Nokia Siemens Networks

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Nokia FlexiHopper (Plus) Product Doc, Rel. 2.7

Commissioning Nokia FlexiHopper (Plus) 2.7 with FIU 19 (E)

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The product is marked with the CE marking and Notified Body number according to the Directive 1999/5/EC.

CE

Contents

1 Summary of changes to Commissioning Nokia FlexiHopper (Plus) 2.7

1.1 Changes in documentation between release 2.5 and release 2.7

- Disturbance alarm filtering feature has been added.
- Unnumbered and numbered link types have been added to PPP link configuration.
- OSPF area border router configuration has been added.
- *Commissioning Aux plug-in unit with FIU 19E outdoor case* chapter has been added.

2 Preparing for commissioning

Steps

1. **Switch the indoor unit power on**

   For more information, see *Switching the power on in FIU 19 (E)* in document *Installing Hardware for Nokia FlexiHopper (Plus) 2.7*.

2. **Connect the local management port (LMP) cable between the PC and the indoor unit**

   For instructions, see *Connecting the LMP cable* in document *Administering Nokia FlexiHopper (Plus) 2.7*.

3. **Start Nokia Hopper Manager**

   For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus) 2.7*.

4. **Set up the connection to the network element**

   For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus) 2.7*.

Expected outcome

The installation is ready for commissioning.

Further information

For more information on the commissioning of Nokia FlexiHopper (Plus) with IFUE, see *Commissioning FlexiHopper (Plus) and MetroHopper with IFUE*.

For more information on the commissioning of Nokia FlexiHopper (Plus) with FIFA, see *Commissioning Nokia FlexiHopper (Plus) and Nokia MetroHopper with FIFA*.

For more information on the commissioning of Nokia FlexiHopper (Plus) with FXC RRI, see *Commissioning Nokia MetroHub*.

3 Commissioning Nokia FlexiHopper (Plus) with the Commissioning Wizard

3.1 Overview of commissioning with the Commissioning Wizard

Purpose

Commissioning is the process of bringing a newly installed network element into use. It configures the system for operational use and defines all the system parameters needed for basic functions. If necessary, the commissioning process can also be performed on a previously commissioned network element.

The Commissioning Wizard contains several pages. Some pages may not be visible depending on the equipment structure present in the network element or the way the Wizard is used. There is a brief hint on each page; more information is available by pressing the F1 key or by clicking the **Help** button on each page.

The Commissioning Wizard defines the minimum number of settings required for an operational network element. To access the identification information and other settings, select the appropriate item on the Hopper Manager's **Configure** menu.

The following chapters present how to start the Commissioning Wizard and how the commissioning mode is chosen.

3.2 Starting the Commissioning Wizard

Steps

1. **On the Hopper Manager menu, select Manage → Commission to start the Commissioning Wizard**

   The Commissioning Wizard is launched.

Figure 1. Commissioning Wizard start page

2. **Click the Next button to move on to the next Wizard page**

   Hopper Manager refreshes the Equipment View.

3. **Start commissioning 1IU or 2IU operation modes**

   For instructions, see *Commissioning 1IU operation modes* or *Commissioning 2IU operation modes*.

Expected outcome

The Commissioning Wizard is started.

3.3 Commissioning 1IU operation modes

Before you start

Tip

If you want to adjust the settings on the previous page of the commissioning wizard, you can go back by clicking the **Back** button.

Steps

1. **To select the Flexbuses to be commissioned, check the checkboxes in the Available Flexbuses field, and click the Start button**

   This turns the Flexbus power on. Nokia Hopper Manager notifies you if any connected outdoor units are found (see the figure *Flexbus scanning page*).

   If you know that the Flexbus power is already on (for example, you can see it in the **Equipment View** window), click **Next** to move on to the next page. Then the scanning process is bypassed.

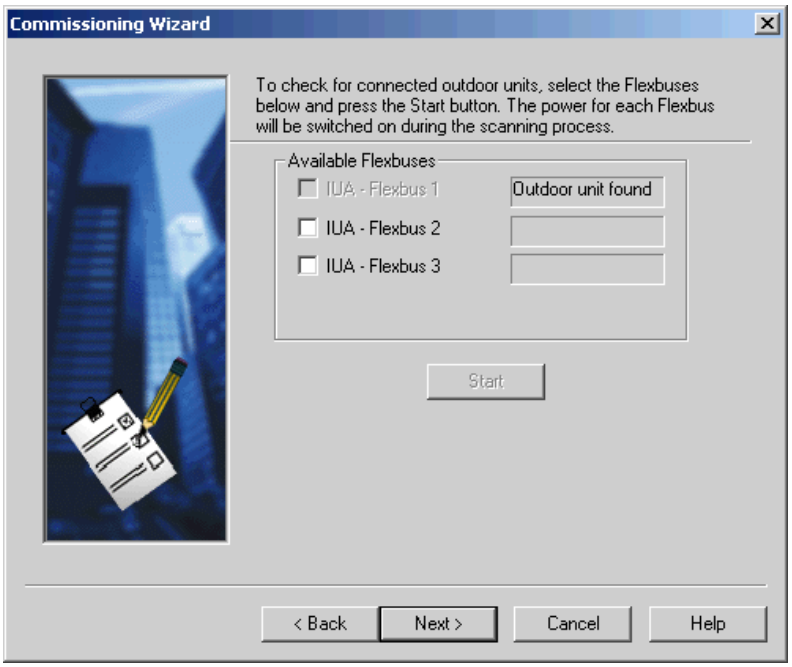

Figure 2. Flexbus scanning page

2. Click the Next button

3. Install the necessary licences

Note

If a time-limited licence is used in commissioning, then a non-time-limited licence must be installed before the expiration of the time-limited licence.

Tip

The time-limited licence is valid only for 60 days trial period.

If a concurrent software download is ongoing in the unit to which the licence file is to be downloaded, wait for the completion of the download before loading the licence file. If the inactive SW bank is invalid, please erase it before licence download.

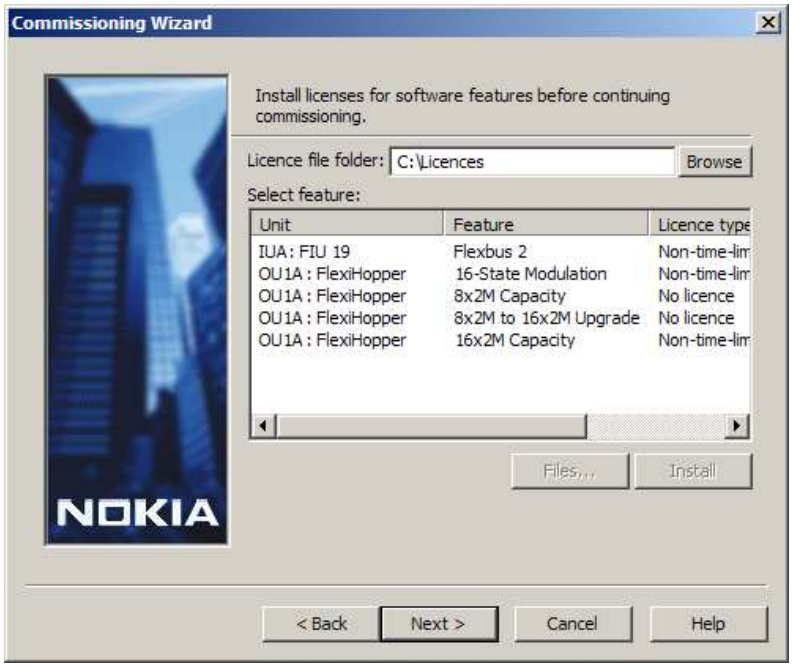

Figure 3. Licence installation page

To install a licence:

a. Save the licence file to a folder on a local drive
b. Browse for the folder in which the licence file is saved
c. Select the feature which the licence will activate in the **Select feature** window
d. Click **Install**
e. Click **Next**

Please note that each equipment feature must then be enabled separately in the settings windows.

Tick the **Flexbus 2 in use** checkbox in the **FIU 19 Settings Interfaces** window and click OK to activate it.

Tick the **Use OSPF in...** checkbox in the **Network Settings OSPF** window and click OK to activate it.

Tick the **Enable SNMP** checkbox in the **Network Settings SNMP Settings** window and click OK to activate it.

Choose 8x2M or 16x2M from **Capacity** dropdown list in the **FIU19E settings** window and click OK to activate it.

Choose 16-state from modulation dropdown list in the **FlexiHopper settings** window and click OK to activate it.

4. Enter the site information (optional), and click Next

Enter the following information:

- equipment name
- group name
- site name
- site location.

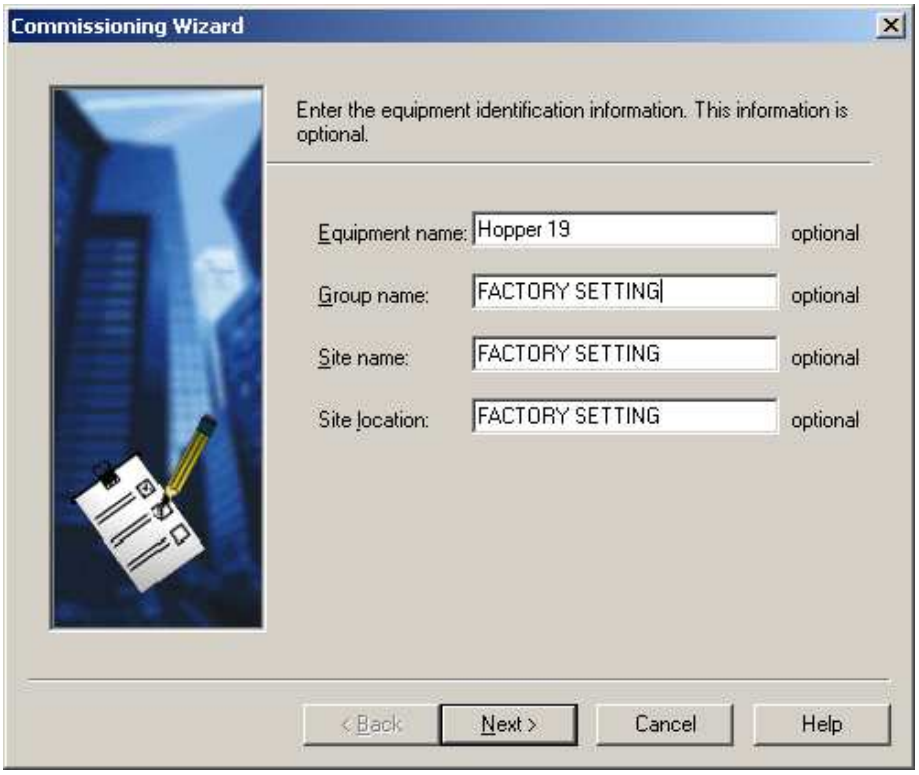

Figure 4. Site information (default settings) window

5. Select the protection mode settings from the drop-down lists, and click Next

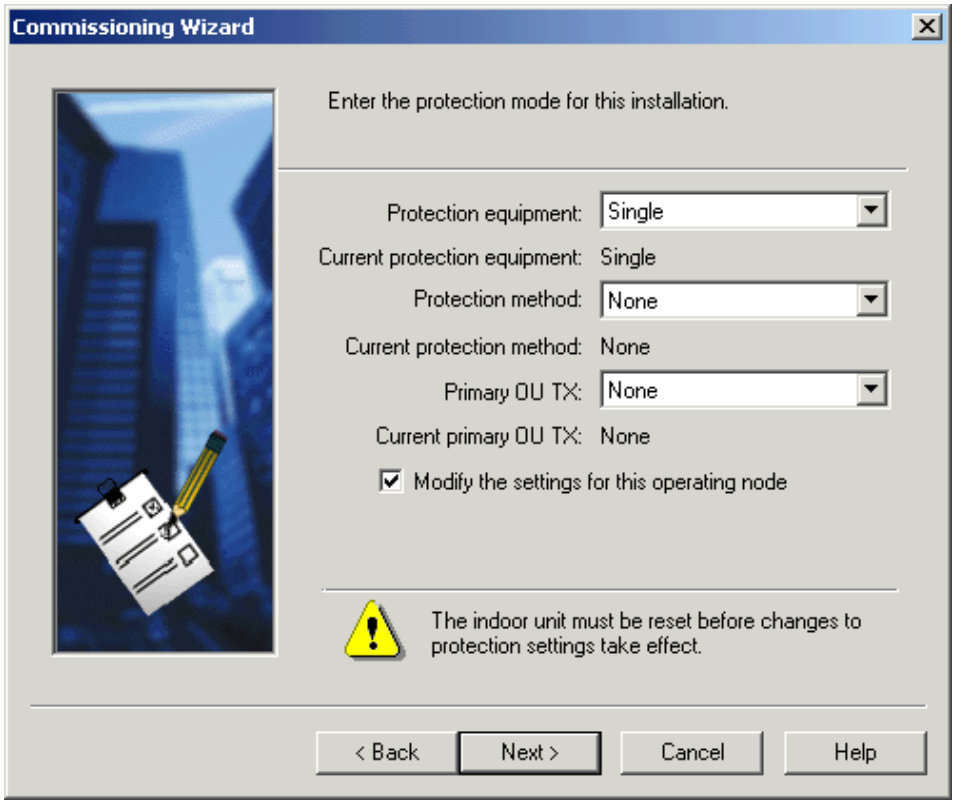

Figure 5. Protection mode settings

6. Set Flexbus settings, and click Next

To avoid extra alarms, set unused Flexbuses to 'not in use' by unchecking the **In use** checkbox.

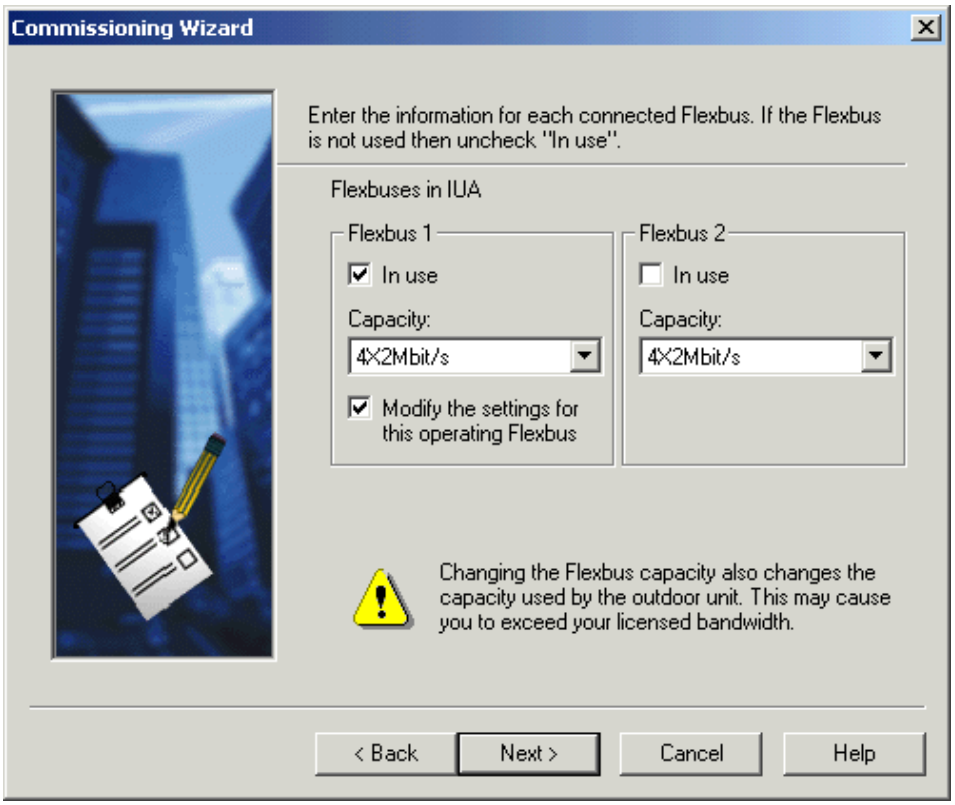

Figure 6. Flexbus settings

7. *If* you are using simple network management protocol (SNMP)

   Then

   move on to step 9

   Else

   Select the settings for the Q1 port and the LMP, and click Next

   In the drop-down lists, select:
   - baud rate
   - Q1 group address
   - Q1 address.

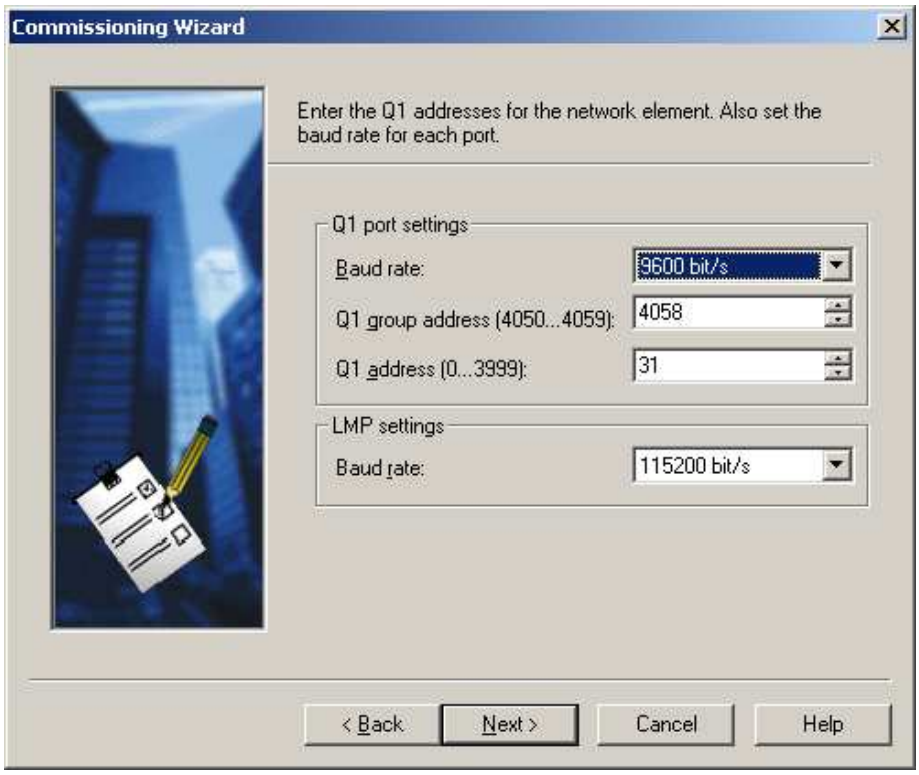

Figure 7. Settings for the Q1 and the local management ports

8. Select the Q1 bus routing, and click Next

The Q1 bus routing defines the way in which Q1 commands are routed through the network element.

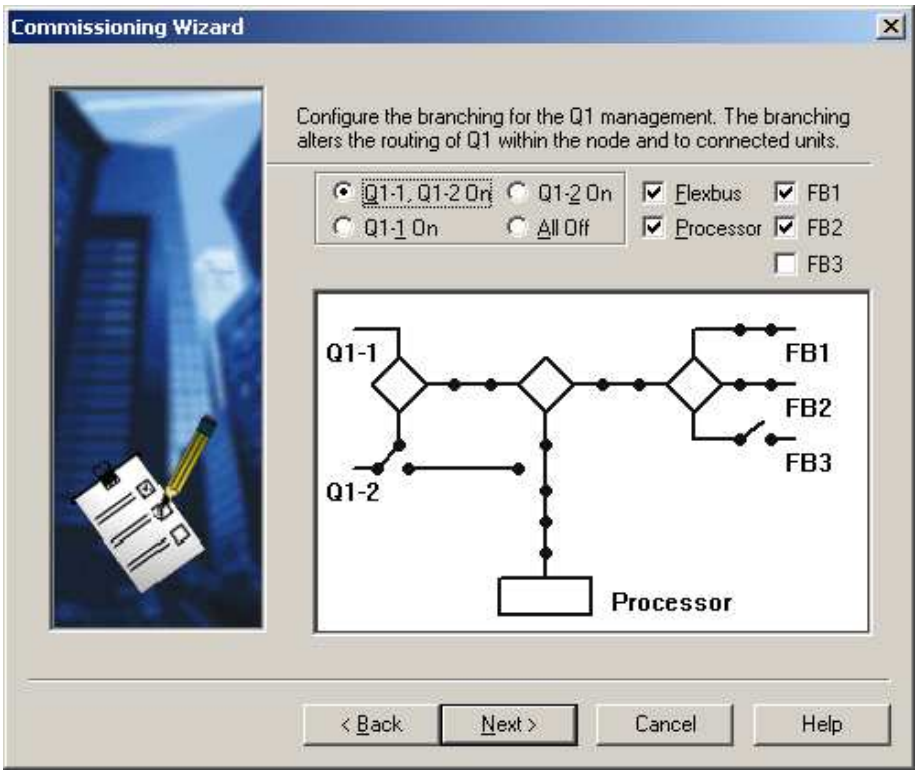

Figure 8. Q1 bus routing

9. Select the settings for the outdoor units connected to each Flexbus interface, and click Next

In the drop-down lists, select:

- Tx frequency
- maximum Tx power
- Tx power on/off
- Interleave status (is selectable in 4-state (depth 2 or depth 4) and in 16-state is fixed to depth 4).
- scrambler
- modulation.

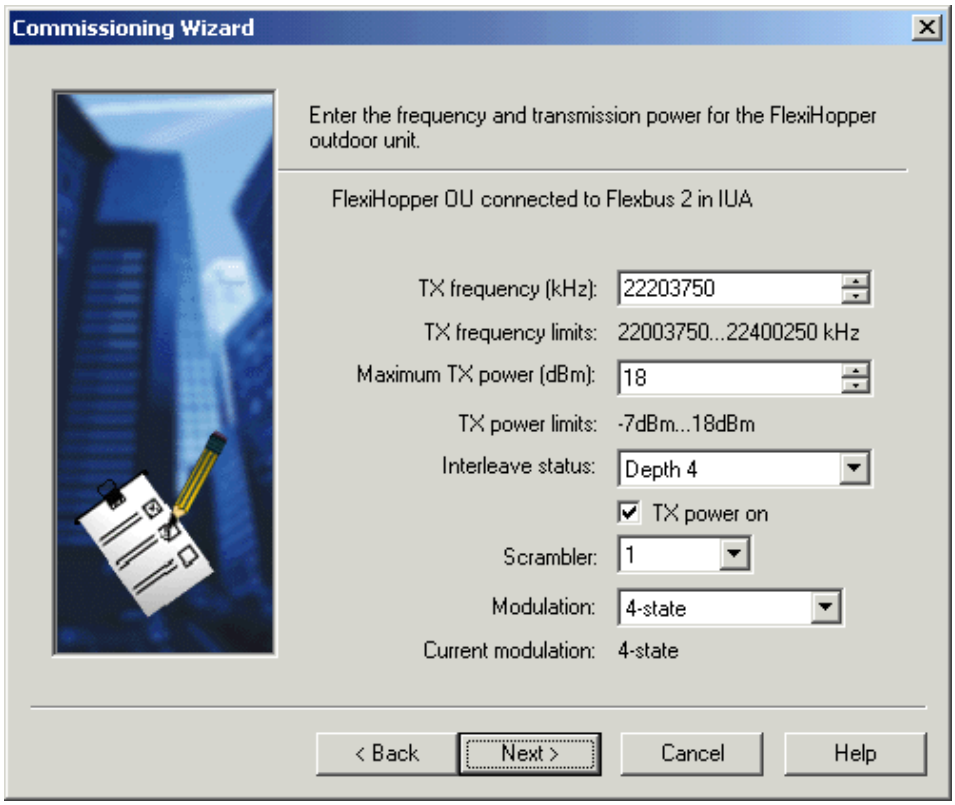

Figure 9. Settings for the outdoor units

After you have entered all the required settings, a summary of commissioning settings is displayed (see the following figure in step 10). It contains all the settings you have defined for the radio(s).

10. Check that the settings are correct and click Next to send the settings to the node

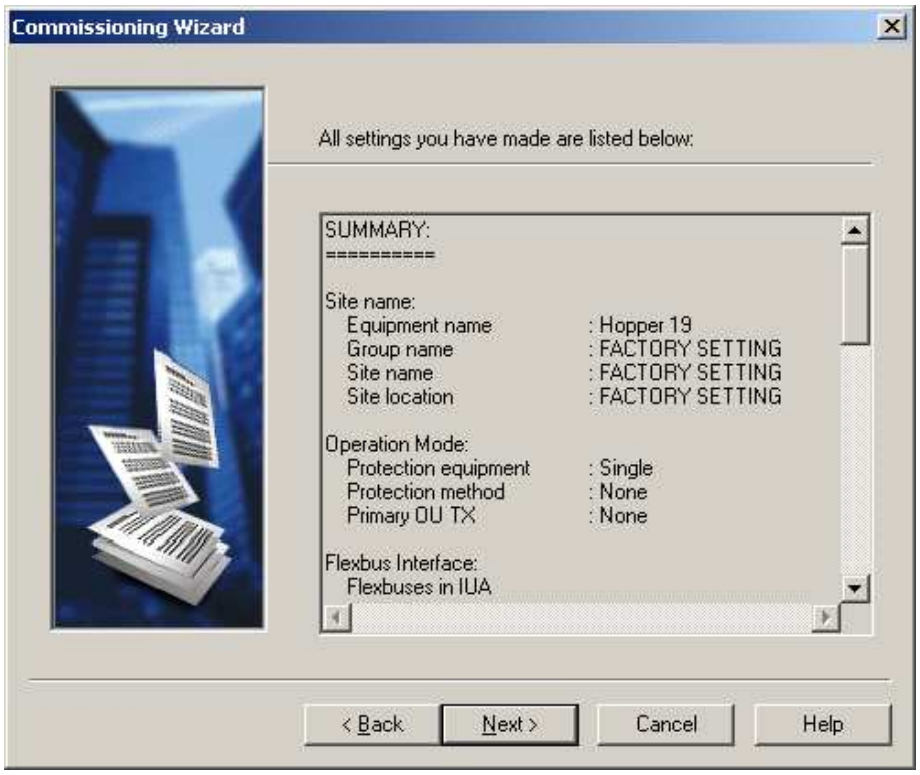

Figure 10. A summary of the settings

After clicking **Next**, the following confirmation dialogue box is displayed:

Figure 11. Confirmation dialogue box

11. Click the Yes button to confirm sending the settings to node

After sending the commissioning settings to the node, you can check the hop status and the Rx level of all connected outdoor units. For each Flexbus interface, the connected outdoor unit is displayed with its current status and received input level.

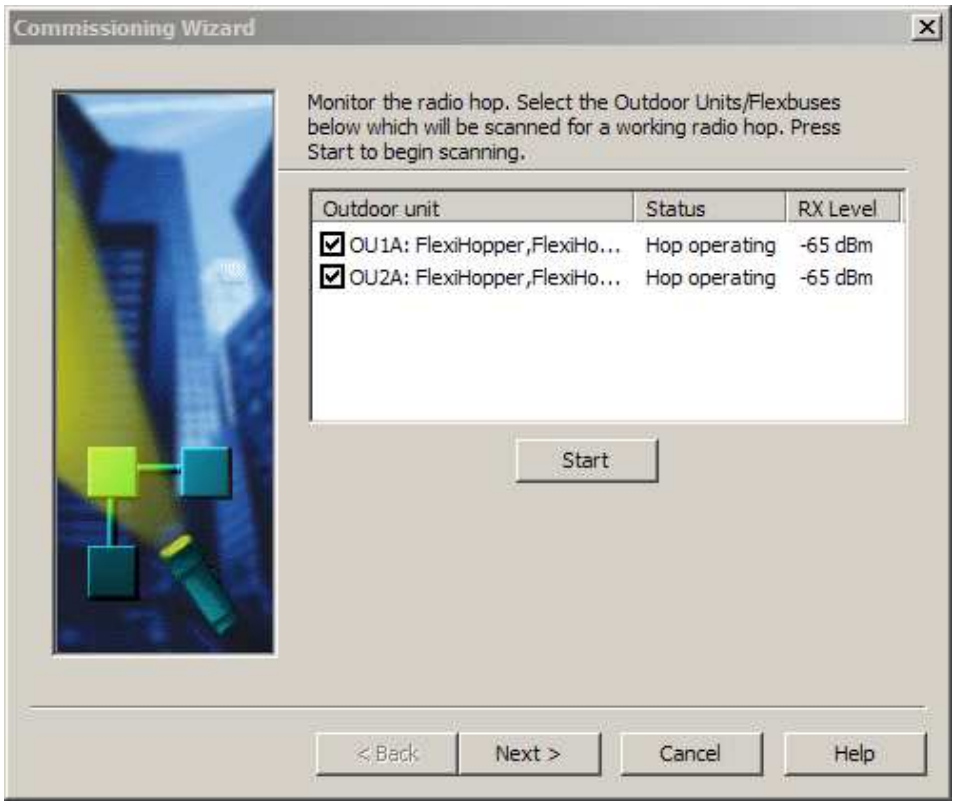

Figure 12. Monitor the radio hop

The status of the hop is not ready before both ends of the hop are commissioned successfully.

12. Select the OUs and Flexbuses to be scanned for a working radio hop, and click Start

13. Fine align the antenna

For more information, see fine aligning the antenna in document *Installing Hardware for Nokia FlexiHopper (Plus)*.

14. On the last page of the Commissioning Wizard, set the node clock and installation information for the units, and click Finish to complete the Wizard

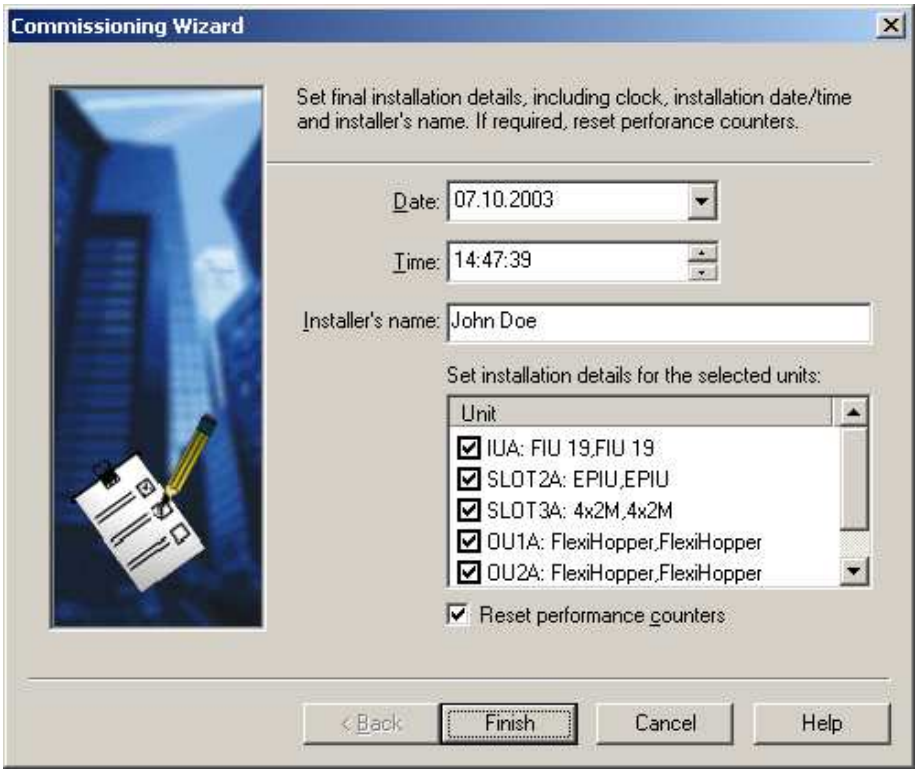

Figure 13. Installation details on the last page of the Commissioning Wizard

15. Make the cross-connections with the Nokia Hopper Manager (FIU 19 (E))

For more information, see *Creating a new connection graphically* and *Creating a new connection using a list based method*.

Steps 14 and 15 can also be performed in the reverse order.

16. Make any additional settings with the Hopper Manager

These settings can include:

- ALCQ/ATPC (for more information, see *Configuring FlexiHopper (Plus) outdoor unit settings*)
- identification data (for more information, see *Configuring identifications*)

- network settings (FIU 19E only) (for more information, see *Viewing and changing general SNMP settings*)
- fault settings (for more information, see *Changing the alarm settings*)
- alarm output cross-connections (for more information, see *Creating PI bit cross-connections*)
- plug-in unit settings (for more information, see *Configuring Flexbus plug-in unit settings*, *Configuring Aux plug-in unit settings*, and *Setting the Ethernet interface settings*)
- performance management settings (for more information, see *Configuring FIU 19 (E) performance management settings* and *Configuring FlexiHopper Plus outdoor unit performance management settings*).

17. Reset statistics and error counters

For instructions, see *Resetting the statistics and counters* in document *Monitoring Nokia FlexiHopper (Plus)*.

18. Monitor the hop for at least half an hour

For instructions, see *Monitoring the hop*.

19. Save a copy of the node to a file

20. Make a backup of the IU and OU configurations

For more information, see *Overview of backing up configuration settings*.

21. Run the commissioning report from the Hopper Manager

For instructions, see *Creating a commissioning report*.

22. Export the alarm log to a file (if needed)

For instructions, see *Exporting information to a text file* in document *Administering Nokia FlexiHopper (Plus)*.

23. Close the connection to the node

For instructions, see *Closing the connection to a node* in document *Administering Nokia FlexiHopper (Plus)*.

Expected outcome

The 1IU operation mode has been commissioned.

3.4 Commissioning 2IU operation modes

Before you start

Caution

The equipment may not work properly if it is not commissioned correctly. Before commissioning the 2IU operation mode, make sure that the indoor unit (IU) B is switched off.

Steps

1. **Switch the power *on* to IU A, but leave IU B switched *off***

   For instructions, see *Switching on the power in FIU 19 (E)* in document *Installing Hardware for Nokia FlexiHopper (Plus)*.

2. **Connect the local management port (LMP) cable between the PC and the IU A**

   For instructions, see *Connecting local management port (BQ connector or RJ-45 connector with FIU 19E)* in document *Installing Hardware for Nokia FlexiHopper (Plus)*.

3. **Start Nokia Hopper Manager**

   For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

4. **Set up the connection to the network element**

   For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

5. **Run the Commissioning Wizard as in IU mode**
   a. Select the Flexbus to be commissioned.
   b. Install the necessary licenses.
   c. Enter the site information (optional).

6. **Set the protection mode to 2IU+2OU Protected**

   Make other protection settings, if required.

7. **Click Finish, and answer 'Yes' to the question about resetting the indoor unit**

8. **After Nokia Hopper Manager has performed the reset, wait 30 seconds and the switch the power *on* to IU B**

9. **Wait 30 seconds so that IU B has started and is operating correctly**

10. **Either refresh the Equipment View in Nokia Hopper Manager or close the connection and open it again**

    The **Equipment View** window displays two indoor units and the expansion unit (although some equipment may appear ghosted or disabled) , if units are not installed.

11. **Run the Commissioning Wizard again**

    For instructions, see *Commissioning 1IU operation modes*.

Note

When the equipment is commissioned into 2IU protected mode and both indoor units have been switched on, do not change the protection mode.

Expected outcome

The 2IU operation mode has been commissioned.

4 Configuring identifications and settings

4.1 Installing licences

Before you start

Before installing licences, save the licence file to a folder on a local drive, and configure the folder from which the licence files are fetched in the **Licence file folder** field of the *Licence Manager* window.

Steps

1. **Start Hopper Manager and click Manage**
2. **Click Licences**

   The *Licence Manager* window opens.

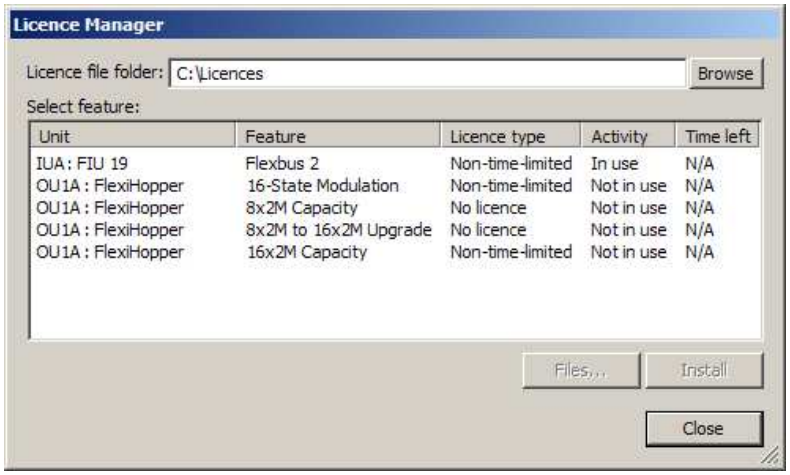

Figure 14. Licence Manager window

3. **Browse the folder in which the licence file is**

4. **Select the feature for which the licence will be installed in the *Select feature* list**

5. **Click Install**

   The licence for the feature is installed.

Note

If a time-limited licence is used in commissioning, then a non-time-limited licence must be installed before the expiration of the time-limited licence.

Tip

The time-limited licence is valid only for 60 days trial period.

4.2 Installing licences on-demand

Before you start

Before installing licences on-demand, save the licence file to a folder on a local drive, and configure the folder from which the licence files are fetched in the **Licence file folder** field of the *Licence Manager* window.

Steps

1. **Open the FlexiHopper Settings - FlexiHopper window in the FlexiHopper (Plus) Radio settings**

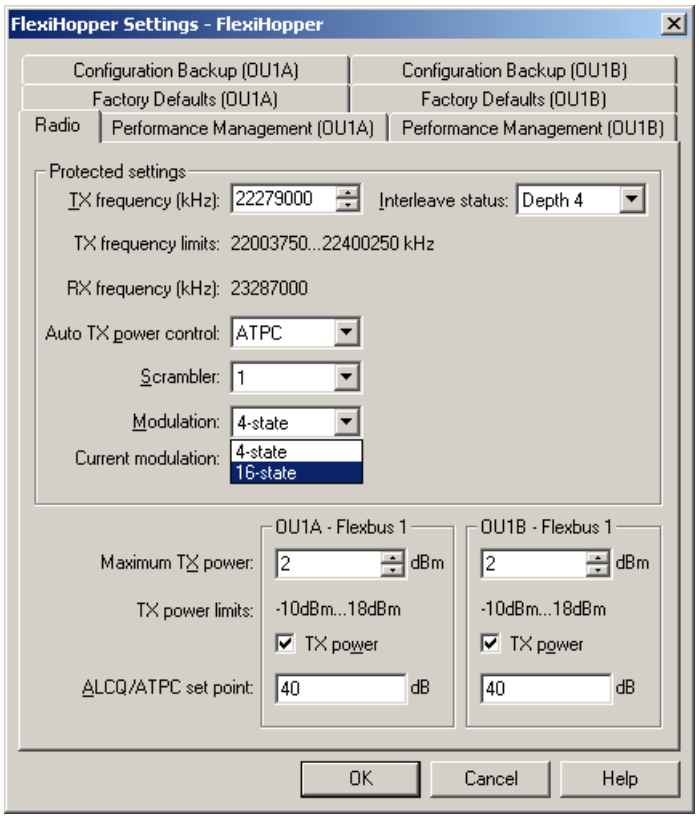

Figure 15. **FlexiHopper Settings - FlexiHopper** window

2. Select *16-state* from the Current modulation drop-down list

3. Click OK

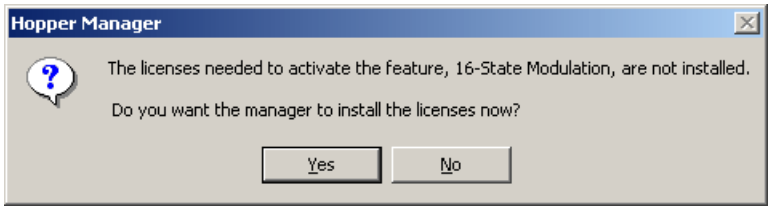

Figure 16. On-demand installation question

Click *Yes*.

If the licence file is found in the folder configured before the installation, the licence is installed.

4. **If the licence file is not found, re-configure the folder from which the licence files are fetched and start again from Step 1**

   Note that each licence is tied to the serial number of the unit to be upgraded.

4.3 Configuring identifications

Purpose

All Nokia FlexiHopper (Plus) unit identifications and settings are accessed via the **Configure** menu in the Hopper Manager. Alternatively, you can use the pop-up menus by clicking the right mouse button over a unit in the **Equipment view** window.

Before you start

Check that Nokia Hopper Manager is connected to the equipment.

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Identifications**

   The **Select Object** dialogue box opens.

2. **Select the appropriate unit**

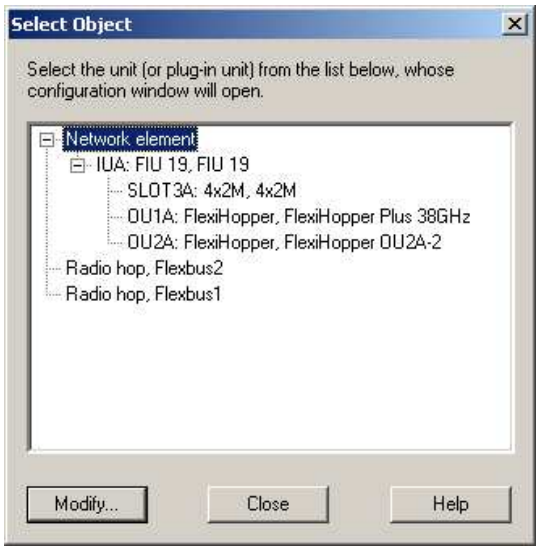

Figure 17. Select Object dialogue box

To view or change far-end identifications, select *Radio hop, Flexbus*.

3. Click Modify to open a dialogue box detailing the identifications of the selected unit

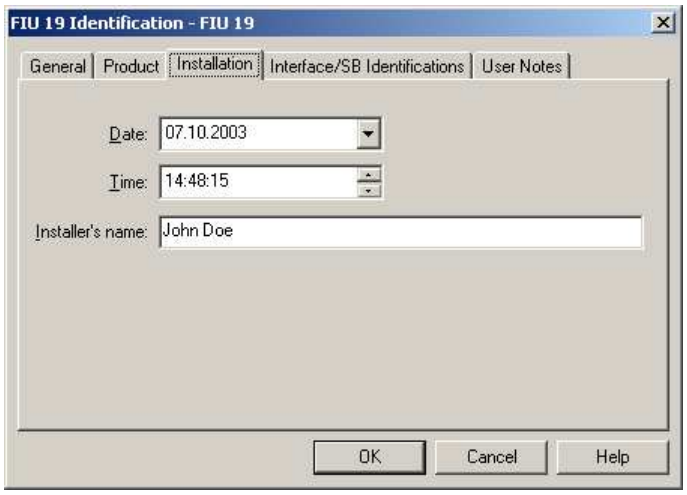

Figure 18. Identifications of the selected unit

Further information

Identifications are displayed separately for the network element, and each functional entity (IU, OU, plug-in unit).

User-defined identifications for a network element or a unit can include, for example, notes on the installation. The identifications used in alarm display can also be changed. Some of the information cannot be altered because it is read directly from the equipment.

4. Type in the desired identification in the dialogue box, and click OK

Expected outcome

The identifications have been configured.

4.4 Viewing and changing unit settings

Before you start

Check that Nokia Hopper Manager is connected to the equipment.

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. On the Hopper Manager menu, select Configure → Settings

The **Select Object** dialogue box opens.

2. Select the appropriate unit

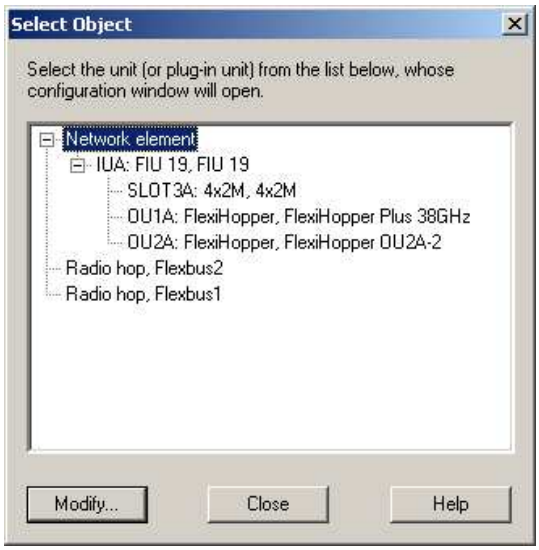

Figure 19. Select Object dialogue box

3. Click Modify

A dialogue box, detailing the settings of the selected unit, opens.

4. Change the settings for the unit, if necessary

If certain settings are changed (for example, transmit frequency or Flexbus capacity), also the settings of the terminal at the other end of the hop have to be changed correspondingly. Certain options are disabled while configuring a virtual node.

5. Click OK to send the changes to the node

Expected outcome

The unit settings are displayed and, optionally, you have changed some settings.

4.5 Configuring network element settings

Purpose

Network element settings are common Q1 management and protection mode settings for a complete Nokia FlexiHopper (Plus) system.

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select *Network element*, and click Modify**

   A dialogue box for the network element settings opens.

   Click the tabs to switch between pages.

3. **Select the Operation Mode tab to change the operation mode settings**

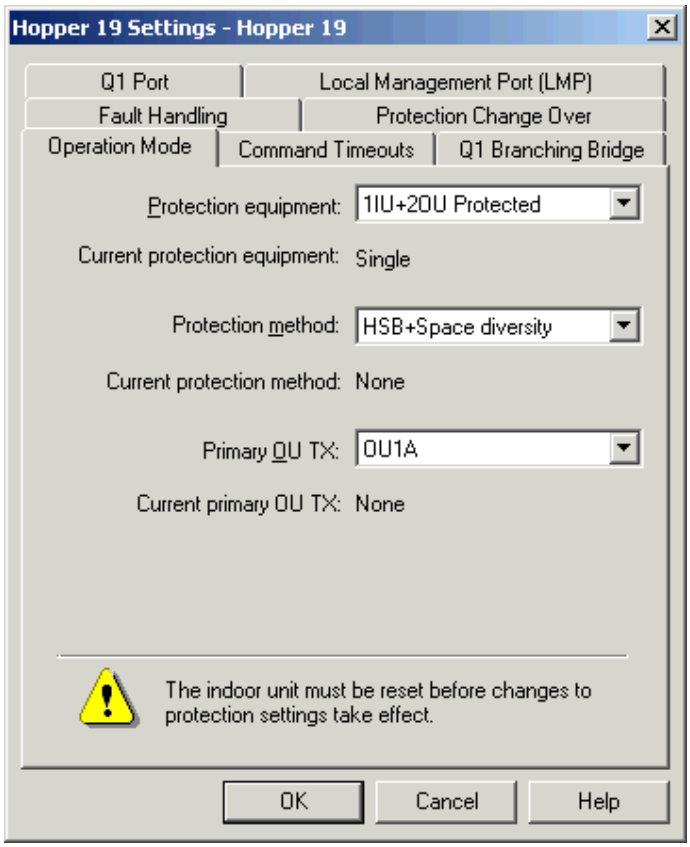

Figure 20. Operation Mode tab in a dialogue box for the network element settings

In the drop-down lists, select the value to change the protection equipment, protection method, or primary outdoor unit in a protected setup.

Note

The indoor unit must be reset before changes to the protection settings take effect.

Note

When using the 1-antenna hot-standby (HSB) protection mode, configure the radio that is connected to the coupler input with lower insertion loss than the primary outdoor unit transmitter.

4. Select the Q1 Branching Bridge tab to change the Q1 branching settings

Select or clear the boxes to achieve the desired setting.

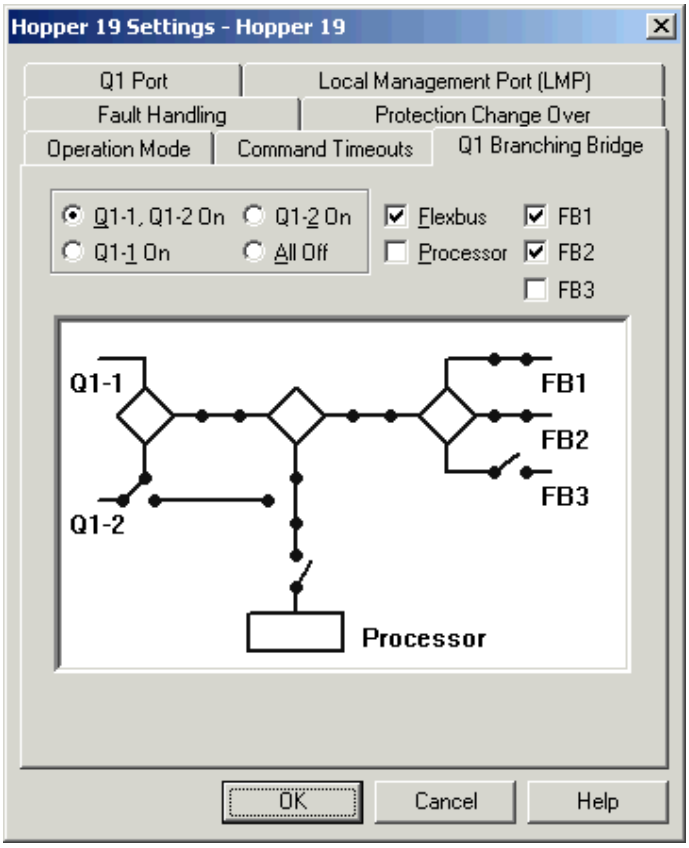

Figure 21. Branching bridge settings

5. Select the Q1 Port tab to change the Q1 port settings

To change the Q1 group address, Q1 address, or the baud rate of the Q1 ports, type in the desired value or select it from the list.

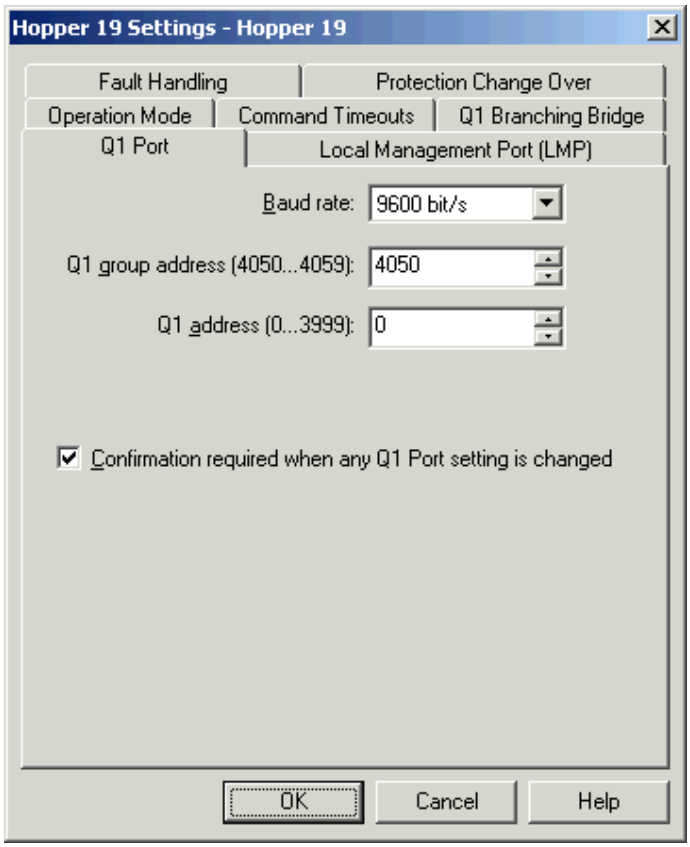

Figure 22. Q1 port settings

The figure above shows the default factory settings, and must be changed when configuring the Q1 port settings.

When FIU 19 (E) is used in connection with a Nokia Talk-family base transceiver station (BTS), the Q1 port baud rate must be set to 9600. This is the rate used by the BTS.

6. Select the Local Management Port (LMP) tab to change the LMP settings

To change the Q1 group address, Q1 address, or the baud rate of the (LMP), type in the desired value or select it from the list.

Tip

To ensure the maximum LMP speed, set the LMP baud rate to 115.2k.

Tip

To avoid having to set the COM port speed manually, set the baud rate to "Auto" in Hopper Manager's **Tools** → **Options** → **Manager Options** menu, *Communication* tab.

7. Select the Protection Changeover tab to change the changeover settings

To change the protected mode changeover settings, select the values from the drop-down list.

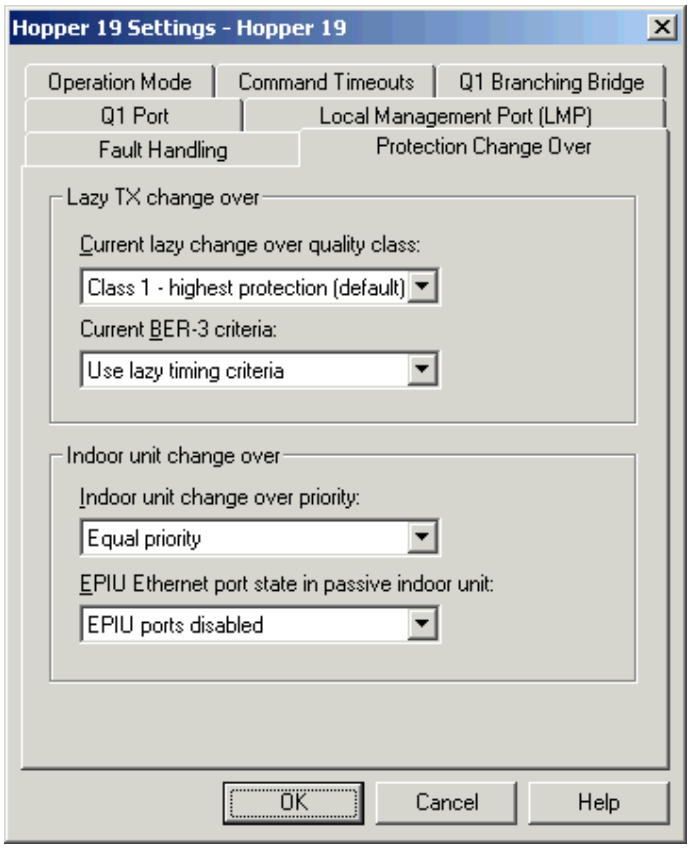

Figure 23. Protected mode changeover settings

For more information on the protection methods, see technical note in Maintenance Documentation in NOLS (Nokia Online Services) under Transmission and Backbone → Microwave Radios → Nokia FlexiHopper Plus Microwave Radio.

8. Select the Fault Handling tab to change the fault handling settings

If the indoor unit is used with BTS polling with older style Q1 fault codes, you can check the box on this tab to activate the old style fault handler for reasons of compatibility (see the figure *Fault handling settings*).

To prevent alarms of very short duration appearing and being recorded in the alarm history, check the box **Enable disturbance alarms filtering**.

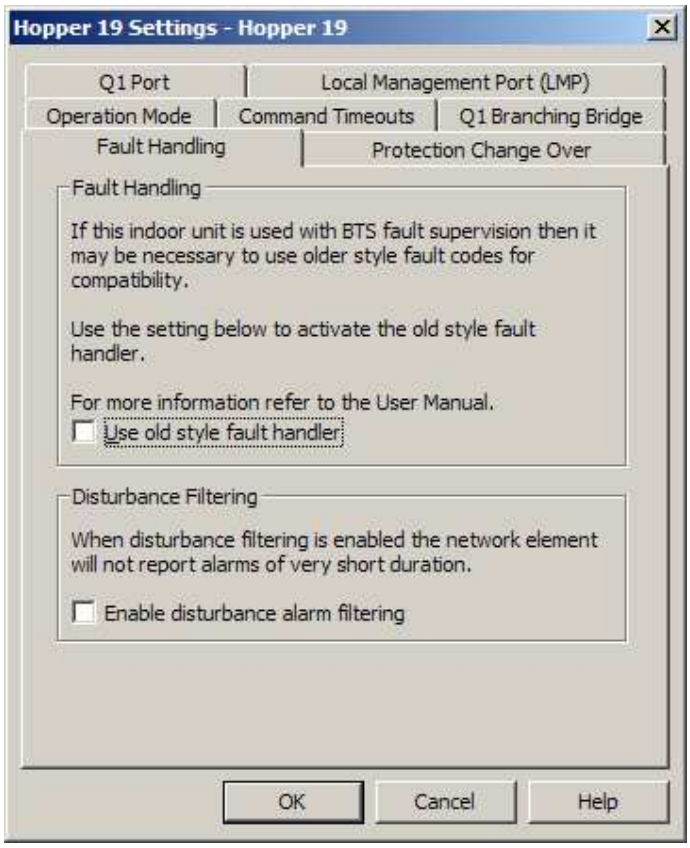

Figure 24. Fault handling settings

9. Select the Command Timeouts tab to change the command timeout settings

Control is the time period after which forced controls expire automatically and the network element resumes the normal operating mode.

Confirm is the time period during which confirmation is required for certain commands.

To set values for command timeouts, type in the desired value (control 60 - 6500 seconds, confirm 60 - 600 seconds).

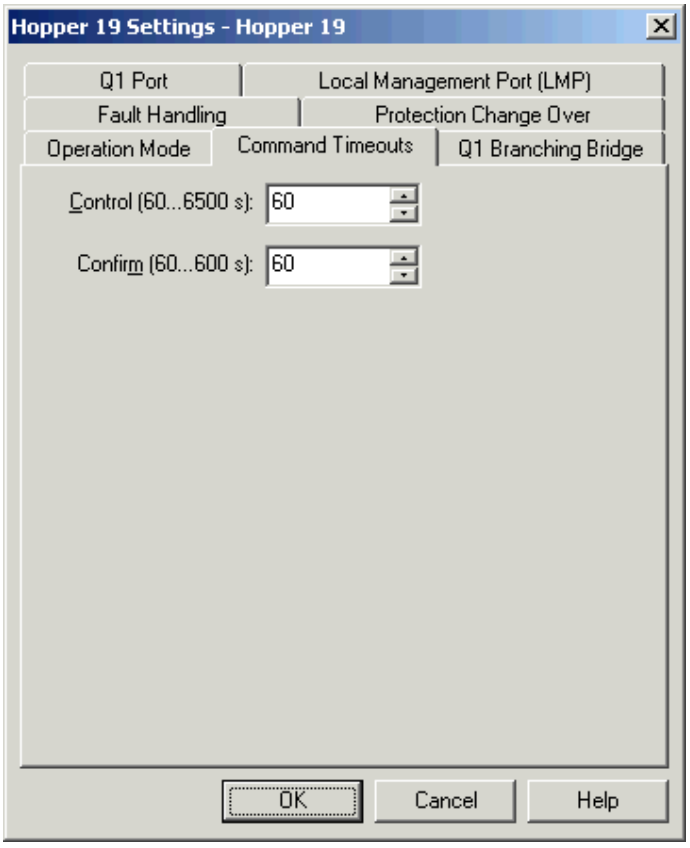

Figure 25. Command timeout settings

Expected outcome

The network element settings have been configured.

4.6 Configuring FIU 19 (E) indoor unit settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **To check or change the indoor unit settings, select the FIU 19 (E) unit and click Modify**

   The **FIU 19 Settings - FIU 19** dialogue box opens.

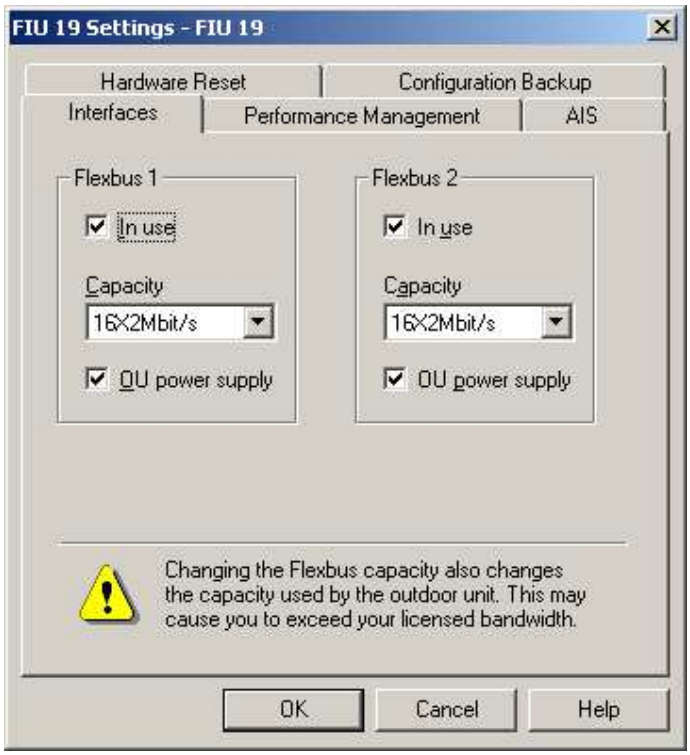

Figure 26. FIU 19 Settings - FIU 19 dialogue box

The content of the dialogue box varies, depending on the equipment configuration (for example, if the FIU 19 (E) unit is in single or protected mode).

To perform a hardware reset, select the **Hardware Reset** tab and click the **Send the reset** button.

Some settings (Operation mode, for example) require that the unit is reset before the new settings become operational. Usually the reset command is sent right after such settings have been modified.

3. **Select Interfaces tab to check or change interface settings**

4. **Set the Flexbus in use by clicking the checkbox**

   If the Flexbus is not in use, the payload is cut and all Flexbus signal alarms deactivated. Statistics and bit error ratio (BER) measurements are not collected. However, the outdoor unit can still be managed.

5. **To change the Flexbus capacity, select the new capacity from the drop-down list**

! Caution

An incorrect outdoor unit capacity value may cause you to exceed your licensed bandwidth and may interfere with other links. Set the capacity of the outdoor units to the same value at both ends.

It is not necessary to set the transmission capacity separately for the outdoor unit (OU). When the capacity is set for the Flexbus interface, the OU is automatically configured to this capacity.

In the protected mode, a capacity common to both protected outdoor units is displayed.

6. **Set the outdoor unit power supply *on* by clicking the OU power supply checkbox**

7. **To check or change the performance management settings**

   For more information, see *Configuring FIU 19E performance management settings*.

8. Select the AIS tab to check or change Flexbus BER alarm and alarm indication signal (AIS) settings

The AIS settings tab opens.

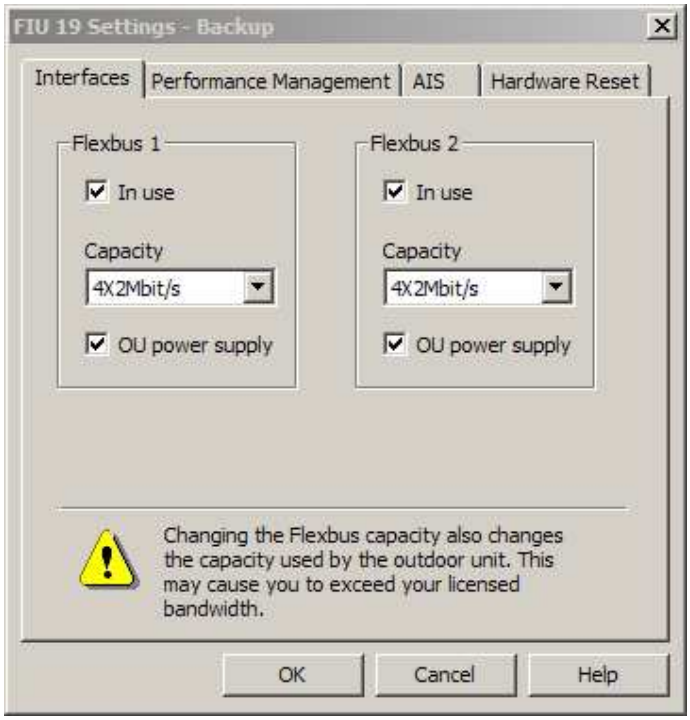

Figure 27. FIU AIS tab in the FIU 19 Settings - FIU 19 dialogue box

9. Check the checkbox to enable connecting the alarm indication signal to 2M interfaces when the Flexbus BER alarm is active

10. To change the Flexbus BER alarm threshold, select a new threshold from the BER alarm threshold drop-down list

11. To change the BER calculation gating time, select a new time from the Gating time drop-down list

Set the gating time according to the selected alarm threshold (the lower the threshold, the longer the gating time) to get reliable alarm triggering.

12. To back up or restore configuration settings, see Overview of backing up configuration settings

13. Click OK to send the changes to the node

Expected outcome

The FIU 19 (E) indoor unit settings have been configured.

4.7 Configuring IP DCN & SNMP settings in FIU 19E

4.7.1 Configuring IP interface settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. On the Hopper Manager menu, select Configure → Network Settings

The **Network Settings** dialogue box opens.

2. Click the IP Interface Settings tab

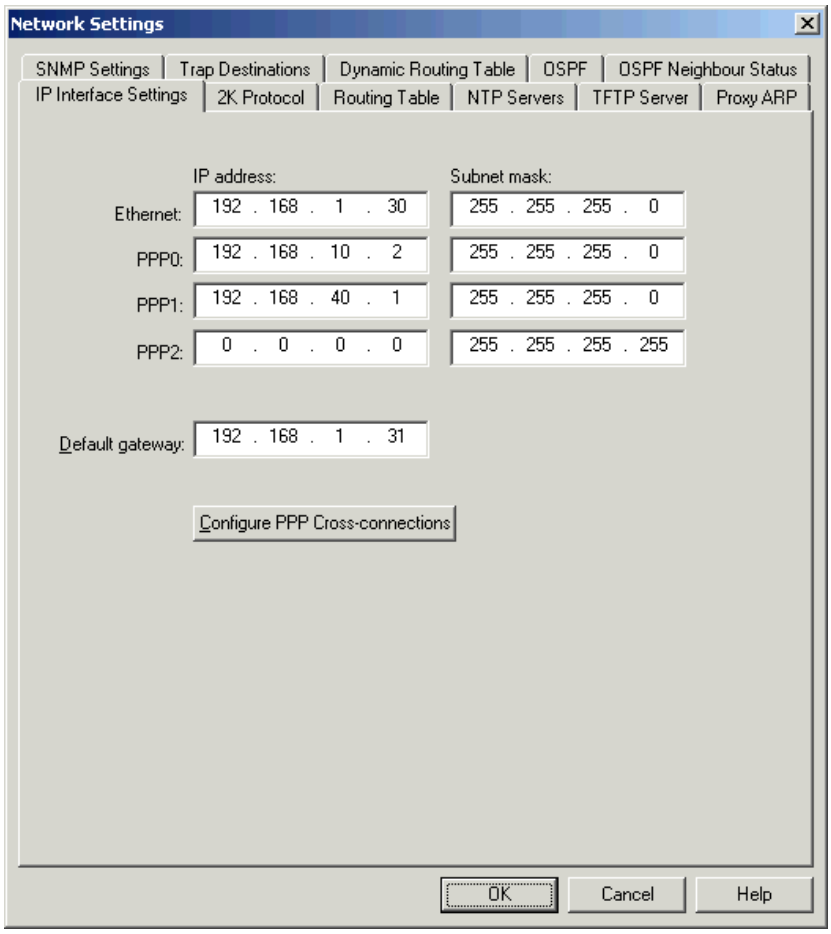

Figure 28. IP Interface Settings

Table 1. IP Interface Settings data

IP address	IP address of the FIU 19E Ethernet / ppp0/ppp1/ppp2 interfaces.
Subnet mask	Subnet mask of the FIU 19E's Ethernet / ppp0 - 2 interface.
Default gateway	IP address of the FIU 19E's default gateway.

3. Modify the IP Interface settings

Ethernet interface: Given its own IP address and subnet mask, the host (here the FIU 19E device) can determine whether or not an IP datagram is destined for a host on its own subnet. PPP interfaces of FIU19E also need an IP address and network mask if they are used. If one does not use these interfaces, their IP address and mask should be set to 0.0.0.0 and 255.255.255.255 respectively.

PPP interfaces may also be unnumbered. Unnumbered PPP interfaces do not require that an IP address is configured for each interface. To use unnumbered PPP interfaces, the PPP cross-connections must be connected first. Both ends of that radios hop must be configured as unnumbered.

4. Modify the Default gateway settings

Default gateway setting is used together with static routing. It tells that all the IP packets whose destination IP address does not have entry in static/dynamic routing table should be sent to the default gateway. Default gateway address is typically an IP address of a router in one of the directly attached networks. If default gateway setting is not used, it can be set to 0.0.0.0.

5. To modify the PPP cross-connection settings, click the Configure PPP Cross-connections button

Before PPP interfaces can be used, they have to be physically connected to physical data channels (HopLAN or AUX Fast) inside FB cable. If PPP links are used, it is expected that PPP0 is connected to either of the data channels inside FB1, same relationship applies between PPP1 and FB2, and PPP2 and FB3. Only one PPP link can be used per radio hop. If PPP links are not used, they can be left unconnected.

PPP links can be created as numbered or unnumbered by selecting the type from the pop-up menu when creating the connections.

The use of PPP links enables IP connectivity between two or more FIU 19E units located at the far-end of FlexiHopper (Plus) radio links.

For more information, see *Configuring Aux and PPP cross-connections*.

6. Click OK

Expected outcome

The general IP interface settings are displayed and, optionally, some data has been modified.

Default gateway setting is not typically used when OSPF is enabled on FIU19E. Refer to instructions from network planning to find out if it has to be set in your case. Default gateway setting has to be fixed to 0.0.0.0 if not used.

4.7.2 Configuring static routing

Purpose

The routing table is used to configure static IP routes in the FIU 19E. An IP route is identified by IP route destination, net mask, and the next hop (gateway).

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Network Settings**

   The **Network Settings** dialogue box opens.

2. **Select the Routing Table tab**

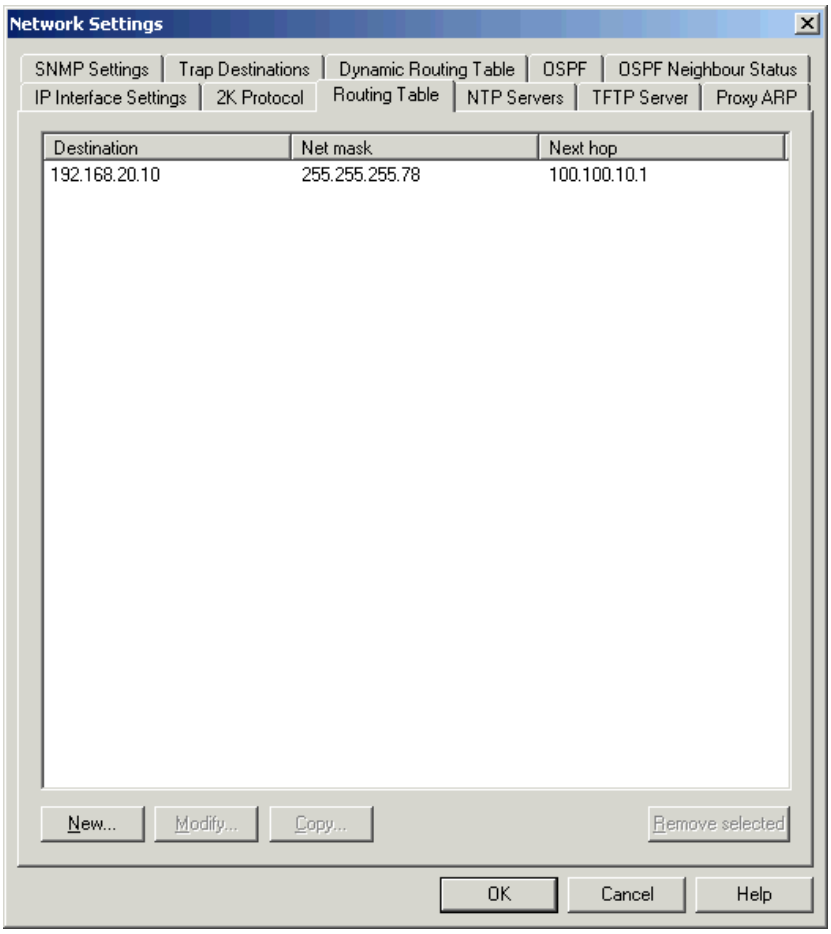

Figure 29. Routing Table tab in the Network Settings dialogue box

Table 2. Data in routing table

Destination	The destination IP address of the route.
Net mask	The range of IP addresses handled by the present route.
Next hop	The IP address of the next hop. FIU 19E sends all IP packets handled by the present route to this IP address.

3. To create a new static IP route, click the New button

The Routing Table Entry dialogue box opens.

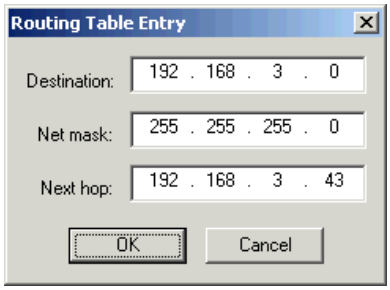

Figure 30. Routing Table Entry dialogue box

4. Configure the settings for the new IP route, and click OK

Configure the following settings:

- Destination
- Net mask
- Next hop.

5. To modify an existing IP route, select it and click Modify

The Routing Table Entry dialogue box opens.

6. Make the necessary changes for the IP route and click OK

7. To create a copy of an existing entry, click Copy

The Routing Table Entry dialogue box opens.

8. If necessary, modify the settings and click OK

New entry is created based on an existing entry.

9. To remove routing table entries, select the respective entry and click Remove selected

10. In Network Settings dialogue box, click OK to send the changes to the node

Expected outcome

The routing table settings have been configured.

4.7.3 Configuring Proxy ARP setting

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established. For additional information on Proxy ARP, see *Proxy ARP* in document *Product Description for Nokia FlexiHopper (Plus)*.

Steps

1. **On the Hopper Manager menu, select Configure → Network Settings**

   The **Network Settings** dialogue box opens.

2. **Select the Proxy ARP tab**

Figure 31. Proxy ARP tab

3. Check the Enable Proxy ARP checkbox, and click OK

Expected outcome

Proxy ARP functionality is enabled on FIU19E.

Caution

The open shortest path first (OSPF) may not be able to route all IP data communication network (DCN) traffic correctly if the proxy ARP is used simultaneously with the OSPF. The proxy ARP should be disabled when the OSPF is used.

4.7.4 Configuring dynamic routing

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Network Settings**

   The **Network Settings** dialogue box opens.

2. **Select the OSPF tab**

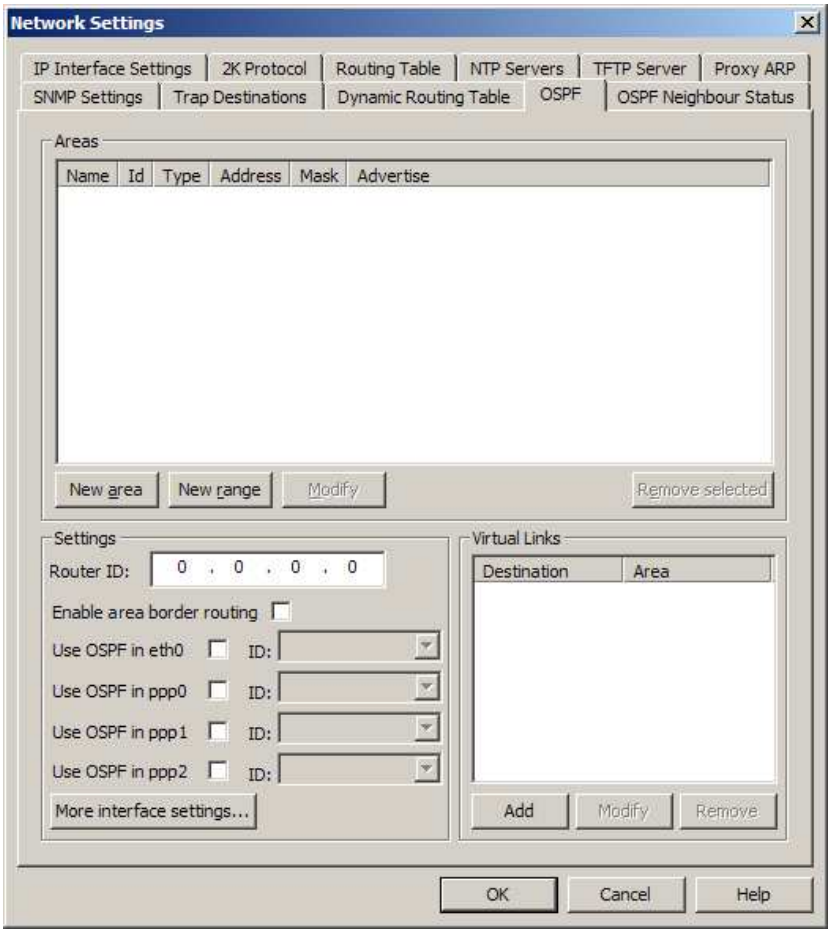

Figure 32. OSPF Settings tab

Table 3. OSPF settings data

New area	Use the New area button to define additional areas.
New range	Use the New range button to make area range definition for defined area.
Modify	Use the Modify button to modify the selected area or area range.
Remove selected	Use the Remove selected button to remove selected area range or area definition.
Router ID	OSPF Routers router identification, typically router ID is the same as one of the router interface IP addresses. If set to 0.0.0.0, then router ID value will be derived from FIU 19E MAC address.
Use OSPF in Eth0, ppp0 - 2	Enables OSPF routing protocol on FIU 19E Ethernet and ppp0 - 2 interface. OSPF protocol can be enabled separately for each interface.
ID	Allows selecting an area ID for Eth0, ppp0, ppp1 or ppp2 interface. OSPF Area ID can be assigned for each interface separately. The Area ID has to be defined before it can be assigned to an interface.
Virtual links	This window shows if one or more virtual links have been defined. The use of virtual links and area range settings is optional.
More interface settings	Allows configuring more OSPF related settings.

3. To create a new OSPF area definition, click New area

The **New area** dialogue box opens.

The Areas window shows a list of areas that have been defined, Area 0 has been created as default, its settings cannot be changed.

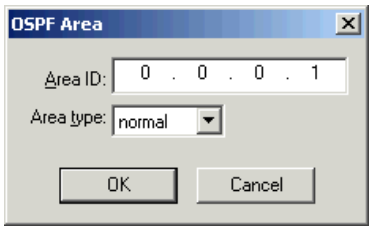

Figure 33. Dialogue for adding an OSPF Area

4. Configure the settings for a new OSPF area, and click OK

The dialogue box allows defining one new area at a time. Simultaneously it is possible to define area type. Area type can be selected from following options: normal, stub and NSSA. Up to 7 areas can be defined for FIU 19E. The area definition becomes visible to the Areas window.

5. To create new OSPF area range definition, click Add range (optional setting)

The **OSPF Range** dialogue box opens.

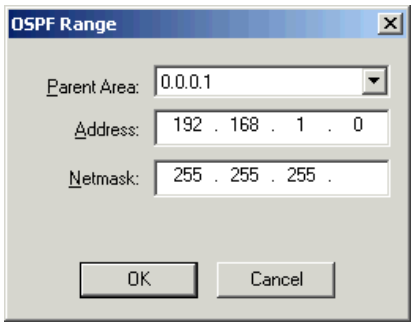

Figure 34. Dialogue for adding OSPF Range

Table 4. OSPF Range data

Parent area	OSPF area in which the defined IP network addresses are used.
Address	IP network address

Table 4. OSPF Range data (cont.)

Netmask	IP network mask

6. Configure the settings for new OSPF area range, and click OK

The dialogue box allows creating one new OSPF area range definition at a time. In the dialogue box the user can select in which area the area range exists. Area range is defined with a single IP network address & mask pair.

Example

Address = 192.168.0.0, Mask = 255.255.0.0. Area definition has to exist before area range definition can be created. Area range - definition only supports advertise mode (do not advertise feature is not supported).

7. Configure Router ID

The Router ID is typically selected to be the same as one of the router interface IP addresses. Every OSPF router in the network has to have a unique Router ID. Note: If one wants to change the Router ID when OSPF is already enabled on FIU 19E, then it is better to disable OSPF before changing the Router ID. This has to be done in three phases:

a. Disable OSPF on all interfaces.

b. Change the Router ID.

c. Enable OSPF on selected interfaces.

8. Enable area border router capability by checking the box if needed

9. Enable OSPF for selected interfaces by adding a tick for each interface that will use OSPF

10. Assign correct Area ID for each router interface by selecting it from pull down menu

The Area ID has to be defined before it will become visible in the Area ID pulldown menu. See step 3 for creating Area ID's.

11. To create a virtual link, click Add (Optional)

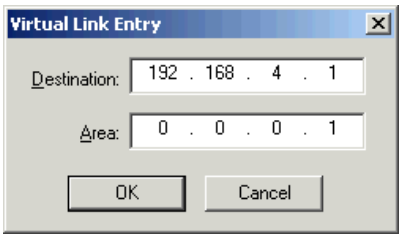

Figure 35. Dialogue for adding a virtual link

Table 5. Virtual Link Entry data

Destination	Destination Router ID of area border router to which the virtual link is created.
Area	Area ID of virtual links transit area. Virtual links transit area type has to be normal.

12. Configure virtual link parameters, and click OK

Virtual links are only needed in some special cases where one wants to connect two area border routers together via a virtual link.

Virtual link has to be defined at both ends of the virtual link.

13. To modify/remove a virtual link definition, select virtual link and click modify/remove

14. To modify more interface settings, click More Interface Settings

The **More Interface Settings** dialogue opens.

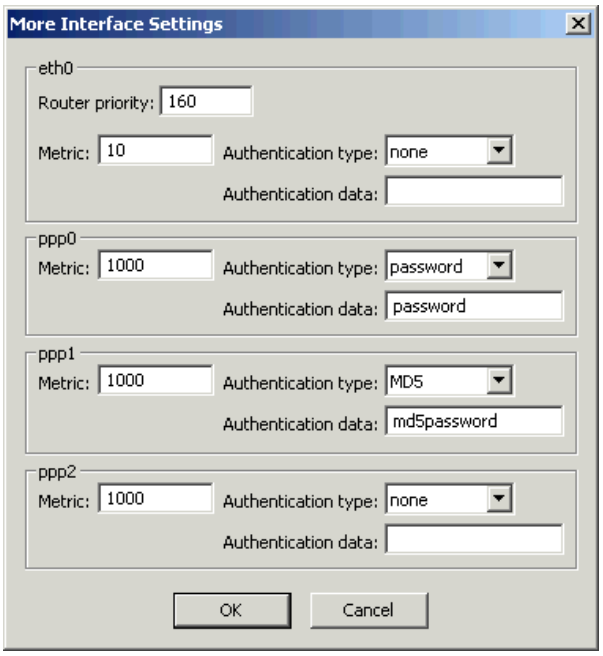

Figure 36. More Interface Settings dialogue

Table 6. More interface settings data

Router priority	Election priority for selecting designated router for LAN segments. Value range 0-255, default value = 10. Value 0 means that it is not selectable as designated router. The setting is valid only for Ethernet interface.
Metric	Link cost for routers output interface (eth0/ppp0-2), value range 0-65536. If set to 0, then the interface default value will be used.
Authentication type	OSPF authentication type. Value range: None, password, MD5. If authentication type is set to none, then no authentication data is needed.
Authentication data	Simple text password. Password length depends on authentication type (none = no password, password = length max 8 characters, MD5 = max 16 characters).

15. After configuring OSPF settings, click OK

Expected outcome

Dynamic routing protocol has been configured on FIU 19E.

Further information

Refer to *Viewing OSPF neighbour router status & dynamic routing table* to see if OSPF protocol is able to form a neighbour relationship with the neighbour routers.

View the dynamic routing table to see if all network addresses become visible.

4.7.5 Viewing OSPF neighbour router status & dynamic routing table

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established. Dynamic routing has been configured.

Steps

1. On the Hopper Manager menu, select Configure → Network Settings

The **Network Settings** dialogue box opens.

2. Select the OSPF Neighbour status tab

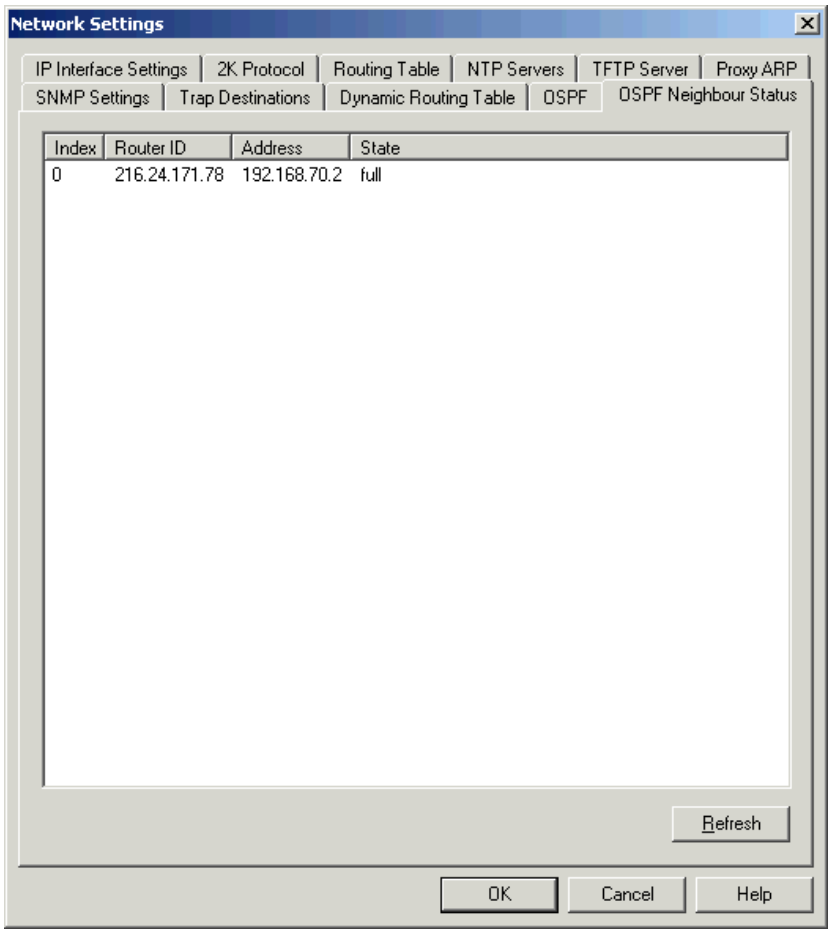

Figure 37. OSPF Neighbour Status window

The OSPF Neighbour Status window shows a list of the neighbour relationships formed by the routing protocol. Neighbours area identified their Router ID and their relative IP address. Neighbour status indication shows full if neighbourship has been formed correctly.

Properly configured OSPF routing protocol must be running also on neighbour routers and ppp link or Ethernet connection must be established to those routers, otherwise neighbour relationships are not formed. Check RFC 2178 for more information.

3. If necessary, use Refresh button to refresh OSPF neighbour status list.

4. To view dynamic routing table, select the Dynamic Routing Tabletab

The Dynamic Routing Table shows a list of routing table entries created by OSPF routing protocol. The following fields are visible: destination network address & mask, next hop router, link metric to destination network, interface name through which the destination network can be reached.

The Routing table also lists the static routing table entries if those have been defined.

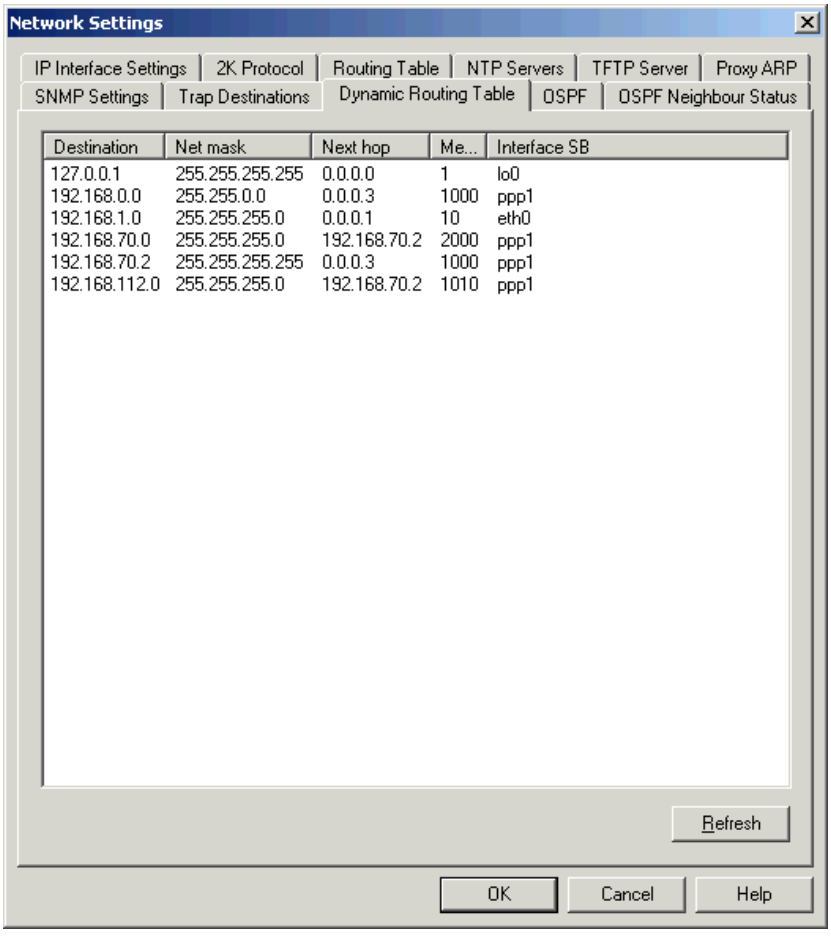

Figure 38. Dynamic routing table

5. If necessary, use Refresh button to refresh Dynamic Routing Table.

4.7.6 Enabling TFTP server functionality in FIU 19E

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

For more information on Trivial File Transfer Protocol (TFTP), see *TFTP* in document *Product Description for Nokia FlexiHopper (Plus)*.

Steps

1. **On the Hopper Manager menu, select Configure → Network Settings**

   The **Network Settings** dialogue box opens.

2. **Select the TFTP Server tab**

3. **Check the Enable TFTP Server checkbox, and click OK**

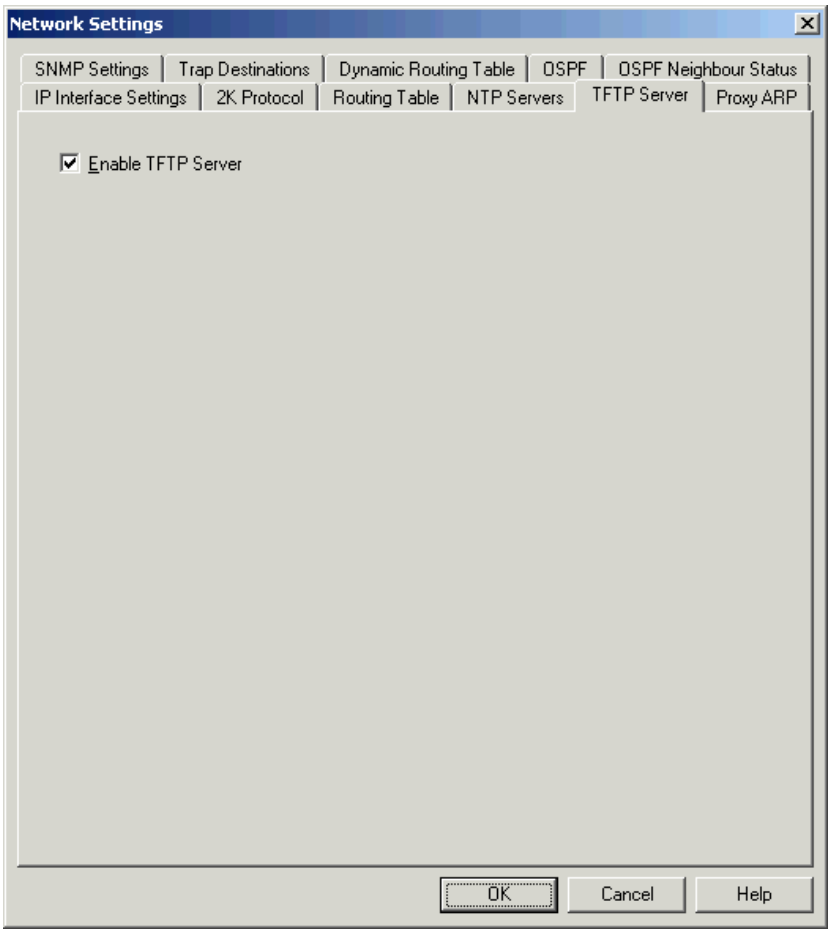

Figure 39. TFTP Server tab in the Network Settings dialogue box

Expected outcome

The trivial file transfer protocol (TFTP) server functionality is enabled in FIU 19E.

4.7.7 Configuring network time protocol (NTP) servers

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

For more information on Network Time Procol (NTP), see NTP in document *Product Description for Nokia FlexiHopper (Plus)*.

Steps

1. **On the Hopper Manager menu, select Configure → Network Settings**

   The **Network Settings** dialogue box opens.

2. **Select the NTP Servers tab**

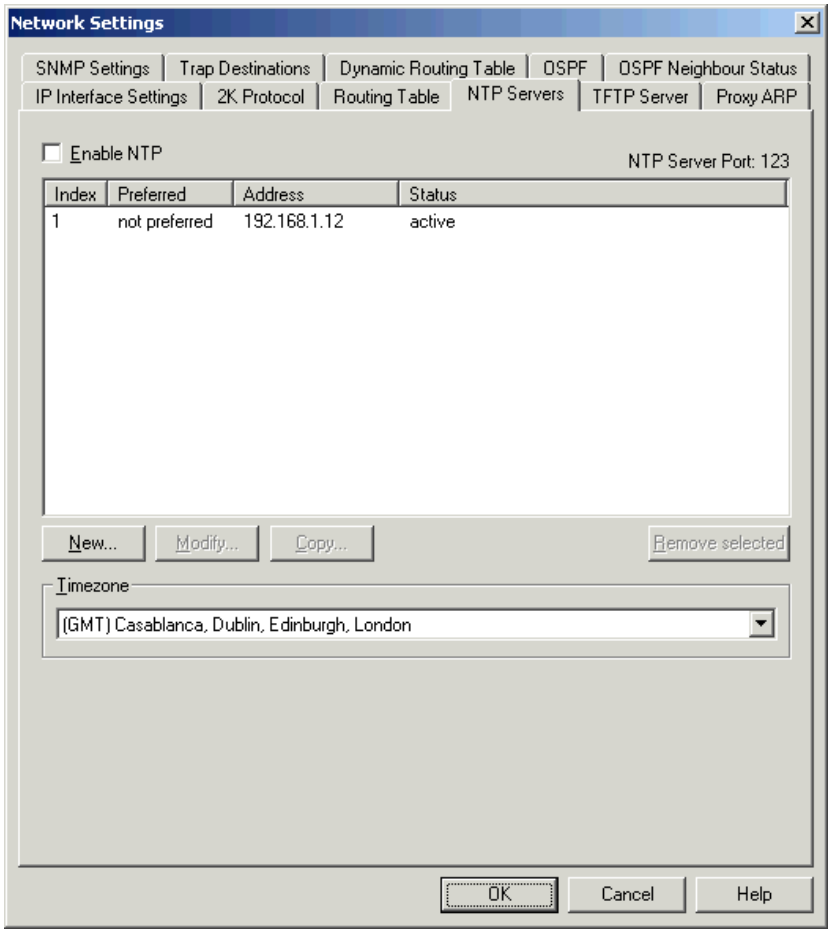

Figure 40. NTP Servers tab in the Network Settings dialogue box

Table 7. NTP server data

Enable NTP	Enables/disables the NTP functionality of the FIU 19E.
Index	The index of the entry in the NTP server table.
Preferred	Use this setting to prioritise the different NTP server entries. Note that only one table entry can be set to *preferred* at the same time.
Address	The IP address of the NTP server.
Status	Shows the current status of the NTP server table entry. Can be used to enable, disable, and delete an NTP server table entry.
Timezone	Select local timezone from the Timezone drop-down list.

3. To add a new network time protocol (NTP) server entry, click New

The **NTP Server** dialogue box opens.

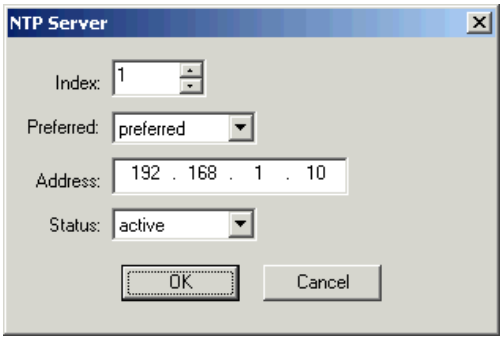

Figure 41. NTP Server dialogue box

4. Configure the settings for the new NTP server entry, and click OK

Configure the following settings:

- Index
- Preferred

- Address
- Status

5. **To modify an existing entry, select the respective entry and click Modify**

   The NTP Server dialogue box opens.

6. **Make the necessary changes for the existing entry, and click OK**

7. **To create a copy of an existing entry, click Copy**

   The NTP Server dialogue box opens.

8. **If necessary, modify the settings and click OK**

   A new entry is created based on an existing entry.

9. **To remove an NTP server entry, select the entry and click Remove selected**

10. **In the Network Settings dialogue box, click OK to send the changes to the node**

Expected outcome

The NTP server settings have been configured.

4.7.8 Configuring trap destination settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **To view or set up destinations for simple network management protocol (SNMP) traps, select Configure → Network Settings on the Hopper Manager menu**

   The **Network Settings** dialogue box opens.

2. **Select the Trap Destinations tab**

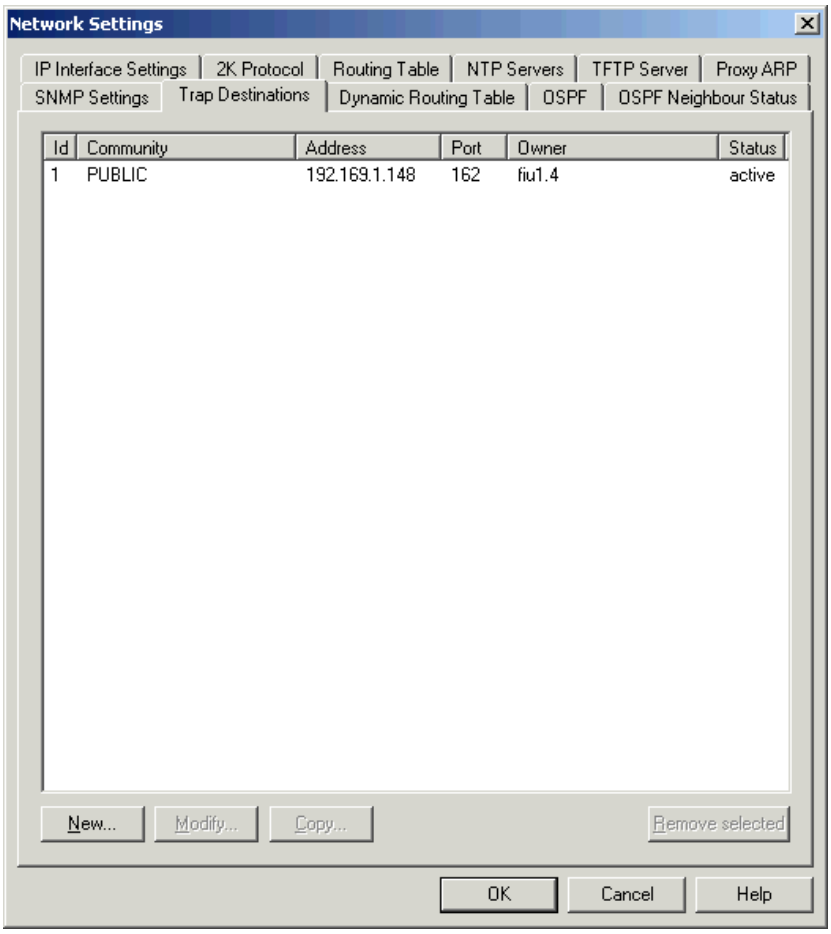

Figure 42. Trap Destinations tab in the Network Settings dialogue box

3. To add a new trap destination, click New

The **Trap Destination Entry** dialogue box opens.

You can set up to five destinations. For a detailed explanation of the trap destinations, see *RFC 2021 (RMON2-MIB)*, which can be obtained upon request.

4. Configure the settings for the new trap destination, and click OK

The settings you need to enter to set up a new entry are displayed in the table below.

Table 8. The settings needed for a new entry

Index	Value of the SNMP table index (RMON2 *trapDestIndex*) is used to identify the table row via SNMP.
Community string	Destination community string is expected by the target management system for incoming traps.
Address	IP address of the target management system.
Port number	Port number for incoming traps in the target management system.
Owner string	String to identify the entity that is assigned to this entry (for example, the management system's name, location or ID).
Status	The status switch allows you to alter the trap destination status from *active* to *not in service*, and vice versa. Traps are only sent to *active* trap destinations, while destinations with *not in service* status are ignored.

5. To modify a configured trap destination, select the entry to be changed and click Modify

The **Trap Destination Entry** dialogue box opens.

All trap destination settings can be modified in the **Trap Destination Entry** dialogue box, except the SNMP table index.

6. Make the necessary changes to the trap destination and click OK

7. To copy trap destination settings to a new entry, click Copy

The **Trap Destination Entry** dialogue box opens.

The trap destination index is a unique identifier according to the standard *RFC 2021 (RMON2-MIB)*. Therefore it needs to be modified in the **Trap Destination Entry** dialogue box.

8. If necessary, modify the settings and click OK

A new entry is created based on an existing entry.

9. **To remove a complete trap destination entry, select the row and click Remove selected**

10. **In the Network Settings dialogue box, click OK to send the changes to the node**

Expected outcome

The trap destination settings have been configured.

4.7.9 Configuring 2K protocol settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Network Settings**

   The **Network Settings** dialogue box opens.

2. **Select the 2K Protocol tab**

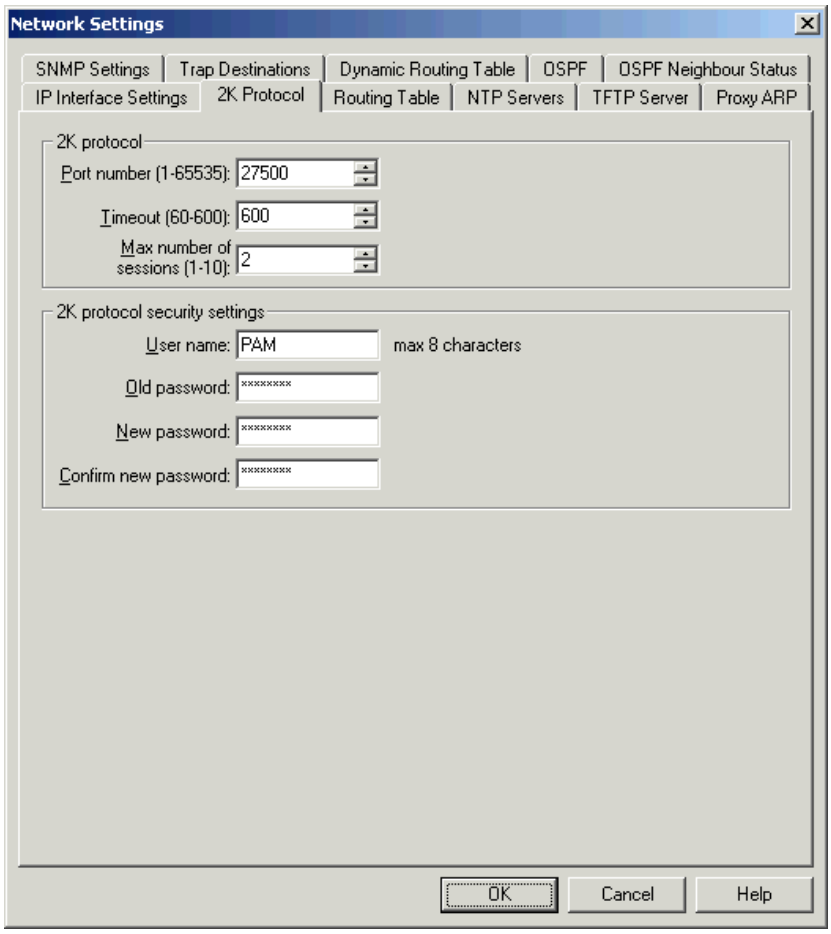

Figure 43. 2K Protocol settings tab in the Network Settings dialogue box

The 2K Protocol is a Nokia proprietary Network Management Protocol via IP data links to connect Nokia Hopper Manager or Management System.

Table 9. 2K protocol settings

Port number	TCP port number to connect to the FIU 19E via IP. Default value is 27500.
Timeout	Specifies the time (in seconds) how long the socket connection is kept reserved after the last command.

Table 9. 2K protocol settings (cont.)

Max. sessions	Specifies the maximum number of simultaneous sessions connected to the same node. By increasing this number, more users can connect to the same node.

Note

When you change the IP address of a node, it can take up to the configured time-out until the current IP socket connections are re-established.

3. To change the 2K protocol security settings, modify the settings in the 2K protocol security settings field

Table 10. 2K protocol security data

User name	Identifies the connecting user. The user name must match with the configured general communication service (GCS) connection tool user name settings of the Nokia Hopper Manager.
Old password, New password, Confirm the new password	Changes the current password settings. This password prevents unauthorized Nokia Hopper Manager connection to FIU 19E node via Ethernet or PPP-link connection. The same password must be entered in the Nokia Connection Tool connection specific parameters (e.g. Q1 Pipe Parameters) when specifying Ethernet or PPP-link connection for Nokia Hopper Manager. The default password is "PAM". To change the password settings, enter the current password and specify a new password. To verify the new settings you have to confirm the new password before it is activated.

4. Click OK to send the changes to the node

Expected outcome

The 2K protocol settings have been configured.

4.7.10 Viewing and changing general SNMP settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Network Settings**

   The **Network Settings** dialogue box opens.

2. **Select the SNMP Settings tab**

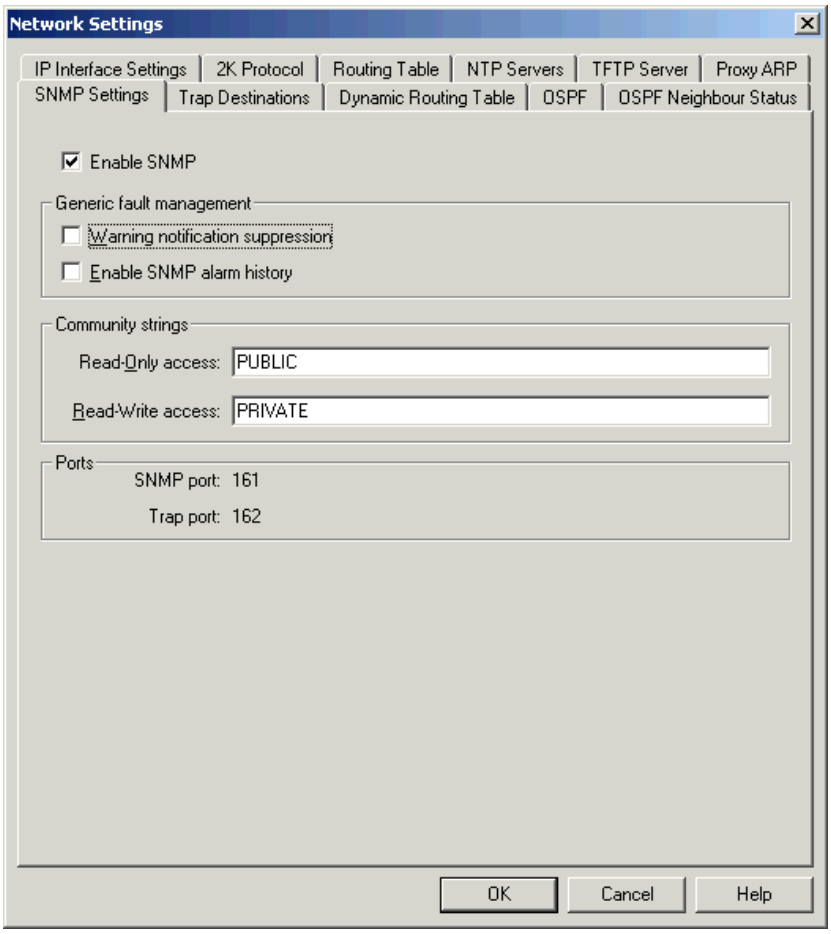

Figure 44. SNMP Settings tab in the Network Settings dialogue box

3. Check the Enable SNMP checkbox to enable SNMP agent inside FIU 19E

4. Change the simple network management protocol (SNMP) settings, if necessary

- Generic fault management

  Check the first checkbox to activate **Warning notification suppression**. This may be needed in management systems that cannot cope with warning traps never being cleared.

  Check the second checkbox **Enable SNMP alarm history** to activate the alarm history for SNMP management systems.

  The **Enable SNMP alarm history** checkbox should be disabled for other than SNMP network management systems.

- Community strings

  Two SNMP community strings can be configured: one for Read-Only access (such as SNMP Get, Get-Next or Get-Bulk requests) and the other for Read-Write access (such as SNMP Set and Get, Get-Next or Get-Bulk requests).

Tip

The community strings are case sensitive. Check that you have exactly the same string in all FIU 19E units and in the management system.

- Ports

  Used SNMP standard ports for traps and other services that can be read but not modified.

5. Click OK to send the changes to the node

Expected outcome

The general SNMP settings are displayed and, optionally, you have changed some settings.

4.8 Configuring Flexbus plug-in unit settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. On the Hopper Manager menu, select Configure → Settings

The **Select Object** dialogue box opens.

2. To check or change the settings of the Flexbus plug-in unit, select the plug-in unit and click Modify

A dialogue box for the settings opens.

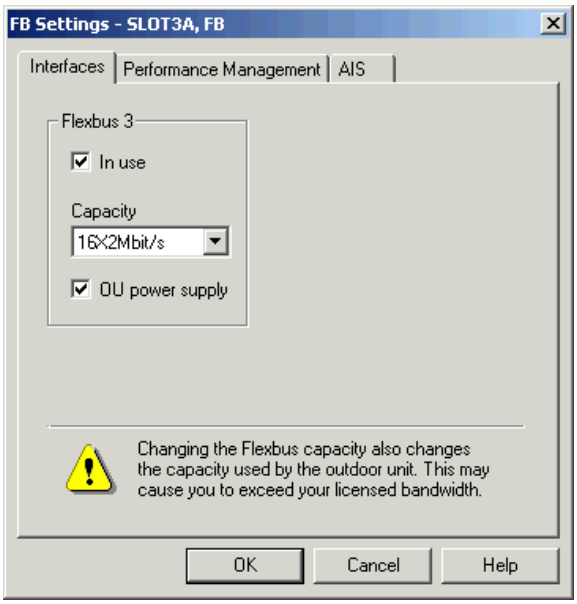

Figure 45. FB Settings dialogue box

3. Click the tabs to switch between pages

The dialogue box has tabs for the **Interfaces**, **Performance management**, and **AIS** settings. The setting options on these pages are the same as described in *Configuring FIU 19 (E) indoor unit settings*.

In single mode, the **Interfaces** tab of the dialogue box contains settings only for Flexbus 3. The Flexbus 4 interface is only available for use in 1IU protection modes.

4. Configure the settings and click OK

Expected outcome

The Flexbus plug-in unit settings have been configured.

4.9 Configuring Aux plug-in unit settings

Purpose

The Aux data plug-in unit provides two auxiliary data channels which support a variety of data formats and speeds. With one plug-in unit, you can use one Aux fast channel and one Aux slow channel at the same time. The maximum bit rate depends on the Flexbus transmission capacity.

In addition, you can use four TTL type programmable I/O channels (software controlled) and/or relay control outputs. You can use the relay controls to turn on equipment rack lights, for example. To a Flexbus, one fast and one slow auxiliary channel can be connected simultaneously.

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select the plug-in unit and click Modify**

   The **AUX Settings** dialogue box opens.

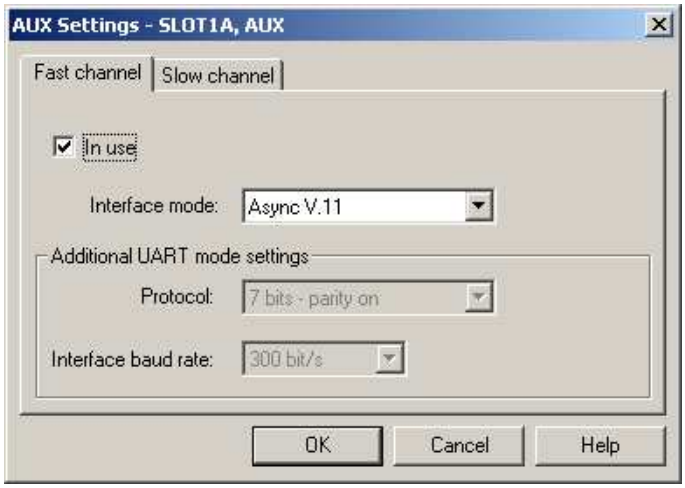

Figure 46. AUX Settings dialogue box

3. Select the **Fast channel** tab to open fast auxiliary channel settings tab

Steps

a. Check the In use checkbox

b. Select the interface mode from the drop-down list

c. Select the required protocol and interface baud rate from the drop-down lists

4. Configure the channel connections

Connect the fast channel to a Flexbus interface (for instructions, see *Configuring AUX and PPP cross-connections*).

5. Select the **Slow channel** tab to open the slow auxiliary channel settings page

Steps

a. Check the In use checkbox

b. Select the interface mode from the list

c. Select the required protocol and interface baud rate

6. Configure the channel connections

Connect the slow channel to a Flexbus interface.

For instructions, see *Configuring AUX and PPP cross-connections*.

7. In the Aux settings dialogue box, click OK to send the changes to the node

8. To configure I/O line settings

For more information, see *Changing the alarm settings*.

Expected outcome

The Aux plug-in unit settings have been configured.

4.10 Setting the real time clock

Before you start

Instead of setting the clock with Hopper Manager, it is possible to use network time protocol (NTP) in FIU 19E or if FIU 19E is under Q1-polling (e.g. Nokia UltraSite EDGE BTS) it will receive real time clock from the Q1-poller, as described in chapter *Configuring network time protocol (NTP) servers*.

Steps

1. Start Nokia Hopper Manager

For more information, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to the FIU 19 (E) node

For more information, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Configure → Set node clock

The **Set Node Clock** dialogue box opens displaying the current computer date and time, and the current node clock.

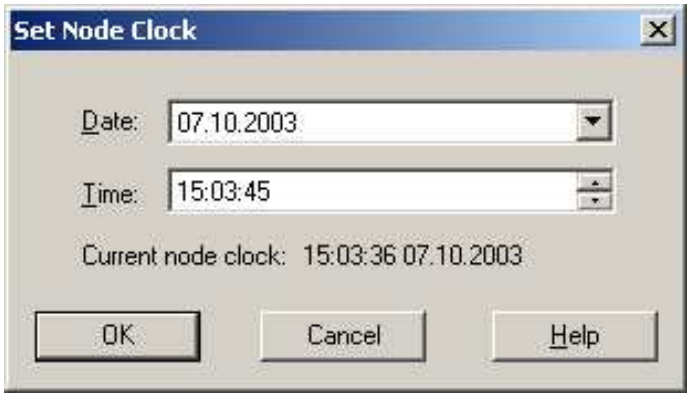

Figure 47. Set Node Clock dialogue box

4. Enter the required date and time, if necessary

5. Click OK to send new real time clock settings to the node

Expected outcome

The real time clock has been set.

4.11 Configuring Ethernet plug-in unit settings

4.11.1 Setting the Ethernet capacity (SIO)

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

The Flexbus interfaces have been configured correctly. If you are using the Ethernet plug-in unit, configure the Serial IO (SIO) settings before configuring the E1 cross-connection settings.

Note that Ethernet capacity must be assigned starting from the first E1 channel in the Flexbus.

Steps

1. On the Hopper Manager menu, select Configure → Settings

The **Select Object** dialogue box opens.

2. Select the appropriate unit and click Modify

The **EPIU Settings** dialogue box opens.

3. Select the SIO tab

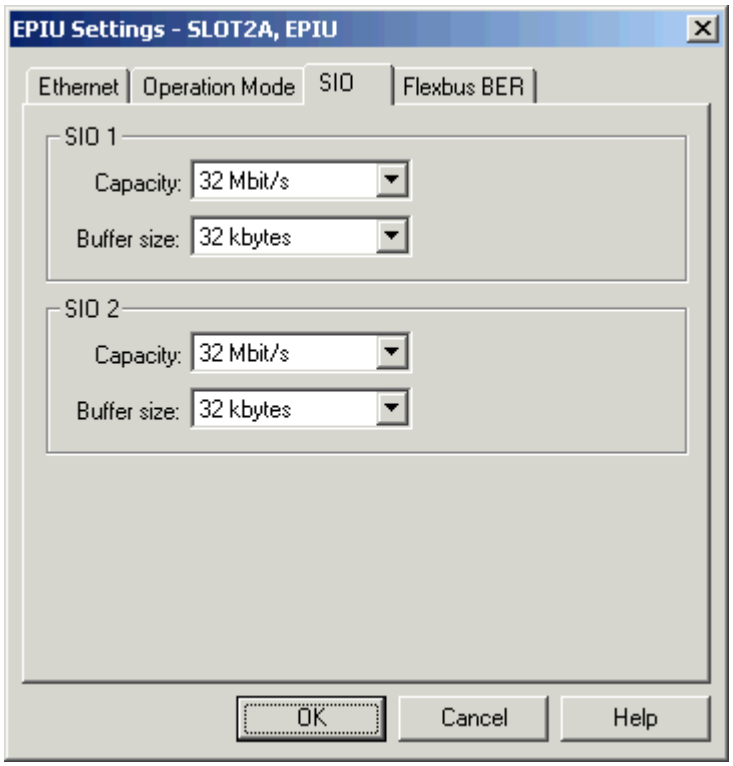

Figure 48. SIO tab in the EPIU Settings dialogue box

4. In the two Capacity drop-down lists (for SIO 1 and SIO 2), select how much of the radio links capacity is to be dedicated to Ethernet traffic

The Ethernet plug-in unit (EPIU) supports the use of two radios for Ethernet traffic. There are two channels to which the capacity has to be configured. The SIO capacity can be configured to 0 - 32 Mbits/s, with 2 Mbits/s granularity. The SIO capacity cannot exceed the radio link capacity. In addition, when E1 signals are carried over the same radio link, the total capacity of E1 and SIO traffic cannot exceed the radio link capacity.

If you want to increase the SIO capacity inside the Flexbus, you have to check that the E1 cross-connections are not overlapping with the part of Flexbus capacity that is reserved for SIO traffic.

Caution

If commissioning fails, Ethernet traffic does not go through the radio hop as expected. Make sure that the SIO capacity over the radio link is configured similarly for Ethernet plug-in units (EPIU) on both sides of the radio hop.

5. **In the Buffer size drop-down list, adjust the buffer size**

6. **Click OK to send the settings to the node**

Expected outcome

The SIO settings have been set.

4.11.2 Setting the Ethernet interface settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

The SIO settings have been configured correctly.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select the appropriate unit and click Modify**

   The **EPIU Settings** dialogue box opens.

3. **Select the Ethernet tab**

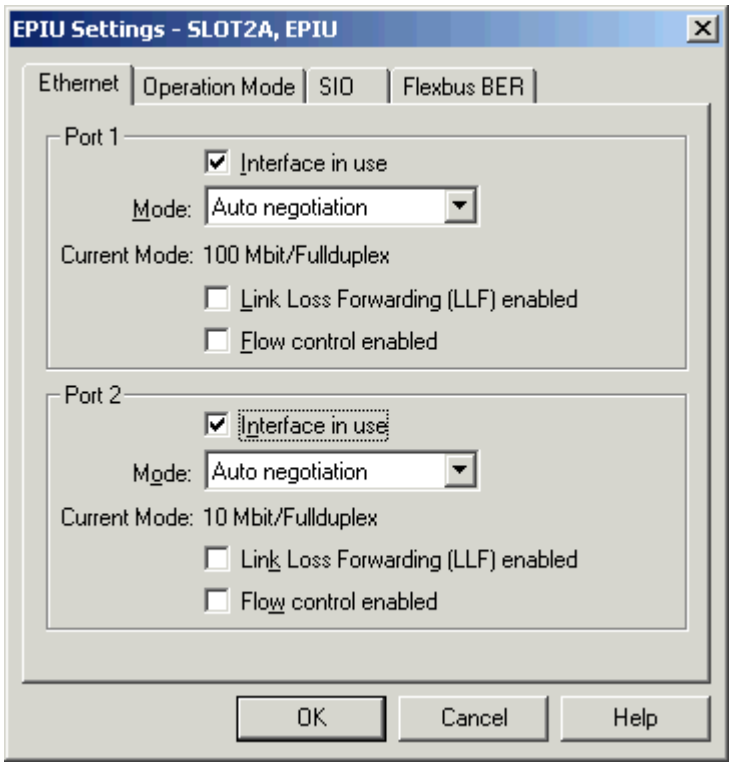

Figure 49. Ethernet tab in the EPIU Settings dialogue box

4. From the Mode drop-down list, select the mode

Both Ethernet plug-in unit (EPIU) ports can be configured separately to work in the following operating modes:

- Auto-negotiation (this is the default mode)
- 100 Mbits/s Full Duplex
- 100 Mbits/s Half Duplex
- 10 Mbits/s Full Duplex
- 10 Mbits/s Half Duplex.

5. To enable the interface, check the Interface in use checkbox

The **Interface in use** setting disables traffic also to Serial IO (SIO) interface. Thus, it is safe to use interface disable function safely in channel separation mode.

If the **Interface in use** setting is off, that interface is kept in link down state.

6. **To enable Link Loss Forwarding functionality (LLF), check the Link Loss Forwarding (LLF) enabled checkbox**

   The LLF cannot be used when EPIU operates in full switch mode or when EPIUs are used in 2IU protection mode.

7. **To switch the flow control on, check the Flow control enabled checkbox**

   Flow control is supported only if Ethernet interface is in full duplex mode. For example, in capacity sharing mode it is possible to use flow control on both channels, or on just one channel, or it can be disabled on both channels.

8. **Click OK to send the changes to the node**

Expected outcome

The Ethernet interface settings have been set.

4.11.3 Setting the operation mode settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select the appropriate unit and click Modify**

   The **EPIU Settings** dialogue box opens.

3. **Select the Operation Mode tab**

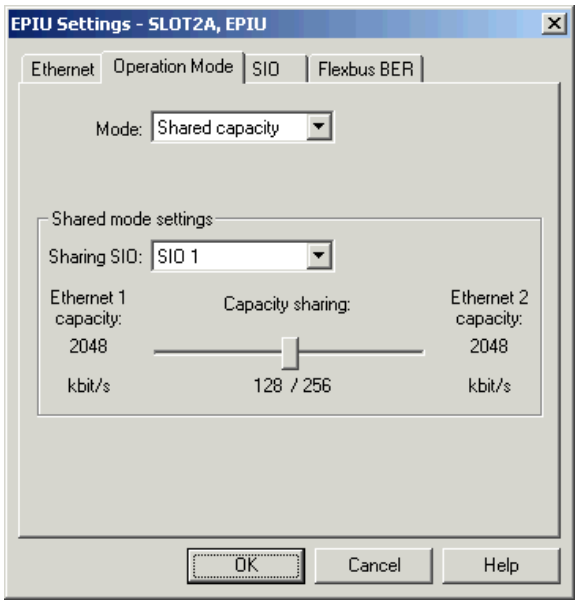

Figure 50. Operation Mode tab in the EPIU Settings dialogue box

In the above figure, it is possible to detect that Serial IO (SIO) 1 is selected for transmitting Ethernet traffic in capacity sharing mode. The capacity sharing ratio is set to 128/256 of the SIO1 capacity. This means that Ethernet capacity is shared evenly between both Ethernet ports. In the above figure both interfaces get 2048 kbits/s of the link's capacity.

Caution

Ethernet traffic over the radio hop may fail if both sides of the radio hop do not use the same Flexbus interface in capacity sharing mode. Make sure both sides of the radio hop use the same Flexbus interface.

---

4. In the Mode drop-down list, select the mode you want to modify

Three operating modes are available:

- Channel separation
- Full switch
- Shared capacity.

5. Select **Shared capacity** in the **Mode** drop-down list to change the shared mode settings

Steps

a. In Sharing SIO drop-down list, select the SIO

b. Moving the slider, adjust the capacity sharing between the ports

6. Click OK to send the settings to the node

Expected outcome

The operation mode settings have been set.

4.11.4 Setting Flexbus BER settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. On the Hopper Manager menu, select Configure → Settings

The **Select Object** dialogue box opens.

2. Select the appropriate unit and click Modify

The **EPIU Settings** dialogue box opens.

3. Select the Flexbus BER tab

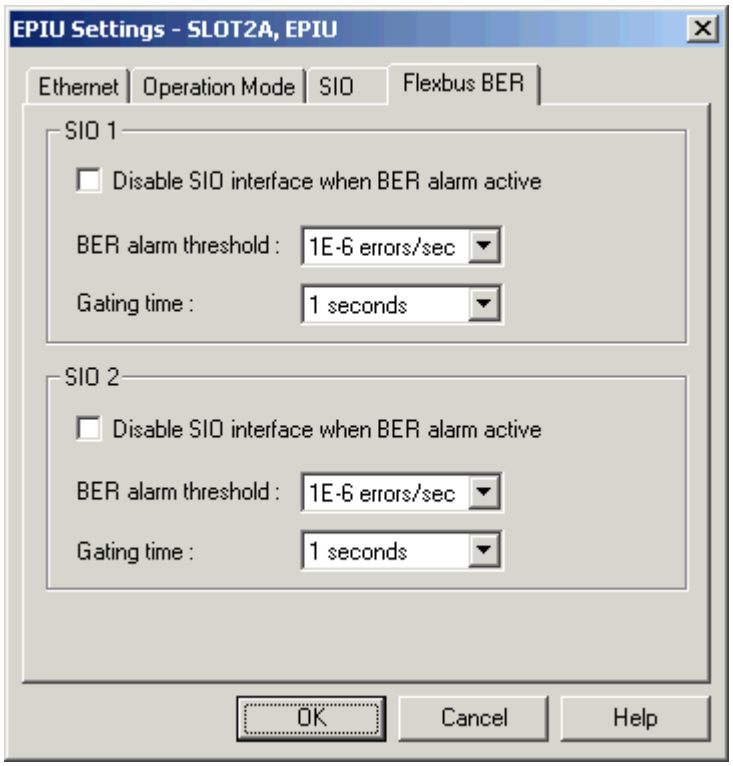

Figure 51. Flexbus BER tab in the EPIU Settings dialogue box

It is possible to set bit error ratio (BER) alarm thresholds and gating time separately for both Serial IO (SIO) interfaces. If the number of errors exceeds the BER alarm threshold during the gating time, an alarm is activated.

4. To disable either one of the SIO interfaces (SIO 1 or SIO 2) when the BER alarm is active, check the Disable SIO interface when BER alarm active checkbox

E1 traffic is not easily harmed by bit errors on the radio path. It can tolerate BER-values of < 1E-3 without too much deterioration of voice quality. The situation is different for packet-based traffic; the Ethernet packet gets corrupted even if one bit is faulty in the Ethernet frame. This may lead to a situation where the majority of the packets are faulty (and are thus dropped) at much smaller BER ratios than 1E-3. On radio links the bit errors are not evenly distributed and errors appear in bursts, thus the packet traffic is not as much affected by large BER values on radio path.

5. **To adjust the BER alarm threshold, select the value from the BER alarm threshold drop-down list**

6. **To set the gating time, select the value from the Gating time drop-down list**

   Set the gating time according to the selected alarm threshold (the lower the threshold, the longer the gating time) to get reliable alarm triggering.

7. **Click OK to send the changes to the node**

Expected outcome

The Flexbus BER settings have been set.

4.12 Configuring FlexiHopper (Plus) outdoor unit settings

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **To check or change the outdoor unit settings, select an outdoor unit and click Modify**

   The **FlexiHopper Settings** dialogue box opens.

   Click the tabs to switch between pages.

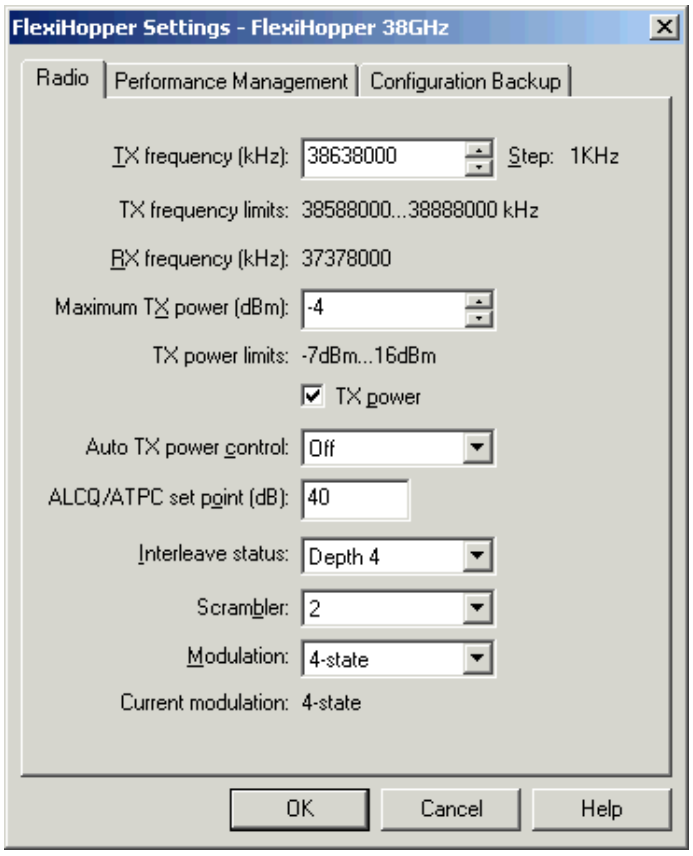

Figure 52. FlexiHopper Settings dialogue box (in single use)

In the **Radio** tab you can modify the transmit power, transmit frequency, automatic transmit power control (ALCQ), modulation, and interleaving settings for the outdoor unit(s).

In a protected setup, some settings are common for both radios, depending on the protection method (hot-standby operation (HSB) or diversity).

3. **To turn the transmit power on/off, select/clear the Tx power checkbox**

4. **To change the transmit frequency, type in the new value in the Tx frequency (kHz) box or click the arrows to adjust the frequency**

The frequency step is read from the equipment. In offline mode the step is 1 kHz.

5. **To change the transmit power, type in the new value in the Maximum Tx power (dBm) box or click the arrow to adjust the power**

   The minimum and maximum values for the transmit power are read from the equipment.

6. **To switch ALCQ on/off, select/clear the ALCQ checkbox**

   For the ALCQ to function, you must set a value in the **ALCQ set point (dB)** box. This value can be obtained from transmission planning.

   For more information on ALCQ, see the relevant technical note in Maintenance Documentation in NOLS under Transmission and Backbone → Microwave Radios → Nokia FlexiHopper Plus Microwave Radio.

7. **To change the interleaving mode, select a new value from the Interleave status drop-down list**

   Possible values for interleaver status are *Off*, *Depth 2*, and *Depth 4* in 4-state modulation type. Note that the outdoor unit stops transmitting while this setting is being changed. Change the setting accordingly also at the other end of the hop. In 16-state modulation the interleaver status is fixed to Depth 4.

8. **To change the modulation type, select a new value from the Modulation type drop-down list**

   Possible values are 4-state modulation or 16-state modulation.

   Changing the modulation mode settings interrupts the traffic for one minute, and the following warning dialogue box is displayed:

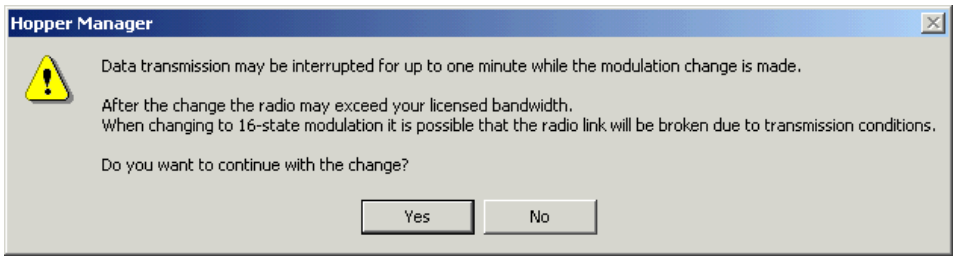

Figure 53. Hopper Manager warning dialogue box

Click **Yes** to confirm the change of modulation type.

9. In the FlexiHopper Settings dialogue box, click OK to send the changes to the node

Expected outcome

Nokia FlexiHopper Plus outdoor unit settings have been configured.

Further information

For instructions on **Performance management**, see *Configuring FIU 19 (E) performance management settings*.

For more information on **Configuration backup**, see *Overview of backing up configuration settings*.

4.13 Configuring cross-connections and cross-connection banks

4.13.1 Overview of editing FIU 19 (E) cross-connections and cross-connection banks

Purpose

A cross-connection bank defines how the 2 Mbit/s signals are routed between 2 Mbit/s and Flexbus interfaces in a node. FIU 19 (E) can contain up to four cross-connection banks. Only one bank is active at a time and you must make the switch to the other bank manually.

The cross-connection banks can be created, copied, activated, renamed, and deleted.

If an Ethernet plug-in unit (EPIU) is used, it reserves part of the Flexbus capacity for Ethernet traffic. Thus, it is recommended that Ethernet traffic capacity is reserved before making 2 MB cross-connections. The capacity is reserved starting from the first 2 MB channel upwards in continuous range.

New cross-connection settings do not take effect until they have been sent to the node (**Manage** → **Send**). In addition, when removing or modifying an existing cross-connection, the changes have to be sent to the node before they can take effect.

In 2IU + 2OU protection, copying a cross-connection setting to a passive unit takes about one minute. During copying, the operation alarm *Operation mode: Fault in change-over function* is active.

The **Cross-connections** window contains one page for each cross-connection bank. The connections are displayed as lines between each of the Flexbus connector points. The selected connection is shown in red, the others in black. The selected connection points are also highlighted.

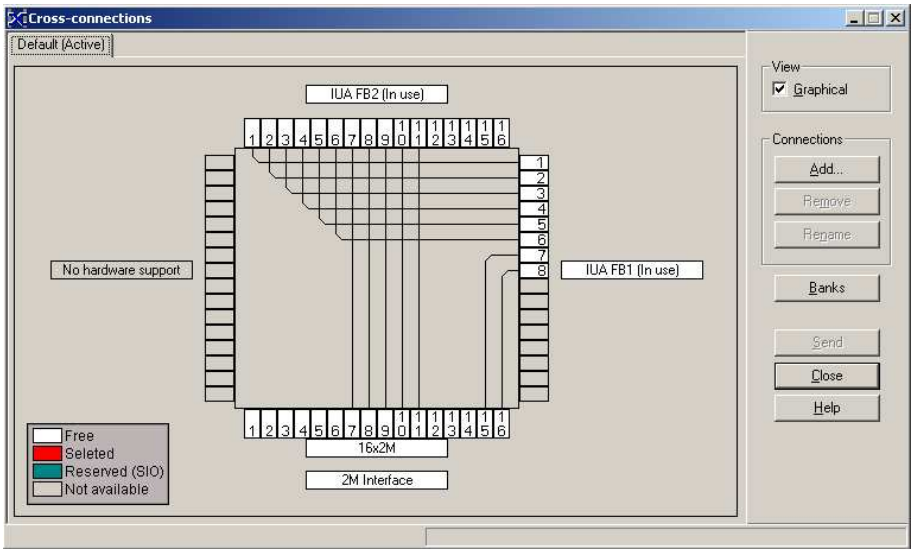

Figure 54. Example of cross-connections in unprotected mode

In 1IU + 2OU and 2IU + 2OU protection modes, common cross-connections for the protected Flexbus interfaces are displayed.

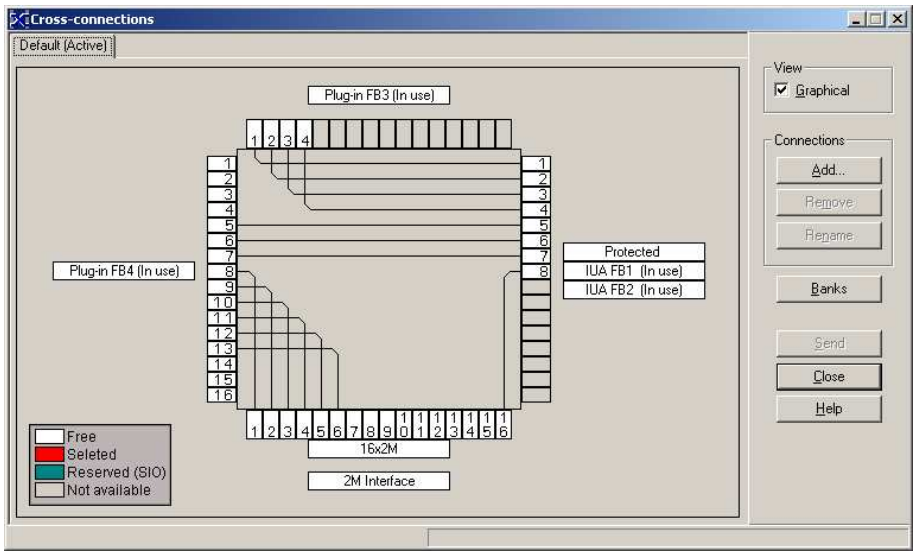

Figure 55. Example of cross-connections in protected mode

There are two methods of creating cross-connection banks. The first is via a graphical user interface (GUI), the other is *a list based method* for editing cross-connections. The list based method can be easier to use if, for example, you do not have a mouse on your computer. For more information, see **Online Help**.

Before adding a new connection, both connection points must be free. Also, when multiple cross-connections are added in the same operation, all connections have their names generated automatically.

Steps

1. **To create a new connection graphically, see Creating a new connection graphically**

2. **To create a new connection using the list based method, see Creating a new connection using a list based method**

Expected outcome

A new cross-connection is created after completing either one of the above steps.

4.13.2 Creating a new connection graphically

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, click Cross-connections → View cross-connections**

   The **Cross-connections** window opens.

   You can toggle between the graphic and list views by checking/unchecking **Cross-connections → Graphic view** or the checkbox in the toolbar.

2. **Click the first connection point so that it is highlighted**

3. **Click the second connection point**

   A new cross-connection appears on the **Cross-connections** window.

4. **Click the Send button to send the changes to the node**

Expected outcome

A new cross-connection is created and it is displayed in the **Cross-connections** window.

Further information

For more information, see *Overview of editing FIU 19 (E) cross-connections and cross-connection banks*.

4.13.3 Creating a new connection using a list based method

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Cross-connections → View cross-connections**

   The **Cross-connection** window opens.

   You can toggle between the graphic and list views by checking/unchecking **Cross-connections → Graphic view** or the checkbox on the toolbar.

2. **On the Hopper Manager menu, select Cross-connections → Add Connection**

   The **Add Cross-connection** dialogue box opens.

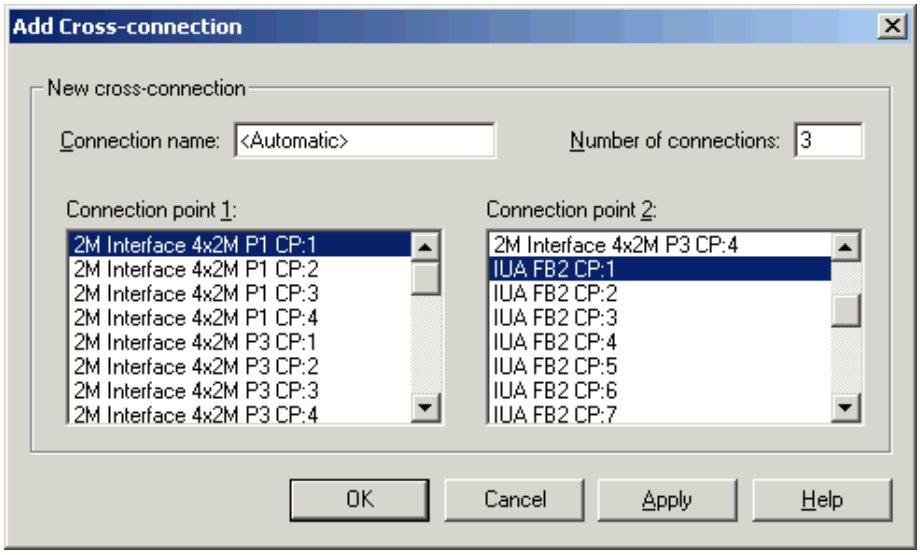

Figure 56. Add Cross-connection dialogue box

3. **In Connection name, type in the new cross-connection name**

4. **In Number of connections, select the number of cross-connections to be added**

5. **In Connection point 1 and Connection point 2, select the two connection points for the start and end of the connection**

If multiple connections are selected, these points are also the first of consecutive cross-connections.

6. **Click Apply**

7. **Click OK after creating the last connection**

   The **Add cross-connection** dialogue box closes.

8. **Click the Send button to send the changes to the node**

Expected outcome

A new cross-connection is created.

Further information

For more information, see *Overview of editing FIU 19 (E) cross-connections and cross-connection banks*.

4.13.4 Renaming a cross-connection

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Cross-connections → View cross-connections**

   The **Cross-connection** window opens.

2. **Select the connection or connections you wish to rename**

3. **On the Hopper Manager menu, select Cross-connections → Rename connection**

   The **Edit Connection Name** dialogue box opens.

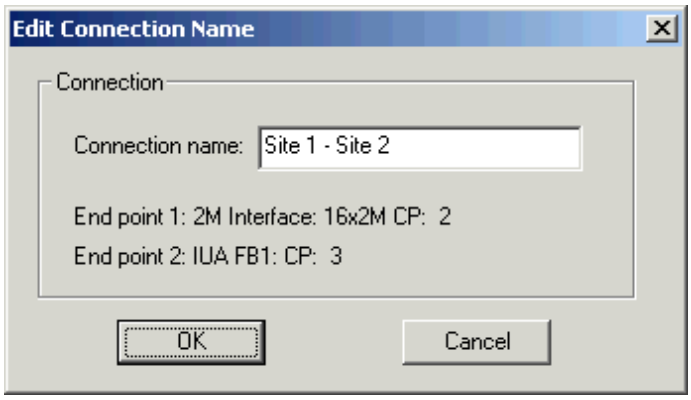

Figure 57. Edit Connection Name dialogue box

4. **In the Connection name textbox, type in the new name for the cross-connection, and click OK**

5. **Click the Send button to send the changes to the node**

Expected outcome

The cross-connection is renamed.

4.13.5 Deleting a cross-connection

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Cross-connections → View cross-connections**

   The **Cross-connections** window opens.

2. **Select the connection or connections you want to delete**

3. **On the Hopper Manager menu, select Cross-connections → Remove connection**

A confirmation dialogue box appears asking if you want to continue with the deletion. Click **Yes** to confirm the removal.

4. Click the Send button to send the changes to the node

Expected outcome

The cross-connection is deleted permanently.

4.13.6 Editing cross-connection banks

Purpose

Nokia FlexiHopper Plus with FIU 19 (E) network element can contain up to four cross-connection banks. The cross-connection banks can be created, copied, activated, renamed, and deleted in either one of the cross-connection windows.

New cross-connection settings do not take effect until they have been sent to the node (**Manage** → **Send**). In addition, when removing or modifying an existing cross-connection, the changes have to be sent to the node before they can take effect.

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. On the Hopper Manager menu, select Cross-connections → View cross-connections

The **Cross-connections** window opens.

2. On the Hopper Manager menu, select Cross-connections → Banks

The **Cross-connection bank management** dialogue box opens, displaying a list that contains all the cross-connection banks with their status.

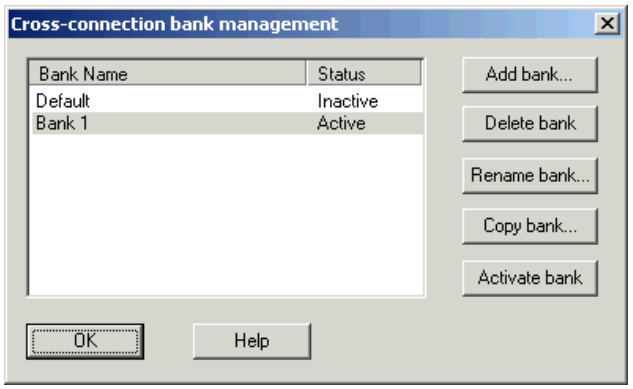

Figure 58. Cross-connection bank management dialogue box

3. To add a cross-connection bank, click the Add bank button in the Cross-connection bank management dialogue box

The **Add bank** dialogue box opens.

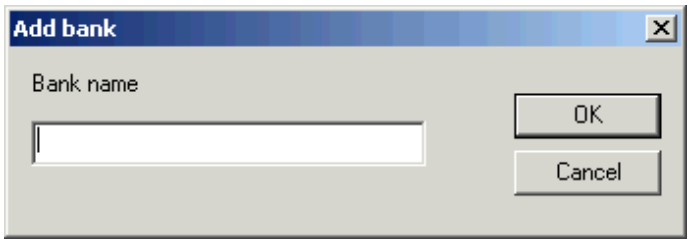

Figure 59. Add bank dialogue box

After giving the new bank a name and clicking **OK** it is added to the list.

4. To copy one bank into another, click the Copy bank button in the Cross-connection bank management dialogue box

The **Copy bank** dialogue box opens.

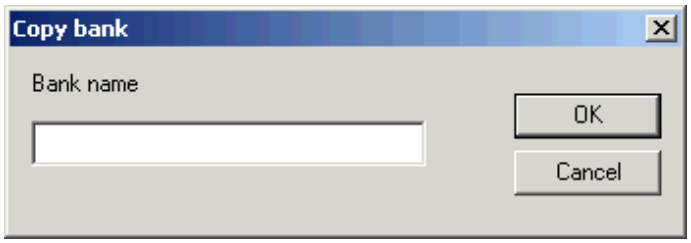

Figure 60. Copy bank dialogue box

This is useful if you want to create another cross-connection bank with only minor differences compared to the original.

5. **To activate a bank, select the bank and click the Activate bank button**

6. **To change the label of a bank, click the Rename bank button**

   The **Rename bank** dialogue box opens.

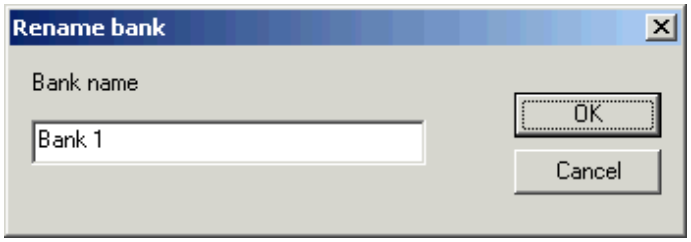

Figure 61. Rename bank dialogue box

Each bank name must be unique.

7. **To permanently remove a bank from the network element, select the bank you wish to delete and click the Delete bank button**

   A confirmation dialogue box appears asking for your approval. Click **Yes** to delete the selected bank.

8. **In the Cross-connection bank management dialogue box, click OK**

The changes are updated to the **Cross-connections** window.

9. Click the Send button to send the changes to the node

Expected outcome

Cross-connection banks have been edited.

4.13.7 Configuring Aux and PPP cross-connections

Before you start

Point-to-point protocol (PPP) cross-connections are only available in FIU 19E

Steps

1. Start Nokia Hopper Manager

For more information, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For more information, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Cross-connections → View AUX and PPP Cross-connections

The **AUX and PPP Cross-connections** dialogue box opens. All existing hardware (HW) interface buttons are enabled and the non-existing HW interface buttons are disabled.

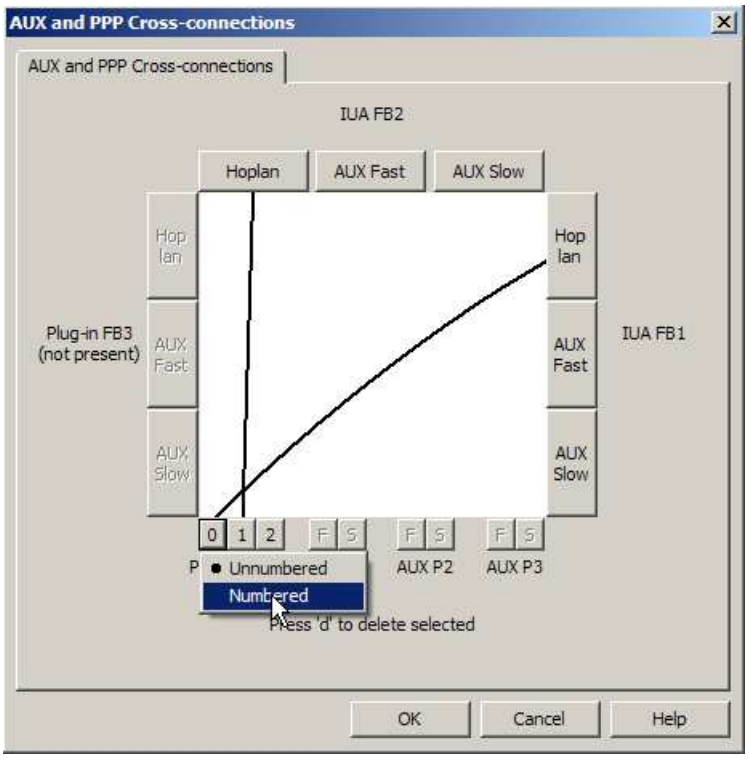

Figure 62. AUX and PPP Cross-connections dialogue box

4. Select the source connection point by clicking the connection button

The connection buttons are the following:

a. PPP interface 0, 1, or 2 (0 button, 1 button, or 2 button)

b. Aux Fast channel in plug-in unit (F button)

c. Aux Slow channel in plug-in unit (S button)

All possible target connection points are enabled and impossible target connection points are disabled.

To deselect a target connection point, right-click anywhere in the dialogue box.

5. Select the target connection point by clicking on one of the enabled target connection buttons

Select numbered or unnumbered PPP link type from pop-up menu.

a. Flexbus Hoplan overhead bits for PPP link use (Hoplan button)
b. AUX Fast overhead bits for PPP link use or Aux Fast channel of plug-in unit (AUX Fast button)
c. AUX Slow overhead bits for Aux Slow channel of plug-in unit (AUX Slow button)

A connection line appears between connection buttons.

6. To select the existing connection, click the connection button at the either end of the connection line

The connection line gets highlighted with red colour.

To deselect the connection click the other end of the selected connection line. The connection line turns back to the default colour (black).

7. To remove a connection line, select the line and press the d key on PC keyboard

The selected connection line disappears.

8. Click the OK button to send the changes to the node

Expected outcome

The Aux and PPP cross-connections have been configured. The new settings are sent to the node and the **AUX and PPP Cross-connections** window closes.

4.14 Changing fault and alarm settings

4.14.1 Changing the alarm settings

Purpose

In the alarm settings you can change the current state of an alarm to *normal*, *forced on*, or *forced off*. Usually an alarm should be left in the normal state. This allows the alarm to be activated and deactivated as various fault conditions arise in the network element.

In some cases, such as testing, it may be necessary to force an alarm on or off. When an alarm is forced off, it is not activated even if a fault condition arises, which would normally cause that particular alarm. If an alarm is forced on, it is always active.

Programmable Interface (PI) bits are also associated with each alarm. They can be used with the Aux data plug-in unit to connect the FIU 19 (E) to external alarm devices, such as display lights. Each alarm can be connected with up to eight PI bits. These bits are then connected to one of the interfaces on the Aux data plug-in unit. This way, it is possible to collect alarms into up to eight categories. Each of these PI bits can be connected to activate one particular Aux data plug-in output.

PI bits are only accessible for indoor unit alarms. The outdoor unit alarms do not support this feature.

Before you start

To change the network element fault handling, see *Configuring network element settings*.

Steps

1. Start Nokia Hopper Manager

For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Alarms → Fault settings

The **Fault Settings** dialogue box opens.

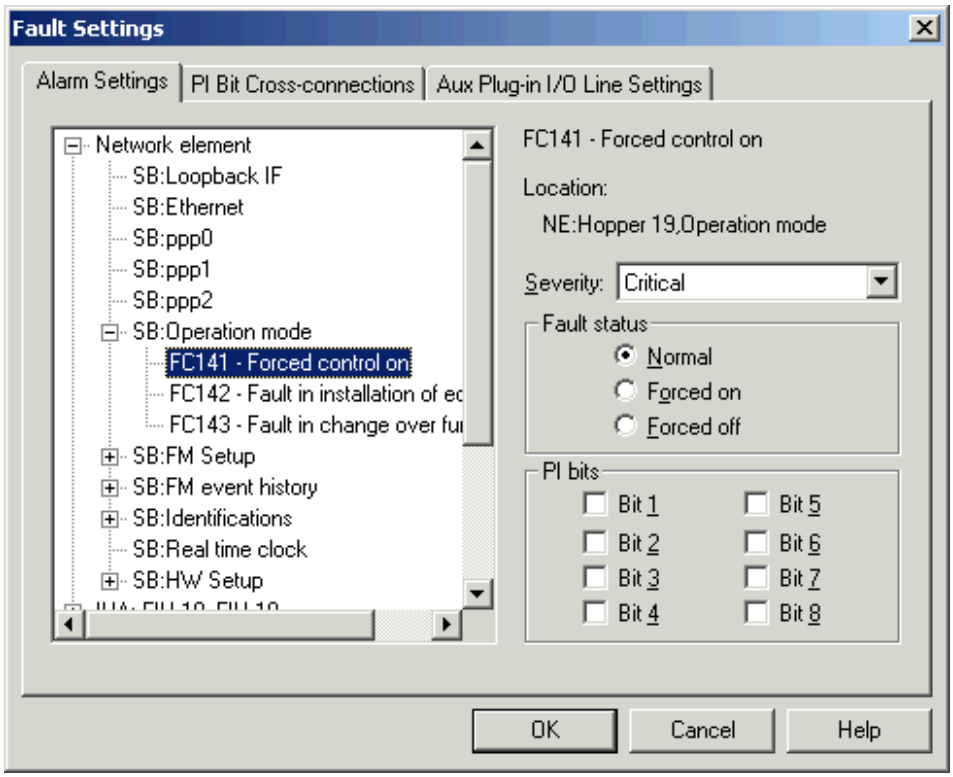

Figure 63. Fault Settings dialogue box

4. Select the alarm to be configured

In the list in the left pane of the dialogue box, select:

- appropriate functional entity
- supervision block (SB)
- alarm fault code (FC).

5. Change the status of an alarm, if necessary

To change the status of the alarm, click one of the buttons:

- **Normal**
- **Forced on**
- **Forced off**.

When using the simple network management protocol (SNMP) management, disturbance alarms (< 1 second) are sent as warnings.

6. **To connect the alarm to a PI bit, select the bit(s) by checking the checkboxes in the PI bits field**

7. **Click OK to send the changes to the node**

Expected outcome

The alarm settings have been changed.

4.14.2 Changing the alarm configurations to reduced mode

Before you start

Hopper Manager has a tool for settings the node alarm configurations to reduced state. In reduced state several alarms are forced off from all units present.

Steps

1. **To set alarm configurations to reduced mode, select Alarms → Fault Settings Configurations → To Reduced Configuration in the Hopper Manager menu**

   The progress dialog opens.

   Expected outcome

   Alarms are suppressed.

2. **To set alarm configurations to full mode, select Alarms → Fault Settings Configurations → To Full Configuration in the Hopper Manager menu**

   The progress dialog opens.

   Expected outcome

   All alarms are available.

4.14.3 Commissioning the alarm input of the Aux data plug-in unit

Purpose

The I/O (input/output) lines of the Aux data plug-in are used to connect an external device to FIU 19 (E).

For an I/O line to operate, it must be marked as being in use, it must also be given a normal state and either an operation mode *input* or *output*.

I/O lines marked as outputs can be used together with the Programmable Interface (PI) bits to connect various alarms to an external device. If an I/O line is marked as an input, it always causes an alarm event in the Aux data plug-in unit when that I/O line becomes active. The alarm is *Active alarm point* for the particular line.

External alarm input information can be read using for example NMS, but it can only be read from that indoor unit in which the Aux data plug-in unit is installed.

Steps

1. Start Nokia Hopper Manager

For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Alarms → Fault settings

The **Fault Settings** dialogue box opens.

4. Select the Aux Plug-in I/O Line Settings tab

5. Set the I/O line configuration

Select the appropriate Aux data plug-in unit by clicking the button on the left in the dialogue box.

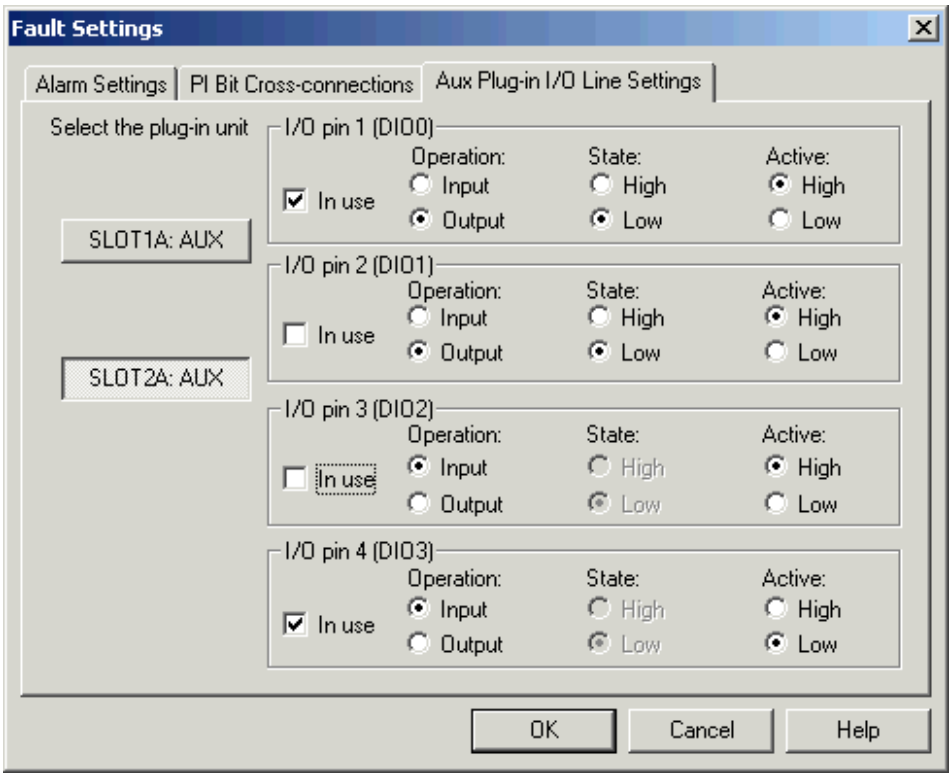

Figure 64. Input/output settings in the Fault Settings dialogue box

There is one button for each present Aux data plug-in unit.

When an Aux data plug-in unit is selected, the rest of the page displays all the I/O line settings for that plug-in unit. These settings can then be modified as required.

Each I/O line must be configured correctly, which means that it must have a normal and an active state set. The normal state is configured under the *State* and the active under the *Active* setting. There are *High* and *Low* options for each.

6. Configure the settings of the selected I/O pin

Configure the following settings:

- In use
- Input operation
- Input/output polarity active high or low.

The I/O pins are DIO0..3 in TTL level input use.

The alarm appears, for example, as *SLOT1A:AUX I/O1 Active alarm point*.

7. Click OK to send the changes to the node

Expected outcome

The alarm input of the Aux data plug-in unit has been commissioned.

4.14.4 Commissioning the alarm output of the Aux data plug-in unit

Before you start

Up to 4 alarms outputs might be configured for each Aux data plug-in unit. Maximum two Aux data plug-in units can be used.

Steps

1. Start Nokia Hopper Manager

For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Alarms → Fault settings

The **Fault Settings** dialogue box opens.

4. Select the Aux plug-in I/O Line Settings tab

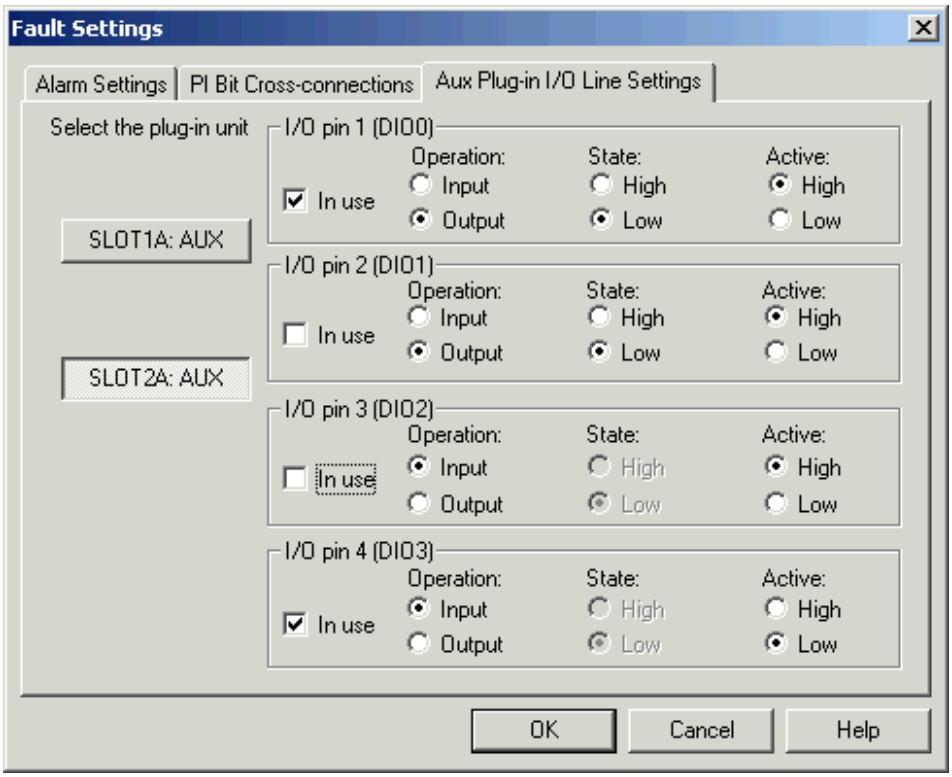

Figure 65. Input/output settings in the Fault Settings dialogue box

5. Configure the settings of the selected I/O pin

Configure the following settings:

- In use
- Input operation
- Input/output polarity active high or low.

6. Change the alarm settings if needed

For instructions, see *Changing the alarm settings*.

7. Select the PI Bit Cross-connections tab and cross-connect the particular I/O pin to the PI bit

For instructions, see *Creating PI bit cross-connections*.

The I/O pins are DIO0..3 in TTL level input use.

8. Click OK to send the changes to the node

Expected outcome

The alarm output of the Aux data plug-in unit has been commissioned.

4.14.5 Creating PI bit cross-connections

Purpose

The PI (Programmable Interface) bit cross-connections determine which of the Aux data plug-in I/O (input/output) lines are activated when an alarm with that PI bit set becomes active. Because the FIU 19 (E) can support two different Aux data plug-in units (in single mode), up to 8 different I/O lines can be available.

Only Aux data plug-in I/O lines, which have been configured as outputs, can be used for creating connections with the PI bits.

Steps

1. Start Nokia Hopper Manager

For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. Set the outputs

For instructions, see *Commissioning the alarm output of the Aux data plug-in unit*.

4. On the Hopper Manager menu, select Alarms → Fault settings

The **Fault Settings** dialogue box opens.

5. Select the PI Bit Cross-connections tab

6. Click on the buttons at the two end points for the connection

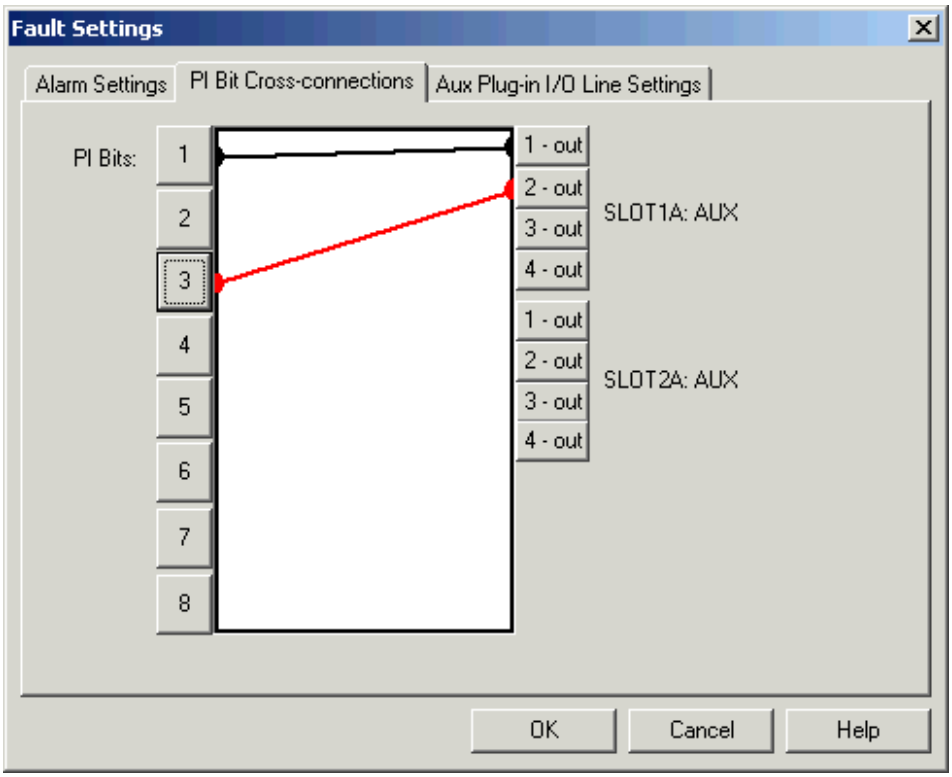

Figure 66. Fault Settings dialogue box

The new connection is displayed in red in the dialogue box.

7. Click OK

Expected outcome

A new PI bit cross-connection is created.

4.14.6 Deleting PI bit cross-connections

Purpose

The PI (Programmable Interface) bit cross-connections determine which of the Aux data plug-in I/O (input/output) lines are activated when an alarm with that PI bit set becomes active. Because the FIU 19 (E) can support two different Aux data plug-in units (in single mode), up to 8 different I/O lines can be available.

Steps

1. Start Nokia Hopper Manager

For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Alarms → Fault settings

The **Fault Settings** dialogue box opens.

4. Select the PI Bit Cross-connections tab

5. Click one of the end points and press the DEL key on your PC keyboard, or use the pop-up menu to delete a PI bit cross-connection

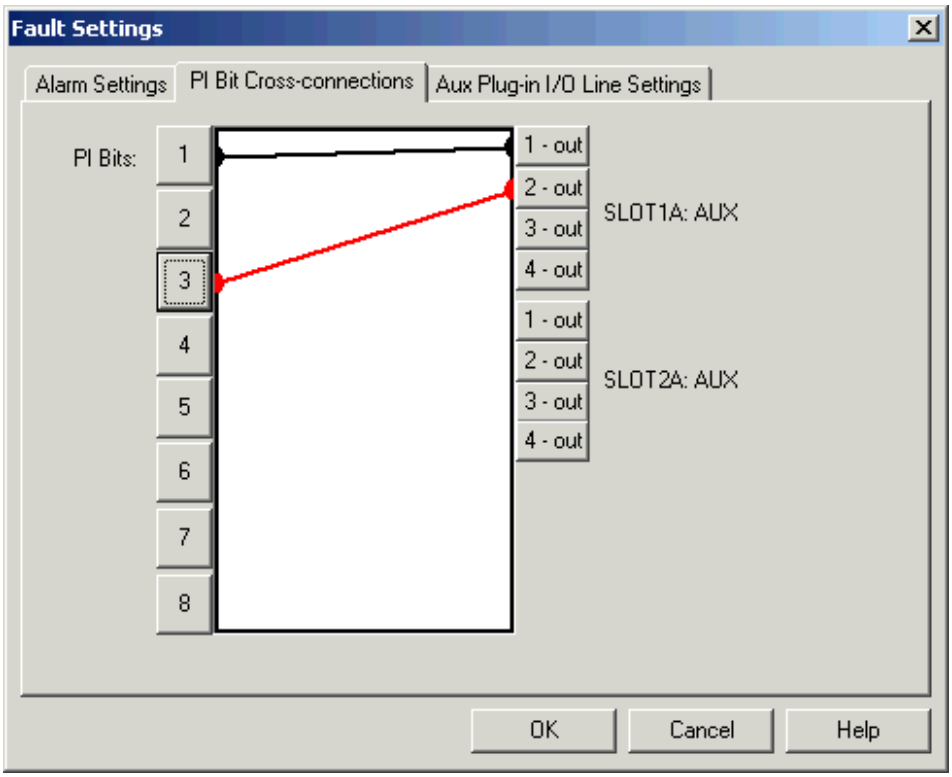

Figure 67. PI Bit Cross-connections tab in the Fault Settings dialogue box

A confirmation dialogue box appears asking whether you want to delete the cross-connection. Click **Yes** to delete the connection.

6. Click OK to send the changes to the node

Expected outcome

The PI bit cross-connection is deleted.

4.14.7 Commissioning a user controllable output of the Aux data plug-in unit

Steps

1. Start Nokia Hopper Manager

For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Alarms → Fault settings

The **Fault Settings** dialogue box opens.

4. Select the Aux Plug-in I/O Line Settings tab

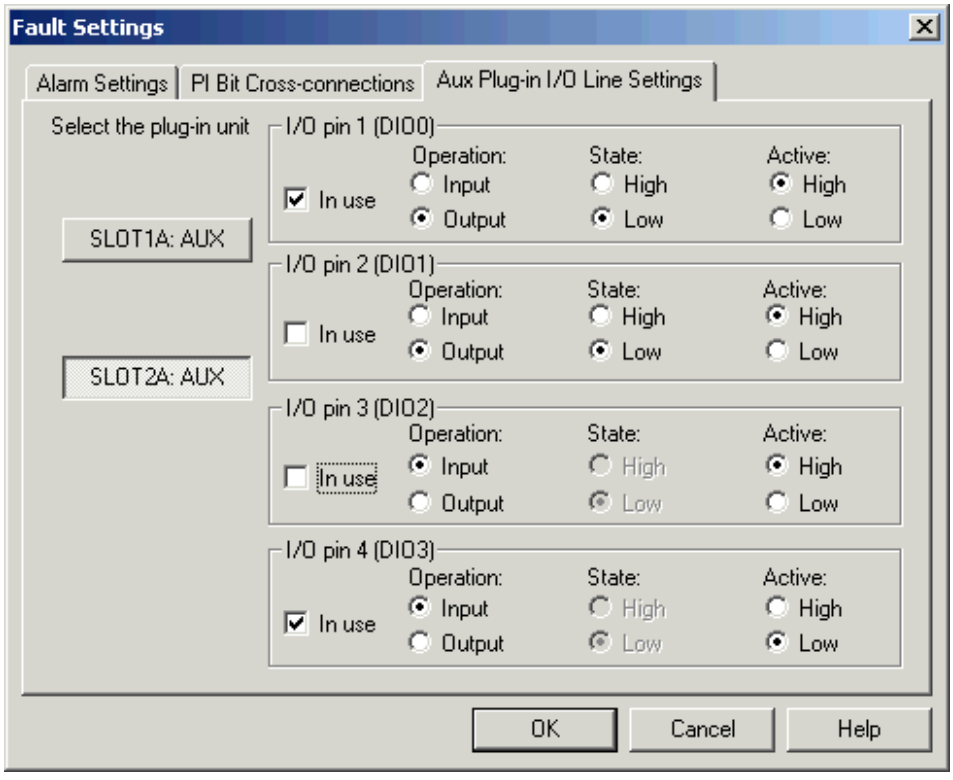

Figure 68. Input/output settings in the Fault Settings dialogue box

5. Check that the particular I/O pin is not cross-connected to any programmable interface (PI) bit

For more information, see *Deleting PI bit cross-connections*.

6. Configure the settings of the selected I/O pin

Configure the following settings:

- In use
- Output operation
- Input/output polarity active high or low.

7. Click OK to send the changes to the node

Expected outcome

A user controllable output of the Aux data plug-in unit has been commissioned.

4.14.8 Commissioning Aux plug-in unit with FIU 19E outdoor case

Before you start

Aux plug-in unit is used in FIU 19E outdoor solution to relay fan alarms. If one of the two fans fails an alarm will be generated and transmitted through Aux plug-in unit. The recommended slot for Aux plug-in unit in outdoor installed FIU 19E is Slot1.

Fan alarm can be read using for example NMS, but it can only be read from that indoor unit in which the Aux data plug-in unit is installed.

Steps

1. Check that Aux cable is connected between Aux plug-in unit port 2 and fan controller board

2. Commission Aux plug-in unit

Configure the following settings:

I/O Line Settings:

- I/O pin 1 (DIO0)
  - Operation: Input
  - Active: High
- I/O pin 2 (DIO1)
  - Operation: Output
  - State: High
  - Active: High

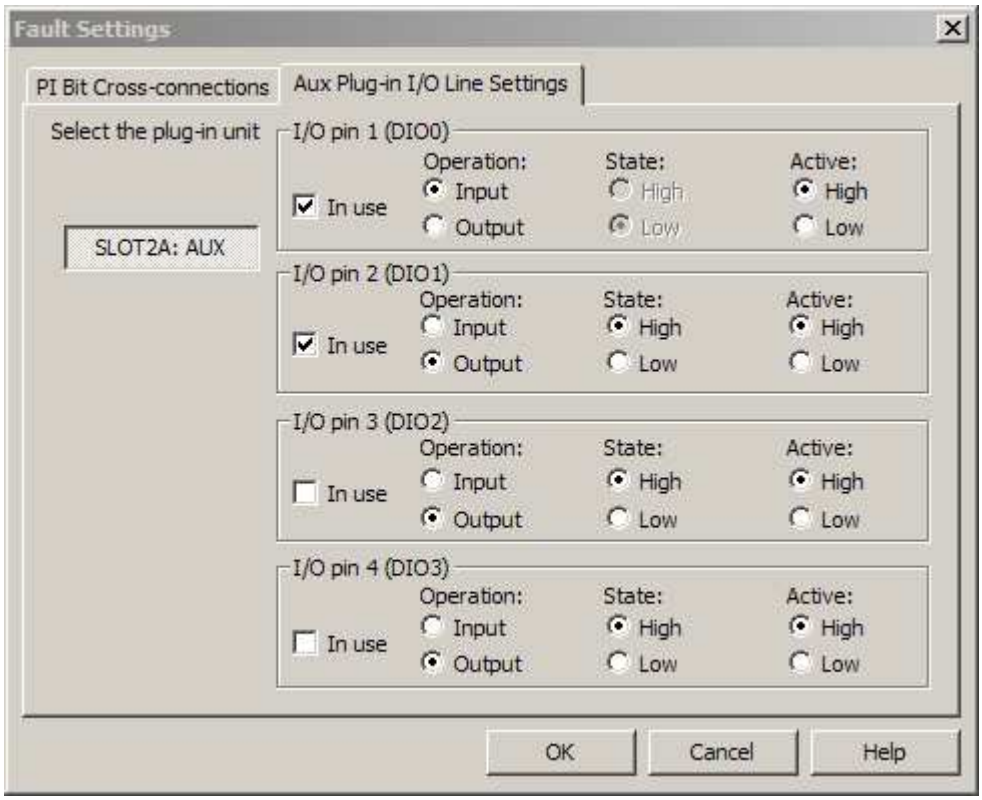

Figure 69. FIU 19E outdoor case Aux plug-in I/O line settings

For more information, see *Commissioning the alarm input of the Aux data plug-in unit* and *Commissioning the alarm output of the Aux data plug-in unit*.

4.15 Configuring performance management settings

4.15.1 Configuring FIU 19 (E) performance management settings

Purpose

Many of the units that contain configuration settings also have performance management settings. The performance management settings include various threshold values for alarms as well as gating times for bit error ratio (BER) measurements.

The protected hop performance settings are located in the **Network Element Settings** dialogue box. The Flexbus, pseudo-random binary sequence (PRBS), and power supply performance settings are located in the **Indoor unit settings** dialogue box. The protected hop is only available in protected modes.

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select *Network element* or *IU*, and click Modify**

   The **Network Element Settings** dialogue box or the **IU settings** dialogue box opens.

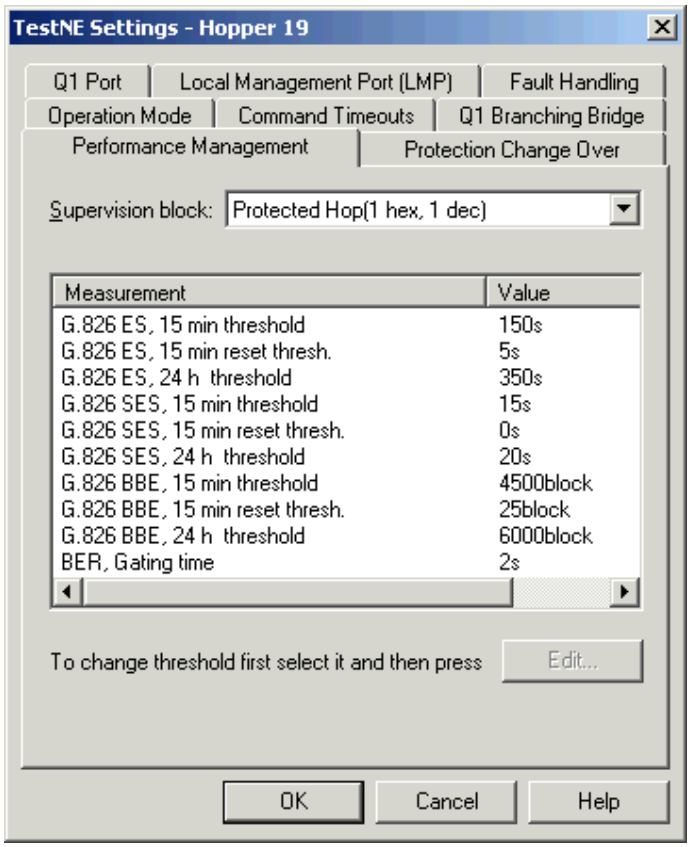

Figure 70. Network Element Settings dialogue box

3. **Select the Performance Management tab**

4. **In the drop-down list, select a Supervision block and then the value in the main list**

5. **Click the Edit button to change the value**

   The **Change Threshold Value** dialogue box opens.

6. **In the Value text box, enter a new value for the threshold and click OK**

   The **Change Threshold Value** dialogue box closes.

7. **In the Network Element Settings dialogue box, click OK to send the changes to the node**

Expected outcome

The FIU 19 (E) performance management settings have been configured.

4.15.2 Configuring FlexiHopper (Plus) outdoor unit performance management settings

Purpose

Many of the units that contain configuration settings also have performance management settings. The performance management settings include various threshold values for alarms as well as gating times for bit error ratio (BER) measurements.

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select the required unit and click Modify**

   The **FlexiHopper Settings** dialogue box opens.

3. **Select the Performance Management tab**

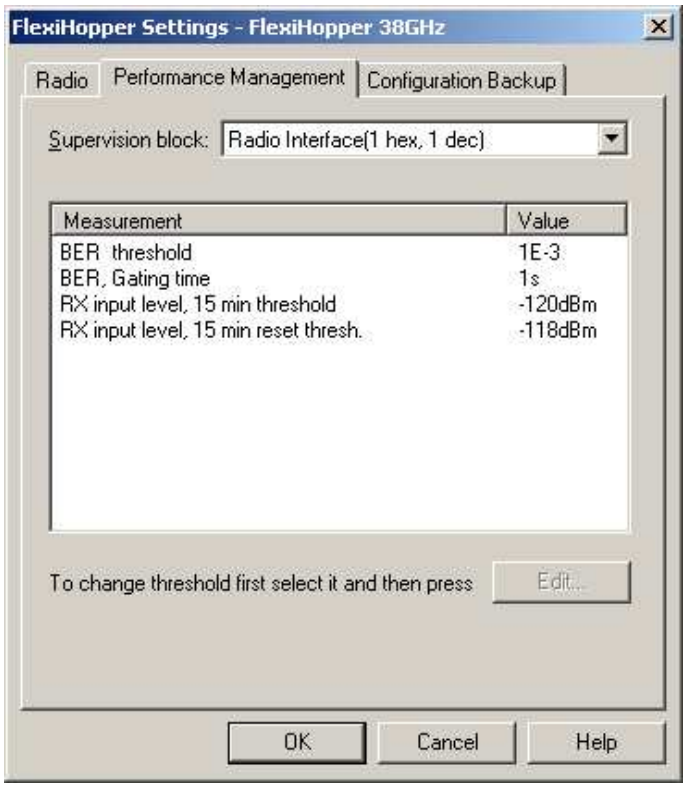

Figure 71. Performance Management tab in the FlexiHopper Settings dialogue box

4. In the drop-down list, select a Supervision block and then select the value in the main list

5. Click the Edit button to change a value

The **Change Threshold Value** dialogue box opens.

6. Change the settings and click OK

The **Change Threshold Value** dialogue box closes.

7. In the FlexiHopper Settings dialogue box, click OK to send the changes to the node

Expected outcome

The FlexiHopper (Plus) outdoor unit performance management settings have been configured.

4.16 Overview of configuring access rights with Nokia Hopper Manager

Purpose

Security in Nokia Hopper Manager is governed by the network element. If security settings are in use, no changes, temporary or permanent, can be made to the network element.

A password must be entered in order to make changes to the network element. The password gives you access rights which allow you to make changes until the rights expire. The timeout for the access rights is set in the **Settings** dialogue box.

If you forget your password, see *Forgotten Hopper password*.

Steps

1. **To configure security settings and switch the node security off permanently, see Configuring security settings and switching the node security off permanently**
2. **To gain access rights, see Gaining access rights**
3. **To cancel access rights, see Cancelling access rights**
4. **To change the password, see Changing the password with Nokia Hopper Manager**

Expected outcome

The access rights have been configured.

4.17 Configuring security settings and switching the node security off permanently

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Node Security → Settings**

   The **Node Security Settings** dialogue box opens.

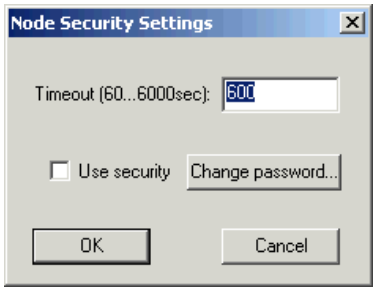

Figure 72. Node Security Settings dialogue box

2. **Uncheck the Use security checkbox to disable security**

3. **Click OK to send the changes to the node**

Expected outcome

The security settings have been configured and the node security is off permanently.

4.18 Gaining access rights

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Node Security → Activate Access Rights**

   Or

   Enter the password when prompted by Nokia Hopper Manager (for example, when changing the settings).

   The **Activate Access Rights** dialogue box opens.

2. **Enter the password and click OK**

Expected outcome

Access rights have been gained.

4.19 Cancelling access rights

Steps

1. **On the Hopper Manager menu, select Configure → Node Security → Cancel Access Rights**

Expected outcome

The access rights have been cancelled and no further changes can be made to the network element.

4.20 Changing the password with Nokia Hopper Manager

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Node Security → Settings**

The **Node Security Settings** dialogue box opens.

2. **Click the Change password button**

   The **Change Password** dialogue box opens.

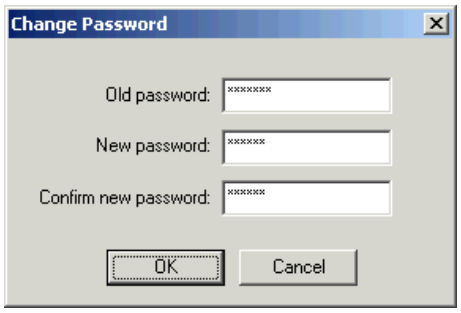

Figure 73. Change Password dialogue box

3. **In the Old password text box, type in the old password**

4. **In the New password text box, type in the new password**

5. **In the Confirm new password text box, type in the new password again and then click OK**

   The **Change Password** dialogue box closes.

6. **In the Node Security Settings dialogue box, click OK to send the changes to the node**

Expected outcome

A new password is created, and the old one no longer applies.

If you forget your password, see *Forgotten Hopper password* in document *Troubleshooting Nokia FlexiHopper (Plus)*.

4.21 Overview of backing up configuration settings

Purpose

The Nokia FlexiHopper (Plus) outdoor unit and the FIU 19 (E) indoor unit support configuration backup. This feature makes it possible to create a backup copy of important unit configuration information. This information can be used in restoring unit settings, or in case of an error.

Backups can be made automatically or manually using the Nokia Hopper Manager. Restorations are done manually using the Nokia Hopper Manager.

Steps

1. **To set the automatic backup, see Setting the automatic backup**
2. **To back up the settings manually, see Backing up the settings manually**
3. **To restore the settings for a unit, see Restoring the settings for a unit**

Expected outcome

The configuration settings have been backed up.

4.22 Setting the automatic backup

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select the indoor or outdoor unit and click Modify**

   A dialogue box for the settings opens.

3. **Select the Configuration Backup tab**

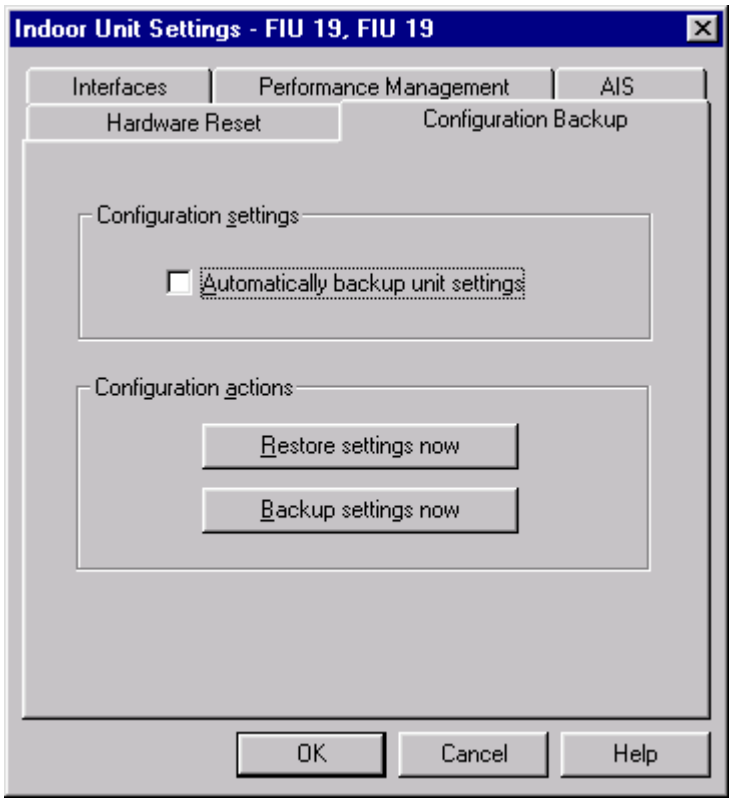

Figure 74. Configuration backup settings

4. Check the Automatically backup unit settings checkbox

Note

User notes are not included in the configuration backup. When the configuration backup is restored, any user notes will be lost.

Caution

If automatic backup is enabled when replacing a unit, you will lose the backup after connecting the unit to the indoor unit. Always disable automatic backup before replacing a unit.

5. Click OK to send the changes to the node

Expected outcome

An automatic back up has been set. Any changed unit settings are backed up. There is a short delay between the change and the backup.

4.23 Backing up the settings manually

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select indoor or outdoor unit and click Modify**

   A dialogue box for the settings opens.

3. **Select the Configuration Backup tab**

4. **Click the Backup settings now button**

   A confirmation dialogue appears asking whether you want to continue. Click **Yes** to back up settings right away.

5. **Click OK to send the changes to the node**

Expected outcome

The settings have been backed up manually.

4.24 Restoring the settings for a unit

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

In some cases, when restoring settings, some other action may be required before the settings are taken into use. For example, when restoring a protected configuration of FIU 19 (E) to an indoor unit, it may be necessary to reset the unit before the protection setting is activated.

Note

If the node is managed with the Simple Network Management Protocol (SNMP), perform a reset. The reset interrupts traffic.

Steps

1. **On the Hopper Manager menu, select Configure → Settings**

   The **Select Object** dialogue box opens.

2. **Select indoor or outdoor unit and click Modify**

   A dialogue box for the settings opens.

3. **Select the Configuration Backup tab**

4. **Click the Restore settings now button**

   A confirmation dialogue box opens asking you whether you want to continue. Click **Yes** to restore the settings.

5. **Click OK to send the changes to the node**

Expected outcome

The unit settings have been restored.

5 Verifying commissioning

5.1 Measuring fading margin

Before you start

Note

Automatic fading margin measurement (AFMM) cuts the transmission over the radio hop.

Steps

1. **Connect locally**

   For more information, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

2. **On the Hopper Manager menu, select Maintenance → Performance → Fading Margin Measurement**

   The **Select Object** dialogue box opens.

3. **Select a FlexiHopper (Plus) outdoor unit**

4. **Click OK**

5. **Click the Do Measurement... button to begin the measurement**

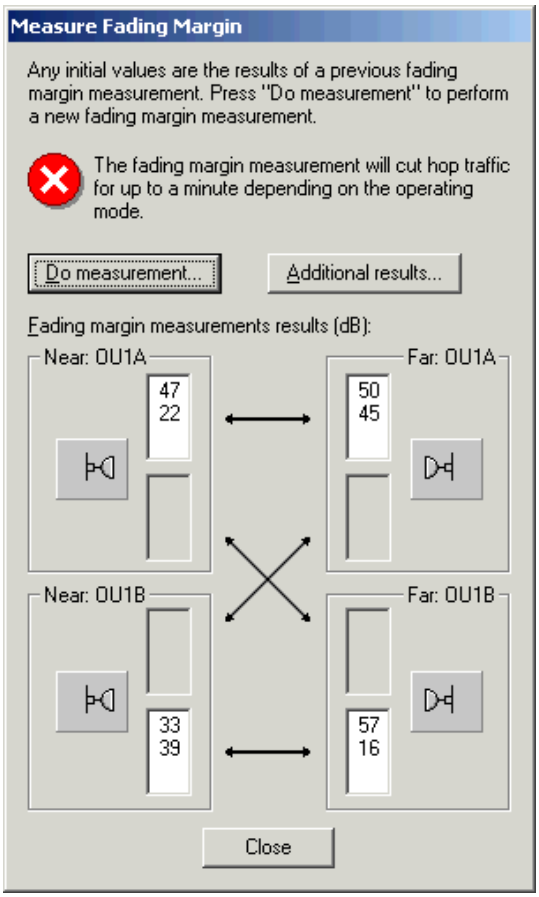

Figure 75. Measure Fading Margin dialogue box

The once displayed measurement results are displayed when you re-open the dialogue box.

Each time you perform a measurement, it is added to the list so that any changes are easily noticeable. The number of results returned depends on the operating mode of the network element. Note also, that the fading margin value should not be confused with the *ALCQ set point* value used with automatic transmit power control (ALCQ).

6. Click Additional results... to see more detailed measurement results

This dialogue box shows the noise level and the maximum Rx level between each radio in the hop as recorded during the fading marging measurement.

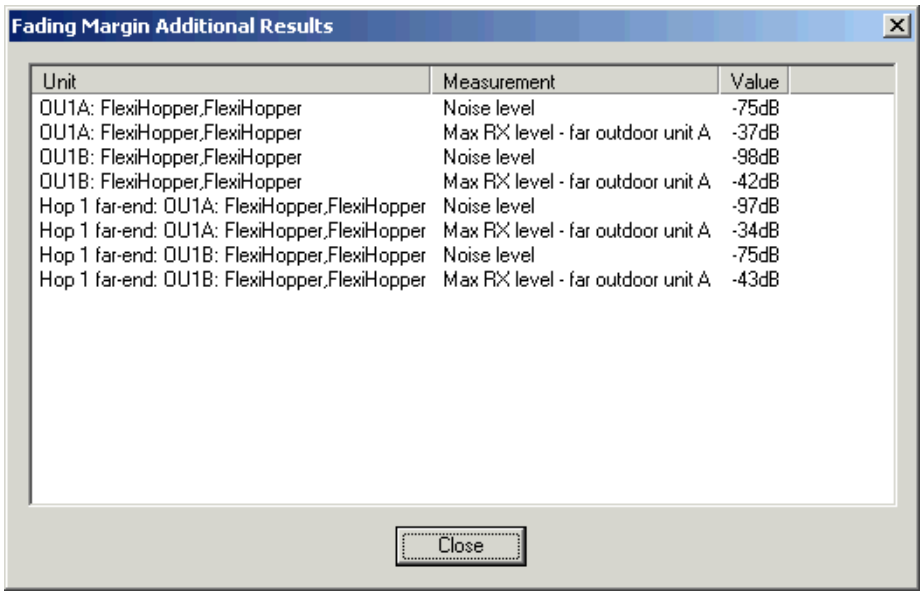

Figure 76. Fading Margin Measurement Additional results dialogue box

7. Click OK

The **Measure fading margin** dialogue box closes.

Expected outcome

The fading margin has been measured. The results are displayed in a list.

Further information

For more information on ALCQ, see the relevant technical note in Maintenance Documentation in NOLS under Transmission and Backbone → Microwave Radios → Nokia FlexiHopper (Plus) Microwave Radio.

5.2 Monitoring the hop

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

It is recommended that you monitor the hop for at least half an hour after all settings have been made at both ends of the hop.

Steps

1. Reset the statistics and counters, and let the hop operate for half an hour (or longer, if necessary)

For more information, see *Resetting the statistics and counters* in document *Monitoring Nokia FlexiHopper (Plus)*.

2. After the time has passed, check that the signal quality statistics and counters do not show any undesired values

Expected outcome

If the signal quality is acceptable (total time = availability time), and there are no unexpected alarms, the monitoring of the hop is complete.

Unexpected outcome

If any unavailability time occurs during monitoring, repeat the monitoring.

6 Creating reports

6.1 Creating a commissioning report

Purpose

Nokia Hopper Manager provides the possibility to create a report that includes a list of the basic settings and information about the network element. You can also create an additional report which contains statistics and commissioning measurement results. However, a report on other items or longer term radio hop monitoring must be created manually.

Before you start

Nokia Hopper Manager software application is running on your computer and a connection to the node has been established.

Steps

1. **On the Hopper Manager menu, select Manage → Commissioning Report**

   The **Commissioning Report** dialogue box opens.

2. **In the Measurement item list, select the items to be included in the commissioning report, and click Next**

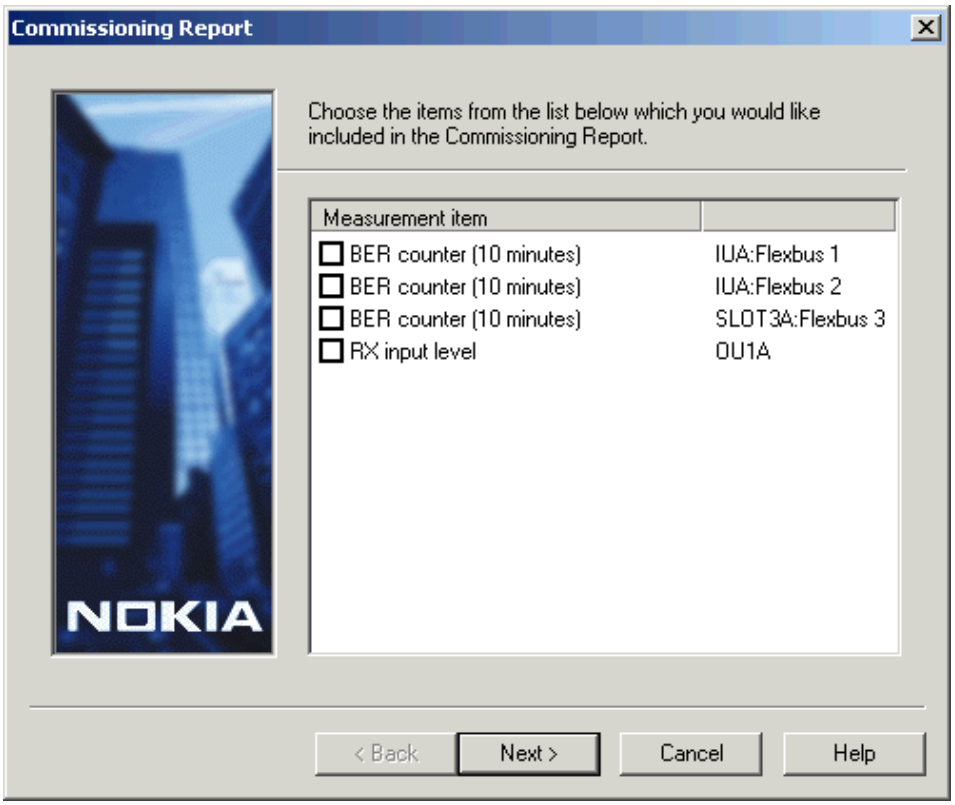

Figure 77. Commissioning Report dialogue box - Measurement item list

3. In the Commissioning report file text box, select a name for the file and the path where to save it, and click Next

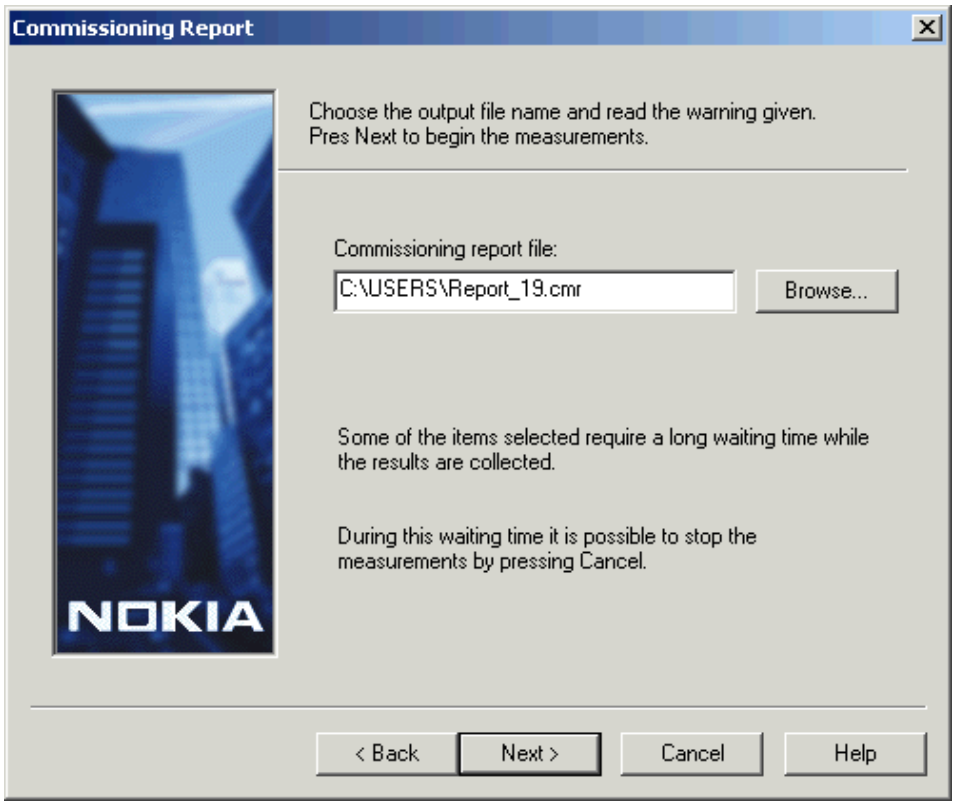

Figure 78. Commissioning Report dialogue box - Commissioning report file

The commissioning report is prepared in approximately 10 minutes.

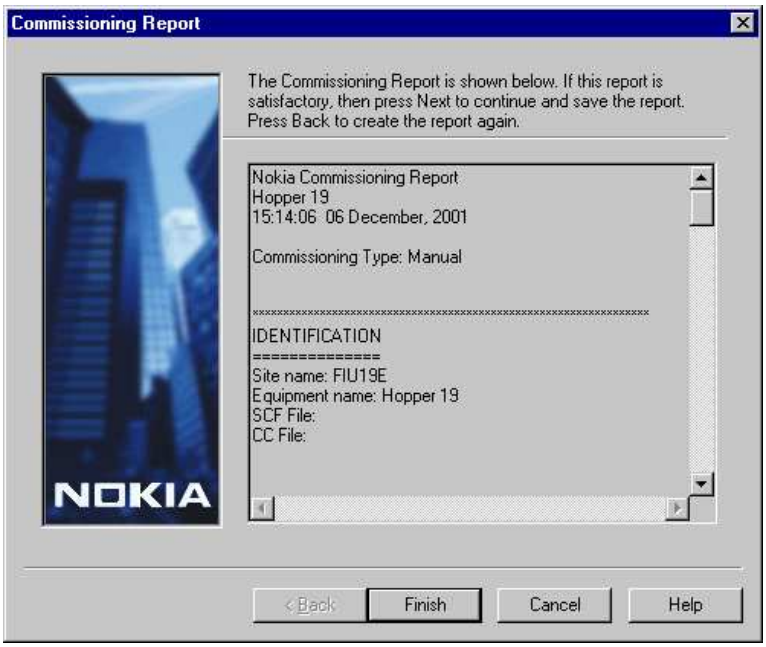

Figure 79. Commissioning report dialogue box - Summary

4. Click Finish

Expected outcome

A commissioning report is created.

6.2 Creating a configuration report

Steps

1. Start Nokia Hopper Manager

For instructions, see *Starting Nokia Hopper Manager* in document *Administering Nokia FlexiHopper (Plus)*.

2. Connect to FIU 19 (E) node

For instructions, see *Connecting locally* in document *Administering Nokia FlexiHopper (Plus)*.

3. On the Hopper Manager menu, select Configure → Configuration report

The **Report view - View level selection** dialogue box opens.

Figure 80. Report view - View level selection dialogue box

4. Select the level of detail in the report

a. Only the main hardware unit specific attributes to report the identification and installation information.

b. The main hardware unit and interface attributes to report all identifications and interface settings.

5. Click the OK button to start refreshing the attributes from the node

The refreshing operation may take several minutes. The progress bar displays the refreshing status.

The **Report view** window opens after all attributes are read.

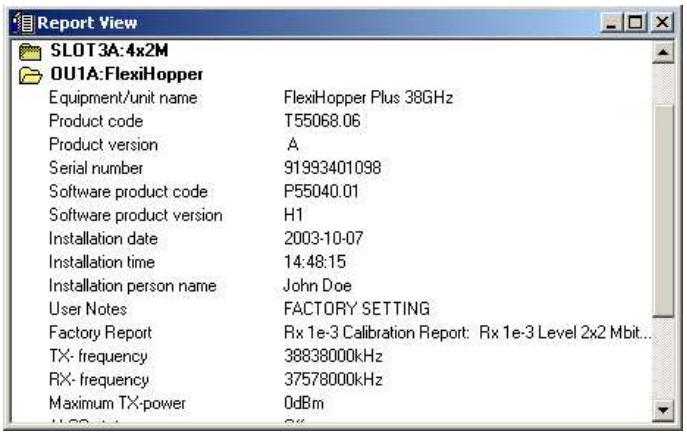

Figure 81. Report view window

6. To expand each configuration item in the Report view window, select the item and double-click or press ENTER on the PC keyboard

7. Save or print the report

For instructions, see *Exporting information to a text file* and *Printing in a Hopper Manager window* in document *Administering Nokia FlexiHopper (Plus)*.

Expected outcome

A configuration report is created.

7 Example of a transmission installation report

FlexiHopper (Plus) terminal information

Note that each hop requires a separate report.

Hop_____/_____

Near-end_____/_____

Far-end_____/_____

Connected in Flexbus:____1 ____2 ____3 ____4

Near-end frequency: _____kHz

Maximum transmit power: _____dBm

Connected in Flexbus:____1 ____2 ____3 ____4

Far-end frequency :_____kHz

Maximum transmit power: _____dBm

Flexbus capacity:____1 ____2 ____3 ____4

Indoor unit capacity: _____x 2Mbit/s

Interleaving status: _____Off _____Depth 2 _____Depth 4

ALCQ (ATPC):_____ON _____OFF

Scramber: ____1 ____2

Modulation type: _____ 4-state _____ 16-state

Licence type: _____ short-term _____ long-term

Licence list:

16-state modulation: ____
SNMP: ____
OSPF: ____
2nd Flexbus: ____
8xE1 capacity: ____
8 to 16xE1 capacity: ____
16xE1 capacity: ____

Fading margin measurement performed: ____(YES)

Average result: _____dB

Outdoor unit and cable installation

Table 11. Method of installation (outdoor unit)

Roof mounting		Wall mounting	
Tower installation		Pole installation	
Inhouse			

Table 12. General information about antenna and cables

Near-end antenna product code and/or antenna size and manufacturer	_____
Far-end antenna product code and/or antenna size and manufacturer	_____

ITEM	TERMINAL A
Antenna height (from ground/sea level)	_____/_____m
Cable length (between IU and OU)	_____m
Cable type (between IU and OU)	RG-_____

Table 13. Outdoor unit and cable Installation checklist

INSTALLATION ITEM CHECKED	Pass	Fail
General appearance of outdoor unit		
IU-OU cables marked and connected to OU		
OU link address clearly marked		
All external connectors and cables checked for correct sealing		
Grounding of outdoor unit		
Grounding of IU-OU cables		

Notes on FlexiHopper (Plus) check:_____

Indoor unit installation

Table 14. Method of installation (indoor unit)

FIU 19/FIU 19E	Site support cabinet/BBU	
	Mounting onto 19” rack	
	Other equipment	
	Name:_____	

Table 15. Indoor unit installation checklist

ITEM	Pass	Fail
General appearance of IU		
IU-OU cables marked and connected to the IU		
2 Mbit/s cables labelled		
Power cable connected to IU		
Separate power supply for FB plug-in unit		
FB plug-in unit power cable connected		
Power supply cables securely attached		
Cables arranged and secured to cable tray		
2Mbit/s attached to DDF/ BTS (other equipment)		
Q1 / 10BaseT cable connected		
All equipment grounded and securely fastened		
Alarm cable connected & labelled		
Aux-data: cable connected & labelled		

Table 15. Indoor unit installation checklist (cont.)

Ethernet plug-in unit: cables connected & labelled		

Test reports

FlexiHopper (Plus) configuration report

Is included in site folder_____Yes _____No

Node (*.nod) files

Is included in site folder_____Yes _____No

Inventory checklist

Refer to unit labels for version and serial numbers.

Table 16. Indoor and outdoor units

	ITEM_____	CHECKED_____
OUTDOOR UNIT		
Serial number		
Program (Version)		
INDOOR UNIT		
Serial number		
Program (Version)		

Installation inspection

Outdoor unit installation	Pass	Fail
Installation completed and checklist filled		
Indoor unit installation		
Installation completed and checklist filled		
IU-OU Cables		
Installation completed and checklist filled		
Transmission		

Installation completed and checklist filled		

Customer name:_____	Site address:_____
Coordinates: latitude:	 longitude:
Contract No.:	
Delivery No.:	
Site name:	
Site No.:	

STAGE	COMPLETE/ OK (Initials)	COMMENTS/DEFICIENCIES
Installation of IU		
Installation of mounting bracket/ alignment unit		
Installation of outdoor unit		
Running cables		
Alignment		
Commissioning		

The undersigned hereby states that all of the items detailed above have been inspected, tested and unless otherwise stated conform to the specified requirements in the contract or order identified above.

Date:_____

Signature of Nokia's site responsible:_____

(In capital letters)

Signature of Customer's site responsible:_____

(In capital letters)