test.**

   #### Expected outcome

   The test is passed. The fault is in the redundant power supply.

   #### Unexpected outcome

   The test fails. The fault is in the master power supply.
3. **Replace the faulty power supply.**

Fault in the power interface unit

Check that the battery connector and the power interface unit have been correctly installed. If they are correctly installed, replace the power interface unit.

10.8 Battery capacity test fails in the manager

Description

Battery capacity test fails or it cannot be run at all in maintenance self tests.

Note

The test is not performed, if there is no AC power supply to Nokia MetroHub.

The problem may be caused by the following:

1. the battery is not connected or it is damaged
2. the battery fuse has blown or it is missing
3. the battery type sensor or temperature sensor are not connected
4. high temperatures in the battery
5. a break in AC supply
6. a fault in the power supply unit
7. a fault in the power interface unit
8. low battery voltage

Symptoms

Battery capacity test fails

Battery capacity test fails or it cannot be run at all in maintenance self tests.

Recovery procedures

Battery is not connected or it is damaged

Connect the battery or change it if it is damaged.

Battery fuse has blown or it is missing

Install a fresh fuse in the battery.

Battery type sensor or temperature sensor are not connected

Measure that the sensors are connected and repair connections if needed.

High battery temperature

It is not possible to perform tests on the battery when the battery temperature is out of range, for example, if the ambient temperature is near +50°C (122°F). High battery temperatures can also be caused by the battery discharging itself because of damaged cells.

If the battery is faulty, replace it.

Break in AC supply

The battery capacity test is cancelled if a break in AC supply occurs. Wait until AC is available and the battery is recharged.

Fault in the power supply unit

Replace the power supply unit.

Fault in the power interface unit

Replace the power interface unit.

Low battery voltage

The battery capacity test is cancelled, if the battery voltage is less than 45 V. Wait until the battery has been recharged and the voltage is over 48 V.

Related Topics

Overview of trouble management

Troubleshooting

Using timeslot monitoring to locate faults

Using MCB/LCB bits to locate faults

Using the condition bits of protected cross-connections to locate faults

Using pending cross-connections to locate faults

Using loopbacks to test the transmission node.

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