Nokia Siemens Networks

LTE Radio Access, Rel. RL15TD ED, Operating Documentation, Issue 01

Commissioning Flexi Multiradio BTS LTE

DN0972163

Issue 01B
Approval Date 2011-11-07

Confidential

The information in this document is subject to change without notice and describes only the product defined in the introduction of this documentation. This documentation is intended for the use of Nokia Siemens Networks customers only for the purposes of the agreement under which the document is submitted, and no part of it may be used, reproduced, modified or transmitted in any form or means without the prior written permission of Nokia Siemens Networks. The documentation has been prepared to be used by professional and properly trained personnel, and the customer assumes full responsibility when using it. Nokia Siemens Networks welcomes customer comments as part of the process of continuous development and improvement of the documentation.

The information or statements given in this documentation concerning the suitability, capacity, or performance of the mentioned hardware or software products are given "as is" and all liability arising in connection with such hardware or software products shall be defined conclusively and finally in a separate agreement between Nokia Siemens Networks and the customer. However, Nokia Siemens Networks has made all reasonable efforts to ensure that the instructions contained in the document are adequate and free of material errors and omissions. Nokia Siemens Networks will, if deemed necessary by Nokia Siemens Networks, explain issues which may not be covered by the document.

Nokia Siemens Networks will correct errors in this documentation as soon as possible. IN NO EVENT WILL Nokia Siemens Networks BE LIABLE FOR ERRORS IN THIS DOCUMENTATION OR FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL OR ANY LOSSES, SUCH AS BUT NOT LIMITED TO LOSS OF PROFIT, REVENUE, BUSINESS INTERRUPTION, BUSINESS OPPORTUNITY OR DATA,THAT MAY ARISE FROM THE USE OF THIS DOCUMENT OR THE INFORMATION IN IT.

⚠ Important Notice on Product Safety

This product may present safety risks due to laser, electricity, heat, and other sources of danger.

Only trained and qualified personnel may install, operate, maintain or otherwise handle this product and only after having carefully read the safety information applicable to this product.

The safety information is provided in the Safety Information section in the “Legal, Safety and Environmental Information” part of this document or documentation set.

The same text in German:

⚠ Wichtiger Hinweis zur Produktsicherheit

Von diesem Produkt können Gefahren durch Laser, Elektrizität, Hitzeentwicklung oder andere Gefahrenquellen ausgehen.

Installation, Betrieb, Wartung und sonstige Handhabung des Produktes darf nur durch geschultes und qualifiziertes Personal unter Beachtung der anwendbaren Sicherheitsanforderungen erfolgen.

Die Sicherheitsanforderungen finden Sie unter „Sicherheitshinweise“ im Teil „Legal, Safety and Environmental Information“ dieses Dokuments oder dieses Dokumentationssatzes.

Table of contents

This document has 120 pages.

List of figures

List of tables

Summary of changes

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made to previous issues.

Changes between issues 01A (2011-02-23, RL15TD) and 01B (2011-11-07, RL15TD)

Editorial corrections have been made.

Installing BTS Site Manager (2)

- Table 1 System HW and SW requirements for BTS Site Manager updated.
- Linus OS installation instructions updated in step 3 Double-click the .exe file to start the installation.
- BTS Site Manager installation instructions for Linux OS added to step 3 Double-click the .exe file to start the installation.

Launching BTS Site Manager (3)

- Paragraph “Note that the update installation package and new installation package will be saved in different locations. The update installation package will be saved in the same folder with the existing BTS Site Manager.” has been removed. Step 2 If you want to establish a local connection, select the Local option from the IP Address list. has been clarified.

Defining IP interfaces settings (6.7)

- Step 1 Select the Transport Ethernet Interface item from the tree view, and define the following settings: has been updated with clarifications to the availability of Total shaper information rate, Total shaper burst size, Shaper information rate and Shaper burst size fields.

Defining concurrent mode settings (6.16)

- Page availability clarified in Purpose.

Changes between issues 01A (2011-02-23, LTE RAN RL15TD, Issue 01, CD1) and 01A DRAFT (2011-01-24, LTE RAN RL15TD, Issue 01)

Chapters Defining AISG MHA settings and Defining concurrent mode settings have been added.

Editorial corrections have been made.

Introduction to Flexi Multiradio BTS LTE site commissioning (1.2)

- Reference to BTS Site Manager Online Help has been added in Commissioning tests.
- Figure 1 Commissioning overview has been updated.

Installing BTS Site Manager (2)

- Step 1 Download the BTS Site Manager installation file. has been clarified.

Defining site properties (6.2)

- • Authentication LDAP server (optional) IP address and Port and • Automatic certificatemanagement (optional) updated.
- Figure 10 Commissioning - Security configuration page updated. FTP server field changed to FTP server on transport module.

Defining BTS settings (6.15)

- RF sharing activation moved to *Defining concurrent mode settings* page. Figure 28 Commissioning - BTS Settings page updated accordingly.

Defining antenna line settings (6.20)

- Paragraph “Note that when you want an AISG-capable MHA (such as WMHD or MDxx) commissioned in the previous release to work in the AISG operation mode, you need to re-commission the BTS. MHAs are removed automatically by the LTE BTS Site Manager. When the BTS restarts after re-commissioning, the AISG capable MHAs are shown as active MHAs in the Commissioning Wizard, and they need to be commissioned into use on the Commissioning AISG MHA Settings page. The MHA commissioned this way is automatically operated in the AISG or current window (alarm) mode.” removed.
- Added sentence “TD-LTE MHA hardware is a study item for later releases.”

Defining Siemens Proprietary AISG1.1 TMARET and RET settings (6.22)

- Added sentence “RL15TD supports AISG2.0 for RET” in Purpose.

Defining radio network configuration (6.27)

- Step 1 Select an MRBTS and then LNBTS item in the tree view and define RNWparameters. has been clarified.

Defining additional site settings (6.29)

- Step 3 To configure RET units, click the RET Settings button. has been updated.

Performing template commissioning (7)

- Sentence “Template commissioning is possible if the BTS or the BTS site is uncommissioned.” has been removed.

Performing RealTilt commissioning (10)

- RCUA changed to RCU in step 8 Click the Finish button to finish the commissioning and exit the Real Tilt Wizard.

Changes between issues 01A DRAFT (2011-01-24, LTE RAN RL15TD, Issue 01) and 01 (2010-06-24, LTE RAN RL05TD)

Defining external fault and control settings chapter has been divided to Defining system module external fault and control settings and Defining radio module external fault and control settings chapters.

Chapter *Defining AISG MHA settings* has been removed.

Introduction to Flexi Multiradio BTS LTE site commissioning (1.2)

- Reference to NetAct added in Reporting.
- Link added to Troubleshooting Flexi Multiradio BTS LTE document in Troubleshooting.
- Figure 1 Commissioning overview has been updated. OMS replaced with NetAct.
- References added to SON Management and Activating LTE RL15TD Features documents in Autoconnection enabled and Autoconfiguration enabled topics.

Installing BTS Site Manager (2)

- Reference added to feature LTE681: Windows 7 Support for Element Manager Client Software in Table 1 System HW and SW requirements for BTS Site Manager.

- Reference to NOLS updated to Nokia Siemens Networks Online Services in Before you start.
- Note on the recommendation of administrator rights has been added to Before you start.

Starting manual commissioning (6.1)

- Link added to *Administering Flexi Multiradio BTS LTE* document in Purpose.

Defining site properties (6.2)

- Secondary forced option added to OAM system preference setting in step 6 Define the external IP addresses:.
- Figure 10 Commissioning - Security configuration page has been updated. FTP server enabling check box added.

Defining physical layer configuration (6.3)

- JT1 interface type information clarified in • Select the check box in the In use column to take the interface in use. This is the only available selection for interface type JT1.
- PDH interface type clarified in step 1 Select the interface type from the Interface Type list.

Defining Ethernet switching settings (6.4)

- Information on **Restore Defaults** button has been added to step 2 Define the queue weights. New step 3 Define the QoS classification settings. has been added.
- Sentence “EIF column displays the Ethernet interface.” removed in step 2 Define the queue weights.

Defining Ethernet Link OAM settings (6.5)

- Step 2 Define the Ethernet Link OAM profile settings. has been updated. **Cancel** button detail added. Figure Figure 14 Ethernet Link OAM Profiles dialog box has been updated.
- Default value for Errored frame period interval has been updated to 1 in step 2 Define the Ethernet Link OAM profile settings.

Defining Ethernet Service OAM settings (6.6)

- Step 2 Select the Insert received optional TLV into reply messages check box. has been added.
- Figure 18 Commissioning - Ethernet Service OAM page, New endpoint has been updated.

Defining IP interfaces settings (6.7)

- Value ranges updated in • Desired minimum transmit interval and • Required minimum receive interval.

Defining Quality of Service settings (6.8)

- Figure 21 Commissioning - Quality of Service page has been updated. SSE traffic type added as well as the check boxes for Overwrite DSCP in Site Support Equipment (SSE) messages and Enable PHB performance counters.

Defining application addresses (6.10)

- Text “Note that when there is only one interface IP configured on transport (VLAN or Plain) application and network interface addresses can be different.” has been removed as LN1.0 specific.

Defining BTS settings (6.15)

- RF sharing enabled check box added as a new step *3 Select the RF sharing enabled check box if you wish to enable RF sharing*.

Defining cell resources (6.16)

- Sector configuration type L added to step 2 Assign the antennas of radio modules to the local cell by selecting the appropriate check boxes.
- RL15TD restrictions updated in step 4 Click the New Cell button and repeat the procedure for each local cell you want to define.

Defining LTE carriers (6.17)

- EARFCN calculation rule has been updated in step 2 Enter the EARFCN for each local cell in the EARFCN column.

Defining antenna line settings (6.20)

- Additional RX gain and Uplink delay fields added to step 2 Define the following antenna settings:. Step 3 Define the following MHA settings: has been updated.

Defining RET settings 1 (6.21)

- Information added on the availability of New Unit and Delete Unit buttons in step 1 Select the RET unit from the Units list.

Defining RET settings 2 (6.22)

- Figure 38 Commissioning - RET Settings 2 page has been updated.
- RET configuration and calibration need clarified in 1 Select the Configuration file option.

Defining site testing (6.28)

- Faults-tab information updated in step 2 Click the Test button for the EAC functionality test.
- Line “Test models are also available in test dedicated state on the BTS Settings page” has been removed. Figure 44 Site Tests dialog box has been updated and Search functionality description added.

Saving commissioning report (6.29)

- Further information on local cell administrative state added to 2 Click the Finish button to finish the commissioning.

Performing RealTilt commissioning (10)

- Reference to Antenna Systems documentation updated.

1 Introduction

1.1 About Flexi Multiradio BTS LTE site commissioning

This document describes how to commission Flexi Multiradio BTS LTE sites using the **Commissioning** wizard in the BTS Site Manager software.

This document provides instructions on how to commission the BTS using the autoconnection and autoconfiguration functionalities and on how to proceed with manual commissioning when autoconnection and autoconfiguration are not available and when there is no commissioning file available. The document also provides instructions for template commissioning and planned commissioning with a commissioning file, and for reconfiguration of the already commissioned site. In addition there are chapters describing testing of the site after commissioning.

For a detailed description of the managed objects (MOs), lists and parameters put in the commissioning file, see the *Flexi Multiradio BTS LTE Commissioning Parameters* and *Transmission Parameters* documents.

Nokia Siemens Networks recommends that the user has the relevant knowledge of base station systems and equipment. Pay careful attention to all warnings and cautions.

These instructions are based on the assumption that the user knows how to use basic computer software. At least the following actions are needed: installing SW, uninstalling SW and changing the IP address in the PC.

Only properly trained and authorized personnel may perform installation, commissioning, or maintenance operations on any Nokia Siemens Networks base transceiver station (BTS).

Screenshots included are representations and should be considered as examples only. The current release of the BTS Site Manager software may differ slightly from the shots depicted. Also, different BTS configurations reflect the views in the **Commissioning** wizard accordingly.

1.2 Introduction to Flexi Multiradio BTS LTE site commissioning

Generic commissioning tasks

Commissioning is a sequence of tasks, such as visual checks and inspections, parameter and SW configurations, tests and reporting, to ensure that the stand-alone equipment in question has been properly installed, has no faulty modules and is ready for integration.

The generic commissioning steps can be seen in the following *Commissioning overview* figure. The details of each step depend on the equipment and version in question and can be found in the relevant documentation.

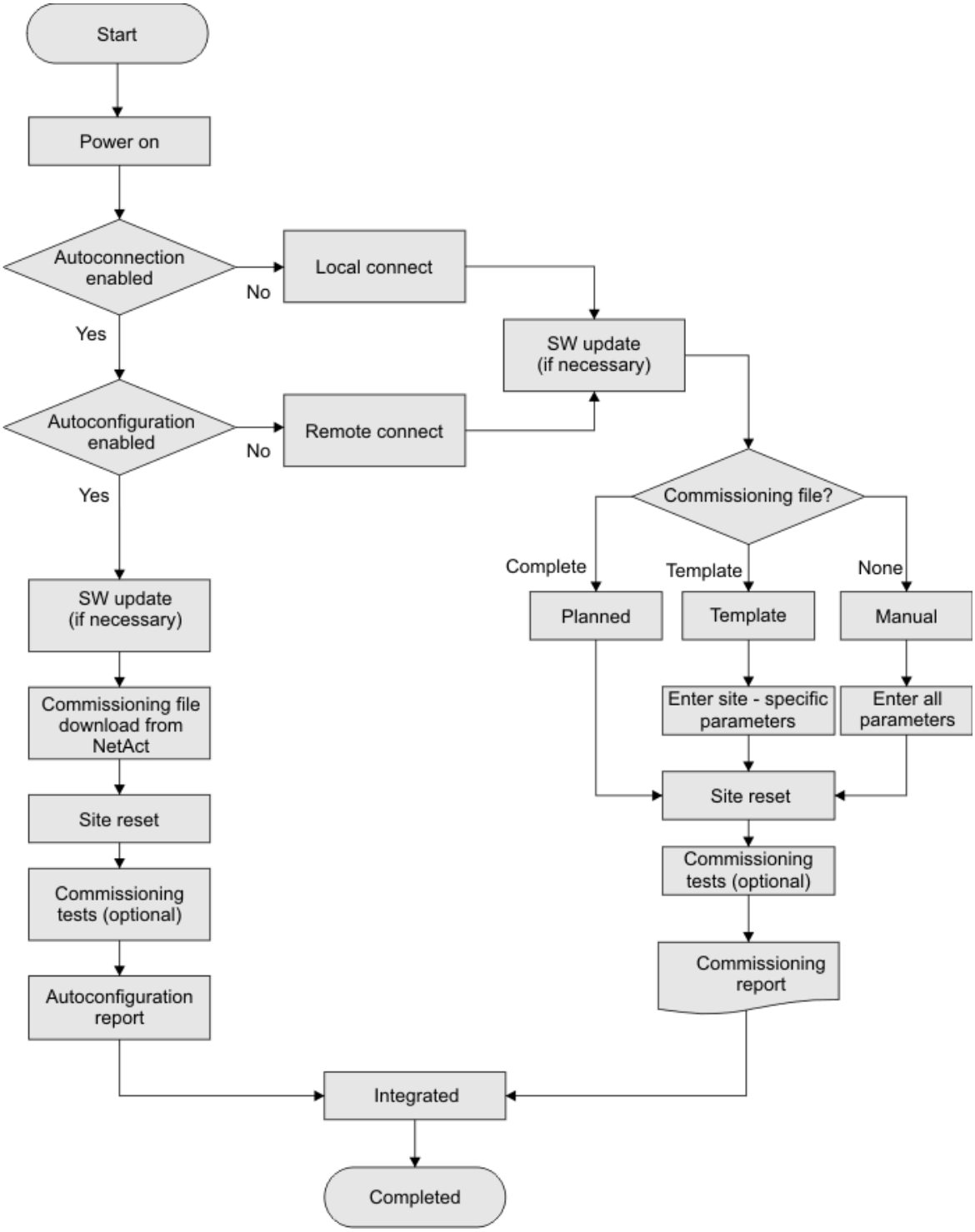

Figure 1 Commissioning overview

Power on

The first part of the visual check is done before powering on the BTS site at the power system. If everything is found to be OK, the 'Power on' check is done and the LED status is verified. The equipment is checked visually to see that there are no fatal installation errors, which might lead to equipment damage during the power on.

The following items are checked:

- the grounding
- power cabling and supply voltage
- other cables and fibres
- LED status during power up
- TX/RX/antenna connector torque check

Autoconnection enabled

This step is automatic if the autoconnection feature is enabled. If autoconnection is not enabled, the connection to the BTS must be done locally.

This feature enables automatic connection to servers in the network, and an automatic establishment of the O&M connection of the BTS to the O&M system.Only HW and cabling need to be installed at the site. No personnel with telecom experience needs to be at the site to commission the BTS, as the integration of a newly installed BTS is fully automated. When the BTS is powered up, it will automatically check the BTS commissioning status, establish IP connectivity and retrieve operator certificate and trust anchors (optional). As soon as the final certificates are available, the BTS starts the secure O&M plane connection to the NetAct framework.

For a detailed description of the autoconnection feature, see the SON Management document. For activation instructions for autoconnection and autoconfiguration features, see the *Activating LTE RL15TD Features* document.

Autoconfiguration enabled

This step is automatic if autoconnection is enabled. If autoconfiguration is not enabled, the BTS can be configured remotely using O&M connection established by autoconnection feature or locally.

The BTS autoconfiguration feature provides automatic commissioning and configuration of new or re-homed base stations from a remote network operation centre with minimal manual intervention. The automated configuration is initiated by the eNB auto configuration agent and controlled by the NetAct auto configuration application, which belongs to the overall NetAct **SON** coordinator application.

For a detailed description of the autoconfiguration feature, see the SON Management document. For activation instructions for autoconnection and autoconfiguration features, see the *Activating LTE RL15TD Features* document.

SW update

This step contains all the actions required to update and/or download SW to the equipment or to the PC for managing the equipment at the site. In case of autoconnection and autoconfiguration this is fully automated, but if autoconnection and/or autoconfiguration is not enabled, this must be done locally (autoconnection not enabled) or remotely (autoconfiguration is not enabled).

Commissioning file download from NetAct

This step is automatic if autoconnection and autoconfiguration features are enabled. NetAct downloads the configuration file to the BTS and activates it. The site will be reset.

Commissioning tests

This contains the key tests that can be carried out to ensure the basic functionality of the equipment in question. Some of the tests are activated automatically, some of them are

run as a part of the **Commissioning** wizard, and some may need to be activated separately. Some of the tests are optional and are run for diagnostic purposes if there is a reason to suspect the functionality. Typical tests and measurements:

- internal loop tests
- external alarm and control tests
- site tests
- site support system alarms shown at the BTS

Some of the functional tests need more parameters than are available during the commissioning, and thus can be run only after the network element has been integrated.

See *BTS Site Manager Online Help* for more information.

Integration

With the end of the configuration phase, the BTS starts the establishment of S1 connection towards the configured **MME**. If IPsec is activated, then the appropriate IPSec Tunnel (or tunnels) - created before the SCTP associations - are established. In case of completely pre-configured neighbor site configurations, the relevant X2 SCTP connections are set-up as well.

Parameter setup

In case autoconnection and autoconfiguration are not enabled, the parameters have to be entered locally or remotely after entering basic parameters for O&M connection. This can be done in three ways (SW update may be necessary before the parameter setup):

- Using a planned commissioning file where all parameters are predefined.
- Using a template commissioning file where the site-specific parameters need to be entered manually.
- By entering all the parameters manually.

This contains all the actions required to set up the parameters for commissioning and for integration. Parameters may include software parameters fed in manually or as a file. The equipment specific product documentation describes the details. The site will be reset after all the required parameters have been entered using one of the above-mentioned methods.

Note that when a parameter is not mentioned in a commissioning instruction, the parameter can be left at its default value, if possible.

Reporting

At the end of the commissioning procedures, BTS Site Manager creates a report that contains a summary of the commissioning parameters and site tests. In case of automated commissioning (autoconfiguration), an autoconfiguration report is created (NetAct). Autoconfiguration report allows the user to view current statuses of BTS(s) in the network and in the planned configuration. It provides advanced filtering options to improve displaying of required information. User can access the web report via a link in the e-mail notification or by entering the address given in summary report generated via BTS configuration planning workflow into the web browser.

Troubleshooting

The purpose of troubleshooting is to rectify the problems found by analysing the test results and, optionally, by running some further tests to identify the cause of the problem. Information about troubleshooting hints and optional tests can be found in the equipment specific documentation. To avoid double work, it is essential to be aware of

the current known problems. The Technical Notes (TN), List of Generic Faults and Change Deliveries (CD) need to be studied from time to time for latest information about known problems and work-around solutions.

Based on the experience and HW repair statistics about the cause of the faults, one major group is 'no fault found'. To minimize unnecessary shipping, spare waiting and 'no fault found' reports, it is essential to double-check the suspected module one more time before sending it to repair.

Once the module is suspected and the replacement seems to rectify the problem, the original suspected module needs to be tried once more. In many cases the actual reason which rectified the problem is a power off/on-reset or plug off/push in reset.

When the module is really suspected or proven faulty, the appropriate error report attached with possible log or test report files is filled. The following information needs to be clearly available in the report:

- site and equipment identification
- module identification
- based on which test the module was suspected faulty
- what other modules were suspected
- what parameters were used
- what other tests failed
- what was the error/fault message/alarm number
- what was the used SW version
- responsible engineer (report filled by) and contact info

For information on troubleshooting a Nokia Siemens Networks Flexi Multiradio BTS LTE, see Troubleshooting Flexi Multiradio BTS LTE document.

2 Installing BTS Site Manager

Purpose

Follow these instructions to install BTS Site Manager software to your PC.

Before you start

You should be familiar with how to install software on your PC and how to manage it. Note that it is recommended that you have administrator rights on your operating system.

To set up and install the BTS Site Manager, you need to have an Internet connection available to download the BTS Site Manager installation file from Nokia Siemens Networks Online Services (NOLS). The installation file can also be delivered on a removable media (CD-ROM, for example).

Check that your computer meets the system requirements listed in the following table.

Item	Specification
Processor	Minimum: 2 GHz dual core
Memory	Minimum: 2 GB
Hard disk space	260 MB
Ethernet connection	10/100/1000 Mbit/s Ethernet card Communication cable (10baseT Ethernet cable with RJ-45 connector)
Display	1024x768
Pointing device	Mouse, touch pad, track ball or equivalent with 2 click buttons
CD-ROM drive (for installation)	Optional
Printer	Optional
Operating system	Microsoft Windows 2000/XP/Vista/7* Windows Server 2003 Linux RHEL 5 (64 bits) *Windows 7 support is added with feature LTE681: Windows 7 Support for Element Manager Client Software.

Table 1 System HW and SW requirements for BTS Site Manager

Steps

1 **Download the BTS Site Manager installation file.**

Save the file on your PC. If the file is zipped, unzip it and then locate the .exe file.

Note that the above example is for a PC running in Windows OS. In other operating systems also the .bin file may be required.

2 **If you have BTS Site Manager running on your PC, close it before starting the installation.**

3 Double-click the .exe file to start the installation.

If you are using Linux, follow these steps:

1. Use Xmanager to connect to Linux computer.
2. Use the following command lines to install BTS Site Manager:
   2.1 chmod 775 nameofthe.bin. Note that if you are using 64-bit Linux OS the file name is in form nameofthe_x64.bin.
   2.2 ./nameofthe.bin file
3. Click the **Next** button to complete the installation when the installation window pops up.

The following page opens.

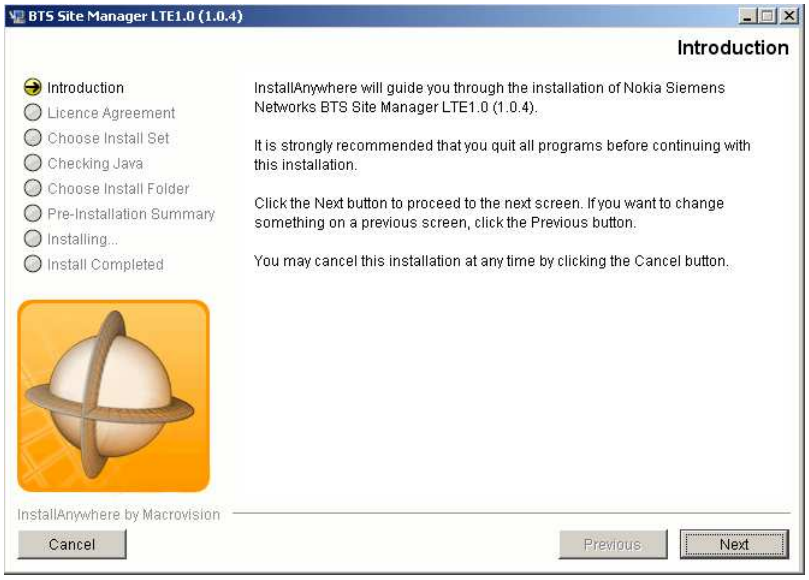

Figure 2 Introduction page

4 Click Next, and read and accept the terms of the license agreement.

5 Click Next.

Define the location where to install the BTS Site Manager. If you have earlier versions of the BTS Site Manager on your PC, you need to remove the installed versions before you can change the location. In this case **Clean installation** must be used.

If the location is changed, it is not required to remove earlier versions of the BTS Site Manager when a new version is installed. The correct BTS Site Manager version is selected automatically when the connection to the BTS is established.

If the installation of the BTS Manager is unsuccessful, use the **Clean installation** option to remove all BTS Site Manager versions from your PC and start the installation again.

6 Click Next, and inspect the summary information for the installation procedure.

7 **Click Next.**

The BTS Site Manager installer installs the software to the specified location.

8 **Click Finish.**

BTS Site Manager installer closes and you can use the BTS Site Manager (see Launching BTS Site Manager).

3 Launching BTS Site Manager

Before you start

Make sure the following conditions are fulfilled:

- If the PC is connected to the FSM **LMP** port, specify your PC's network settings to match the following settings:
  - IP address: 192.168.255.126
  - Subnet mask: 255.255.255.0.
- If you want to establish a connection to the BTS site locally, connect the PC to the LMP port on the System Module (FSM) using a twisted pair Ethernet cable with an RJ-45 connector. In a remote connection, the connection is established via DCN (Data Communication Network) network.

Steps

1 **Start BTS Site Manager by clicking the icon on your desktop.**

The Task Selection view opens.

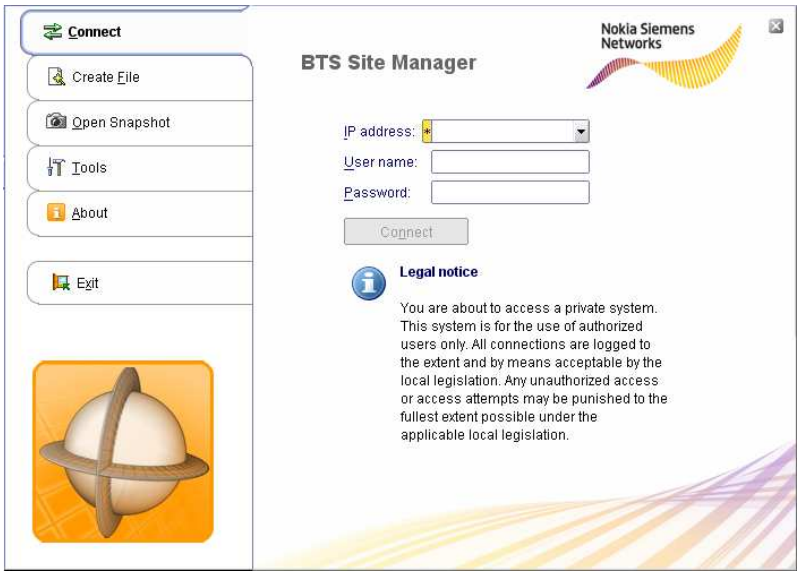

Figure 3 Task Selection view

2 **If you want to establish a local connection, select the Local option from the IP Address list.**

If you want to establish a connection to the BTS site locally, connect the PC to the LMP port on the System Module (FSM) using a twisted pair Ethernet cable with an RJ-45 connector.

3 **If you want to establish a remote connection, define the IP address of the remote BTS.**

4 Enter the User name and Password.

The default user name is *Nemuadmin* and the default password *nemuuser*.

Using web interface at https://192.168.255.129, local user account information can be reset to factory defaults (Nemuadmin/nemuuser) via local connection. The FTM transport module provides a service to recover the transport module. Recovery will delete the configuration except:

- Super user account credentials
- NE account credentials (if existing)
- BTS keypair (BTS certificate and BTS private key, if existing)
- CA certificate (if existing)

Recovery will reset the transport module.

5 Click Connect.

The progress of the operation is displayed in the Task Selection view.

If multiple versions of BTS Site Manager are installed on the PC, the appropriate BTS Site Manager version is selected automatically.

When the connection is established, the Task Selection view closes and the BTS Site Manager main view opens.

If you receive a message with the text "The BTS certificate is self-signed", click the **Accept** button to connect to the BTS.

4 Monitoring autoconnection

Purpose

Autoconnection is a feature which enables the automated connection of the uncommissioned BTS to a server in the network. Commissioning may then be automatically performed via this server. The automated connection means the automatic establishment of IP connectivity over which IP based registration messages can be sent. Using the location information of the newly installed BTS, OMS can correlate the BTS with the required logical configuration. The benefit for the operator is a cheaper and quicker network rollout. After installation, the automatic establishment of a connection allows the commissioning to be completed remotely without the need for a commissioning engineer to visit the site.

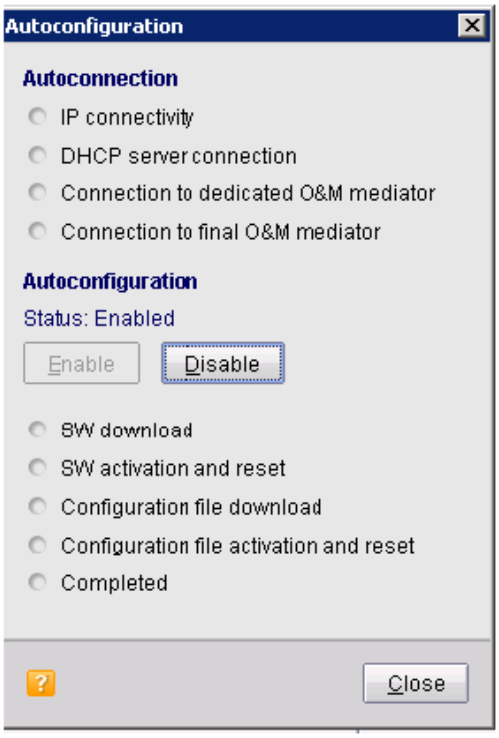

Figure 4 Autoconfiguration dialog

The dialog shown above is displayed automatically when the user establishes the BTS Site Manager session before the start of autoconnection process. The whole autoconnection process is divided into several phases, and their progress is displayed in the above dialog box.

Before you start

BTS must be uncommissioned for the autoconnection and autoconfiguration to start.

Steps

1 **Observe the autoconnection phases.**

These phases consist of IP connectivity establishment, DHCP server connection and connections to dedicated and final O&M mediators.

If autoconnection fails, the Autoconnection Registration dialog box is opened.

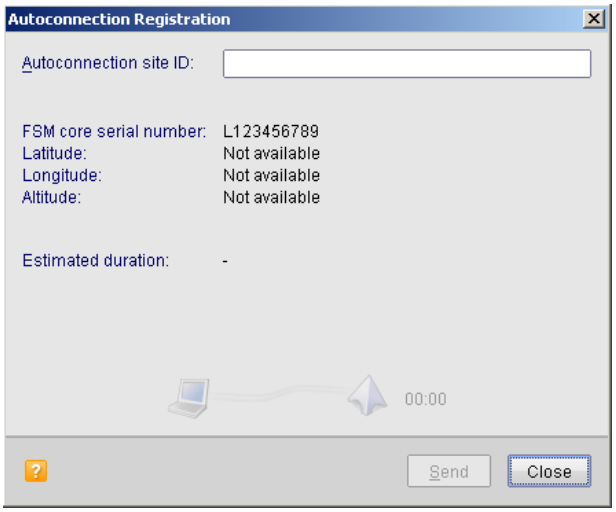

Figure 5 Autoconnection Registration dialog

Here the Autoconnection site ID needs to be provided so that the BTS is identifiable to the upper network element and the autoconnection process can continue.

2 Observe the autoconfiguration phases.

These phases consist of SW download, SW activation and reset, configuration file download and configuration file activation and reset phases. All phases are fully automated and no manual intervention is required.

Autoconfiguration can be disabled by clicking the **Disable** button if for example the site needs to be commissioned manually. Also if autoconfiguration is not used at all, the dialog box can be closed by clicking the **Close** button. Clicking the **Enable** button enables the autoconfiguration.

5 Updating BTS site software

Purpose

The software for the transmission sub-module, radio modules and radio heads is included in the software package for the BTS site and cannot be upgraded separately. Software upgrade can either be performed manually for each BTS using BTS Site Manager, or automatically via the Network Management System.

Updating the BTS site software is optional. You should do it only if the BTS does not have the required software version. Note, that if you are updating just the BTS Site Manager SW you must obtain a separate installation package via operator-specific channels.

In the **Update SW to BTS Site** dialog box you can update new software to the BTS site. This procedure does not download those application files existing in the Flexi Multiradio BTS LTE or Flexi Transport sub-module that have the same version information. You can view the current SW versions in the **Site Information** dialog box by choosing the **Software** → **SW Versions** menu item.

If the BTS site has a connection to Nokia Siemens Networks NetAct™, the NetAct will manage the BTS site SW (that is, checks the SW version and, if it is different than the SW in the NetAct database, downloads new SW in the BTS site).

Steps

1 **Launch BTS Site Manager.**

2 **Choose the Software → Update SW to BTS Site menu item.**

The **Update SW to BTS Site** dialog box opens.

3 **Click the Select File button to locate the master file containing the new software.**

The **Select Build Descriptor** dialog box opens.

Locate and select the master file (TargetBD.xml or SW package zip file), and click the **Open** button. If you select the zip file, the files will be decompressed when you click **Open**. The new SW version is displayed in the **Update SW to BTS Site** dialog box.

4 **Select the Activate SW after update check box to enable the activation of the new software in accordance with SW updating.**

Note that if you do not want to activate the new software on downloading it, you can leave the option unchecked, and the SW is downloaded to the BTS site. If there is a need to update the SW files at one time and perform the activation later, you can leave the **Activate SW after update** check box unselected. This way, only the file update is performed, and the site does not go to reset. To activate SW later, go through the update procedure again, with the **Activate SW after update** check box selected. This time BTS Site Manager does not download the files that already exist in BTS Site.

5 **Click the Update button.**

The **Update** button is enabled if a valid master file has been selected.

SW download takes about 20 minutes. The exact time depends on the number of items to be downloaded and the bandwidth of the DCN connection, for example. The Update Progress steps show the transfer status. Wait for the SW update to be completed. If the **Activate SW after update** check box was selected, the SW will be activated and the site will be reset.

If you want to stop the SW update, click the **Stop** button.

If the SW download fails, update the software again. Note, that if the SW download fails the existing SW version is still in use.

6 **If you want to view information on the SW download, click the View Report button.**

The **Software Update Report** dialog box opens.

7 **Click Close to close the Update SW to BTS Site dialog box.**

6 Manual commissioning

6.1 Starting manual commissioning

Purpose

If no commissioning file is available, Flexi Multiradio BTS site has to be commissioned manually. Commissioning file can also be created using the BTS Site Manager. See Administering Flexi Multiradio BTS LTE document for more information.

The Flexi Multiradio BTS LTE and/or Flexi Transport sub-module (TRS) are commissioned with the **Commissioning** wizard in BTS Site Manager. Commissioning can be started when the modules are in the 'Initialized' state.

The wizard features *Back*, *Next*, *Cancel* and *Help* buttons for navigating. The *Next* button confirms the entered parameters and brings up the following page in each commissioning line. The *Back* button reverses to the previous page in the wizard. The *Cancel* button cancels all the entered parameters and closes the wizard. The *Help* button displays a context sensitive help topic for each page.

At the moment the Commissioning wizard supports English alphabet only. Please remember this when entering text in the parameter fields.

You need to fill in the fields displayed with a yellow stripe. Those parameters are mandatory.

Before you start

All parameters needed to configure the BTS site are determined at the network planning stage. It is essential that the input values match the expected values in the network plan. Do not select the values randomly.

Steps

1 **Click the Commissioning button on the View Bar or choose the Commissioning menu item.**

The **Commissioning - Introduction** page opens.

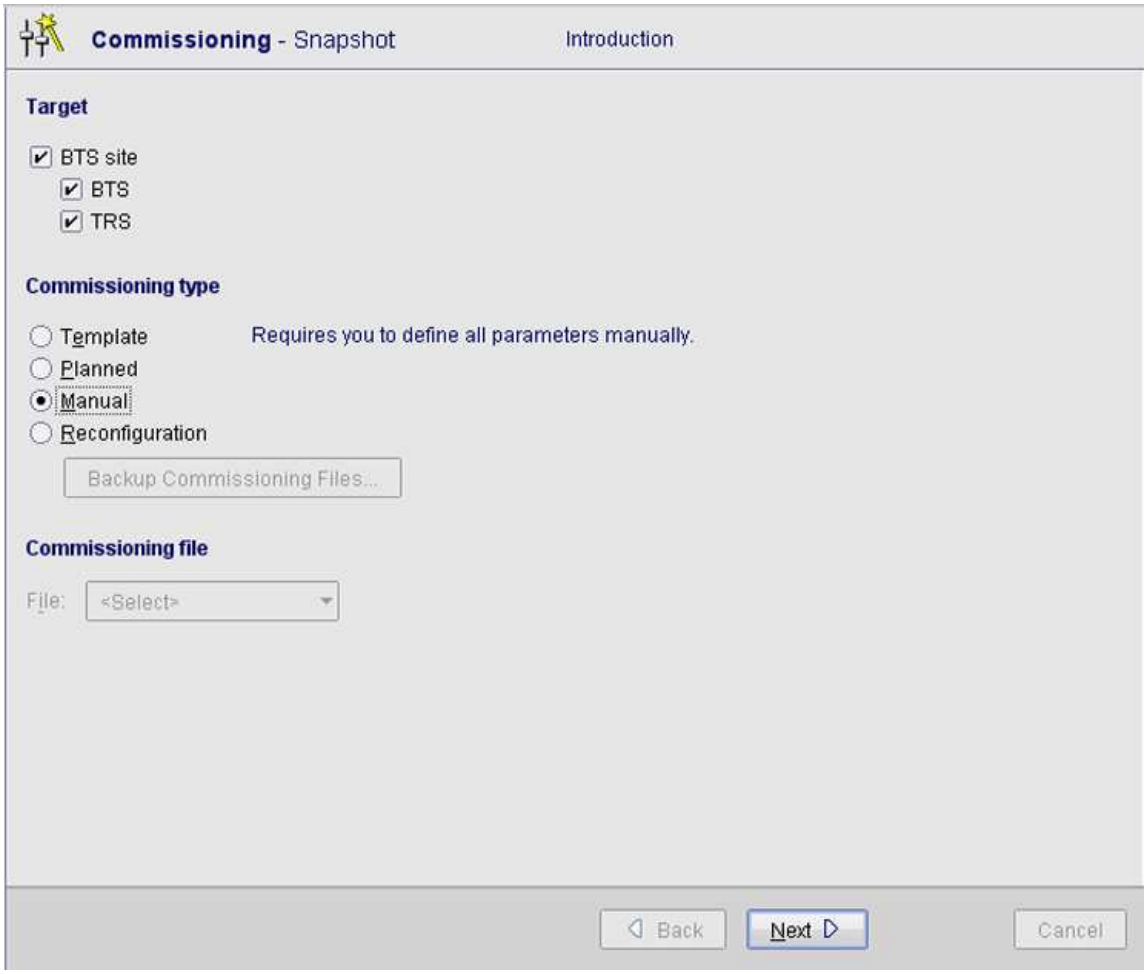

Figure 6 Commissioning - Introduction page with Manual option selected

2 **Select the commissioning target by clicking the appropriate option: BTS site, BTS or TRS.**

3 **Select the Manual option.**

4 **Click the Next button.**

See Defining site properties (if the BTS site or only the TRS will be commissioned) or Defining BTS settings (if only the BTS will be commissioned) for information on how to continue.

6.2 Defining site properties

Purpose

In the **Commissioning - Site Properties** page, you can define the identification information, IP addresses and common configuration options.

This page is shown when the **TRS** or the **BTS site** option was selected in the **Commissioning - Introduction** page. If you selected the **BTS** option, continue to Defining BTS settings.

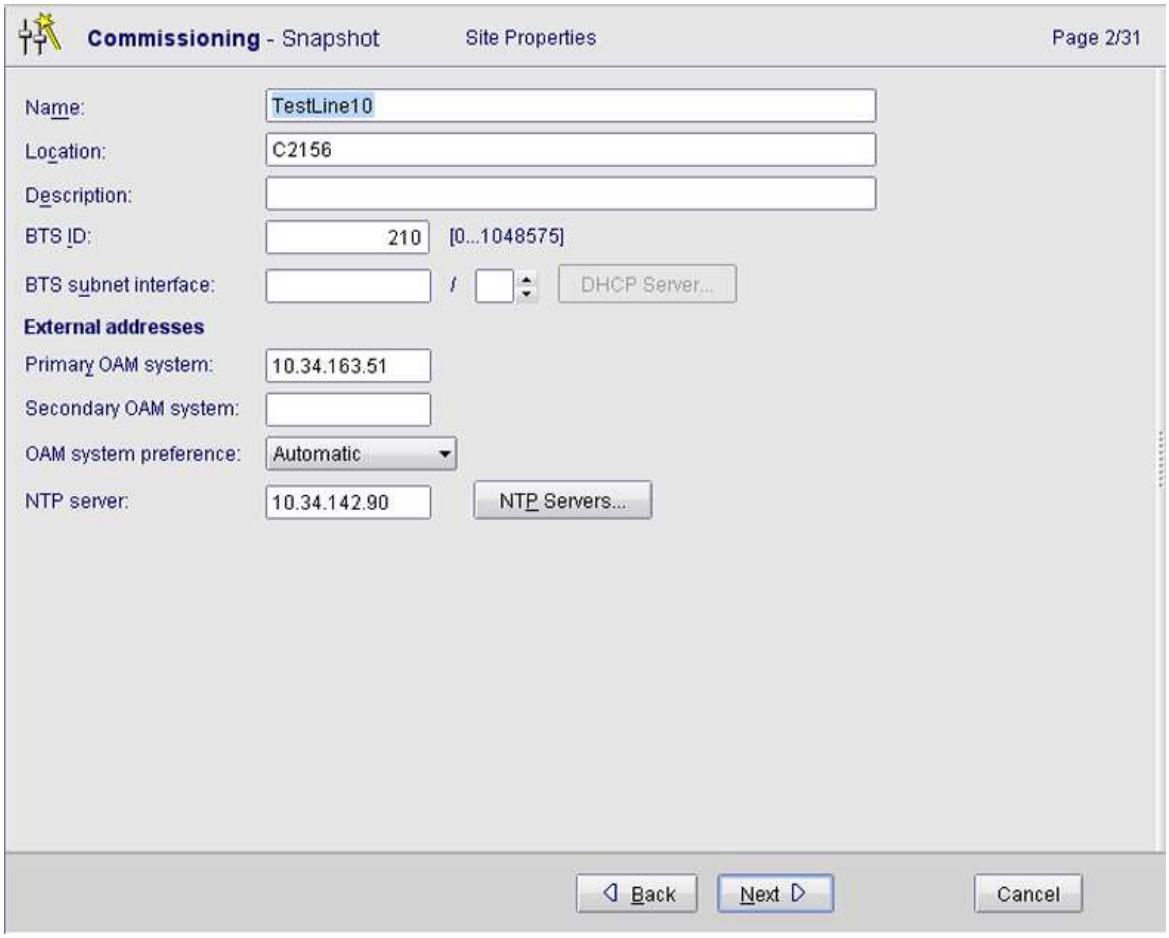

Figure 7 Commissioning - Site Properties page

Steps

1	**Enter the name of the BTS site in the Name field.**
2	**Enter the location in the Location field (optional).**
3	**Enter the description of the element in the Description field (optional).**

4 Enter the BTS identifier in the BTS ID field.

The BTS identifier has to be defined according to an agreed value, which is usually determined at the network planning stage. You should not assign an arbitrary value for this parameter.

Note, that BTS ID in MRBTS (mrbtsId), LNBTS (lnBtsId), BTSSC (btsId) and FTM: IPNO: (btsId) parameters must all have the same BTS ID value in commissioning file. If the value is changed it must be done in site commissioning. IPNO: btsId (BTS ID) is set on Site Properties page. MRBTS: mrbtsId (Multiradio BTS site identifier) and LNBTS: lnBtsId (Instance identifier of object LNBTS) are set on Radio Network Configuration page. BTSSC: btsId is set automatically by BTS Site Manager to commissioning file according to BTS Id value set to other related parameters.

Note also that if you want to change BTS ID for site, whole site commissioning is strongly recommended.

5 Enter the BTS subnet address in the BTS subnet interface field.

The supported format is IPv4. The following IP addresses should not be configured:

- default address (0.0.0.0)
- addresses in the subnet 127.x.x.x (reserved for loopbacks)
- addresses in the subnet 192.168.254.xxx (internal address)
- addresses in the subnet 192.168.255.xxx (internal address)
- multicast address (224.0.0.0 - 239.255.255.255)
- broadcast address (255.255.255.255)
- directed broadcast/network address (x.x.x.255/24 or x.x.x.0/24)

If the defined IP address is not supported, you will get an error message.

After the BTS subnet interface address and subnet mask bits are defined, the **DHCP Server...** button becomes enabled. Clicking the button opens the **DHCP Server** dialog box, where you can configure IP addresses that are delivered via DHCP for the external site equipment. The IP addresses should be part of the subnet defined by the BTS subnet interface and subnet mask bits.

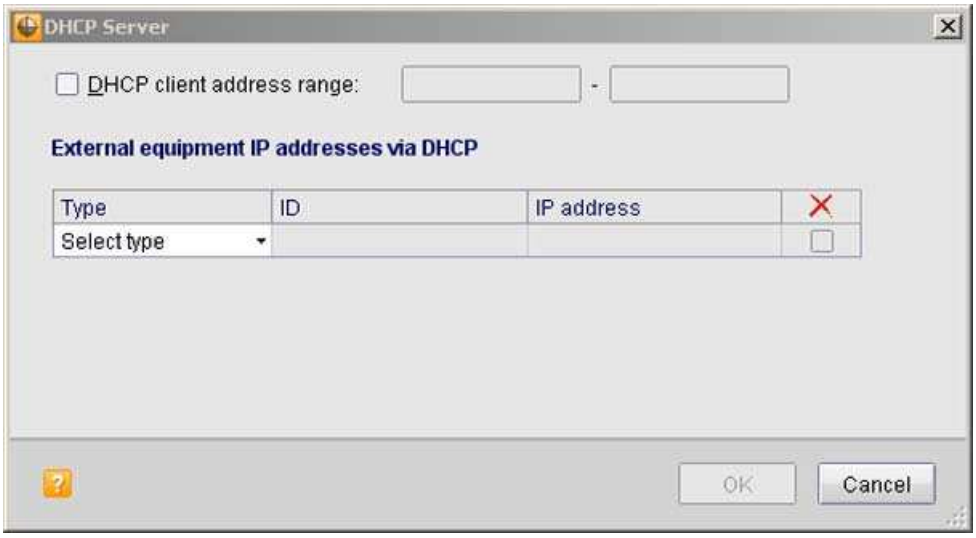

Figure 8 DHCP Server dialog box

To define the **DHCP client address range**, select the check box and enter the IP address range. To define **External equipment IP addresses via DHCP**, select the DHCP configuration types, and enter the identifiers and IP addresses. Click the **OK** button to save the changes and return to the **Commissioning - Site Properties** page.

6 **Define the external IP addresses:**

- **Primary OAM system** and **Secondary OAM system** IP addresses.
- **OAM system preference**: Automatic or Primary forced. Also Secondary forced option is available if Secondary OAM system IP address is configured.
- **NTP Server** IP address
  Only one NTP server IP address is required. Additional NTP servers can be used to protect real-time updates, for example, if one NTP server is temporarily out of service. Clicking the **NTP Servers** button opens the **NTP Servers** dialog box, where you can configure more NTP IP addresses.

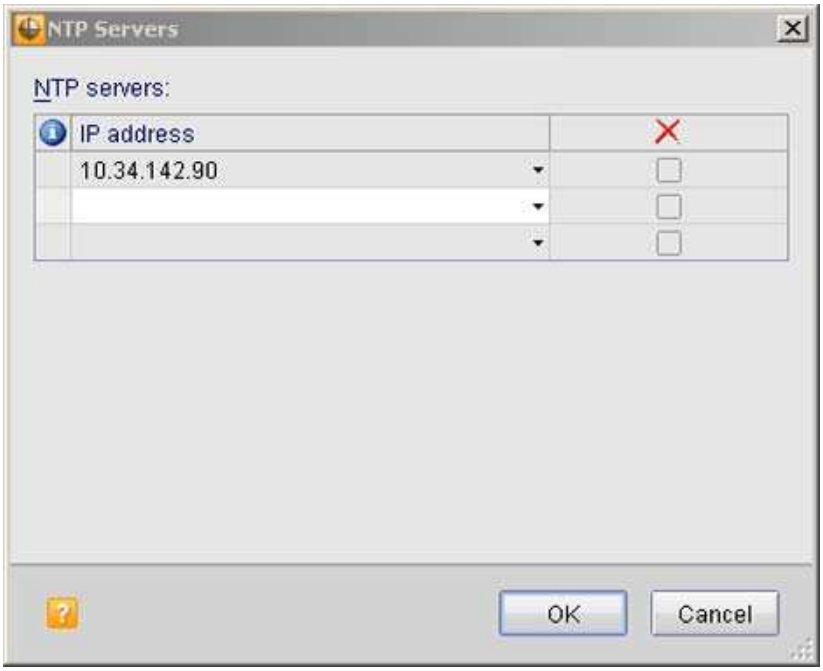

Figure 9 NTP Servers dialog box

Enter the required IP addresses for NTP servers, press enter, and click **OK** to return to the **Commissioning - Site Properties** page.

7 Click the Next button and Security page appears.

8 Define security configuration

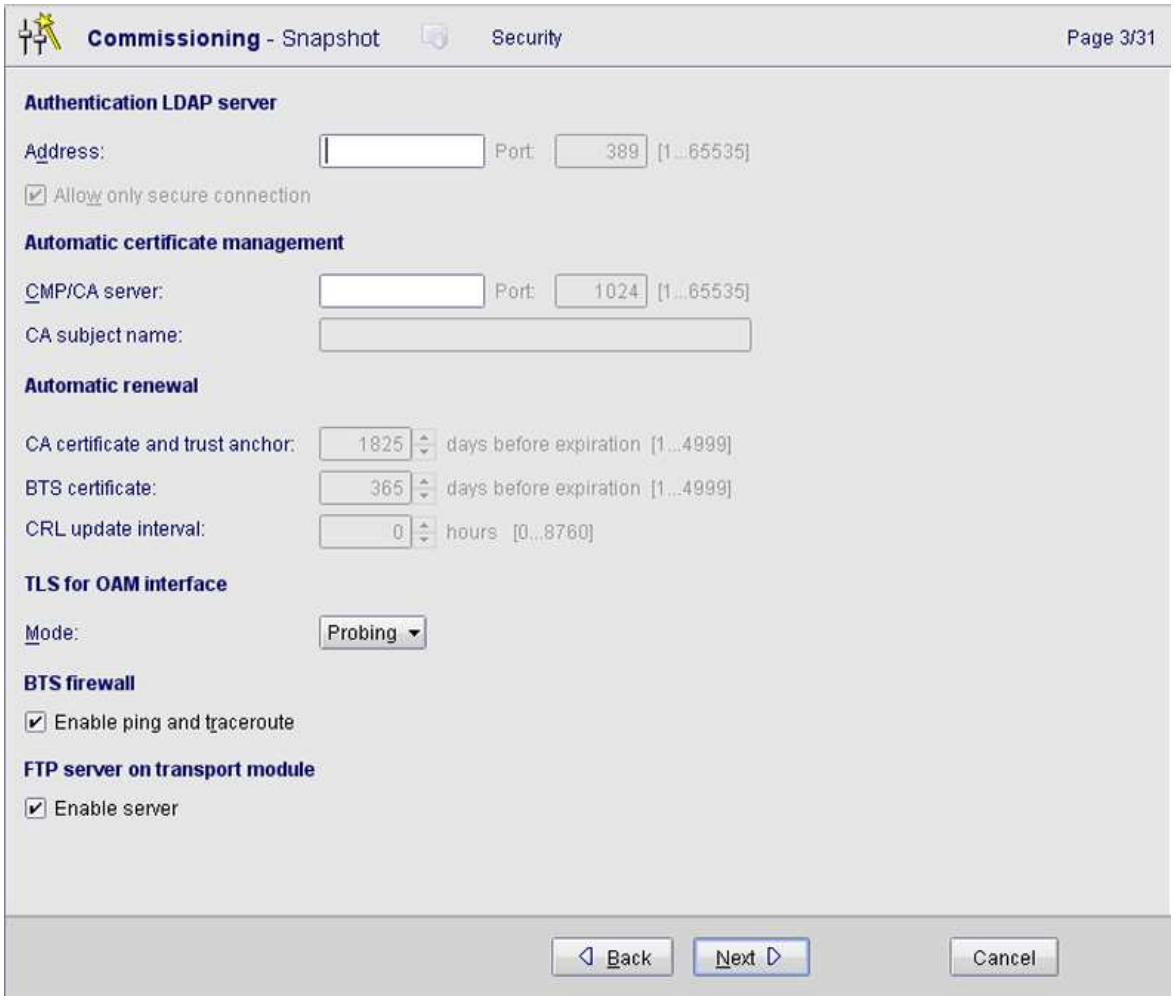

Figure 10 Commissioning - Security configuration page

- **Authentication LDAP server** (optional) IP address and **Port**
  The default LDAP port is 389.
  The LDAP server is used to authenticate remote users from the LDAP server via the DCN network. If the LDAP server address is not configured, users are authenticated using the local super user account information (user name/password) that can be defined during commissioning in the **Commissioning - Authentication Settings** page. Select the **Allow only secure connection** check box.
- **Automatic certificate management** (optional)
  CMP/CA server . The address is needed if certificates are to be managed automatically.
  Enter also the **Port** and **CA subject name**.
- **Automatic renewal**
  Enter the **CA certificate and trust anchor** and the **BTS certificate** renewal days.
  Enter also the the certificate revocation list update period in the **CRL update interval** field.

- **TLS for OAM interface**
  Select the mode for **TLS for OAM interface** setting. *Probing* is the default value. For information on the transmission parameters, see *Transmission Parameters* document.
- **BTS firewall**
  Select the **Enable ping and traceroute** check box.
- **FTP server on transport module**
  Select the **Enable server** check box to enable the FTP server.

6.3 Defining physical layer configuration

Purpose

In the **Commissioning - Physical Layer Configuration** page, you can configure physical interface properties: PDH and Ethernet interfaces. At least one Ethernet interface must be taken in use.

Following modules are supported:

- Flexi Transport Hybrid E1/JT1/T1 Ethernet sub-module, version B (FTIB)
- Flexi Transport Hybrid E1/JT1/T1 Ethernet sub-module, version B (FTLB)

Speed and duplex available options are Autodetect and 1000 Mbit/s Full Duplex for EIF1 and Autodetect, 1000 Mbit/s Full Duplex, 100 Mbit/s Full Duplex and 10 Mbit/s Full Duplex for EIF2 and EIF3. Note that with FTIB interfaces EIF1 and EIF2 cannot be used at the same time.

Steps

1 **Select the interface type from the Interface Type list.**

For FTIB and FTLB the PDH interface type can be E1, T1 or JT1. This setting affects only PDH interfaces.

In addition, FTIB and FTLB support Gigabit/Fast Ethernet interfaces.

2 **Define the following optional PDH interface settings:**

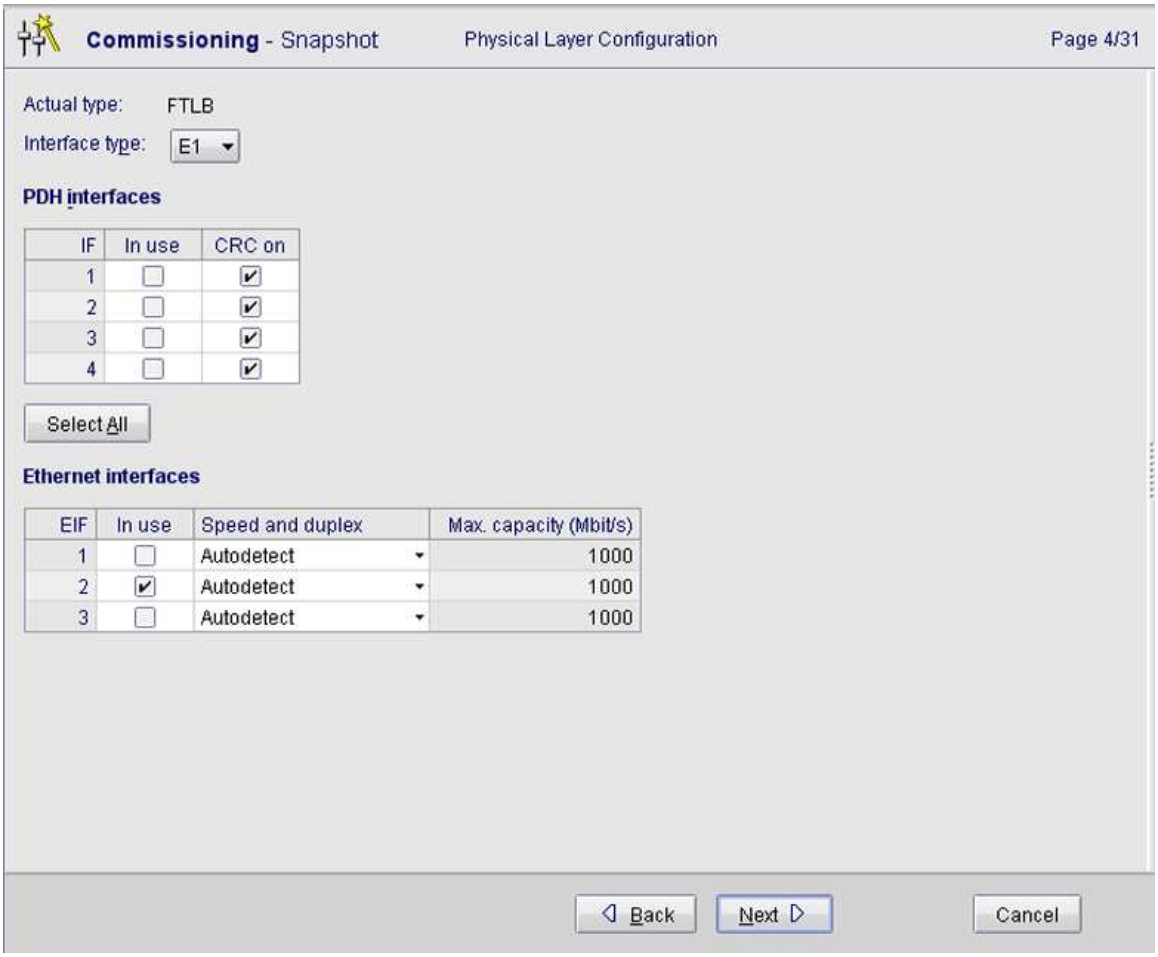

Figure 11 Commissioning - Physical Layer Configuration page for PDH and Ethernet interfaces

You can select all interfaces in a unit by clicking the **Select All** button. Or, you can select multiple interfaces by selecting the first interface, holding down the Shift or CTRL key and selecting the other interfaces. You can then define the needed settings for the selected interfaces simultaneously.

- Select the check box in the **In use** column to take the interface in use. This is the only available selection for interface type JT1.
- If the interface type is E1, select the check box in the **CRC on** column if the Cyclic Redundancy Check is to be used.
- If the interface type is T1, select the line build-out value from the list in the **Lbo** column.

3 **Define the Ethernet settings:**

Define the following settings:

- Select the check box in the **In use** column to take the Ethernet interface in use. Note that when you click **Next** to continue, all configurations not required for the transport mode you have selected are removed.

- Define the value for Speed and Duplex parameter in the **Speed and Duplex** column.

Note that with FTIB interfaces EIF1 and EIF2 cannot be used at the same time.

4 **Click the Next button.**

6.4 Defining Ethernet switching settings

Purpose

In the **Commissioning - Ethernet Switching** page, you can define Ethernet switching configuration. This allows QoS aware Ethernet switching between up to 3 (FTLB) or up to 2 (FTIB) external ports and the local Flexi Multiradio BTS. It can be used for Ethernet aggregation and BTS daisy chaining on cell sites without external equipment.

For information on the transmission parameters, see Transmission Parameters document.

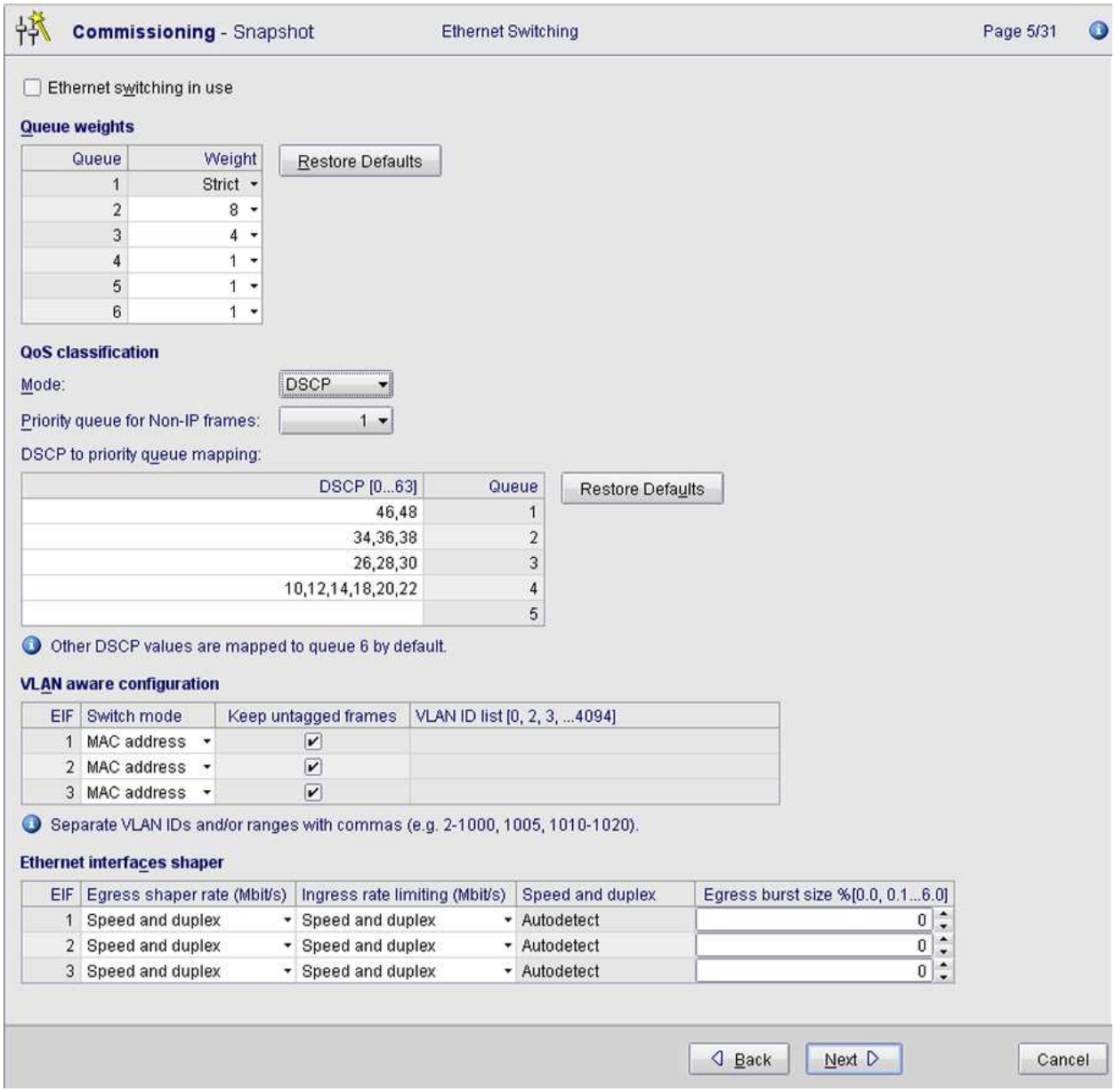

Figure 12 Commissioning - Ethernet Switching page

Steps

1 **Select the Ethernet switching in use check box to enable Ethernet switching.**

2 **Define the queue weights.**

Select the queue weights from the drop-down lists for queues 2-6. Note that queues 5-6 are available only for FTLB unit and queue 1 cannot be modified.

Clicking the **Restore Defaults** button resets the values to default values.

3 **Define the QoS classification settings.**

- Select the QoS classification mode from the *Mode* list: DSCP or VLAN-PCP.
- Select then the priority queue for non-IP frames in the *Priority queue for Non-IP frames* drop-down list. If the mode is VLAN-PCP this list is named as *Priority queue for untagged frames*.
- If the selected mode is DSCP, define the DSCP to priority queue mapping in the *DSCP to priority queue mapping* table. Separate different values by a comma. If the selected mode is VLAN-PCP, select the queues for VLAN-PCPs in the *VLAN-PCP to priority queue mapping* table's Queue-column.

Clicking the **Restore Defaults** button resets the values to default values.

4 **Define the VLAN aware configuration settings.**

- *Switch mode* for Ethernet interfaces. Available values are MAC address and VLAN ID.
- Select the *Keep untagged frames* check boxes for the interfaces.

Enter also the VLAN IDs in the *VLAN ID list* column.

5 **Define the Ethernet interface shaper settings.**

- *Egress shaper rate* for the interfaces in Mbit/s.
- *Ingress rate limiting* for the interfaces in Mbit/s.
- *Speed and duplex* value.
- *Egress burst size* in percentage.

6 **Click the Next button.**

6.5 Defining Ethernet Link OAM settings

Purpose

In the **Commissioning - Ethernet Link OAM** page, you can define the settings for Ethernet link OAM. For information on the transmission parameters, see Transmission Parameters document.

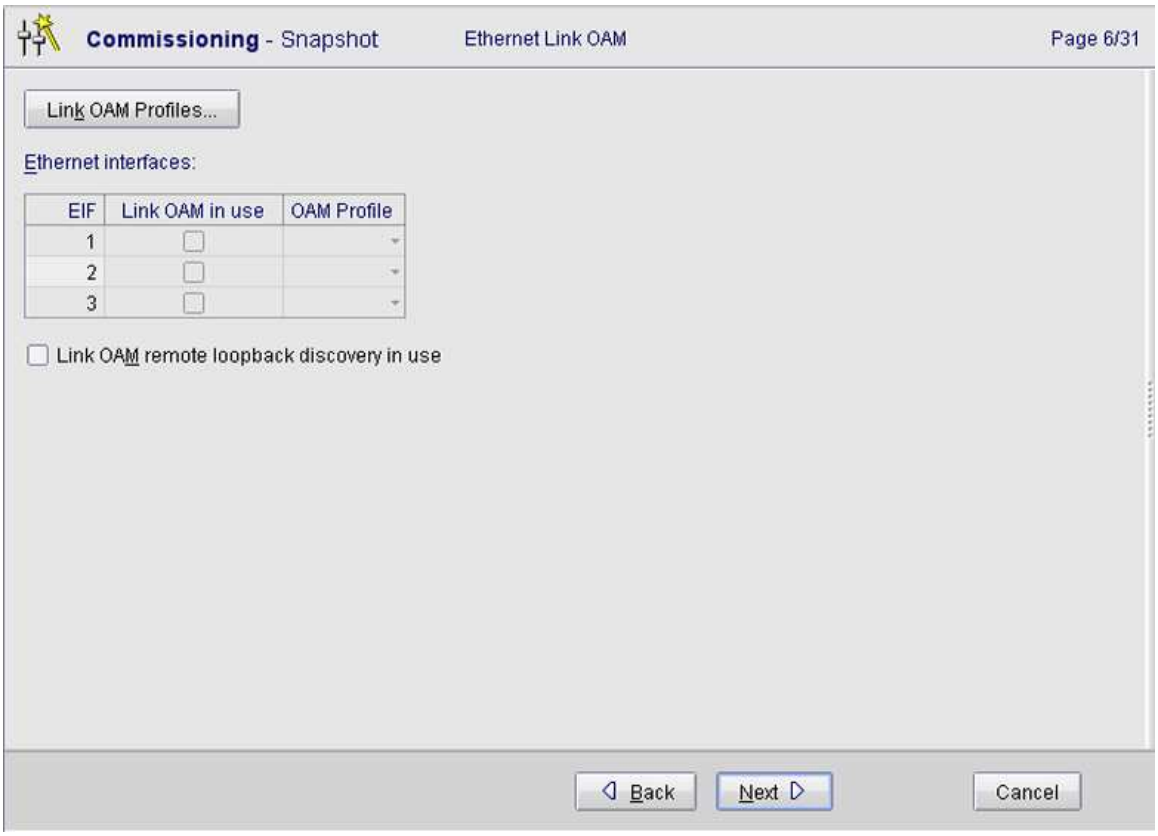

Figure 13 Commissioning - Ethernet Link OAM page

Steps

1 **Click the Link OAM Profiles...button if you want to create a new Ethernet link OAM profile.**

The following dialog box opens.

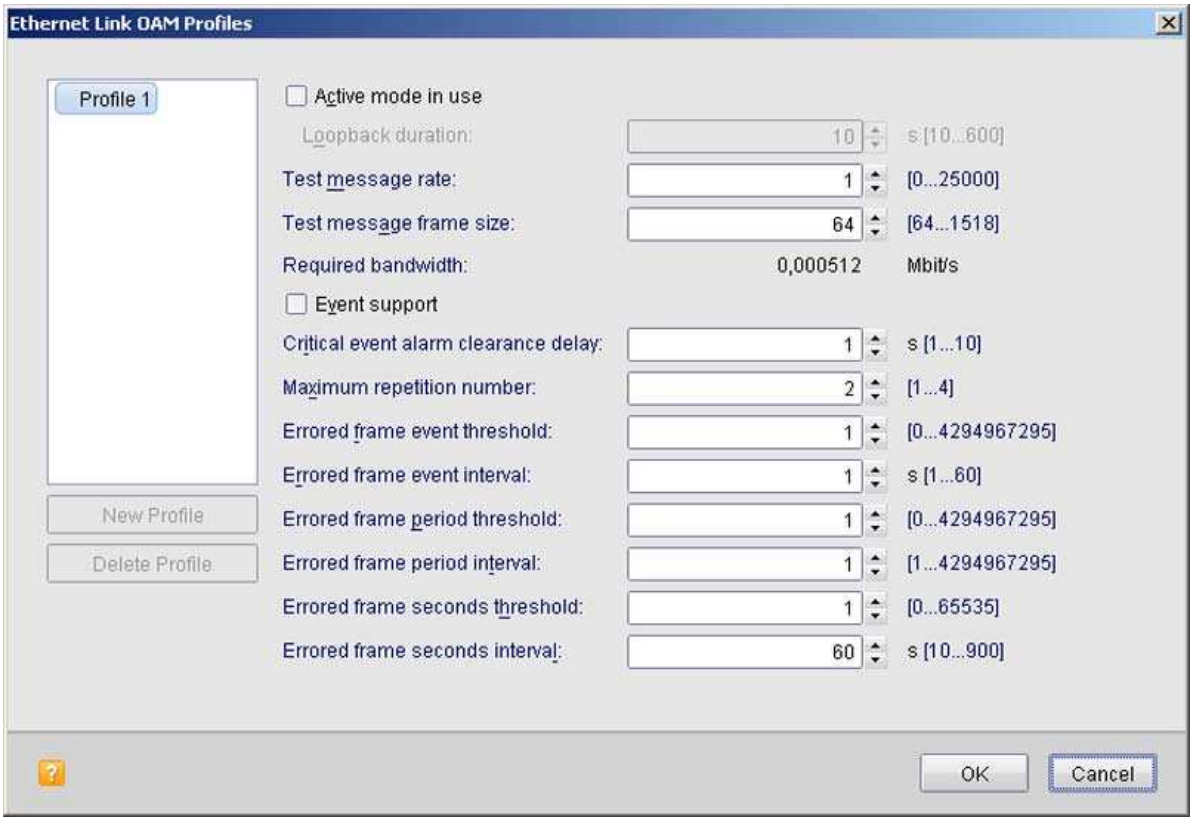

Figure 14 Ethernet Link OAM Profiles dialog box

Click the **New Profile** button to create a new profile.

2 Define the Ethernet Link OAM profile settings.

- **Active mode in use**
  Select the *Active mode in use* check box to enable the active mode.
- **Loopback duration**
  Select the loopback duration in seconds. This field is enabled if the *Active mode in use* check box is selected.
- **Test message rate**
  Enter the test message rate in the *Test message rate* field. Default value is 1.
- **Test message frame size**
  Enter the test message frame size in the *Test message frame size* field. Default value is 64.
- **Required bandwidth**
  The *Required bandwidth* field displays the required bandwidth in Mbit/s.
- **Event support**
  Select the *Event support* check box.
- **Critical event fault clearance delay**
  Enter the critical event fault clearance delay in the *Critical event fault clearance delay* field. Default value is 1.
- **Maximum repetition number**
  Enter the value for maxim um repetition number in the *Maximum repetition number* field. Default value is 2.

- **Errored frame event threshold**
  Enter the value for errored frame event threshold in the *Errored frame event threshold* field. Default value is 1.
- **Errored frame event interval**
  Enter the value for errored frame event interval in the *Errored frame event interval* field. Default value is 1.
- **Errored frame period threshold**
  Enter the value for errored frame period threshold in the *Errored frame period threshold* field. Default value is 1.
- **Errored frame period interval**
  Enter the value for errored frame period interval in the *Errored frame period interval* field. Default value is 1.
- **Errored frame seconds threshold**
  Enter the value for errored frame seconds threshold in the *Errored frame seconds threshold* field. Default value is 1.
- **Errored frame seconds interval**
  Enter the value for errored frame seconds interval in the *Errored frame seconds interval* field. Default value is 60.

Click **OK** to add the new profile and close the dialog box. Click **New Profile** to add a new profile. **Delete Profile** button deletes a profile. Clicking the **Cancel** button shows the *Closing Link OAM Profiles* message in which you can choose to exit the dialog box and discard all changes or choose cancel to continue with the profile settings.

3 **Define the Ethernet interface settings.**

Select the check box in the *Link OAM in use* column to enable link OAM for the interface. Then select the Link OAM profile from the available profiles in the *OAM profile* column.

If you wish to enable link OAM remote loopback recovery select the *Link OAM remote loopback recovery in use* check box.

4 **Click the Next button.**

6.6 Defining Ethernet Service OAM settings

Purpose

In the **Commissioning - Ethernet Service OAM** page, you can define the settings for Ethernet service OAM settings: create new domains, associations and endpoints.

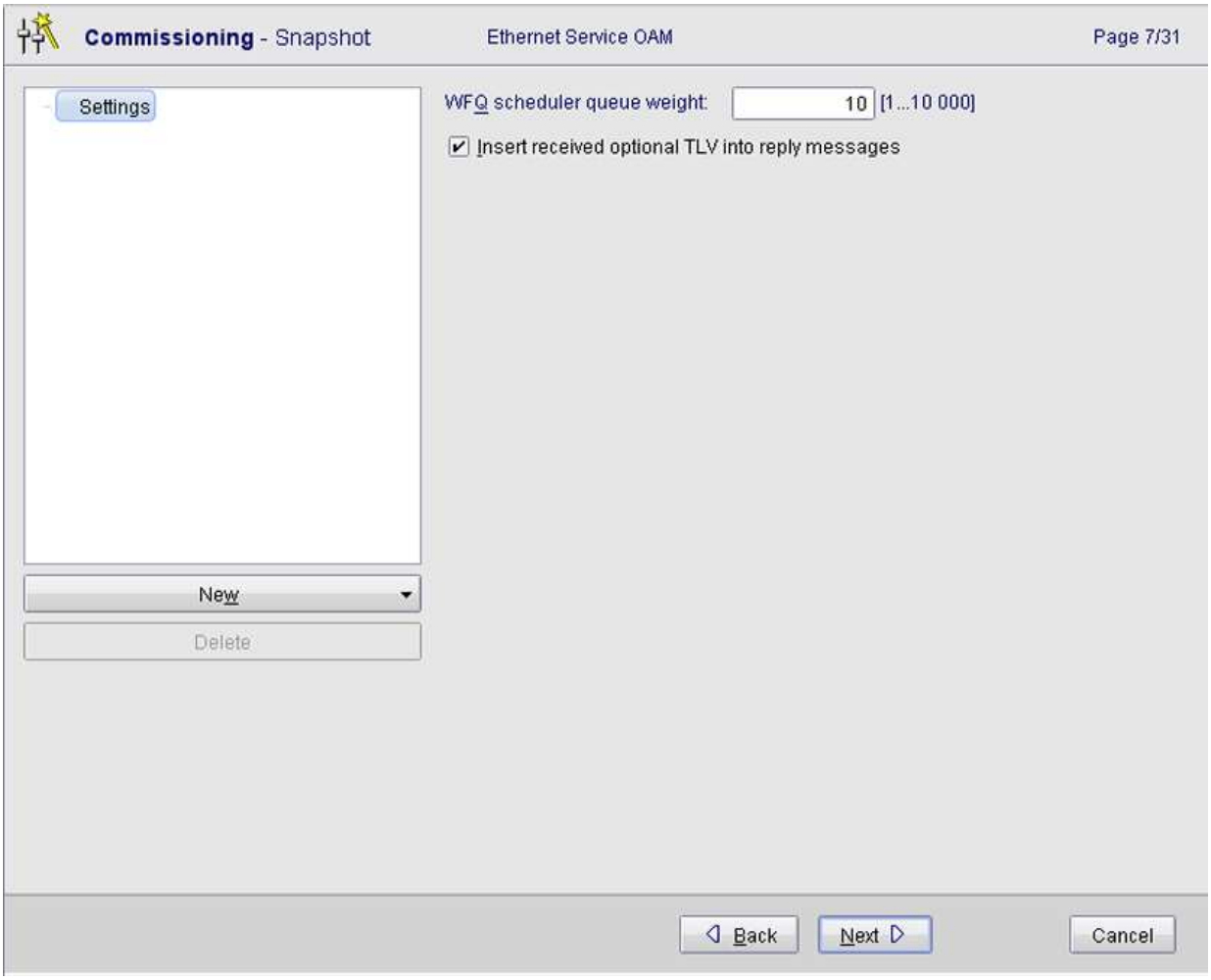

Figure 15 Commissioning - Ethernet Service OAM page

Steps

1 **Enter the WFQ scheduler queue weight in the WFQ scheduler queue weight field.**

2 **Select the Insert received optional TLV into reply messages check box.**

Select the *Insert received optional TLV into reply messages* check box to insert received optional TLV into reply messages. If this parameter is set to checked, the optional TLV received in a Link Trace or Loopback message (LTM or LBM message) is sent back unchecked in the corresponding reply message (LTR, or LBR).

3 **Click the New button to create a new Domain.**

The New domain view opens. Enter a name for the new domain and select a level for it from the *Level* drop-down list.

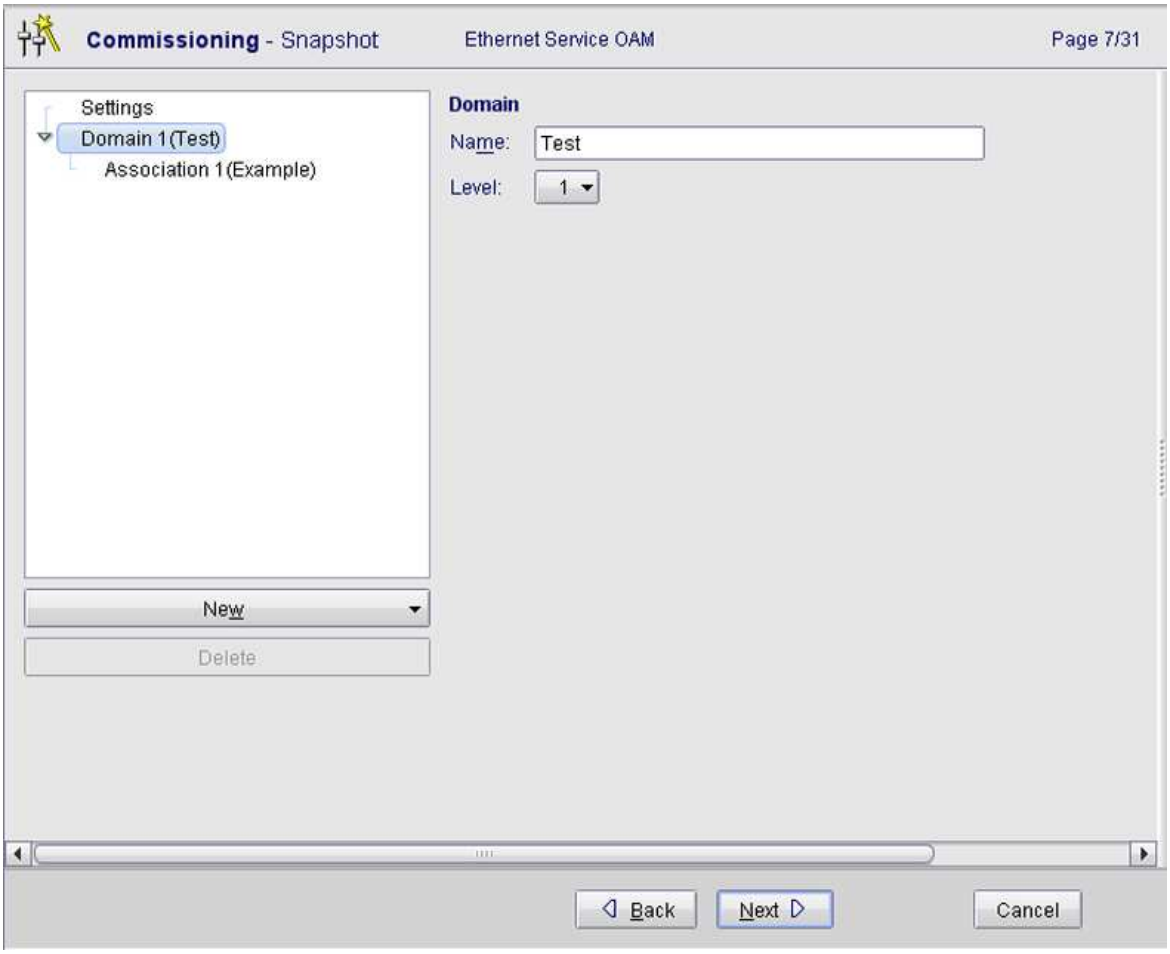

Figure 16 Commissioning - Ethernet Service OAM page, New domain

4 **Click the New button to create a new Association.**

The New association view opens. Enter the name for the association and define the VLAN ID in the *VLAN ID* field.

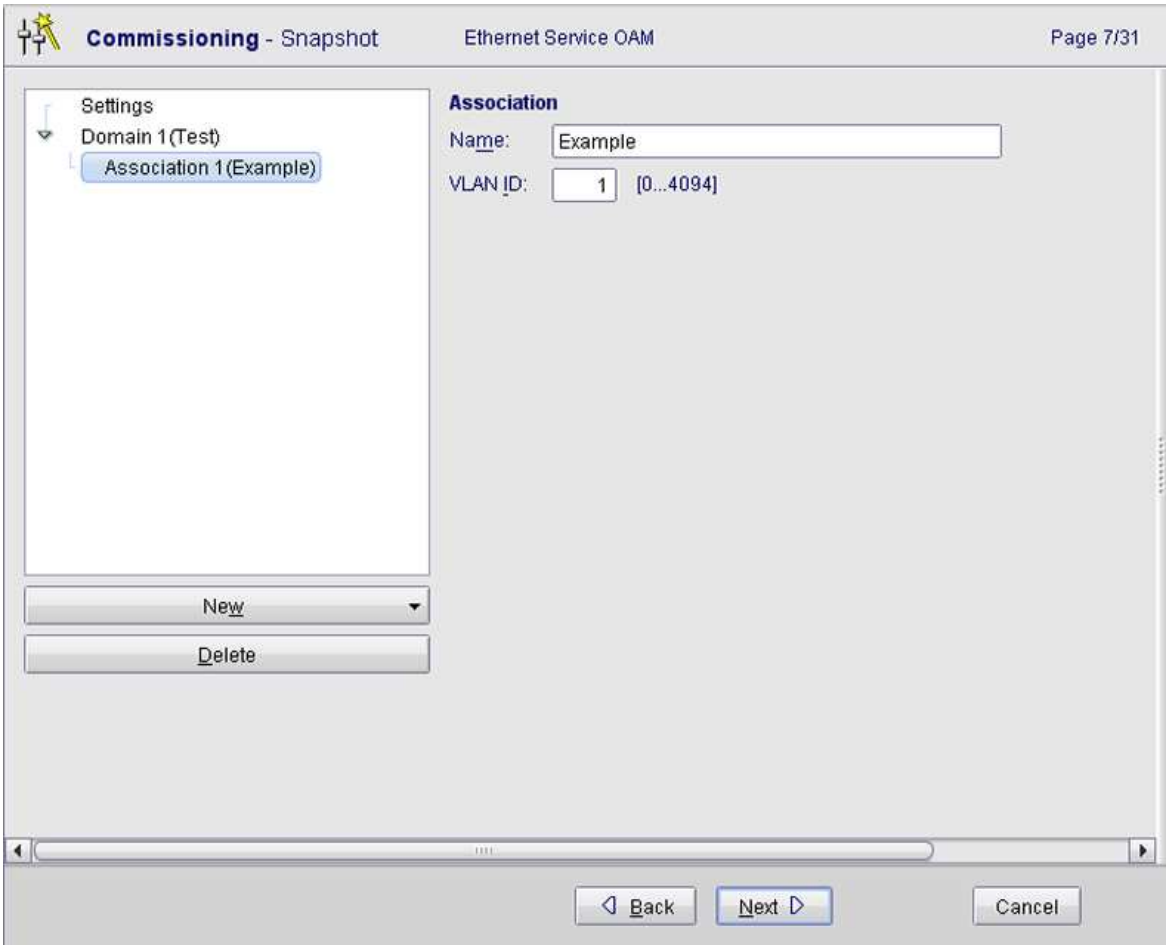

Figure 17 Commissioning - Ethernet Service OAM page, New association

5 **Click the New button to create a new Endpoint.**

The New endpoint view opens.

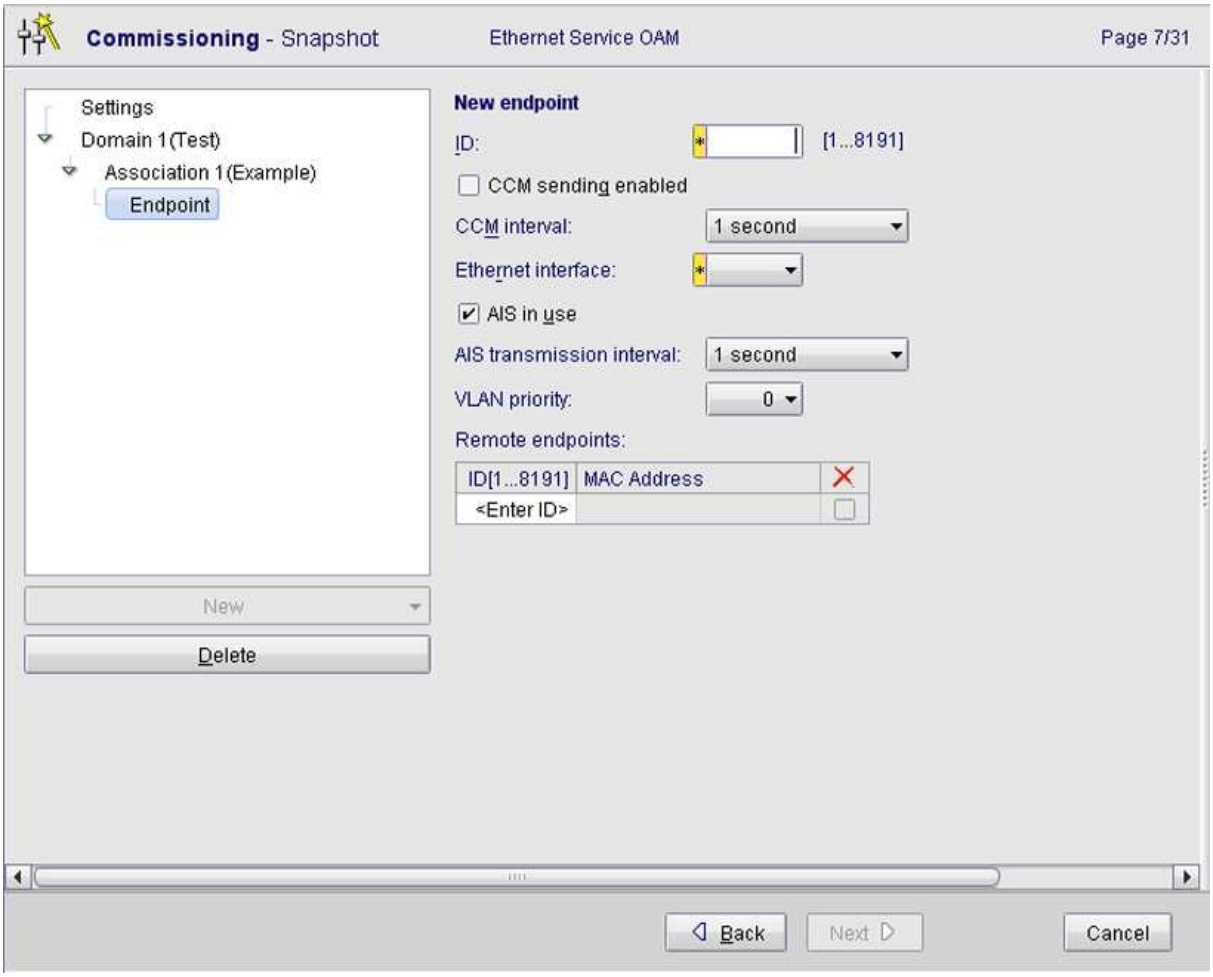

Figure 18 Commissioning - Ethernet Service OAM page, New endpoint

Define the following settings:

- **ID**
  Enter the endpoint ID in the *ID* field.
- **CCM sending enabled**
  Select the *CCM sending enabled* check box to enable the sending of continuity check messages (ETH_CCM) towards the remote Maintenance Association End-points (MEPs) of the endpoint.
- **CCM interval**
  Select the CCM interval from the *CCM interval* drop-down list. This sets the rate for sending CCM messages.
- **Ethernet interface**
  Select the Ethernet interface from the *Ethernet interface* drop-down list.
- **AIS in use**
  Select the *AIS in use* check box to enable AIS message sending.
- **AIS transmission interval**
  Select the AIS transmission interval in the *AIS transmission interval* check box. This sets the rate for sending AIS messages.
- **VLAN priority**
  Select the VLAN priority value from the *VLAN priority* drop-down list.

- **Remote endpoints**
  Define the remote endpoint IDs and MAC addresses in the Remote endpoints table. If you want to delete an endpoint, select it in the *Delete* column.

6 **Click the Next button.**

6.7 Defining IP interfaces settings

Purpose

In the **Commissioning - IP Interfaces** page, you can define IP interface settings for transport Ethernet and VLAN. For information on the transmission parameters, see Transmission Parameters document.

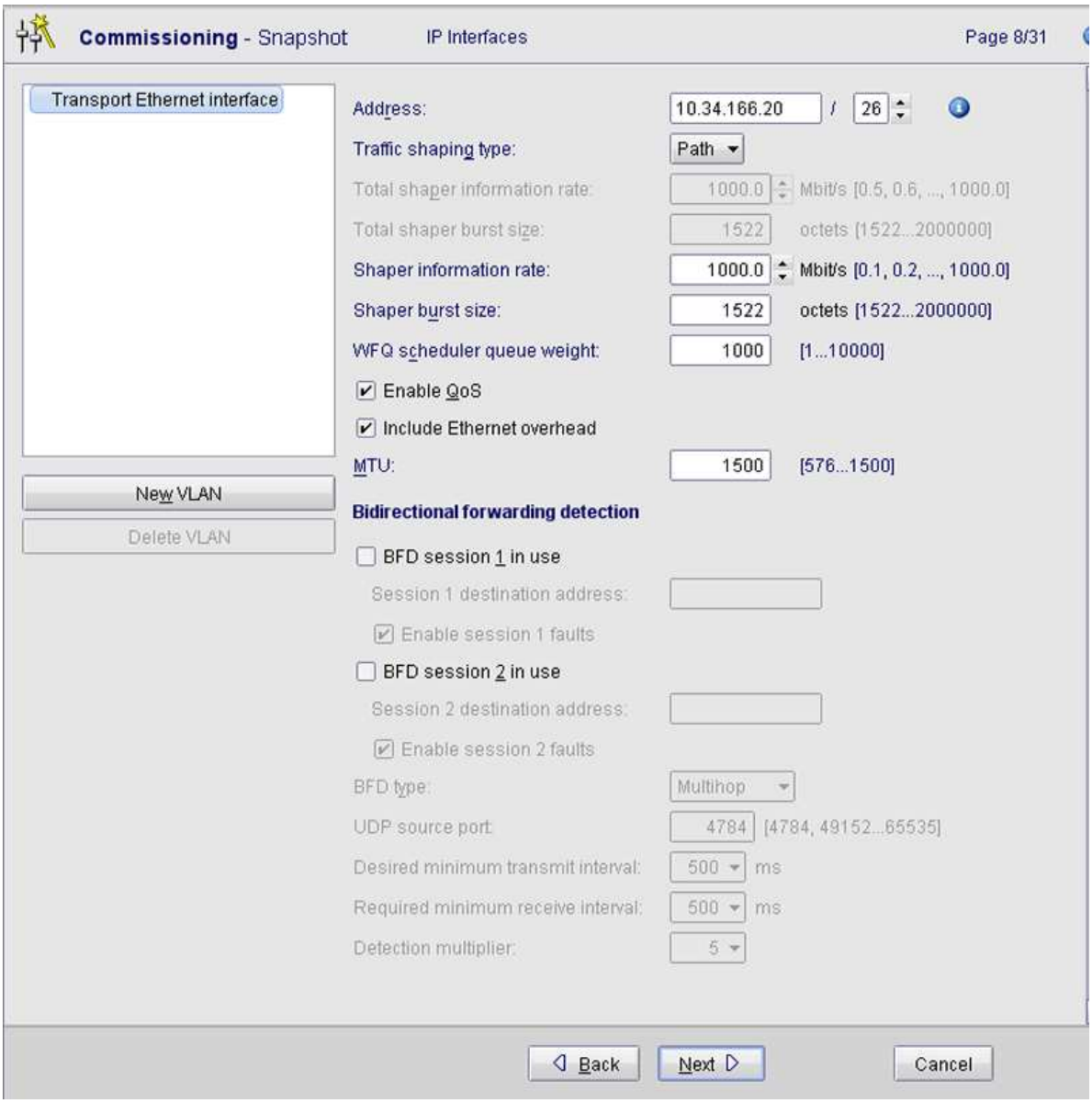

Figure 19 Commissioning - IP Interfaces, plain Ethernet interface page

Steps

1 **Select the Transport Ethernet Interface item from the tree view, and define the following settings:**

- **Address** and **Netmask bits**
  Enter the IP address of the Transport Ethernet interface in the *Address* field. Enter also the netmask bits.
- **Traffic shaping type**
  Select the traffic shaping type value from the *Traffic shaping type* drop-down list. Available values are Off, WFQ and Path.
- **Total shaper information rate**
  Enter the total shaper information rate in Mbit/s in the *Total shaper information rate* field. The value in this field can be entered if the selected Traffic shaping type is WFQ.
- **Total shaper burst size**
  Enter the total shaper burst size in octets in the *Total shaper burst size* field. The value in this field can be entered if the selected Traffic shaping type is WFQ.
- **Shaper information rate**
  Enter the shaper information rate in Mbit/s in the *Shaper information rate* field. The value in this field can be entered if the selected Traffic shaping type is Path.
- **Shaper burst size**
  Enter the shaper burst size in octets in the *Shaper burst size* field. The value in this field can be entered if the selected Traffic shaping type is Path.
- **WFQ sheduler queue weight**
  Enter the **WFQ scheduler** (Weighted Fair Queuing) queue weight in the *WFQ scheduler queue weight* field
  - Enable QoS
    Select the *Enable QoS* check box to enable Quality of Service monitoring.
  - Include Ethernet overhead
    Select the *Include Ethernet overhead* to take Ethernet overhead into account.
- **MTU**
  Enter the value for the maximum transfer unit in the *MTU* field.

2 **Define the Bidirectional Forwarding Detection settings.**

- **BFD session 1 in use**
  Select *BFD session 1 in use* to enable Bidirectional Forwarding Detection (BFD) session 1. This is used to enable or disable BFD functionality on Transport Ethernet Interface.
- **Session 1 destination address**
  Enter the session 1 destination address. This sets the IP address of the peer node to which BFD session needs to be established.
- **Enable session 1 faults**
  Check this check box to enable faults for session 1.
- **BFD session 2 in use**
  Select *BFD session 2 in use* to enable Bidirectional Forwarding Detection (BFD) session 2. This is used to enable or disable BFD functionality on Transport Ethernet Interface.

- **Session 2 destination address**
  Enter the session 2 destination address. This sets the IP address of the peer node to which BFD session needs to be established.
- **Enable session 2 faults**
  Check this check box to enable faults for session 2.
- **BFD type**
  This selects the BFD type: Multi hop or Single hop. Multi hop is a solution for arbitrary paths between systems with many hops and unpredictable paths. A pair of systems may have multiple paths between them that may overlap. Single hop tracks IP connectivity between directly-connected systems: Supplement the detection mechanisms in routing protocols and monitor router-host connectivity.
- **UDP source port**
  For Single hop BFD mode UDP source port can be 3784, 49152 … 65535. Default is 3784. For Multi hop BFD mode UDP source port can be 4784, 49152 … 65535. Default is 4784.
- **Desired minimum transmit interval**
  Select the interval from the *Desired minimum transmit interval* list. The range is from 500 to 5000 ms. Default value is 500 ms.
- **Required minimum receive interval**
  Select the interval from the *Required minimum receive interval* list. The range is from 500 to 5000 ms. Default value is 500 ms.
- **Detection multiplier**
  Select the multiplier from the *Detection multiplier* list. The value range is 2-10 in steps of 1. Default value is 5.

3 Click the New VLAN button, and define the following settings:

Note that maximum five VLANs can be configured or 4 VLANs and one plain Ethernet interface.

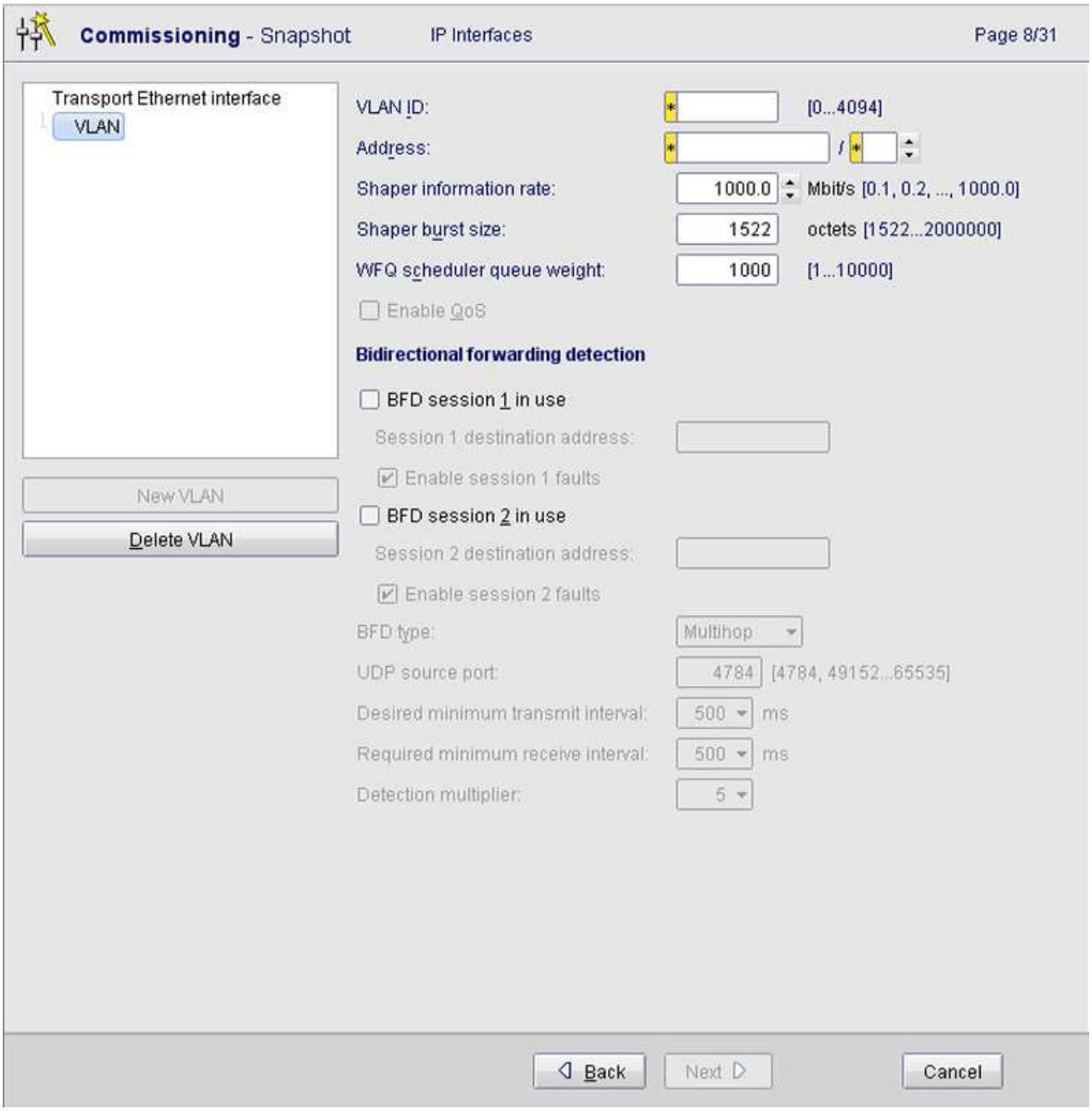

Figure 20 Commissioning - IP Interfaces, VLAN interface page

- **VLAN ID**
  Enter the VLAN ID in the *VLAN ID* field.
- **Address** and **Netmask bits**
  Enter the VLAN IP address in the *Address* field. Enter also the netmask bits.
- **Shaper information rate**
  Enter the shaper information rate in Mbit/s in the *Shaper information rate* field.
- **Shaper burst size**
  Enter the shaper burst size in octets in the *Shaper burst size* field.
- **WFQ sheduler queue weight**
  Enter the WFQ scheduler queue weight in the *WFQ scheduler queue weight* field.
  - Enable QoS
    Select the *Enable QoS* check box to enable Quality of Service monitoring.

4 **Define the Bidirectional Forwarding Detection settings.**

See step 2.

5 **Click the Next button.**

6.8 Defining Quality of Service settings

Purpose

In the **Commissioning - Quality of Service** page, you can configure Quality of Service settings for the Ethernet interfaces.

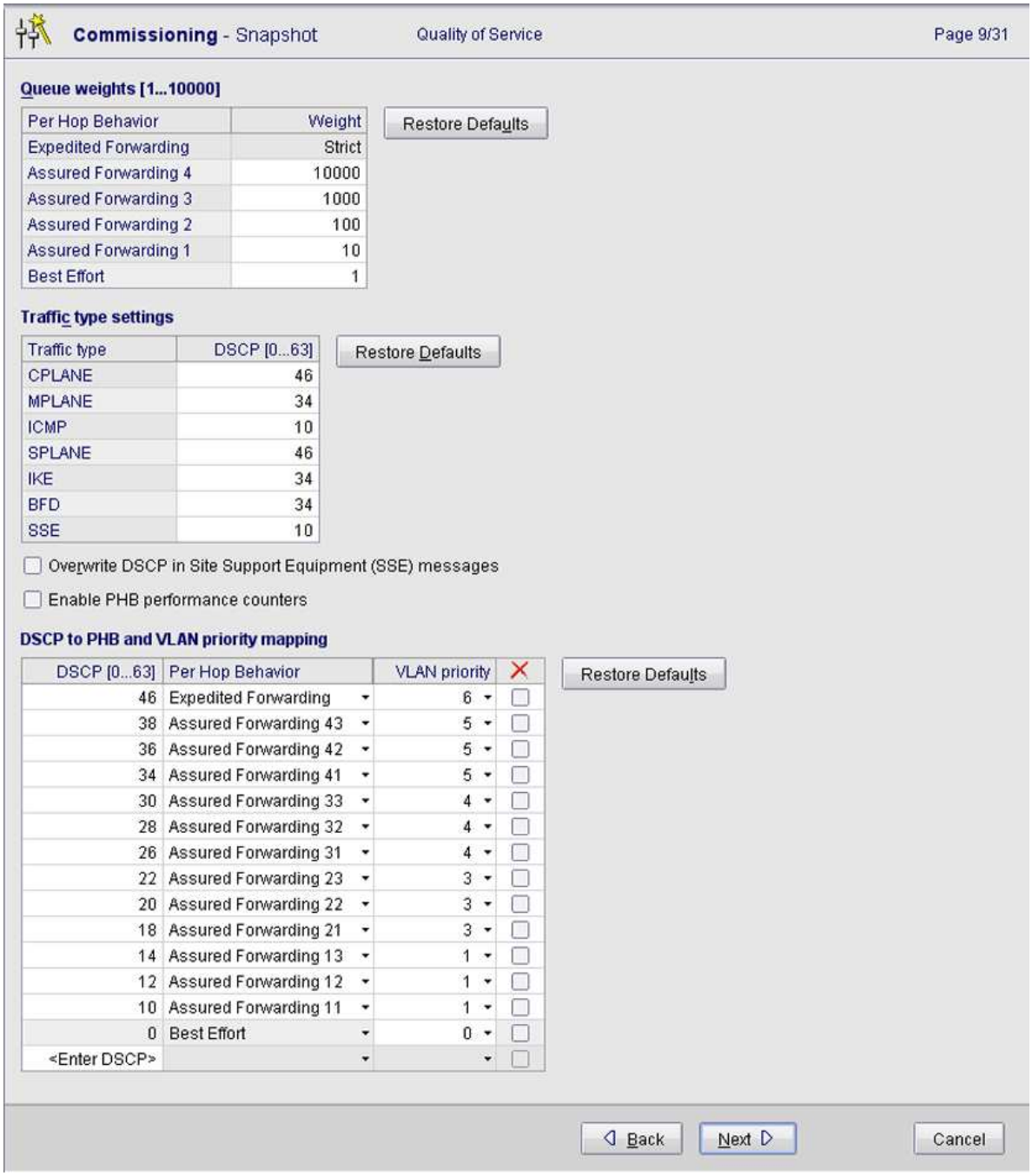

Figure 21 Commissioning - Quality of Service page

Steps

1 **Define the Quality of Service settings.**

- *Weight* for each Per Hop Behavior.
  Enter the weight for each queue in the *Weight* column. The value range is from 1 to 10000. The weight for Expedited Forwarding cannot be changed. Clicking the **Restore Defaults** button restores the default values.
- Define the DSCP values for the traffic types in the *DSCP* column. Clicking the **Restore Defaults** button restores the default values.
  Select the *Overwrite DSCP in Site Support Equipment (SSE) message* check box if you wish to enable this parameter.This parameter specifies if the DSCP value is overwritten in outgoing Site Support Equipment (SSE) messages.
  Select the *Enable PHB performance counters* check box if you wish to enable PHB performance counters.
- Enter the *DSCP* and *VLAN priority* values for the traffic types.
  Select the Per Hop Behavior (Queue) for each traffic type from the list in the *Per Hop Behavior* column. Clicking the **Restore Defaults** button restores the default values.
  If you wish to delete an entry from the table, select the corresponding check box in the *Delete* column.

2 **Click the Next button.**

6.9 Defining Timing over Packet settings

Purpose

In the **Commissioning - Timing over Packet** page, you can configure Timing over Packet settings.

Timing over Packet enables synchronization reference distribution over Ethernet or IP network to the BTS.

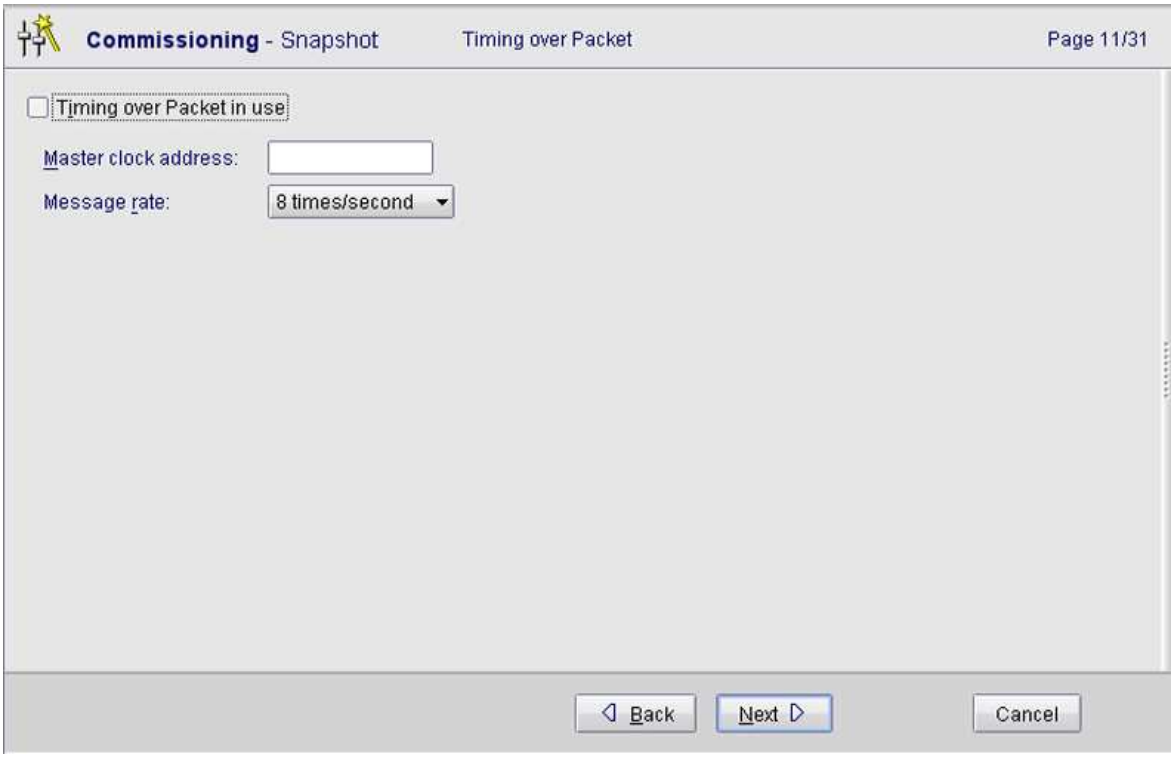

Figure 22 Commissioning - Timing over Packet settings page

Steps

1 **Define the Timing over Packet settings.**

Define the following settings:

- **Timing over Packet in use**
  Select *Timing over Packet in use* to enable Timing over Packet.
- **Master clock address**
  Enter the IP address of the master clock in the *Master clock address* field.
- **Message rate**
  Select how often the synchronization message is to be sent by the Timing over Packet master within the transmission duration request period from the *Message rate* list: 8, 16 or 32 times/second. Default value is 16 times/second.

2 **Click the Next button.**

6.10 Defining application addresses

Purpose

In the **Commissioning - Application Addresses** page, you can define application addresses for different planes. Application addresses can be virtual addresses or the same as network interface IP address. Plane addresses can be configured to the same value as network interface IP addresses.

All planes must always be configured.

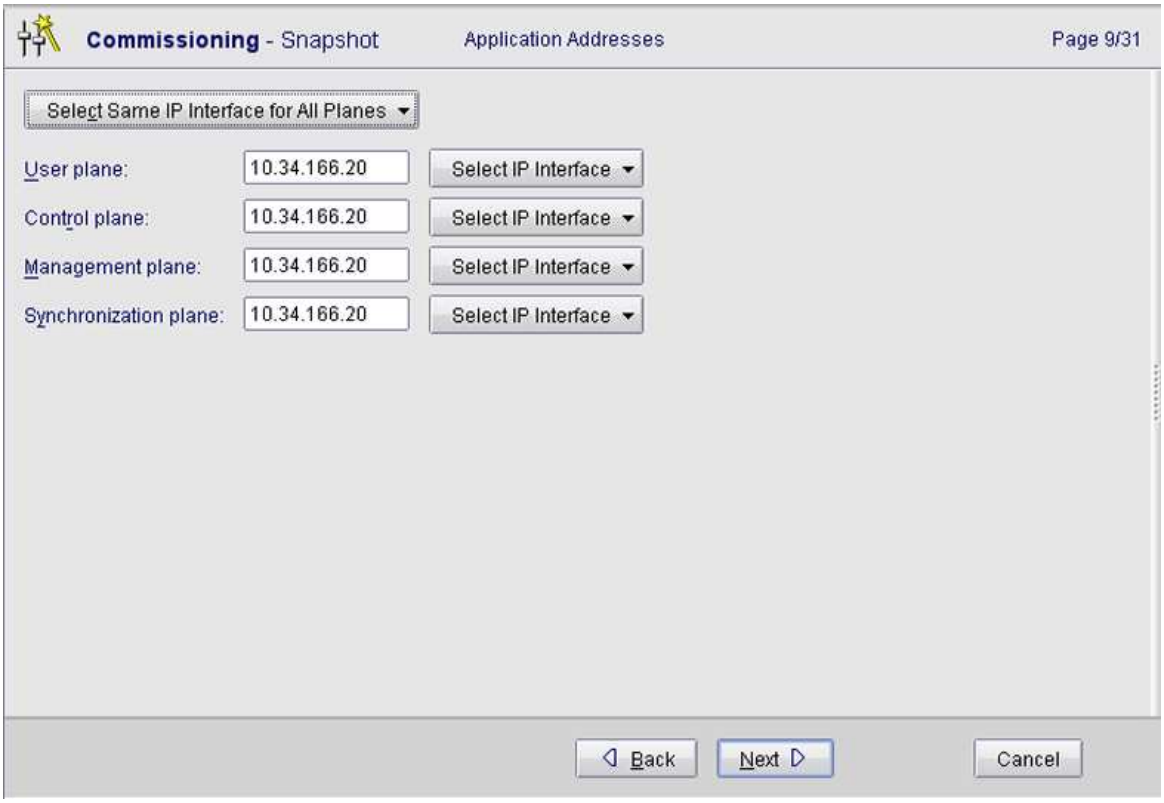

Figure 23 Commissioning - Application Addresses page

Steps

1 **Enter the IP addresses for the following planes:**

- **User plane**
- **Control plane**
- **Management plane**
- **Synchronization plane**

These fields are editable, but you can also use the **Select Same IP Interface for All Planes** and **Select IP Interface** buttons if you wish to use the same IP address for all planes or select a pre-defined address from the drop-down menu.

2 **Click the Next button.**

6.11 Defining IP security policies

Purpose

In the **Commissioning - IP Security** page, you can define IP security options. For information on the transmission parameters, see Transmission Parameters document.

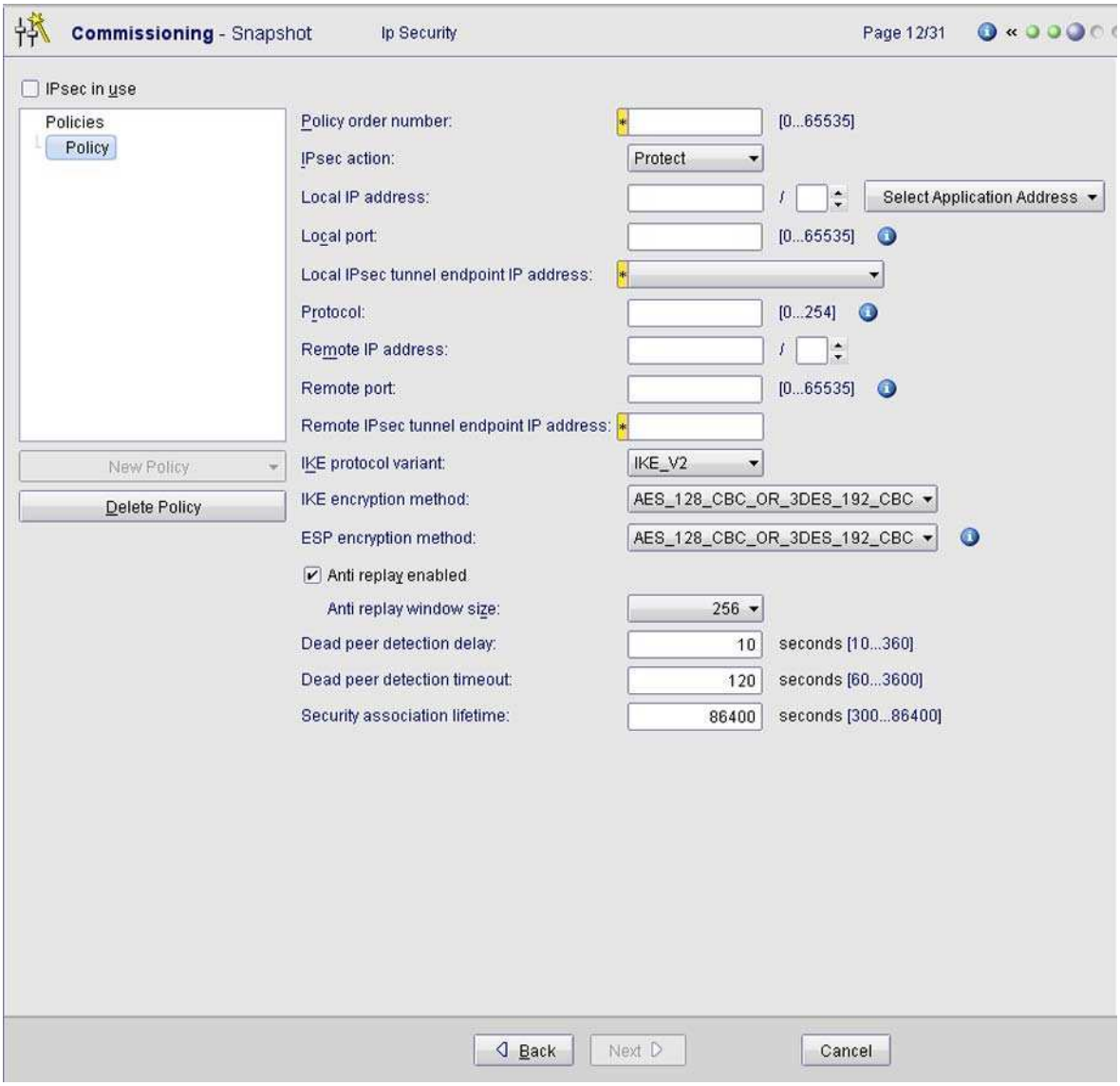

Figure 24 Commissioning - IP Security, Policy settings page

Steps

1 **Select the IPsec in use check box if you wish to take IP security in use.**

2 **Click the New Policy button, and define the following settings:**

Choose the policy type from the drop-down list: Unfilled, U-plane, C-plane, M-plane, S-plane, Authentication LDAP, NTP or CMP.

- **Policy order number**
  Enter the policy order number in the *Policy order number* field. The smaller the order number is the more highly valued is the policy.
- **IPsec action**
  Select the IPSec action from the drop-down list. Bypass-setting does not process any packets, Discarded-setting does not forward any packets. Protected-setting follows the IPsec process.
- **Local IP address**
  Enter the local IP address in the *Local IP address* field. Enter also the address netmask bits. You can either define this address yourself by selecting the Define address radio button (empty value means any address - whole range of addresses) or choose the address from the drop-down list if you select the Select application address option.
- **Local port**
  Enter the local port number in the *Local port* field. Empty value means any port - whole range of ports.
- **Local IPsec tunnel endpoint IP address**
  Enter the local tunnel endpoint address in the *Local tunnel endpoint IP address* field.
- **Protocol**
  Enter the protocol value in the *Protocol* field. Empty value means any port - whole range of ports.
- **Remote IP address**
  Enter the remote IP address in the *Remote IP address* field. Enter also the address netmask bits.
- **Remote port**
  Enter the remote port value in the *Remote port* field. Empty value means any port - whole range of ports.
- **Remote IPsec tunnel endpoint IP address**
  Enter the remote tunnel endpoint address in the *Remote tunnel endpoint IP address* field.
- **IKE protocol variant**
  Select the IKE protocol variant from the drop-down list.
- **IKE encryption method**
  Select the encryption method from the drop-down list.
- **ESP encryption method**
  Select the encryption method from the drop-down list.
- **Anti replay enabled**
  Select the checkbox to enable the anti replay window feature.
- **Anti replay window size**
  Select the anti replay window size in packets from the drop-down list.
- **Dead peer detection delay**
  Enter the dead peer detection delay in seconds in the *Dead peer detection delay* field.
- **Dead peer detection timeout**
  Enter the dead peer detection timeout in seconds in the *Dead peer detection timeout* field

- **Security association lifetime**
  Enter the security association lifetime in seconds in the *Security association lifetime* field.

3 **Click the Next button.**

Synchronization page opens.

6.12 Defining synchronization settings

Purpose

In the **Commissioning - Synchronization** page you can configure the synchronization settings.

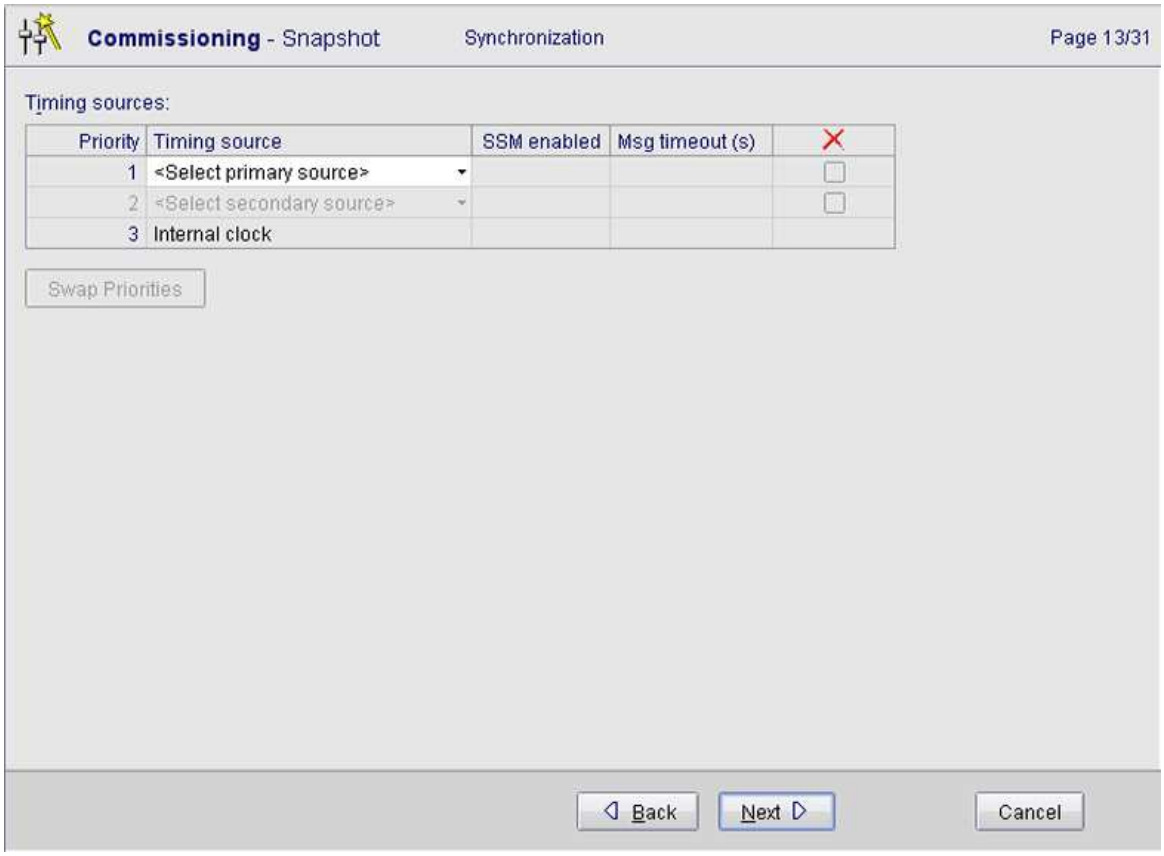

Figure 25 Commissioning - Synchronization page

Steps

1 **Define the synchronization settings.**

Define the priority order of synchronisation timing sources. For synchronous Ethernet, select also the *SSM enabled* to enable SSM and the message timeout.

Clicking the **Swap Priorities** button changes the order of the first two timing sources. Internal clock is fixed.

2 **Click the Next button.**

6.13 Defining routes

Purpose

In the **Commissioning - Routing** page, you can create static indirect routes to transport network.

A maximum of 100 static routes can be configured including the default gateway.

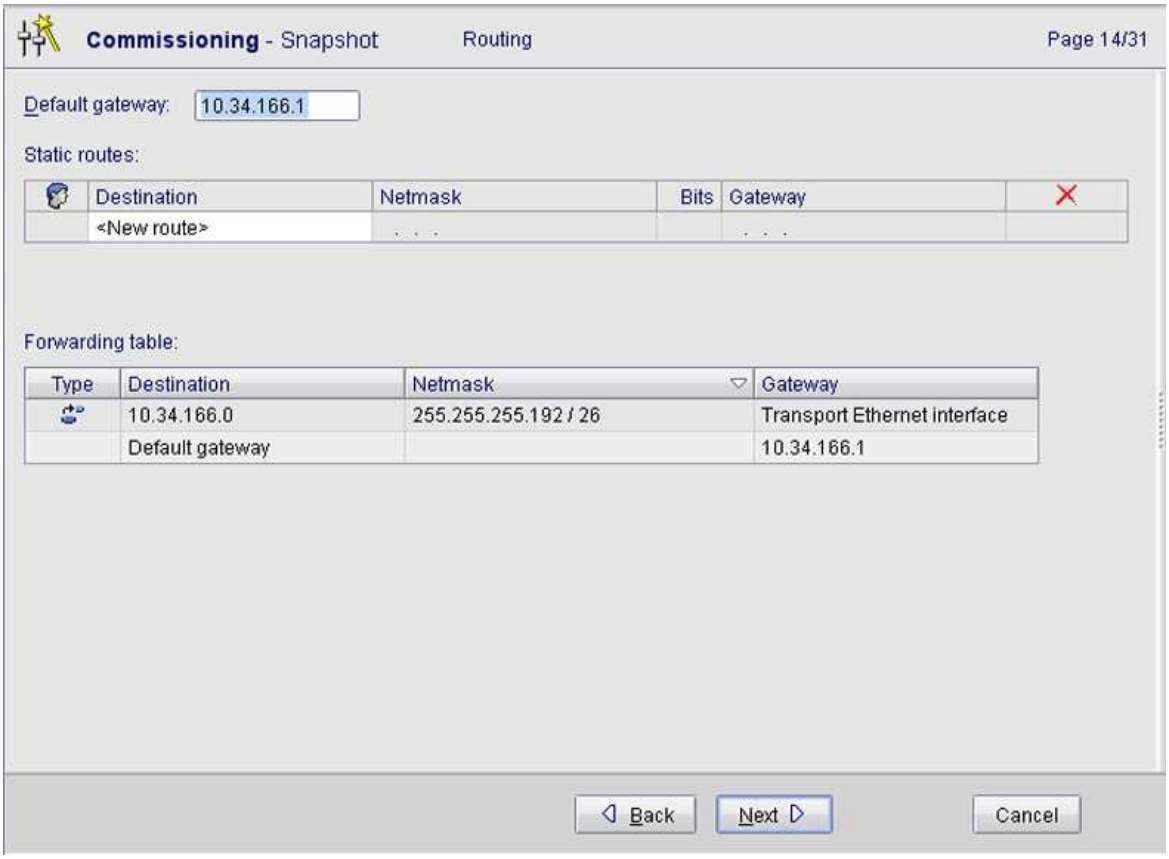

Figure 26 Commissioning - Routing page

Before you start

The IP addresses of the static routes need be unique within the network element and the following IP addresses should not be configured for *Destination* and *Gateway*:

- 0.0.0.0
- 127.0.0.0 - 127.255.255.255 (loopback address)
- 255.255.255.255 (special direct broadcast address)
- 224.0.0.0 - 239.255.255.255 (multicast address)
- 192.168.254.0 - 192.168.255.255 (NE private address space).

Steps

1 **Define the Default Gateway.**

2 **Define the static routes.**

Define the following settings for each static route:

- **Destination**
  Enter the destination IP address of the route in the *Destination* column.
- **Netmask**
  Enter the netmask of the destination IP address in the *Netmask* column.
- **Bits**
  Enter the netmask length (bits) of the destination IP address in the *Bits* column.
- **Gateway**
  Enter the gateway IP address in the *Gateway* column.

3 **Click the Next button.**

6.14 Defining IP filtering

Purpose

In the **Commissioning - IP Filtering** page, you can configure restricted mode exception rules, and activate or deactivate the restricted mode for LMP.

In the so-called restricted mode of the LMP, it is possible to access only the local BTS site. All IP packets with public IP address in source or destination will be discarded. You can define exception rules to the restricted mode so that any IP packet that matches for any rule in any ruleset is not discarded. In unrestricted mode, other network elements within the same network can also be accessed.

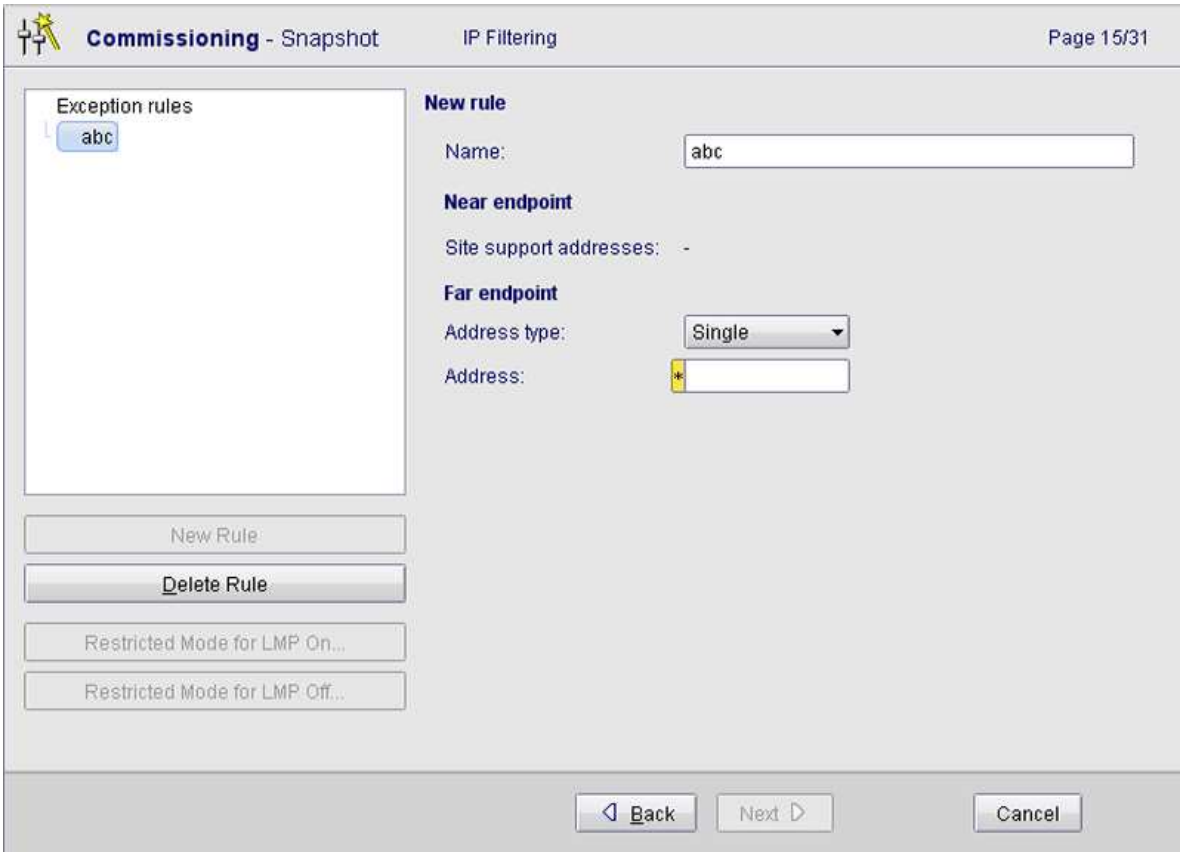

Figure 27 Commissioning - IP Filtering page

Steps

1 **Click the New Rule button to add a rule.**

2 **Enter the name for the rule in the name field.**

3 **Define the following settings for Far endpoint:**

- **Address type**
- Depending on the **Address type** selection, define the other parameters:
  If you selected the **Single** option, define the **Address**.
  If you selected the **Range** option, define the **Address** and **Subnet mask**.

4 **If you want to modify an exception rule, select the rule from the tree view, and make the necessary modifications.**

5 **If you want to delete an exception rule, select the rule from the tree view, and click the Delete Rule button.**

6 **If you want to activate the restricted mode, click the Restricted Mode for LMP On button.**

7 **If you want to deactivate the restricted mode, click the Restricted Mode for LMP Off button.**

NOTICE: It is not recommended to set the restricted mode to OFF. The restricted mode is a security feature for the DCN network.

Setting restricted mode for LMP off allows all types of traffic between any host connected to the LMP ports and the DCN network. To restrict unknown hosts traffic, it is recommended to add specific rules between LMP hosts and DCN network instead of enabling **Restricted Mode for LMP Off**. This will be enabled during initial commissioning or end-to-end tests.

8 **Click the Next button.**

6.15 Defining BTS settings

Purpose

In the **Commissioning - BTS Settings** page, you can define BTS information.

This page is shown when the **BTS** or the **BTS site** option was selected in the **Commissioning - Introduction** page. If you selected the **TRS** option, continue to Sending parameters to BTS site.

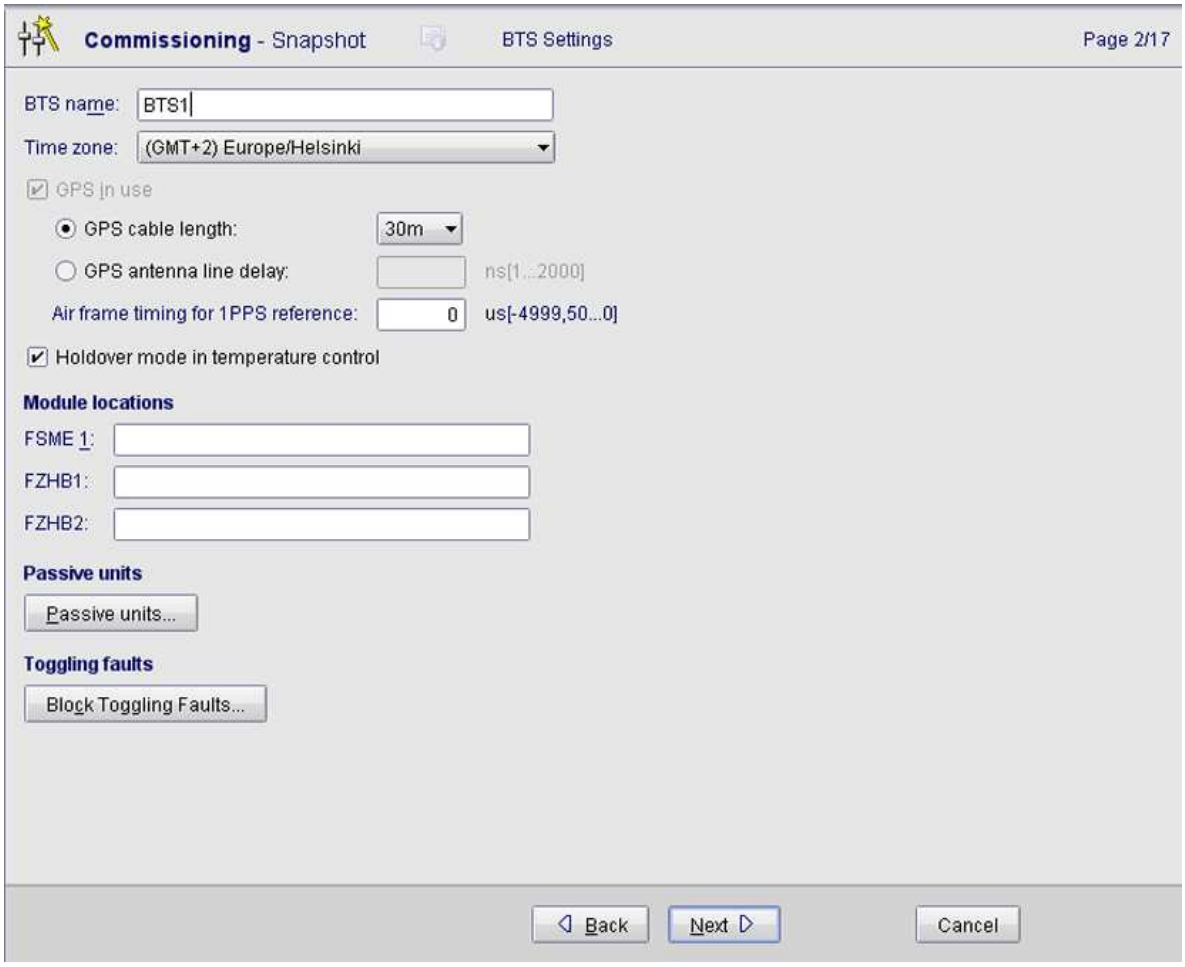

Figure 28 Commissioning - BTS Settings page

Steps

1 **Enter the BTS name in the BTS name field if necessary.**

If you have defined the **Name** parameter in the **Commissioning - Site Properties** page during the TRS commissioning, this field is disabled.

2 **Select the local time zone from the Time zone list, if needed.**

The computer time zone is used as default.

3 **Select the synchronization source for BTS fault management.**

Select **GPS in use** to add the GPS source to the BTS fault handling system. Note that selecting a synchronization source during commissioning only defines it for fault purposes. In other words, a fault is triggered if a selected synchronization source is missing.Define also the propagation delay for the GPS cable. Either select the GPS cable length in meters in the **GPS cable length** drop-down list, or enter the delay value in nanoseconds in the **GPS antenna line delay** field.Enter the air frame timing for 1PPS reference in the **Air frame timing for 1PPS reference** field.

Note that:

- The GPS cable length can be given only if the cable is purchased by Nokia Siemens Networks and the length is known exactly. The reason is that the propagation delay value per meter varies between different cable types and deviations from the given length cause timing offset in the air interface.
- If the GPS solution at the BTS site differs from the NSN purchased one, the total GPS antenna line delay value can be entered in nanoseconds. If this option is used, the total delay from GPS antenna to Sync In interface of the BTS must be taken into account, including also the settings of the external GPS receiver: cable delay and offset settings given to the GPS receiver change the timing of the PPS pulse and therefore the situation of the whole chain must be covered when entering the value in nanoseconds.
- Cables are not the only components causing propagation delay. In the antenna line there may be also lightning arrester, line amplifier(s), splitter(s), adapter (for example, from TTL to RS422/485) and the given value must cover the total propagation delay of all of these components. It must be noticed that delay of these components may vary a lot between different product variants and therefore the delay of each component must be known.

4 **Select the Holdover mode in temperature control check box, if required.**

When the **Holdover mode in temperature control** check box is not selected, minimizing the noise level of the BTS cooling fans is the primary function. This means that the BTS-internal temperature stability is secondary issue, following that the operational time in GPS holdover situation is not optimized.

When check box has been selected, the operation differs so that the primary function is to keep the ambient temperature of the BTS master clock (OCXO) as stabile as possible, in order to maximize the BTS operational time in GPS holdover situation. The temperature stabilization is done by changing the speed of the BTS cooling fans, without taking into consideration the noise level.

5 **Define the module locations in the FSM and FR fields (optional).**

If you have defined the **Location** parameter in the **Commissioning - Site Properties** page during the TRS commissioning, the FSM field is disabled.

6 **If you want to define information on passive units of the site, click the Passive Units button.**

The **Passive Units** dialog box opens.

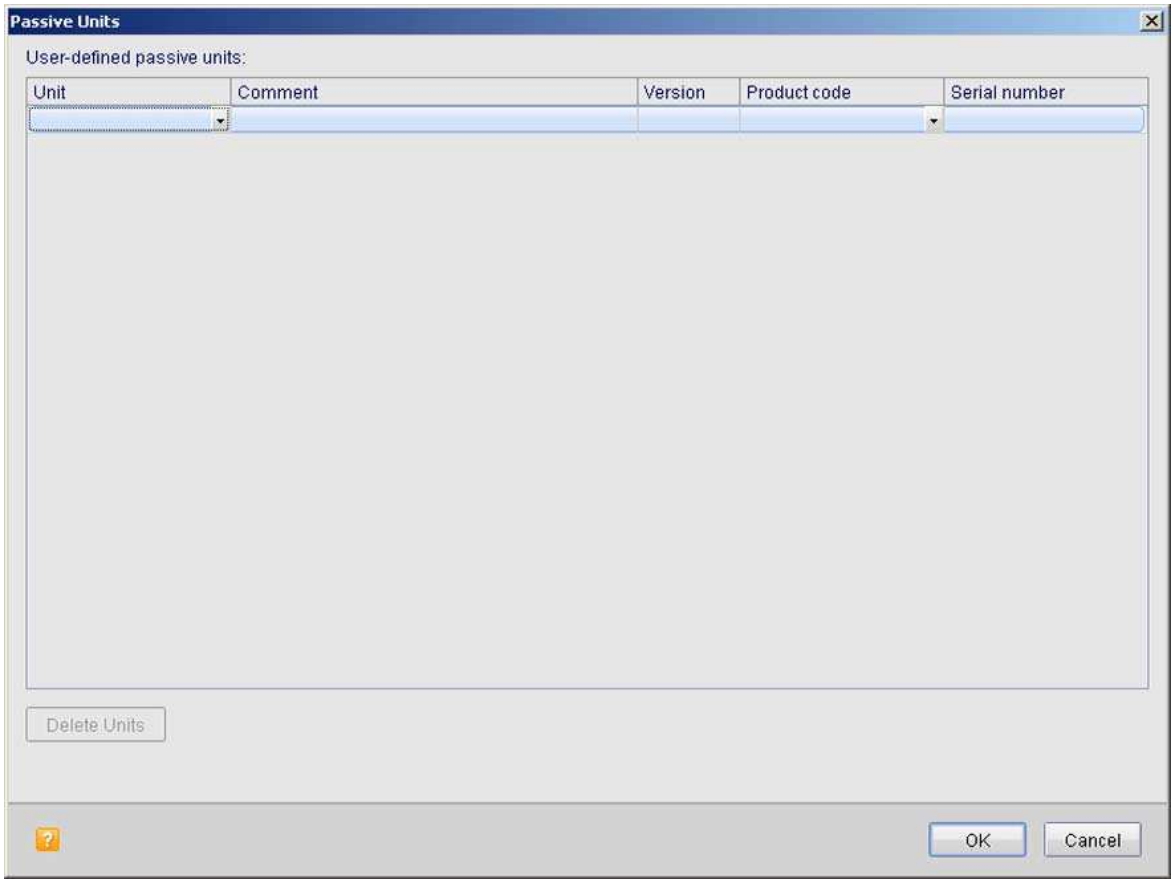

Figure 29 Passive Units dialog box

Define the properties for the units. Click the **OK** button to save the changes and return to the **Commissioning - BTS Settings** page.

7 If you want to block toggling faults, click the Block Toggling Faults button.

The **Block Toggling Faults** dialog box opens.

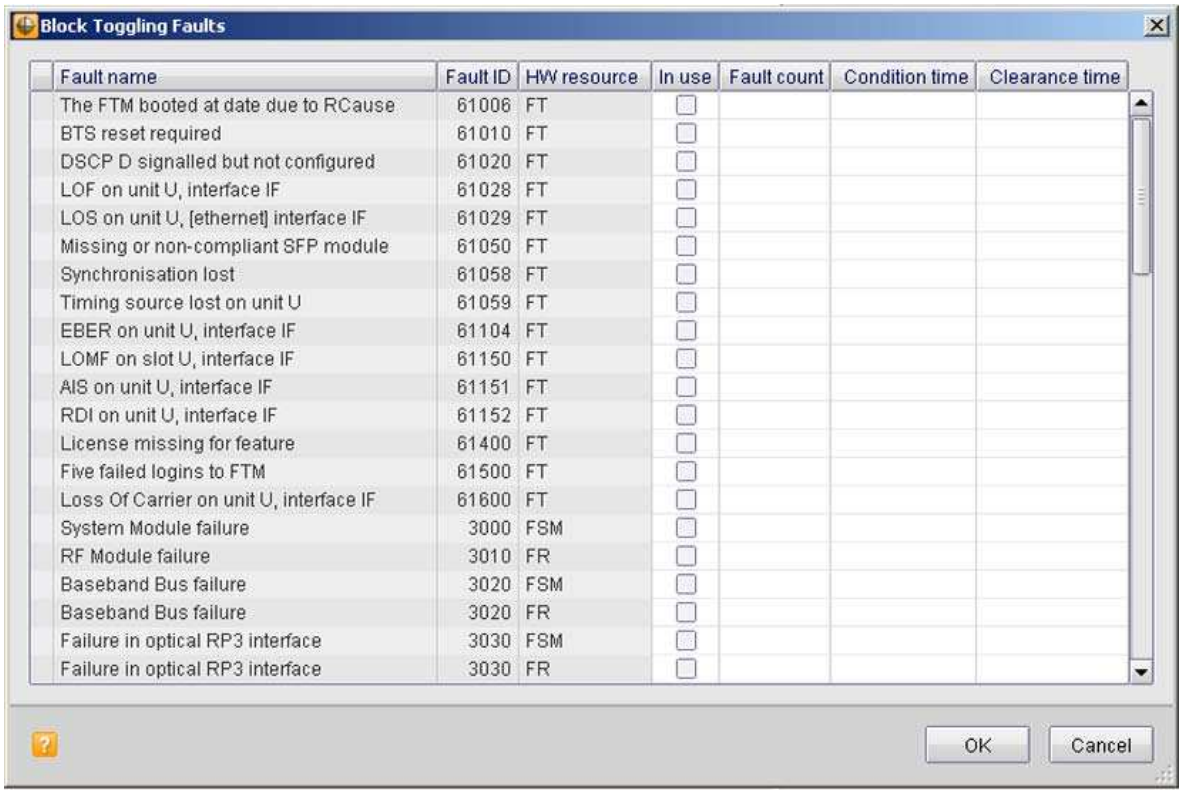

Figure 30 Block Toggling Faults dialog box

Define the settings for block toggling faults. The Block Toggling Fault dialog box can be used to reduce the amount of faults in the BTS to the really important ones and to prevent the system from getting loaded with faults which are filling the fault buffers, but do not provide further important information. It can also be used to keep the system clear of faults which are raised and cleared in a short period of time and which do not give further information for fault analysis and fault localization.

Click the **OK** button to save the changes to the commissioning file. Click **Cancel** to close the dialog box and return to the **Commissioning - BTS Settings** page. Note that this cancels the changes made if they are not saved already by clicking the **OK** button.

8 Click the Next button.

6.16 Defining concurrent mode settings

Purpose

In the Commissioning - Concurrent Mode Settings page you can set concurrent mode setting for multiradio BTS. This page is shown when the HW configuration contains at least one radio module supporting concurrent technology 2G in LTE-2G sharing. Page is not shown in chained RF configurations because RF sharing is not supported in chained RF configurations.

Note also that page is not shown when HW configuration contains radio module supporting 2G from RF interface 4 but does not contain radio modules supporting 2G from other RF interfaces.

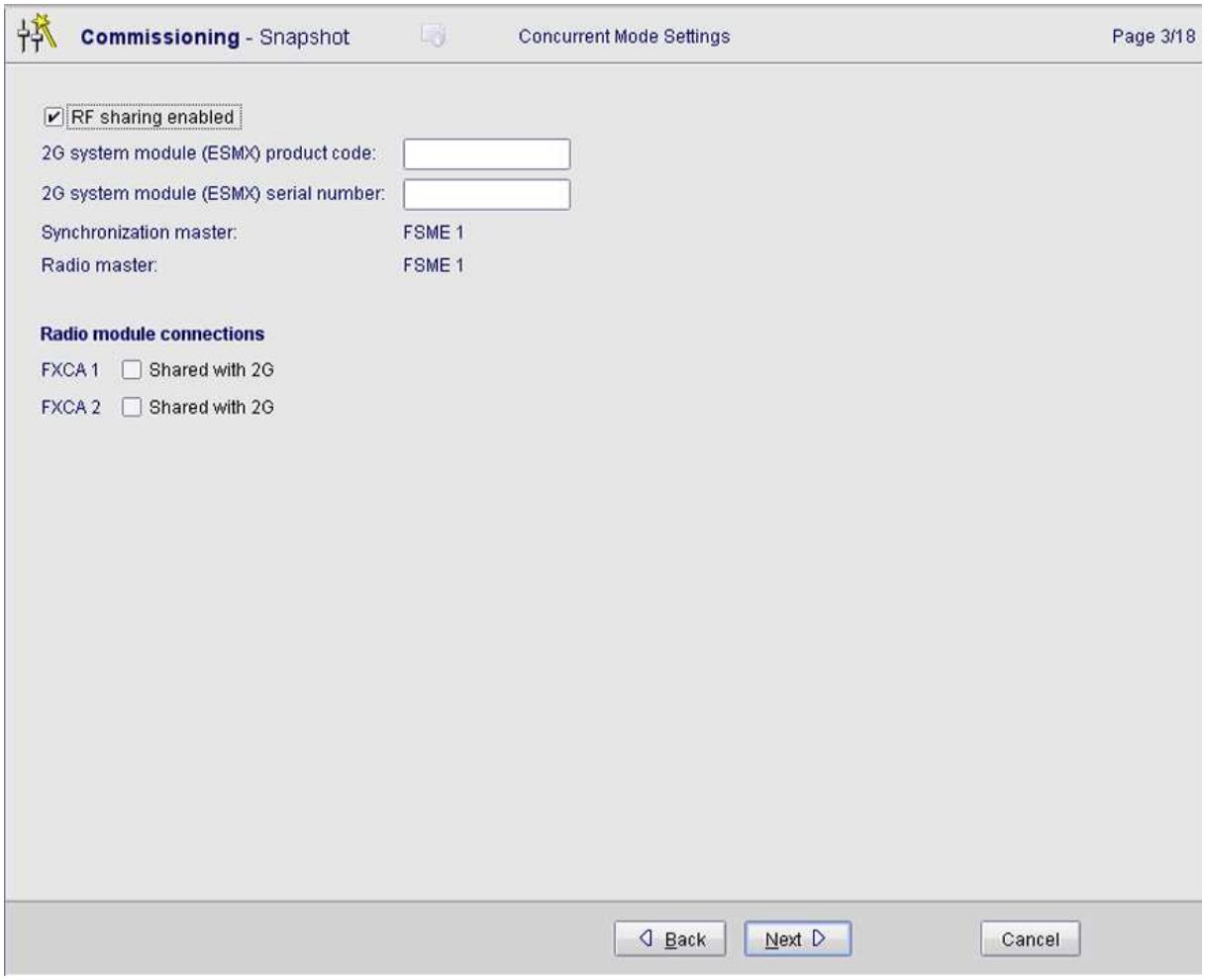

Figure 31 Commissioning - Concurrent Mode Settings page

Steps

1 **Select RF sharing enabled check box to enable RF sharing.**

This parameter enables the RF sharing in LTE-2G sharing. Enabling this parameter means that multiradio RF module can be used for GSM/EDGE and LTE carriers at the same 3GPP frequency band. When operating in RF sharing mode, a single RF module is connected to both technology system modules simultaneously.Flexi EDGE System

Module is operating in GSM/EDGE SW mode and Flexi Multimode System Module in LTE SW mode. Both are connected to the one and same Flexi Multiradio RF Module.

2 **Enter the 2G system module product code and serial number.**

Enter the 2G system module's product code and serial number in the respective optional fields.

The *Synchronization master* field shows the LTE system module as synchronization master. The synchronization master takes care of synchronization issues. LTE system module works as synchronization master in LTE-2G sharing.

The *Radio master* field shows the LTE system module as radio master. Radio master manages the shared RF modules.

3 **Define the radio module connections.**

The *Shared with 2G* check box is enabled if the RF module supports FSM/EDGE. Note that if RF sharing enabled check box is selected at least one of the RF modules supporting 2G must be selected as shared RF module. Shared RF module must be physically connected to the same interface (RP3 interface) in both technology system modules.

4 **Click the Next button.**

6.17 Defining cell resources

Purpose

In the **Commissioning - Cell Resources** page, you can create local cells, and define antennas of the radio modules and carrier power to the local cells. Local Cell Resource (LCR) is a concept for defining all hardware that a global cell requires in the base station. Local cells (LCELL) are then mapped to global cells (LNCEL) on the commissioning RNW page.

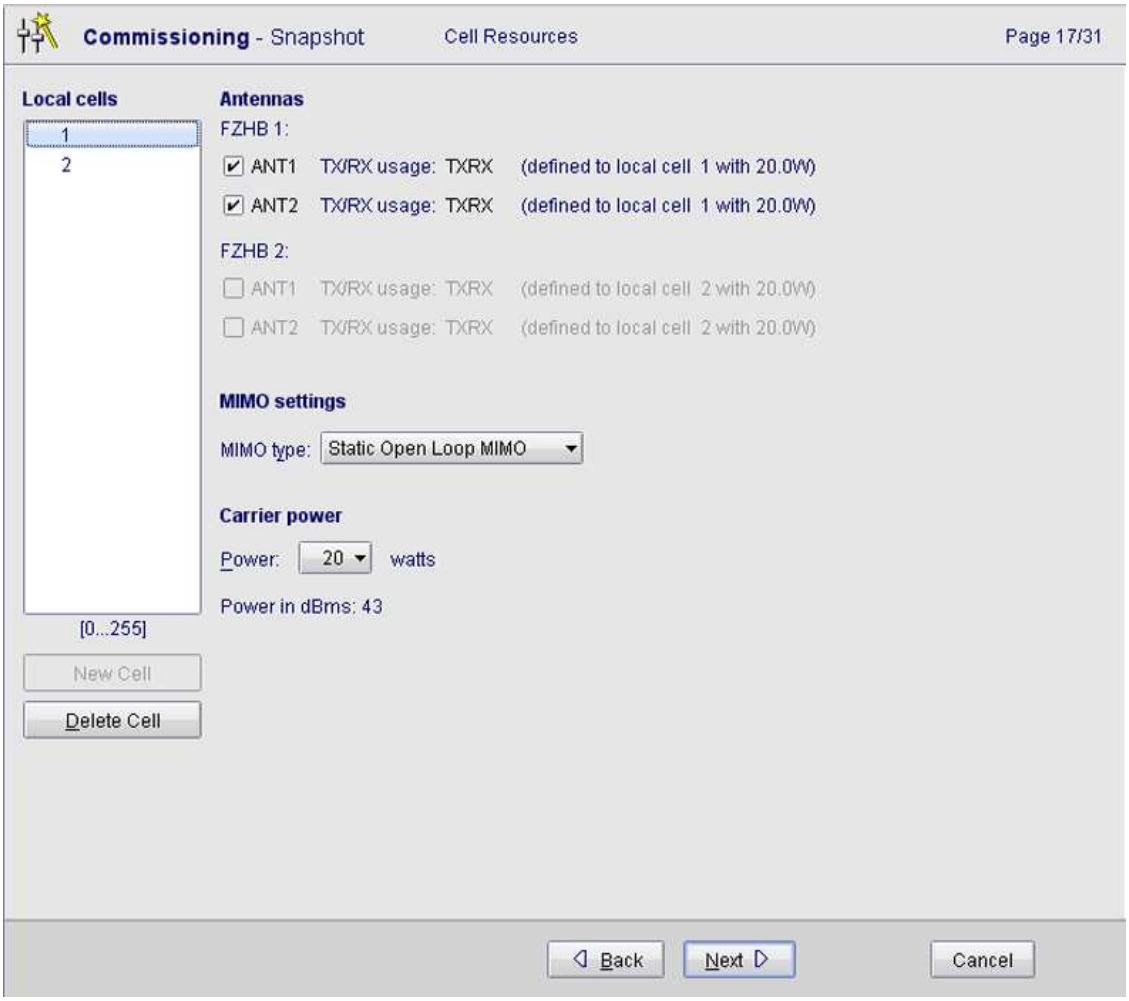

Figure 32 Commissioning - Cell Resources page

Local cell identifiers are determined at the network planning stage. It is essential that the value input matches the expected value in the radio network plan. You should not select the values arbitrarily.

Steps

1 **Define the cell id for the first cell in the Local cells list.**

2 **Assign the antennas of radio modules to the local cell by selecting the appropriate check boxes.**

Antennas have fixed Tx/Rx usage: TxRx for ANT 1, ANT 3 and ANT 5, and Rx for ANT 2, ANT 4 and ANT 6 in non-MIMO sector configuration type A. In MIMO sector configuration types (G, H, I, L) both antennas mapped to local cell have Tx/Rx usage: TxRx.

You can select antennas for local cells as follows:

- ANT 1 (TxRx) + ANT 2 (Rx) (sector configuration type A)
- ANT 3 (TxRx) + ANT 4 (Rx) (sector configuration type A)
- ANT 5 (TxRx) + ANT 6 (Rx) (sector configuration type A)
- ANT 1 (TxRx) + ANT 3 (TxRx) (MIMO sector configuration type G)
- FRx ANT1 (TxRx) + FRy ANT1 (TxRx) (MIMO sector configuration type H)
- FRx ANT3 (TxRx) + FRy ANT3 (TxRx) (MIMO sector configuration type H)
- FRx ANT5 (TxRx) + FRy ANT5 (TxRx) (MIMO sector configuration type H)
- ANT 1 (TxRx) + ANT 2 (TxRx) (MIMO sector configuration type I)
- ANT 3 (TxRx) + ANT 4 (TxRx) (MIMO sector configuration type I)
- ANT 5 (TxRx) + ANT 6 (TxRx) (MIMO sector configuration type I)
- ANT 1 (TxRx) + ANT 2 (TxRx) + ANT 3 (TxRx) + ANT 4 (TxRx) + ANT 5 (TxRx) + ANT 6 (TxRx) + ANT 7 (TxRX) + ANT 8 (TxRX) (MIMO sector configuration type L). Note, that sector beamforming MIMO type (Single Stream Beamforming) is selectable only when sector configuration type L is used so it cannot be used with other sector configuration types.

In an RF module you can configure only one sector configuration type. Sector configuration type H can be configured using two release 2.1 (or newer) RF modules.

Radio modules are numbered according to system module interfaces, that is, the radio module connected to the system module interface #1 is FRxx 1.

Note also that a configuration with 1TX / 1RX per sector can be built up by configuring a normal MRC (sector configuration type A) configuration, where only one antenna cable is deployed. A fault will then be created for the missing antenna cable but it can be ignored. The BTS will continue to operate.

For more information on the configuration types, see the *Cabling Flexi Multiradio BTS LTE and Creating Configurations* document.

3 **Enter the carrier power in the Power field.**

Carrier power selected for the local cell is used from Tx capable antennas. This means that carrier power entered to local cell is used from both Tx capable antennas in MIMO sector configuration types. Carrier power is assigned to the global cell (LNCEL), and it is shown as read only information on commissioning Radio Network Configuration page. The allowed carrier power values are shown according to the autodetected radio modules.

4 **Click the New Cell button and repeat the procedure for each local cell you want to define.**

The **New Cell** button is enabled if the settings for the previously defined local cell are valid. Multi carrier configurations are not supported in RL15TD. Depending on the number of antennas and the sector configuration type, the maximum is 3 local cells and the maximum allowed number of cells is checked automatically.

5 **If you want to delete a local cell, select the local cell from the list and click Delete Cell.**

6 **Select the MIMO type from the drop-down menu if MIMO sector configuration type is in use.**

MIMO drop-down is visible only when appropriate configuration is selected.

The MIMO type drop-down list displays the MIMO (Multiple Input Multiple Output) type in MIMO sector configuration types. MIMO type is assigned to the global cell (LNCEL), and it is shown as read-only information on commissioning Radio Network Configuration page. Several MIMO types are supported. When shown, this list is automatically enabled.

When two Tx capable antennas are mapped to cell then only MIMO types are selectable in MIMO type list. Exception is sector configuration type I where SingleTX (sector configuration type I) is selectable even though there are Tx capable antennas mapped to the cell.

7 **Click the Next button.**

The **Next** button is enabled if you have created at least one local cell and if the settings for all defined local cells are valid.

6.18 Defining LTE carriers

Purpose

In the **Commissioning - LTE Carriers** page, you can define LTE carrier frequencies for local cells; those are assigned then automatically to global cells (LNCEL) and shown as read-only information on the commissioning Radio Network Configuration page. The allowed E-UTRAN Absolute Radio Frequency Channel Number (EARFCN) values for frequency bands are displayed below the *Carrier candidate* table.

LTE carrier candidates are determined at the network planning stage. It is essential that the value input matches the expected value in the radio network plan. You should not select the values arbitrarily.

The Equipment view displays the selected local cell and the radio module assigned to it as highlighted.

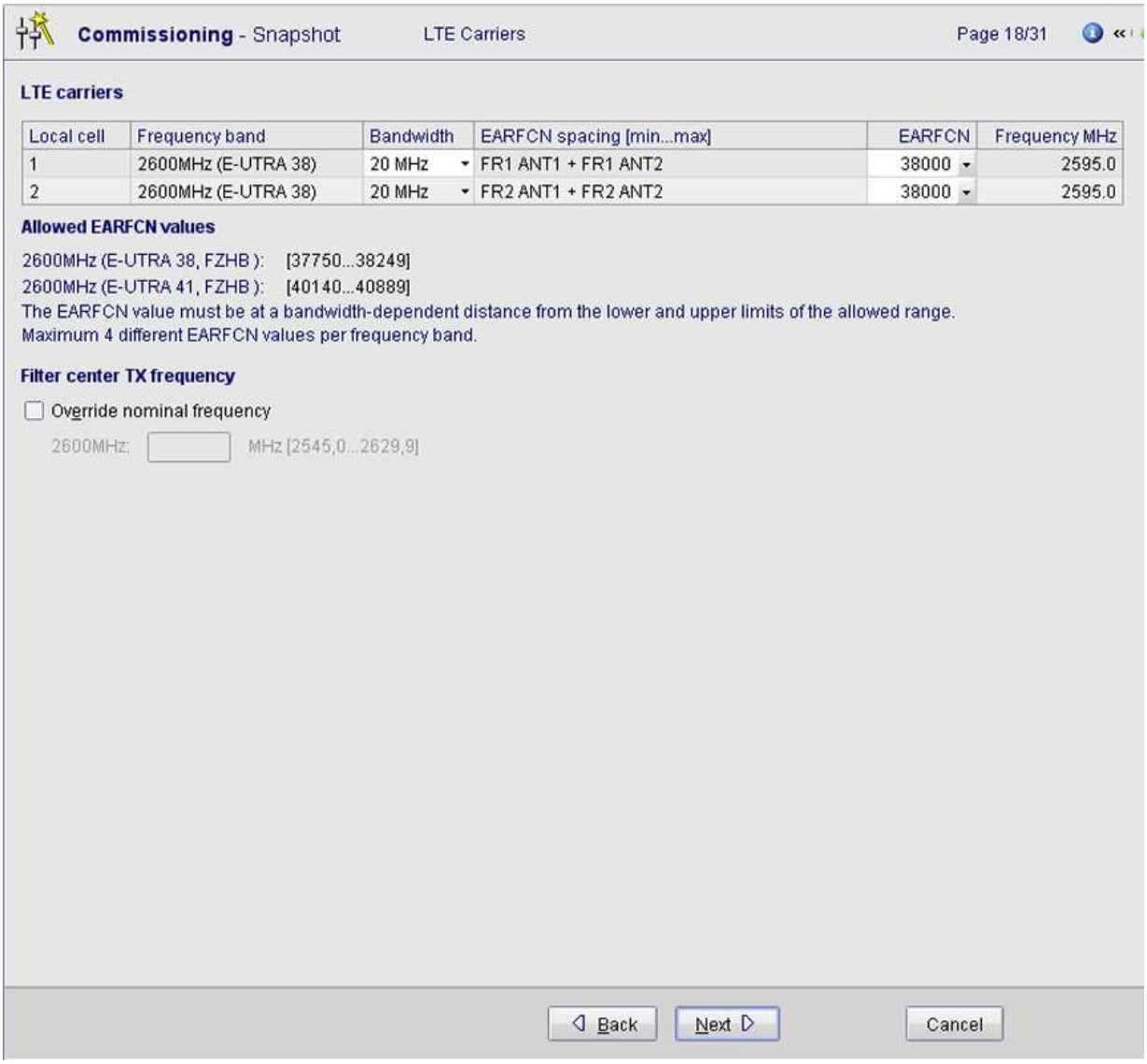

Figure 33 Commissioning - LTE Carriers page

Steps

1 **Select the bandwidth for each local cell.**

The bandwidth is then assigned automatically to the global cell (LNCEL), and it is shown as read-only information on the commissioning Radio Network Configuration page. The allowed bandwidth value is shown according to the autodetected radio modules.

2 **Enter the EARFCN for each local cell in the EARFCN column.**

Up to four different values can be defined for each frequency band. The frequencies are calculated according to the channel numbers and displayed in the *Frequency MHz* column.

3GPP standard specifies the supported EARFCN values for each E-UTRA frequency band. The supported MHz frequency band and E-UTRA frequency band are shown according to the autodetected radio modules.

The *Allowed EARFCN Values* field displays the available EARFCN value range. The EARFCN value must be at a bandwidth-dependent distance from the lower and upper limits of the allowed range.

All values in calculation rule below are in EARFCN value:

- Lower EARFCN limit: Minimum 3GPP EARFCN value + LCRx Planned.Carrier.Bandwidth/2 = Lowest EARFCN value that can be used
- Higher EARFCN limit: Maximum 3GPP EARFCN value - (LCRx Planned.Carrier.Bandwidth/2 -1) = Highest EARFCN value that can be used.

3 **Select the Override nominal frequency check box if necessary and enter a frequency value for frequency bands needed.**

Enabling the override nominal frequency check box makes it possible to set a filter center TX frequency value for needed frequency bands also in multiband configurations. The filter center TX frequency defines an absolute TX frequency in kHz for overriding nominal filter center frequency tuning. The parameter can be used to override the nominal filter tuning to minimize noise to the neighboring frequency bands. Because of high attenuation requirements in two system co-location cases, the setting needs to be possible for both high and low frequencies. If the parameter value is not defined, the TX filter frequency is evaluated as an average of the configured center frequencies.

4 **Click the Next button.**

6.19 Defining antenna line management settings

Purpose

In the **Commissioning - Antenna Line Management** page, you can set antenna line management related settings to all radio modules' antennas.

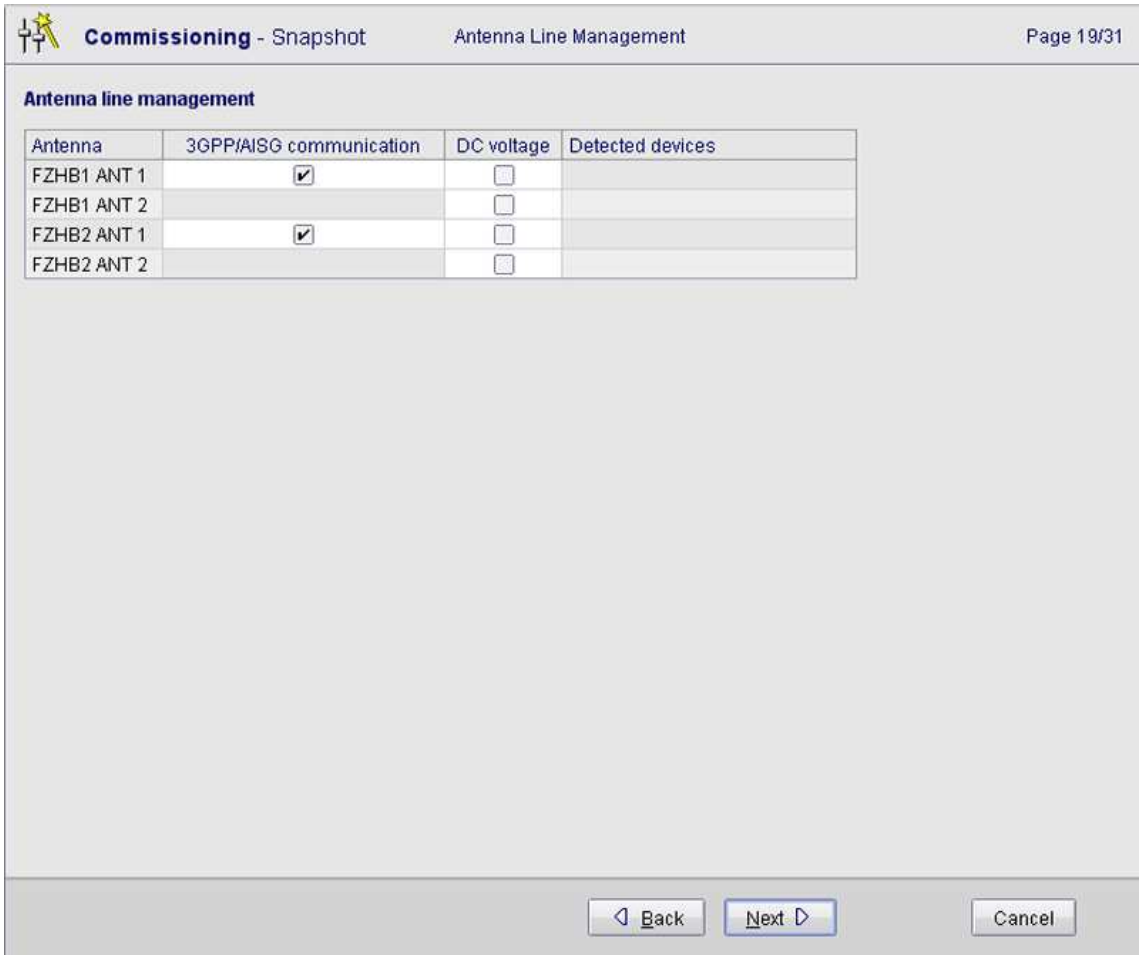

Figure 34 Commissioning - Antenna Line Management page

Steps

1 **If necessary, disable the 3GPP/AISG communication settings in the 3GPP/AISG communication column.**

Disabling the 3GPP/AISG communication settings may be necessary if the detection of antenna line devices causes a conflict from two 3GPP/AISG communication capable antenna lines. The settings for 3GPP/AISG communication are enabled by default.

2 **If necessary, disable the DC voltage settings in the DC voltage column.**

It may be necessary to disable DC feeder voltage for antenna line in some configurations. However, DC voltage is enabled for all antennas as default.

3 **Click the Next button.**

6.20 Defining antenna line settings

Purpose

In the **Commissioning - Antenna Line Settings** page, you can define the non-AISG MHA and antenna settings. The AISG MHAs are commissioned on the AISG MHA Settings page.

TD-LTE MHA hardware is a study item for later releases.

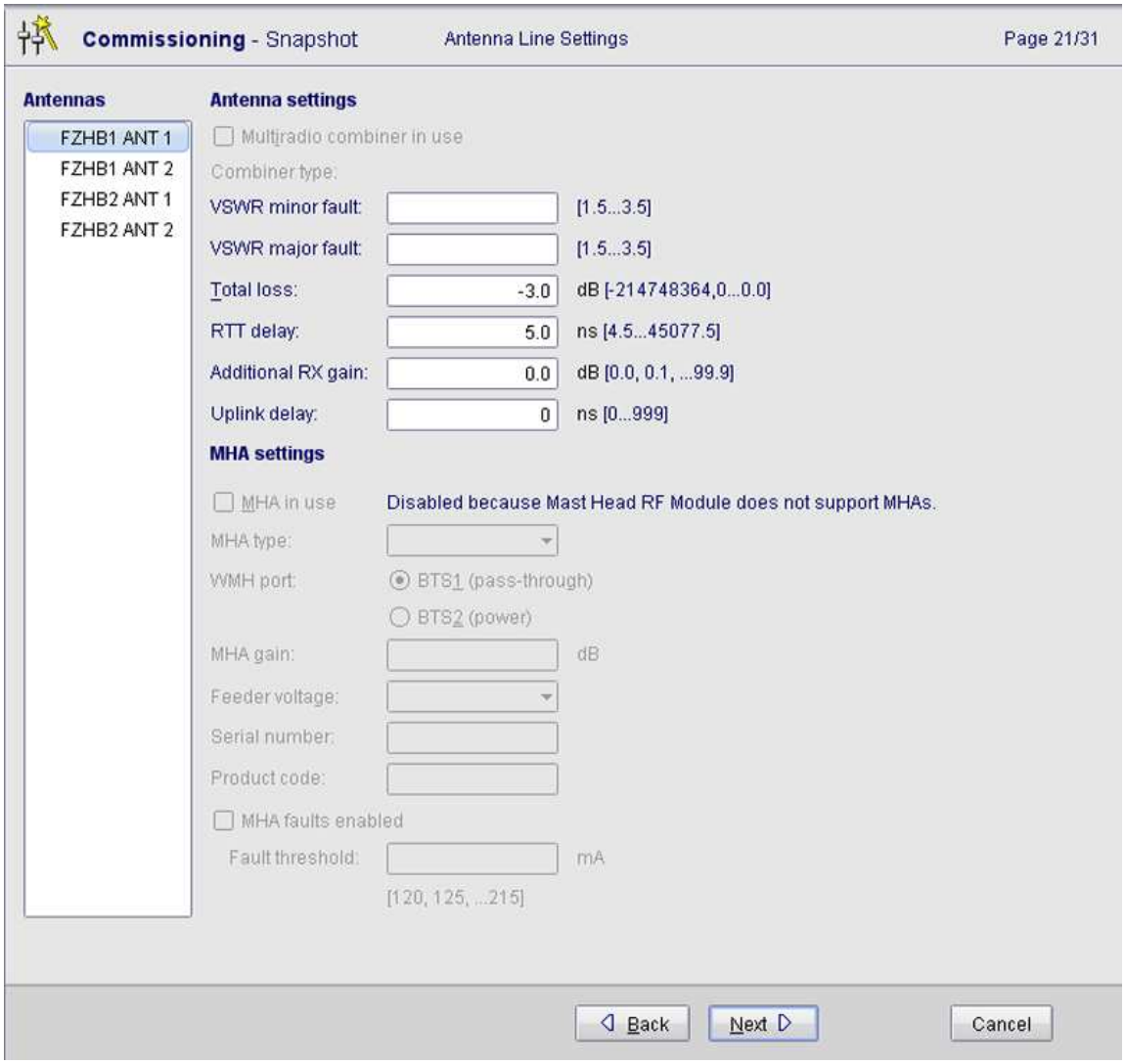

Figure 35 Commissioning - Antenna Line Settings page

Steps

1 **Select the antenna from the Antennas list.**

Define the **Antenna settings** and **MHA settings** described in steps 2-3.

2 **Define the following antenna settings:**

- **Multi radio combiner in use**

- **VSWR minor fault**
- **VSWR major fault**
- **Total loss**
- **RTT delay**
- **Additional RX gain**
  Enter the additional RX gain in dB in this field.Additional RX gain in decibels is used in Gain calculation to compensate an RX gain produced by an external device, for example the base station when two radio modules are cross-connected together via RX diversity outputs sharing the antenna line. The gain produced by the external device must be known in order to apply a proper value here.
- **Uplink delay**
  Enter the uplink delay in ns in this field.Antenna line uplink delay in nanoseconds, is used to compensate the antenna line UL delay difference between main and diversity RX branches of the cell. This is needed to avoid gain (that is, performance) loss due to the time difference between RX branches data. For example, offset of 1/2 chip period (130ns) introduces diversity gain degradation of about 1dB. Different delays are met for example when two radio modules are cross-connected together via RX diversity outputs. You can provide absolute UL delay values for all RX branches of the cell, or optionally only the positive difference referred to the smallest delay branch and leave smallest delay branch value to zero. It is not required to apply the UL delay when the delay for RX branches of the cell are about equal.

3 Define the following MHA settings:

TD-LTE MHA hardware is a study item for later releases.

- **MHA in use**
- **MHA type**
  The non-AISG MHA types are shown depending on the frequency band of the antenna of the radio module.
- Depending on the **MHA type** selection, define the appropriate settings:
  If the selected MHA Type is *WMHC*, select the *WMH Port*: BTS1 or BTS2.
  If the selected *WMH port* option for *WMHC* is *BTS1*, select the *Feeder Voltage* by clicking the appropriate option: 0 V, 12 V, 28 V or Automatic. The 28 V option is enabled only for main antennas. If the selected option is *BTS2*, the *Feeder voltage* is set to the default value and cannot be changed.
  If the selected **MHA type** is *Other*, select the *Feeder Voltage* by clicking the appropriate option: 0 V or 12 V. Select the *MHA faults enabled* check box if necessary. If you select the check box, enter the threshold for the fault in the *Fault threshold* field.
- **MHA gain**
  Note that MHA Gain is enabled only if the MHA supports adjustable gain and for Other MHAs.
- **Serial number**
- **Product code**

4 Repeat the procedure for each antenna.

5 Click the Next button.

6.21 Defining AISG MHA settings

Purpose

In the **Commissioning - AISG MHA Settings** page, you can define **AISG MHA** settings for autodetected active mode and current mode AISG MHAs.

The MHAs that cannot be autodetected are commissioned on the **Commissioning - Antenna Line Settings** page.

These pages are available if AISG MHAs are used.

TD-LTE MHA hardware is a study item for later releases.

Figure 36 Commissioning - AISG MHA Settings page

Steps

1 **Select the MHA from the MHAs list.**

In the **Commissioning - AISG MHA Settings** page, the list contains autodetected MHAs.

If you are creating a commissioning file in off-line mode without a connection to the BTS site, click **New MHA** to add MHAs to the list.

2 **For an autodetected MHA, define the following settings:**

- **Used in**
  Select where the MHA is used: **This BTS**, **This and other BTS**, or **Other BTS**.
  If the MHA is not selected to any antenna line, if it is working on the different frequency than the antenna line's frequency, or if there are no radio modules that support MHAs, the MHA is shown to belong to the other BTS.
- **Antenna**
- **MHA gain**
  Enter the MHA gain value. The value range and default value depend on the type of the MHA.
  Note that MHA gain is set to the default value and cannot be changed if the MHA supports only fixed MHA gain.
- **MHA faults enabled** and **Fault threshold**
  If the *MHA type* of the AISG MHA is *Other* and it works in the current mode, select *MHA faults enabled* if necessary. If you select this option, enter the threshold value in the *Fault threshold* field.
- **Additional data**

Label	Note
Antenna model number	length values: 0..15 characters
Antenna serial number	length values: 0..17 characters
Antenna bearing	values:0.0...359.9 deg
Installation date	length values: 0..6 characters
Installer ID	length values: 0..5 characters
BTS ID	length values: 0..32 characters
Sector ID	length values: 0..32 characters

Table 2 AISG MHA settings page - additional data.

Label	Note
Antenna operating frequency band	The same frequency band is selectable only once in the list for device. Antenna operating band(s): 1 - 3GPP band I: 2100 MHz 2 - 3GPP band II: 1900 MHz 3 - 3GPP band III: 1800 MHz 4 - 3GPP band IV: 1700 MHz 5 - 3GPP band V: 850 MHz 6 - 3GPP band VI: 800 MHz 7 - 3GPP band VII: 2600 MHz 8 - 3GPP band VIII: 900 MHz 9 - 3GPP band IX: 1800 MHz 10 - 3GPP band X: 1700 MHz 11 - 3GPP band XI: 1500 MHz 12 - 3GPP band XII: 700 MHz 13 - 3GPP band XIII: 700 MHz 14 - 3GPP band XIV: 700 MHz 15 - 3GPP band XIX: 800 MHz 16 - 3GPP band XX: 800 MHz 17 - 3GPP band XXI: 1400 MHz
Beamwidth	values: 0...360 deg
Gain	values: 0.0...25.5 dBi

Table 2 AISG MHA settings page - additional data. (Cont.)

The following settings cannot be changed: *MHA type*, *Detected from*, *LNA number*, *Serial number*, *Product code*.

Infotip

MHA Infotip can be used to check MHA and radio module frequencies while commissioning AISG MHA Settings.

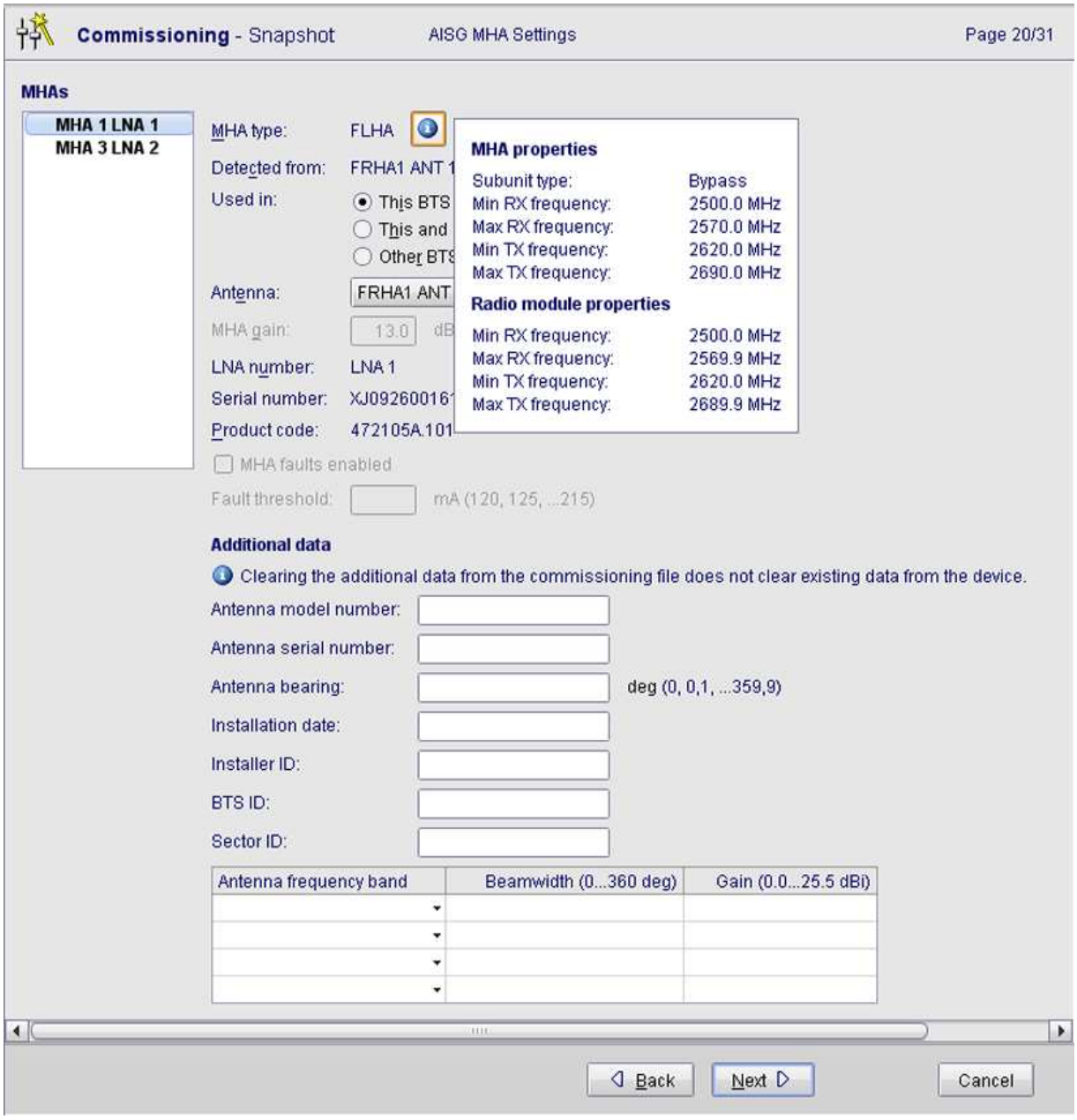

Figure 37 AISG MHA Infotip.

MHA properties **Subunit type**	
Min. RX frequency	MHz
Max. RX frequency	MHz
Min. TX frequency	MHz
Max. TX frequency	MHz

Radio module properties	
Min. RX frequency	MHz
Max. RX frequency	MHz
Min. TX frequency	MHz
Max. TX frequency	MHz

Table 3 AISG MHA Infotip data.

3 **If you are creating a commissioning file in off-line mode without a connection to the BTS site, define the following settings:**

- *MHA type*
  The MHA types are shown depending on the frequency band of the antenna of the radio module.
- *Detected from*
  This matches the antenna line to which the MHA unit is installed.
- *Used in*
- *Antenna*
- *MHA gain*
- *LNA number*
- *Serial number*
- *Product code*

Additional data:

- *Antenna model number*
- *Antenna serial number*
- *Antenna bearing*
- *Installation date*
- *Installer ID*
- *BTS ID*
- *Sector ID*
- *Antenna frequency band*
- *Beamwidth*
- *Gain*

4 **Repeat the procedure for each autodetected MHA.**

5 **Click the Next button.**

6.22 Defining Siemens Proprietary AISG1.1 TMARET and RET settings

Purpose

In the *Commissioning - Siemens Proprietary AISG1.1 TMARET and RET Settings* page, you can define Siemens Proprietary AISG1.1 TMARET and RET settings.

A TMARET unit contains both MHA and RET unit. Note that only DTMARETFV1, DTMARETFV2, DTMARETFV3, DTMARETFV4, SDTMARETFV1, SDTMARETFV2, SDTMARETFV3 and TMARETFV1 TMARET types can be commissioned in the TMARET Settings page.

RL15TD supports AISG2.0 for RET.

Autodetected AISG MHAs are commissioned in the AISG MHA Settings page, and auto-detected AISG RETs are commissioned on the RET Settings page.

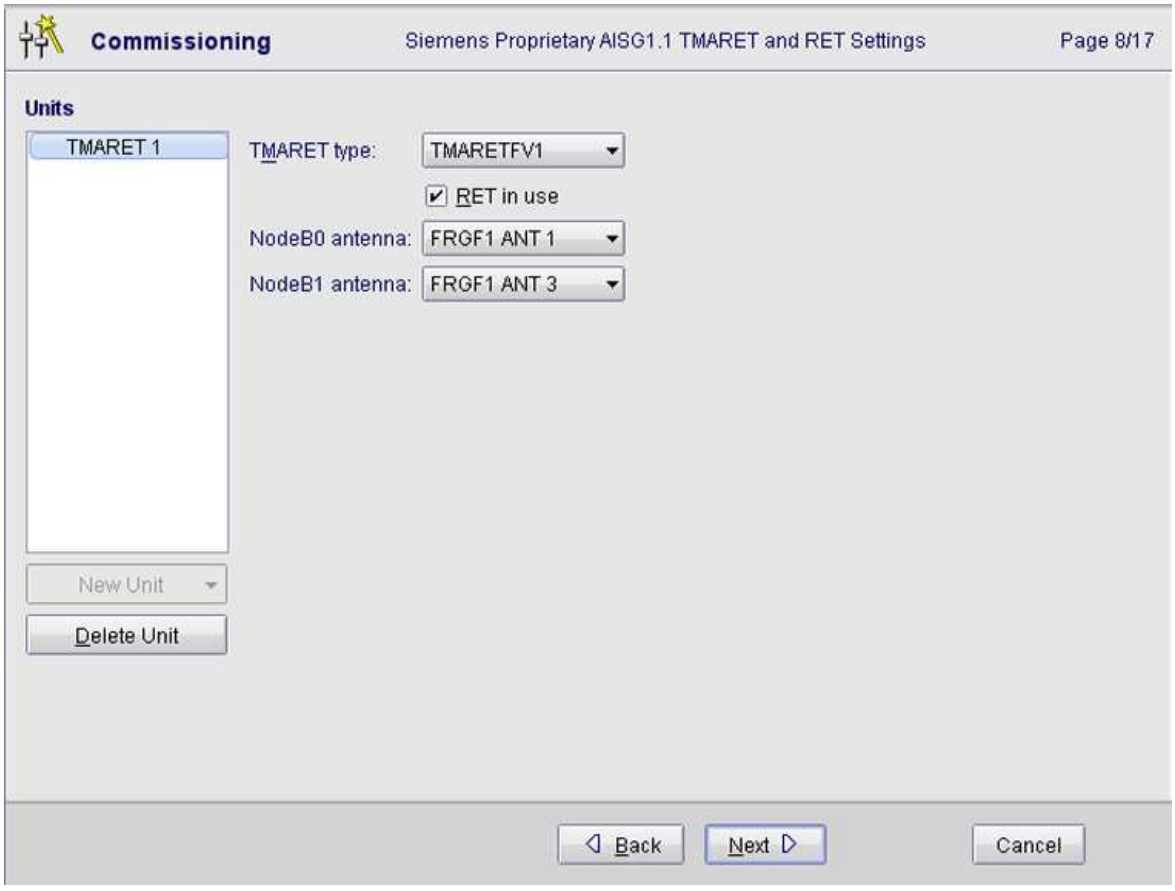

Figure 38 Commissioning - Defining Siemens Proprietary AISG1.1 TMARET and RET settings page (TMARET)

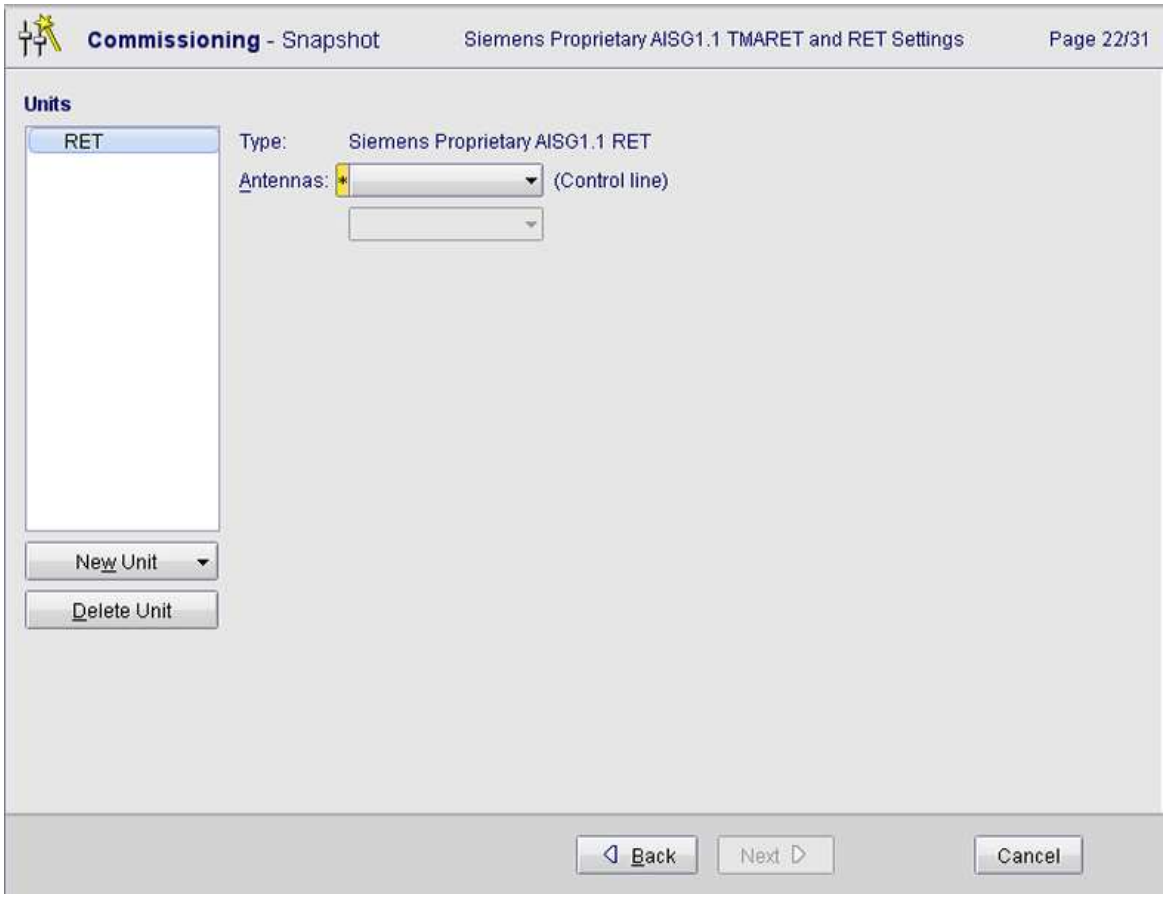

Figure 39 Commissioning - Defining Siemens Proprietary AISG1.1 TMARET and RET settings page (RET)

Steps

1 **Click the New Unit button to add either a new TMARET or RET unit to the HW configuration.**

2 **For a TMARET unit, define the following settings:**

- *TMARET type*.
- *RET in use*
- *NodeB0 antenna*
- *NodeB1 antenna*

3 **For a RET unit, define the following settings:**

- *Antennas*

4 **Repeat the procedure for each TMARET or RET unit.**

5 **Click the Next button.**

6.23 Defining RET settings 1

Purpose

In the **Commissioning - RET Settings 1** page, you can select the Remote Electrical Tilt (RET) usage for antenna lines. This page is available only if there are autodetected RET units.

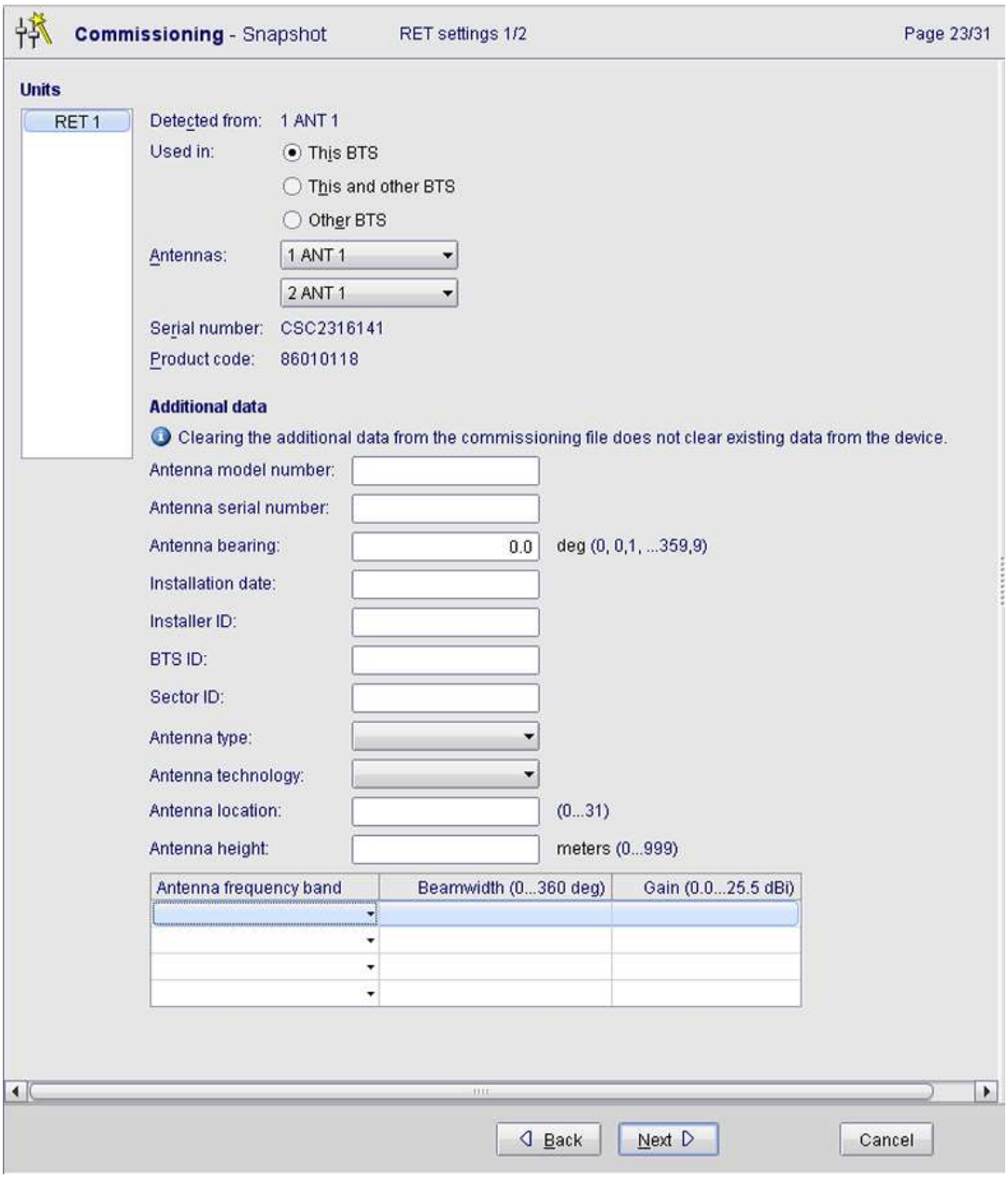

Figure 40 Commissioning - RET Settings 1 page

Steps

1 **Select the RET unit from the Units list.**

The **Detected from** list shows information on the antenna line from where the RET is autodetected. The list matches the antenna line to which the RET unit is installed.

You can add and delete units by using the **New Unit** and **Delete Unit** buttons. These buttons are available in offline mode.

2 **Used in**

Define the RET connection information by selecting the appropriate **Used in** option:

- **This BTS**
- **This and other BTS**
- **Other BTS**

3 **Antennas**

Selecting the antenna line from the first list enables the second list. The first antenna line selection is mandatory for the RET if the selected **Used in** option is This BTS or This and other BTS. Each antenna line can be selected once.

If only one RET is autodetected from the antenna line, that antenna line and another antenna line belonging to the same local cell are selected by default for the RET but you can select other antenna lines for the RET. If there are more than one autodetected RET in the antenna line, you can select which RETs are used in which antenna lines.

4 **Additional data:**

Label	Note
Antenna model number	Information can be seen also in RET Settings dialog box. values: 0...15 characters
Antenna serial number	Information can be seen also in RET Settings dialog box. values: 0...17 characters
Antenna bearing	Information can be seen also in RET Settings dialog box. values: 0.0...359.9 deg
Installation date	values: 0...6 characters
Installer ID	values: 0...5 characters
BTS ID	Information can be seen also in RET Settings dialog box. values: 0...32 characters

Table 4 RET settings - additional data.

Label	Note
Sector ID	Information can be seen also in RET Settings dialog box. values: 0...32 characters
Antenna type	only for RET Antenna type according to the user scheme
Antenna technology	only for RET Antenna technology: 0: voice; 1: data; 2: voice/data
Antenna location	only for RET values: 0...31
Antenna height	only for RET length values: 0...999 meters
Antenna frequency band	Same frequency band is selectable only once in the list for device. Antenna operating band(s): 1 - 3GPP band I: 2100 MHz 2 - 3GPP band II: 1900 MHz 3 - 3GPP band III: 1800 MHz 4 - 3GPP band IV: 1700 MHz 5 - 3GPP band V: 850 MHz 6 - 3GPP band VI: 800 MHz 7 - 3GPP band VII: 2600 MHz 8 - 3GPP band VIII: 900 MHz 9 - 3GPP band IX: 1800 MHz 10 - 3GPP band X: 1700 MHz 11 - 3GPP band XI: 1500 MHz 12 - 3GPP band XII: 700 MHz 13 - 3GPP band XIII: 700 MHz 14 - 3GPP band XIV: 700 MHz 15 - 3GPP band XIX: 800 MHz 16 - 3GPP band XX: 800 MHz 17 - 3GPP band XXI: 1400 MHz
Beamwidth	values: 0...360 deg
Gain	values: 0.0...25.5 dBi

Table 4 RET settings - additional data. (Cont.)

5 **Click the Next button.**

6.24 Defining RET settings 2

Purpose

In the **Commissioning - RET Settings 2** page, you can select the Remote Electrical Tilt (RET) usage for antenna lines. This page is available only if there are autodetected RET units.

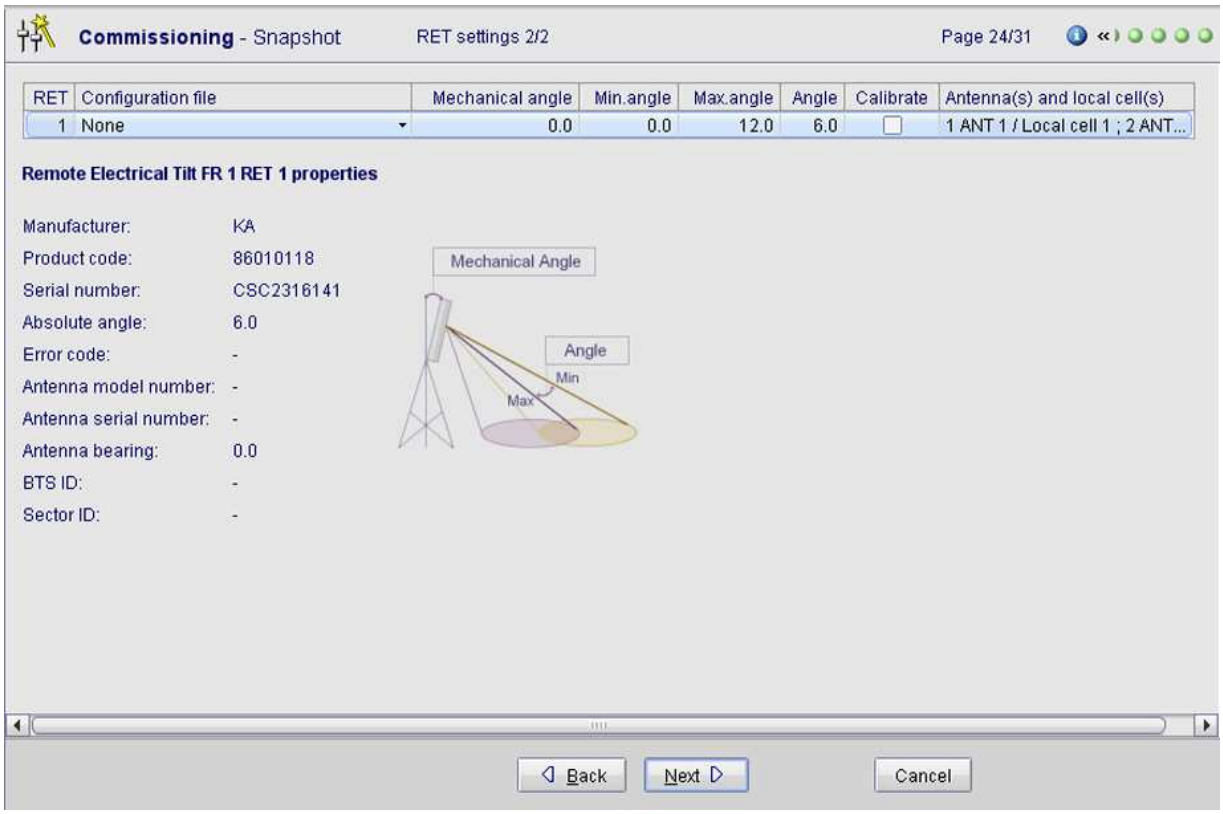

Figure 41 Commissioning - RET Settings 2 page

Steps

1 **Select the Configuration file option.**

- **Browse** - This option can be used to browse for the correct file(s). Selected file content is stored to configuration file parameter.
- **Activate** - This option can be used to activate the selected configuration file(s).
- **Use Current** - This option is the default setting when the configuration data exists already in the site configuration file.
- **Activate Current** - This option activates the configuration file that is already included in the site configuration file.
- **None** - This option is enabled when there is no configuration file in the site configuration file for this unit. Selecting this option also clears any previous parameter values for this unit.

The configuration data files for RET antennas delivered by Nokia Siemens Networks are available in the BTS software package. If the files are zipped, you have to unpack them before you can browse for them. Ask the antenna vendor for missing or updated configuration data files.

Note, that in order to set the angle successfully RET needs to be configured (or selected with configuration file activation) and calibrated (or selected to be calibrated).

2 **Enter the installation angle.**

Enter the installation angle in the **Mechanical angle** column. If the selected configuration file contains the mechanical angle, the value defined in the file is displayed.

3 **Enter the minimum angle.**

Enter the minimum angle to be used in calibration in the **Min. angle** column.

Changing the minimum or maximum values may cause incorrect tilt functionality if the values are not in the proper range. It is recommended to enter values only if they are not retrieved from the device after the activation of the configuration file.

4 **Enter the maximum angle.**

Enter the maximum angle to be used in calibration in the **Max. angle** column.

Changing the minimum or maximum values may cause incorrect tilt functionality if the values are not in the proper range. It is recommended to enter values only if they are not retrieved from the device after the activation of the configuration file.

5 **Enter the current tilt angle.**

Enter the current tilt angle in the **Angle** column. The angle value has to be between the defined **Min. angle** and **Max. angle** values.

6 **Calibrate the antenna.**

Select the check box in the **Calibrate** column to calibrate the antenna.

The **Antenna(s) and local cell(s)** column shows for a commissioned RET the related FR antenna connectors/local cells. For an uncommissioned RET, the column shows the FR antenna connector where the RET was scanned from.

7 **Check the RET properties.**

You can see the following properties for the RET unit(s):

- **Manufacturer** - Shows the autodetected name of the RET manufacturer.
- **Product code** - Shows the autodetected product code of the RET.
- **Serial number** - Shows the autodetected serial number.
- **Absolute angle** - Shows the autodetected absolute angle value.
- **Error code** - The error code is shown when the RET is not configured and/or not calibrated.
- **Antenna model number** - Shows the antenna model number.
- **Antenna serial number** - Shows the antenna serial number.
- **Antenna bearing** - Shows the antenna bearing in degrees.
- **BTS ID** - Shows the BTS ID.
- **Sector ID** - Shows the sector ID.

8 **Click the Next button.**

6.25 Defining system module external fault and control settings

Purpose

In the **Commissioning - System Module External Fault and Control Settings** page, you can define system module external fault and control lines for external devices.

The exact number of external fault and control lines for system module depends on the type of the module.

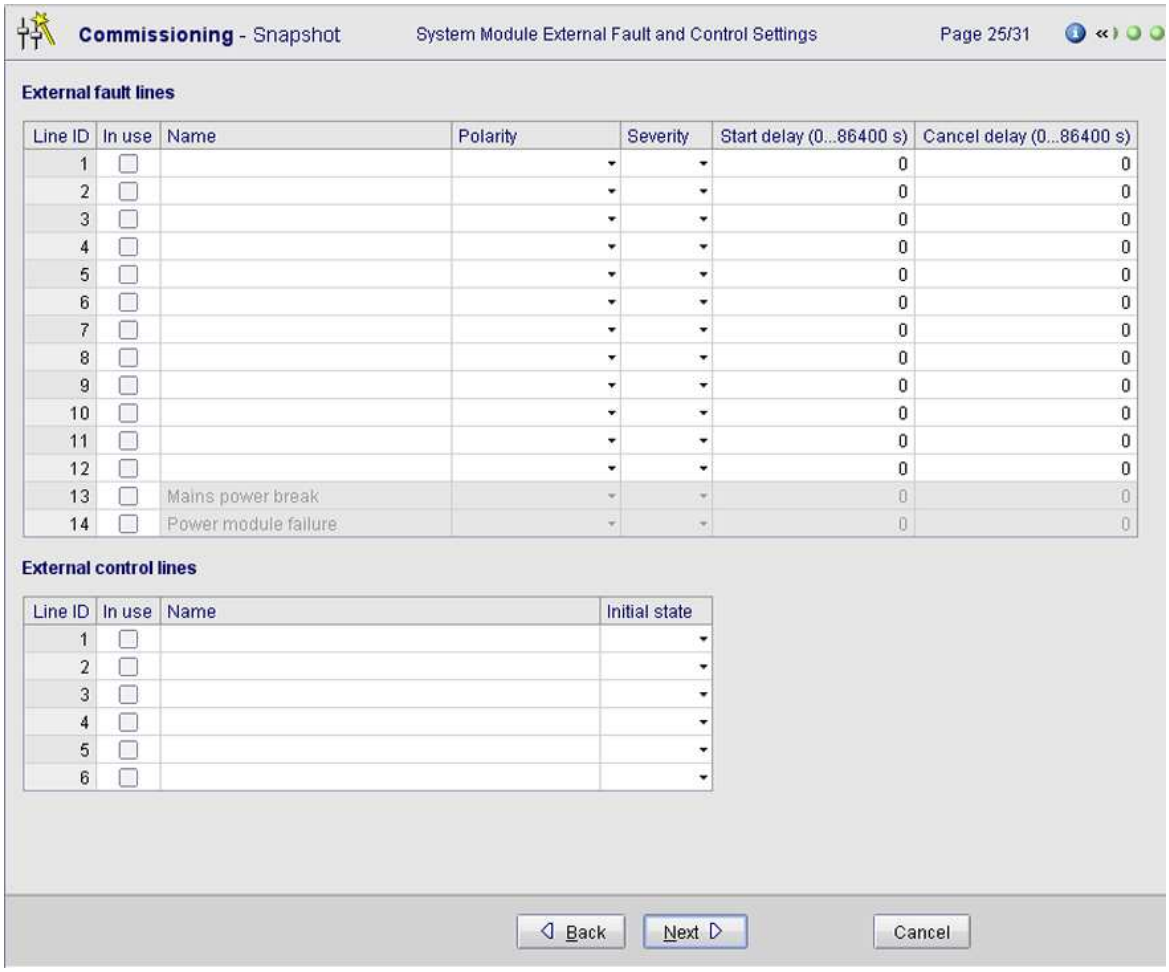

Figure 42 Commissioning - System Module External Fault and Control Settings page

Steps

1 **Define the following settings for the External fault lines:**

For the mains and FPM faults, you can only change the polarity and severity. The name of the fault line is set to the default value.

The FPM HW does not support the Normally Closed polarity.

Define the external fault lines:

- Select the check box in the **In use** column if the input device is in use

- Enter the name of the input device in the **Name** column
- Select the input device polarity from the list in the **Polarity** column: Normally Open or Normally Closed
- Select the input device severity from the list in the **Severity** column: Critical, Major or Minor
- Enter the start delay in the **Start delay** column. This sets the start delay before fault is generated. Value range is 0...86400 seconds and the default value is 0
  It is possible to define filtering times for external faults. For example, the condition of the air filter may be monitored via external faults and, occasionally, wind may also cause faults. Unnecessary faults may be avoided by defining filtering times for external faults
- Enter the cancel delay in the **Cancel delay** column. This sets the cancellation delay before the fault is cancelled. The value range is 0...86400 seconds and the default value is 0.

2 Define the following settings for the External control lines:

- Select the check box in the **In use** column if the control is in use.
- Enter the control name in the **Name** column.
- Select the initial state from the list in the **Initial state** column: On or Off.

3 Click the Next button.

6.26 Defining radio module external fault and control settings

Purpose

In the **Commissioning - Radio Module External Fault and Control Settings** page, you can define radio module external fault and control lines for external devices. The page for radio module EAC settings is shown only if radio modules support external fault and control lines.

The exact number of external fault and control lines for radio modules depends on the type of the modules.

Steps

1 **Define the following settings for the External fault lines:**

For the mains and FPM faults, you can only change the polarity and severity. The name of the fault line is set to the default value.

The FPM HW does not support the Normally Closed polarity.

Define the external fault lines:

- Select the check box in the **Used in LTE** column if the input device is in use in LTE. This column is visible for radio module if it supports external fault and control lines.
- Select the check box in the **Used in 2G** column if the input device is in use in 2G. This column is visible for radio module if it supports external fault and control lines.
- Enter the name of the input device in the **Name** column
- Select the input device polarity from the list in the **Polarity** column: Normally Open or Normally Closed
- Select the input device severity from the list in the **Severity** column: Critical, Major or Minor
- Enter the start delay in the **Start delay** column. This sets the start delay before fault is generated. Value range is 0...86400 seconds and the default value is 0
  It is possible to define filtering times for external faults. For example, the condition of the air filter may be monitored via external faults and, occasionally, wind may also cause faults. Unnecessary faults may be avoided by defining filtering times for external faults
- Enter the cancel delay in the **Cancel delay** column. This sets the cancellation delay before the fault is cancelled. The value range is 0...86400 seconds and the default value is 0.

2 **Define the following settings for the External control lines:**

- Select the check box in the **In use** column if the control is in use.
- Enter the control name in the **Name** column.
- Select the initial state from the list in the **Initial state** column: On or Off.

3 **Click the Next button.**

6.27 Defining radio network configuration

Purpose

In the **Commissioning - Radio Network Configuration** page, you can configure the radio network for the site.

For a detailed description of the managed objects (MOs), lists and parameters stored in the commissioning file, see the *Flexi Multiradio BTS LTE Commissioning Parameters* and *LTE RNW Parameters* documents.

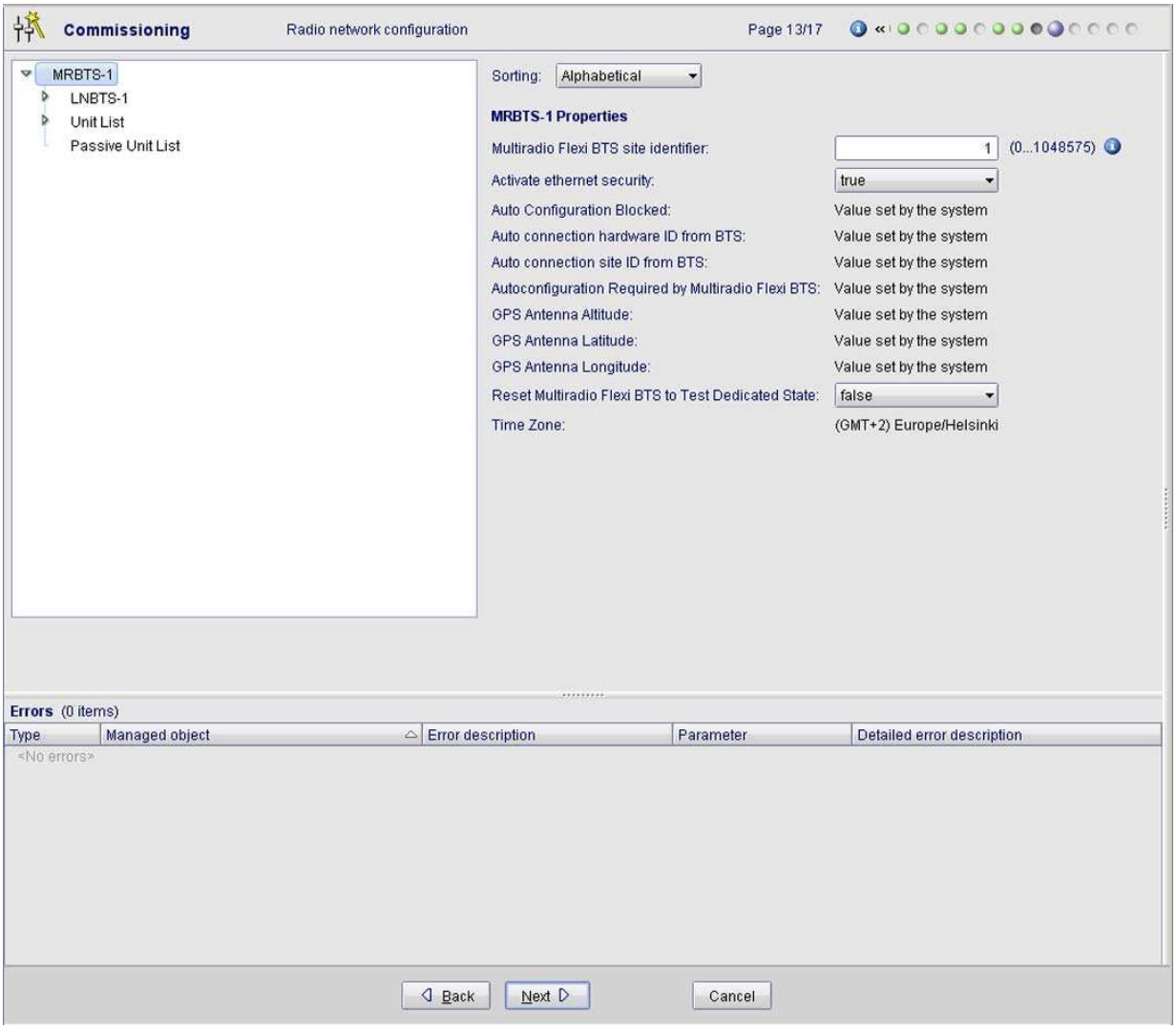

Figure 43 Commissioning - Radio Network Configuration page

Steps

1 **Select an MRBTS and then LNBTS item in the tree view and define RNW parameters.**

The parameter area displays the RNW parameters of the MRBTS main level, MRBTS object's child objects and possible lists and list items. Select an object/item in the tree to view its RNW parameters.

The parameter area information can be sorted either in the alphabetical or related functions order from the Sorting drop-down menu. Enter the values in the text fields or choose an appropriate value from a drop-down menu where applicable. If there are errors/confilicts in the values an error icon will be shown in the tree object/item.

Note that if you wish to reset the BTS to Test Dedicated state choose value ‘true’ in the drop-down list. The setting is visible under the MRBTS main level.

2 **Check for errors in the parameter configuration.**

In the **Errors** table at the bottom of the page you can see if there are any errors in the parameters’ configuration. Clicking a parameter in the **Parameter** column points to the parameter in question and the **Detailed error description** column describes the error in detail. Follow the instructions to correct any problems.

3 **Click Next.**

Next button is enabled when all mandatory settings are entered and the settings are valid.

6.28 Sending parameters to BTS site

Purpose

In the *Commissioning - Send Parameters* page, you can send the previously entered commissioning parameters to the BTS site. You can also view the commissioning parameters and save them in an XML file.

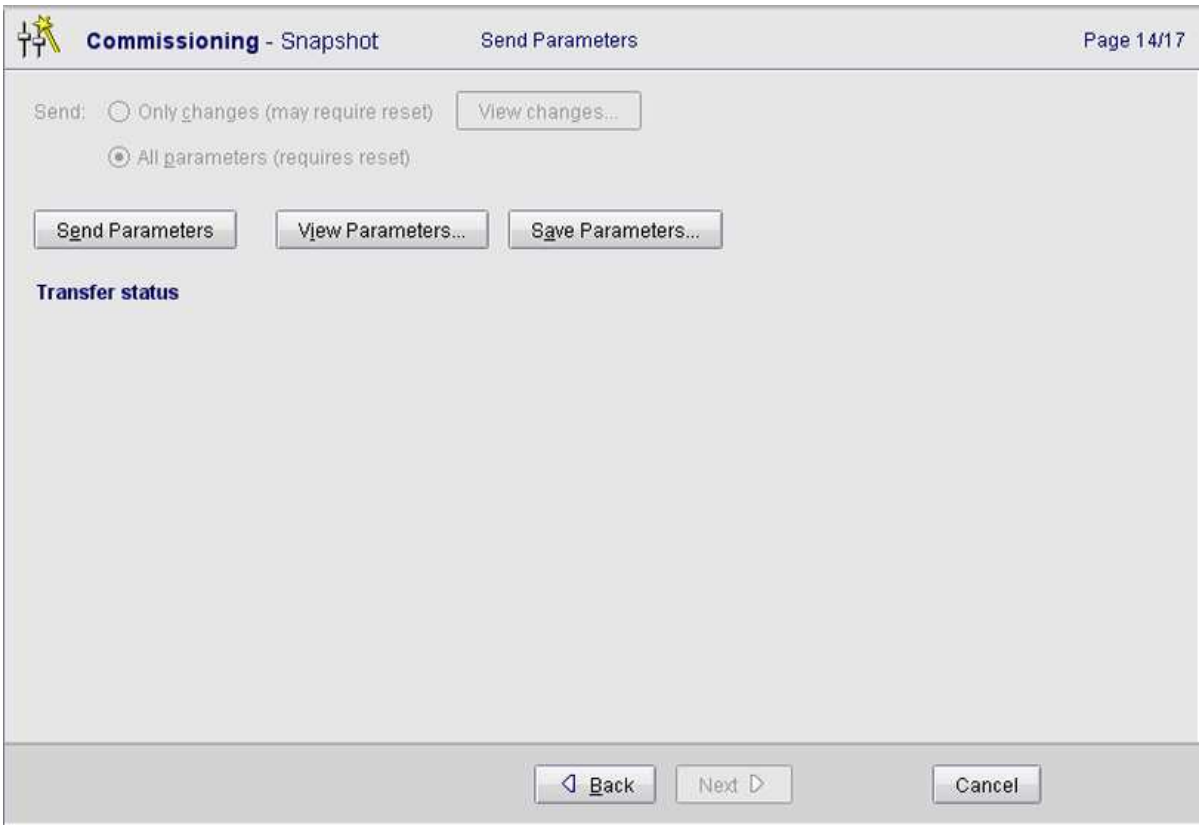

Figure 44 Commissioning - Send Parameters page

Steps

1 **Select the level of changes to be sent to the BTS site.**

If 'BTS' or 'TRS' is selected on Commissioning - Introduction page and BTS and TRS is in commissioned state and RNW status is correct you can choose from the Send: **Only changes (may require reset)** and Send: **All parameters (requires reset)** radio buttons the level with which to send the changed parameter information. In other cases, for example in 'Site', 'TRS' and 'BTS' (uncommissioned) commissioning, options are not shown at all and all parameters are sent to BTS site. Click the *View changes...* button to open the *View commissioning parameters* dialog box where you can view the changed parameter information.

The radio buttons are shown as disabled and all parameters is selected by default when:

- BTS ID is changed in commissioning.
- BTS is commissioned, but radio network configuration content is invalid.
- Commissioning file is not received from the commissioned BTS site.
- Parameters, which can be modified only in object creation have been changed.

When **All parameters (requires reset)** radio button is selected, all parameters from BTS and RNW part of commissioning file and/or TRS is sent to the BTS. When **Only changes (may require reset)** - radio button is selected, only changes from BTS and RNW part of commissioning file and/or TRS are sent to BTS site.

2 **If you want to view the commissioning parameters before sending them to the site, click the View Parameters button.**

The *Commissioning - View Parameters* dialog box opens. The parameters list is split in the sublevels, which you can expand or collapse by clicking the arrow. You can view the contents of the list by scrolling down the list.

Click *Close* to close the dialog box and return to the *Send Parameters* page.

3 **If you want to save the commissioning parameters, click the Save Parameters button, and enter the file name and select the location for the file to be saved.**

Saving the parameters produces a commissioning file that can be used in the template and planned commissioning.

4 **Click the Send Parameters button.**

In the template, manual and reconfiguration commissioning, if you have not saved the parameters before clicking the *Send Parameters* button, you will be asked if you want to save the parameters before sending them.

You can follow the parameter transfer status in the page.

After the file transfer is complete, a site reset follows and the *Next* button becomes enabled.

Note, that once the **Send Parameters** button is clicked the process cannot be canceled. Clicking the **Cancel** button in the commissioning wizard pages cancels the commissioning wizard.

5 **Click the Next button.**

6.29 Defining additional site settings

Purpose

In the **Commissioning - Additional Site Settings** page, you can change the local user account, manage certificates and configure Remote Electrical Tilt (RET) units.

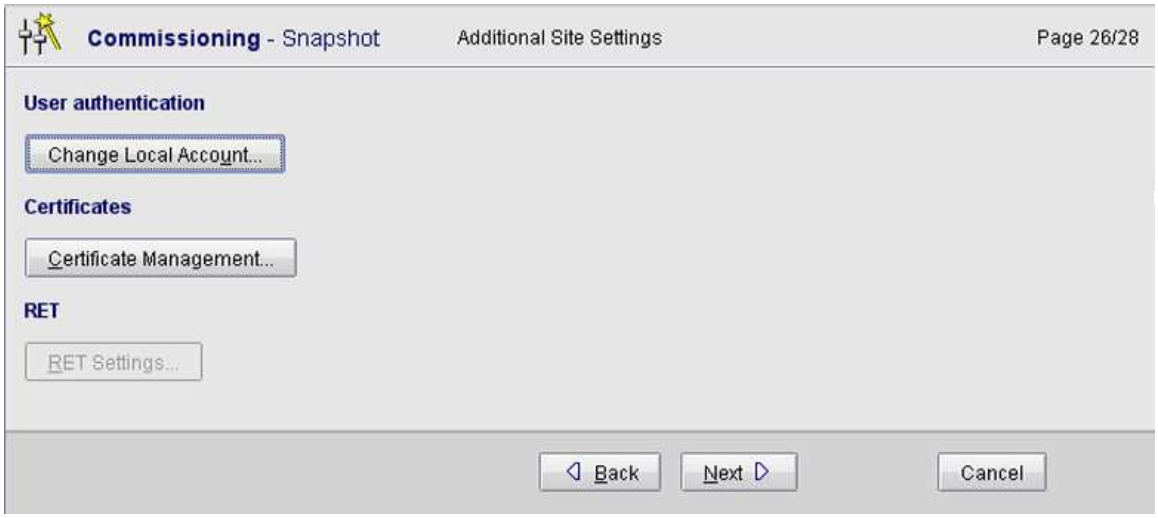

Figure 45 Commissioning - Additional Site Settings page

Steps

1 **To change the user name and password of the local account, click the Change Local Account button.**

The **Change Local Account** dialog box opens.

2 **To manage certificates, click the Certificate Management button.**

The **Certificate Management** dialog box opens.

3 **To configure RET units, click the RET Settings button.**

The **RET** dialog box opens. If RET is not connected to RF the button is disabled.

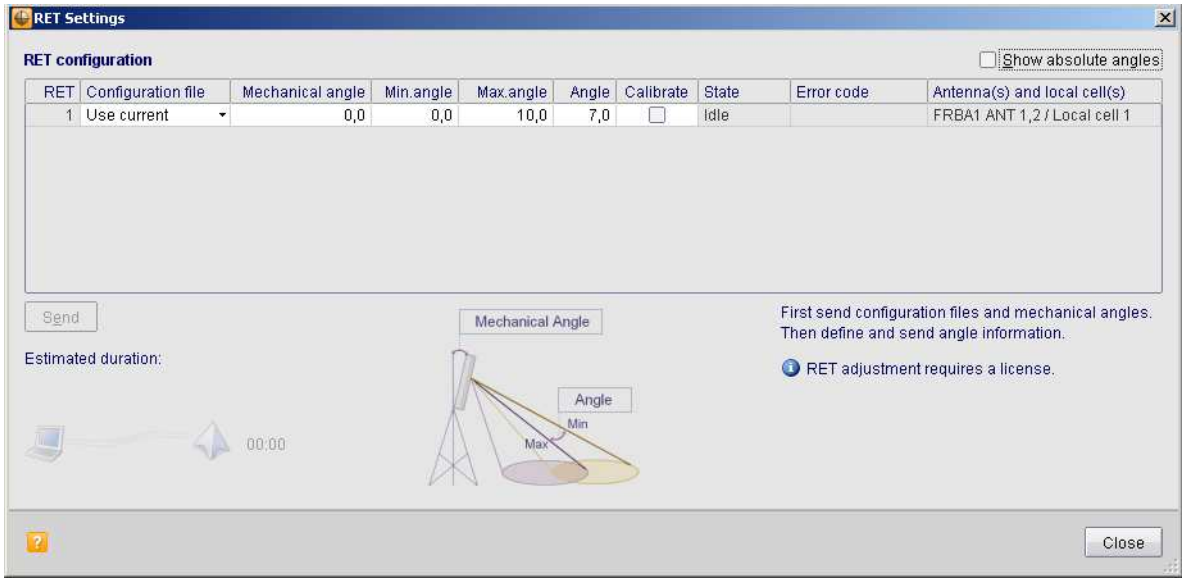

Figure 46 RET Settings

4 Define the configuration data.

Select the configuration file from the list in the **Configuration file** column, or browse for the file by selecting the **Browse** option from the list.

The configuration data files for RET antennas delivered by Nokia Siemens Networks are available in the BTS software package. If the files are zipped, you have to unpack them before you can browse for them. Please ask the antenna vendor for missing or updated configuration data files.

Enter the installation angle of the antenna in the **Mechanical angle** column.

Click the **Send** button to send the configuration data to the BTS site.

5 Set the tilt angles.

Enter the minimum tilt angle in the **Min. angle** column and the maximum tilt angle in the **Max. angle** column if necessary.

Changing the default minimum and maximum angle values defined in the selected configuration file may cause incorrect tilt functionality if the values are not in the proper range.

Enter the current angle in the **Angle** column.

Click the **Send** button to set the tilt angles.

6 Select the check boxes in the Calibrate column, and click the Send button to calibrate the selected antennas.

Antennas are calibrated automatically after sending the configuration file but you can calibrate antennas manually if a unit is already configured.

7 **Click the Close button to close the RET dialog box, and return to the Commissioning - Additional Site Settings page.**

8 **Click the Next button.**

6.30 Defining site testing

Purpose

In the **Commissioning - Site Testing** page, you can run tests on the commissioned site. The test results will be saved in the Commissioning Report.

The first testing option is **Site tests**. In the **Site Tests** dialog box, you can execute an Ethernet test for validating Ethernet interfaces of the system module HW resources, an Antenna line communication test to validate interfaces to all detected 3GPP antenna line devices, and an Antenna tilt exercise test to test antenna tilt control mechanics for all detected Tilt HW resources. You can run the tests if modules are not in 'Initializing' state.

The second test option is **EAC functionality test** for testing the external faults and controls. The EAC test is available when the EAC information has been received from the BTS.

Steps

1 **Click the Test button for the Site tests.**

The **Site Tests** dialog box opens.

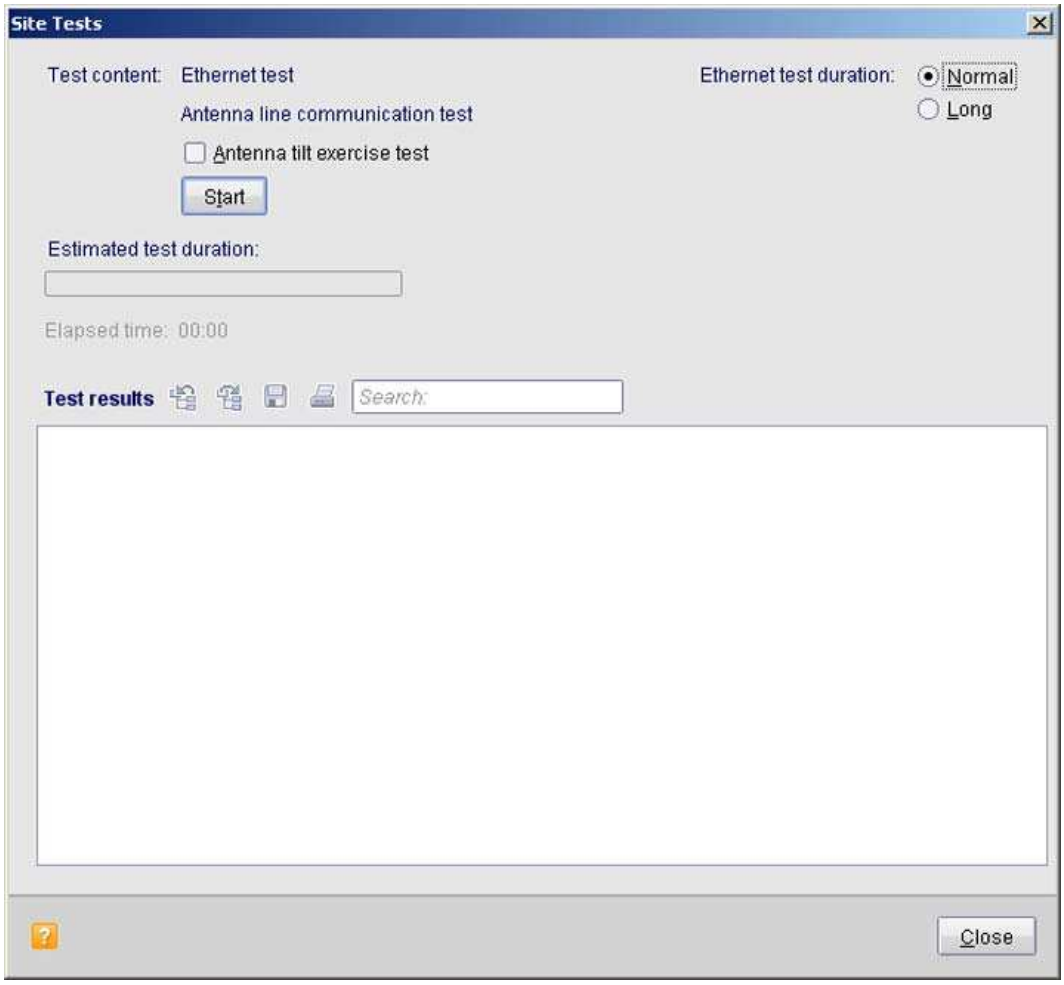

Figure 47 Site Tests dialog box

Define the following settings:

- Select the **Antenna tilt exercise test** check box if you want to run the test with the Ethernet and Antenna Line Communication tests.
- Select the **Ethernet test duration** by clicking the appropriate option.

Click the **Start** button to start the test. When the test is started, the **Test results** list shows the list of tests to be executed.

You can also search the test results using keywords in the *Search* field. Hits are displayed highlighted.

If you want to save the test results, click the button and enter the filename and location for the file in the **Save Site Tests Results** dialog box.

If you want to print the test results, click the button and specify print options in the **Print Site Tests Results** dialog box.

Click **Close** to close the **Site Tests** dialog box and return to the **Commissioning - Site Testing** page.

2 Click the Test button for the EAC functionality test.

The **Commissioning - EAC Functionality Test** dialog box opens.

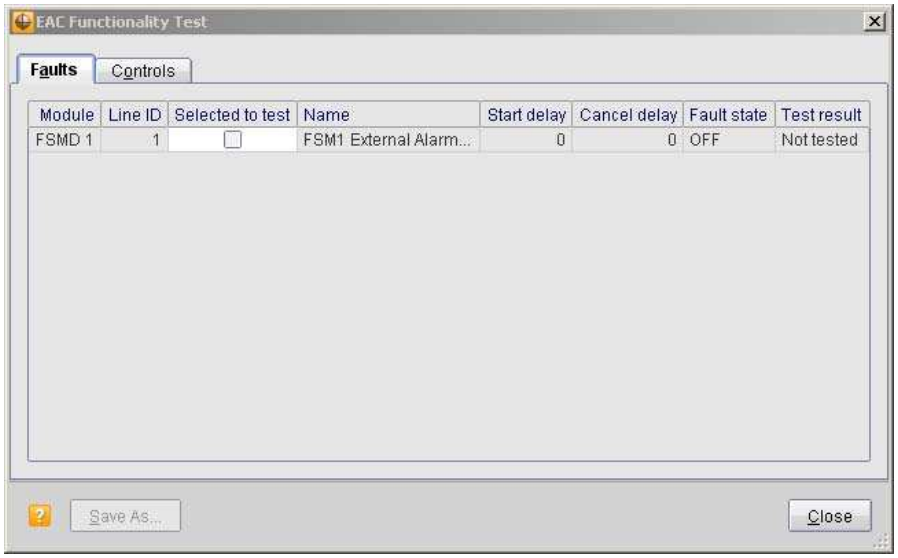

Figure 48 Commissioning - EAC Functionality Test dialog box

In the **Faults** tab, you can test EAC input lines by selecting the check box in the **Selected to test** column. The **Test result** is changed to 'Faulty'. Change the state of the supervised external device. After the state change notification is received from the BTS, the new state is displayed in the **Fault state** column, and the **Test result** is changed to 'OK'.

In the **Controls** tab, you can test the EAC output lines. Change the state of the output line in the **Line state** column. After the BTS has changed the state of the external control line, check the state of the supervised external device, and change the **Test result**.

The test results are saved in the Commissioning Report.

The **Start delay** column shows the start delay before a fault is generated. The **Cancel delay** column shows the cancellation delay before a fault is cancelled. These values are

set in the commissioning phase. For more information, see Defining external fault and control settings.

Click **Close** to close the **Commissioning - EAC Functionality Test** dialog box and return to the **Commissioning - Site Testing** page.

3 **After you have run the desired tests, click the Next button.**

6.31 Saving commissioning report

Purpose

In the *Commissioning - Commissioning Report* page, you can save the commissioning report in a file on the PC. The report contains the parameters entered during commissioning, test results of the executed tests and a list of active alarms, if there are such alarms.

The report is split in the sublevels, which you can expand or collapse by clicking the arrow. You can expand all levels at the same time by clicking the button or collapse all levels by clicking the button. You can view the contents of the report by scrolling down the list.

The report is an ASCII text file that you can open and check with any text editor.

Steps

1 **If you want to save the report, click the button, and enter the file name and select the location for the file to be saved.**

2 **Click the Finish button to finish the commissioning.**

Expected outcome

You can check the status from the Status bar of the BTS Site Manager main window. If the commissioning was successful, the status bar should display 'Commissioned' or 'On Air' when exiting the wizard. However, the administrative state of the local cell(s) may be set to Disabled after exiting the wizard. In this case the administrative state must be enabled manually.

After the successful commissioning, there should be no Commissioning parameter mismatch faults shown in the *Faults view*.

Further information

Typically, the network configuration is stored on individual module serial number level to enable fast and efficient search in the network, in case such information is needed. One of the entry points for this data is after commissioning.

Depending on the requirements of the IM system, where this information is stored, there might be several options to collect the data. The most typical is to scan the modules with a bar code reader. Nokia Siemens Networks recommends a certain bar code reader HW and SW to enable a more automated transfer of data.

7 Performing template commissioning

Purpose

Template commissioning provides an option to commission network elements using a predefined template file. Since the same configurations are commonly used in several network elements, you can store a commissioning file and use it as a template file when commissioning elements, for example, with a similar hardware configuration. This will significantly reduce the number of parameters that need to be configured as mainly only site specific parameters need to be changed - BTS name, id and IP address, for example. Site specific parameters are configured on the **Site Properties** and **BTS properties** commissioning pages.

All parameters needed to configure the BTS site are determined at the network planning stage. It is essential that the input values match the expected values in the network plan.

Commissioning can be started when the modules are in 'Initialized' state.

Steps

1 **Choose the View → Commissioning menu item or click the Commissioning button on the View Bar.**

The **Commissioning - Introduction** page opens.

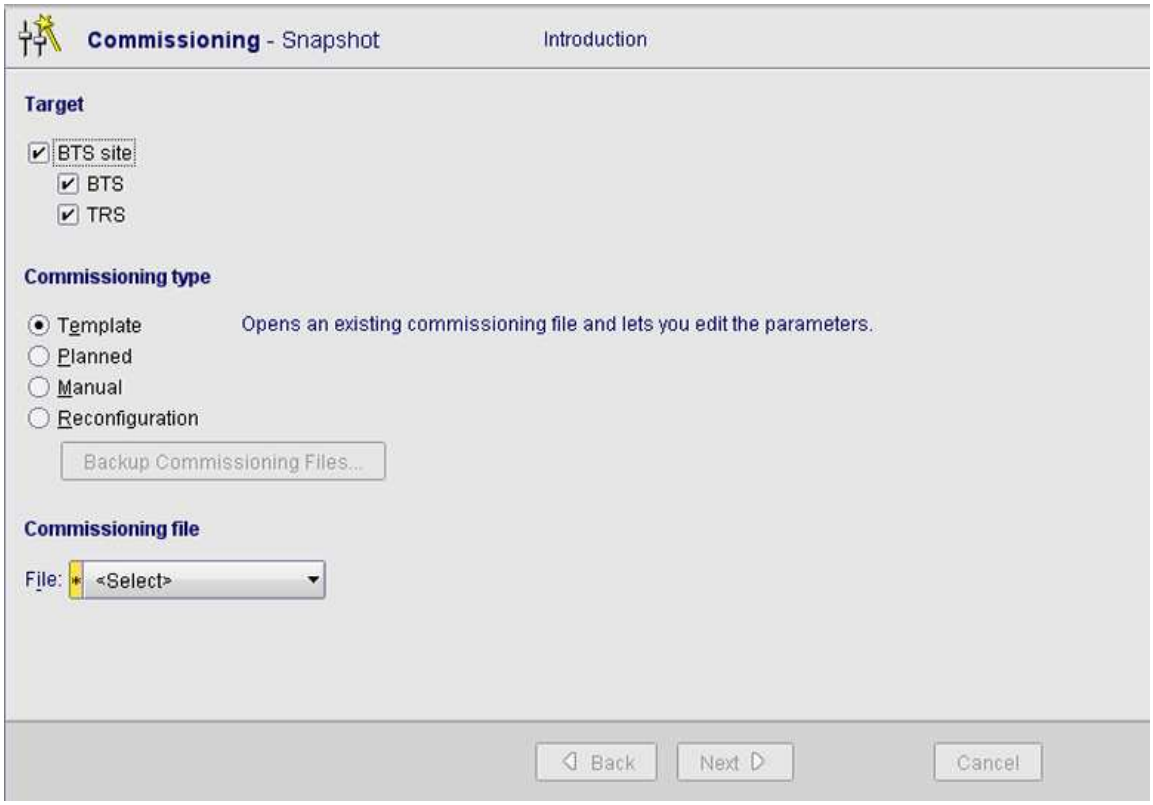

Figure 49 Commissioning - Introduction page with Template option selected

2 **Select the commissioning target by clicking the appropriate option: BTS site, BTS or TRS.**

3 **Select the Template option.**

4 **Select the commissioning file.**

You can select the file from the **Select** list that displays TRS and BTS commissioning files from the default folder. You can also enter the path and file name in the field, or browse for the commissioning file by selecting the Browse option.

The supported file formats are XML and ZIP (including the XML format commissioning files). If you selected the **BTS site** option, select the ZIP file containing both the BTS and TRS commissioning files.

If the selected file's content is invalid, an 'Incorrect file content' message box will be displayed. Clicking **Details** gives more information on the content of the file.

5 **Click the Next button.**

See Defining site properties (if the BTS site or only the TRS will be commissioned) or Defining BTS settings (if only the BTS will be commissioned) for information on how to continue.

8 Performing planned commissioning

Purpose

Planned commissioning provides an option to commission network elements by loading to the Flexi Multiradio BTS LTE and/or Flexi Transport sub-module a commissioning file that has been specifically made for the BTS site.

Planned commissioning is available when the BTS or the BTS site is uncommissioned.

All parameters needed to configure the BTS site are determined at the network planning stage. It is essential that the input values match the expected values in the network plan.

You can also create the commissioning file with BTS Site Manager. For more information on the file creation, see the *BTS Site Manager Online Help*.

Commissioning can be started when modules are in the 'Initialized' state.

Steps

1 **Choose the View → Commissioning menu item or click the Commissioning button on the View Bar.**

The **Commissioning - Introduction** page opens.

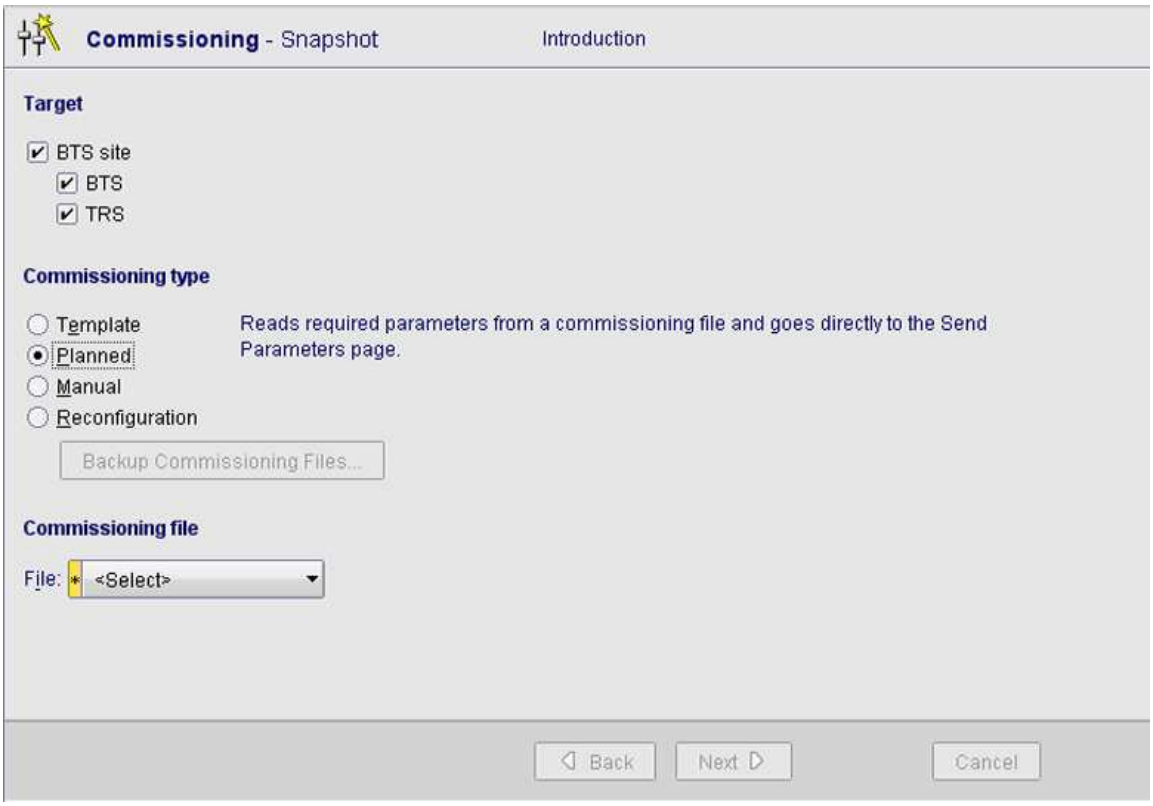

Figure 50 Commissioning - Introduction page with Planned option selected

2 **Select the commissioning target by clicking the appropriate option: BTS site, BTS or TRS.**

3 **Select the Planned option.**

4 **Select the commissioning file.**

You can select the file from the **Select** list that displays commissioning files from the default folder. You can also enter the path and file name in the field, or browse for the commissioning file by selecting the Browse option.

The supported file formats are XML and ZIP (including the XML format files). If you selected the **BTS site** option, select the ZIP file containing both the BTS and TRS commissioning files or the BTS and TRS commissioning files one by one.

If the selected file's content is invalid, an 'Incorrect file content' message box will be displayed. Clicking Details gives more information on the content of the file.

5 **Click the Next button.**

The **Commissioning - Send Parameters** page opens. See Sending parameters to BTS site for information on how to continue the commissioning.

If the selected file has XML validation errors, or if the commissioning file version differs from the version that the BTS Site Manager uses, you need to go through all the wizard pages. In that case, see Defining site properties (if the BTS site or only the TRS will be commissioned) or Defining BTS settings (if only the BTS will be commissioned) for information on how to continue.

9 Performing reconfiguration commissioning

Purpose

Reconfiguration commissioning provides an option to commission already commissioned network elements. The reconfiguration can be used when a new configuration can solve problems or when a new configuration can release HW resources for another site and/or to enable an element to function more efficiently.

During the reconfiguration, the site remains operational until the mandatory site reset at the end of the commissioning.

All parameters needed to configure the BTS site are determined at the network planning stage. It is essential that the input values match the expected values in the network plan.

Commissioning can be started when modules are in the 'Initialized' state.

Steps

1 **Choose the View → Commissioning menu item or click the Commissioning button on the View Bar.**

The **Commissioning - Introduction** page opens.

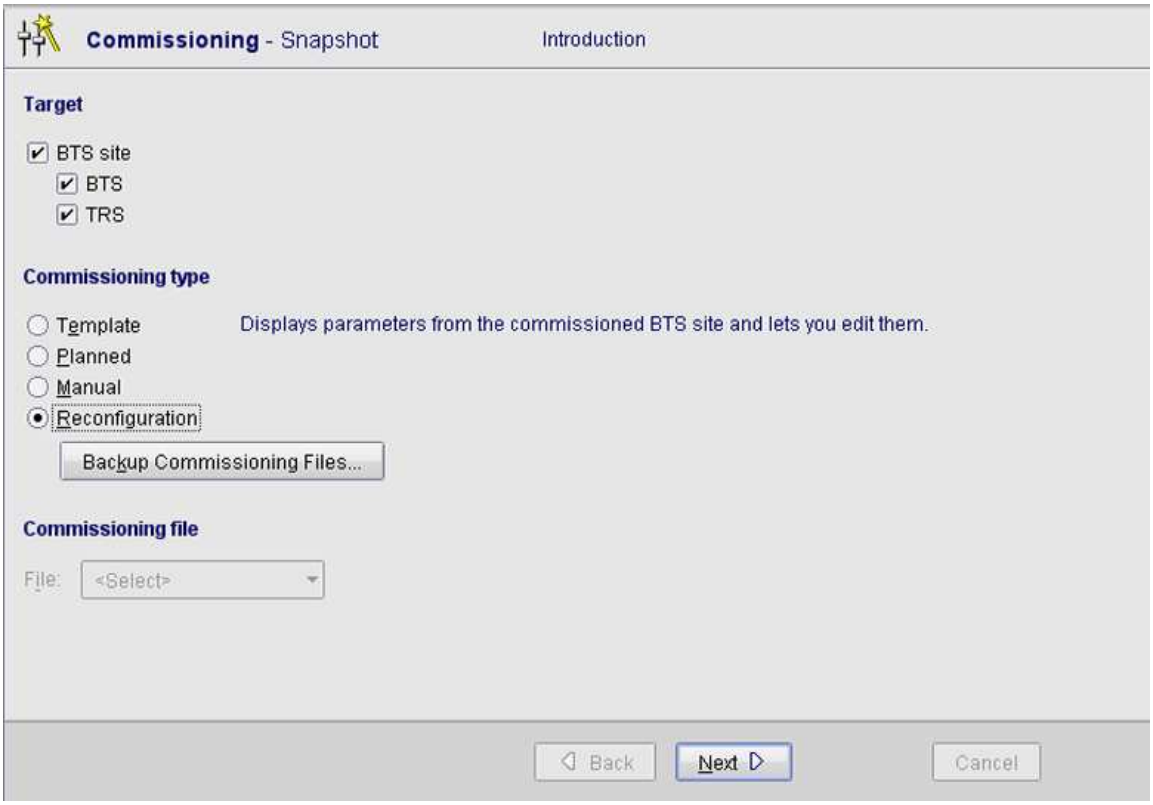

Figure 51 Commissioning - Introduction page with Reconfiguration option selected

2 **Select the commissioning target by clicking the appropriate option: BTS site, BTS or TRS.**

You can select only the elements that are already commissioned. The *BTS site* option is enabled only if both the TRS and BTS are commissioned.

3 **Select the Reconfiguration option.**

Selecting this option enables the **Backup Commissioning Files** button. Clicking the button opens the **Backup Commissioning Files** dialog box, where you can save the commissioning file for backup before changing the configuration.

4 **Click the Next button.**

See Defining site properties (if the BTS site or only the TRS will be commissioned) or Defining BTS settings (if only the BTS will be commissioned) for information on how to continue.

10 Performing RealTilt commissioning

Purpose

The **Real Tilt Wizard** in BTS Site Manager is a tool for commissioning the Real Tilt equipment. In the commissioning, you can set the configuration parameters for the Real Tilt Control Unit (RCU) and verify that the RCU works.

The **Real Tilt Wizard** features Back, Next and Cancel buttons for navigating. The **Next** button confirms the entered parameters and brings up the following page. The **Back** button reverses to the previous Wizard page. The **Cancel** button cancels all the entered parameters and closes the Wizard.

Every **Real Tilt Wizard** page reflects the actual situation in the connected RCU. The parameters entered in the Wizard pages are accepted only if they are within acceptable limits.

Before you start

This instruction assumes that you have allocated IP addresses to all your RAN elements and arranged the IP routing according to the principles described in the LTE documentation. You must have a public IP address also for the RealTilt Solution and you must arrange the routing according to the same principles.

If using other than Kathrein's antennas, ensure that the antenna table file has been downloaded.

Ensure that you have the latest software version downloaded. For more information, see Operation and Maintenance (O&M) tasks in the Nokia Siemens Networks Antenna Systems Operating Documentation set.

Steps

1 **Choose the Antenna→ Real Tilt → Connect menu item to connect to the RCU.**

2 **Choose the Antenna→ Real Tilt → Real Tilt Wizard menu item to launch the Real Tilt Wizard.**

3 **Define the IP address, Subnet mask and Gateway for the RCU in the respective fields.**

The IP address can be for example an address that is next to that of the BTS.

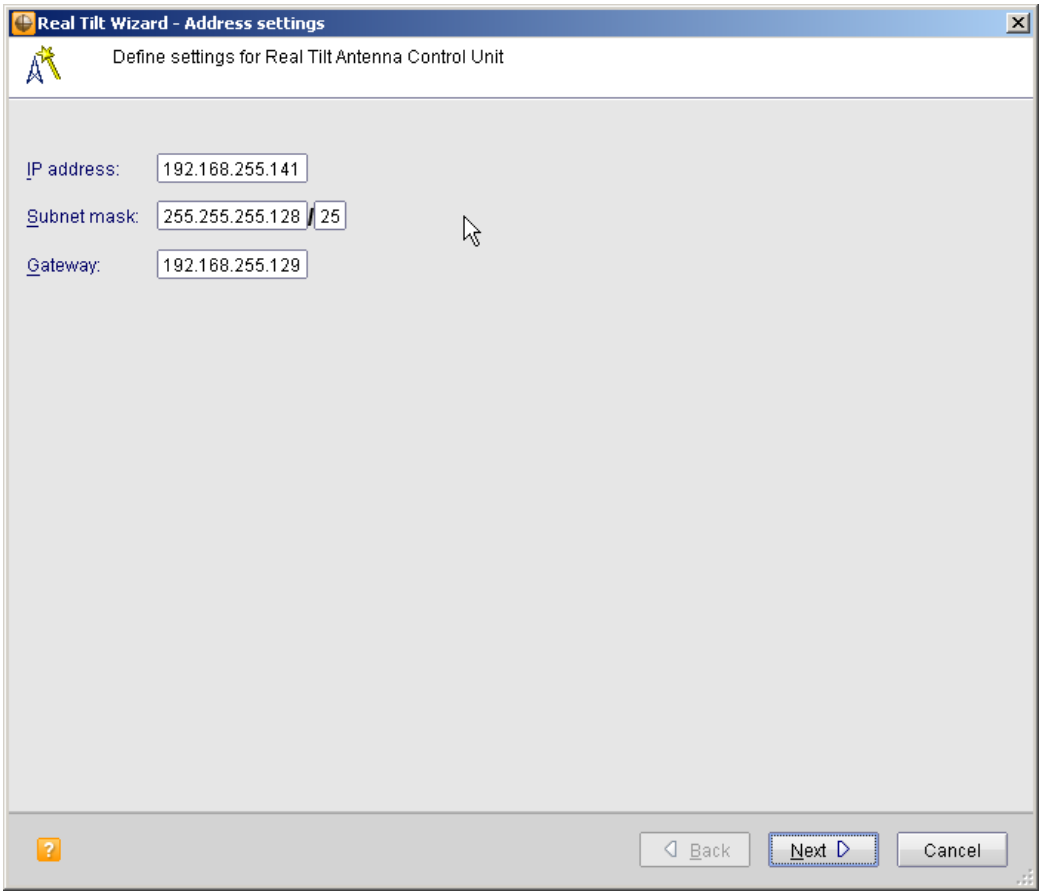

Figure 52 Real Tilt Wizard - Address Settings page

Click the Next button.

4 Map antennas to the local cells.

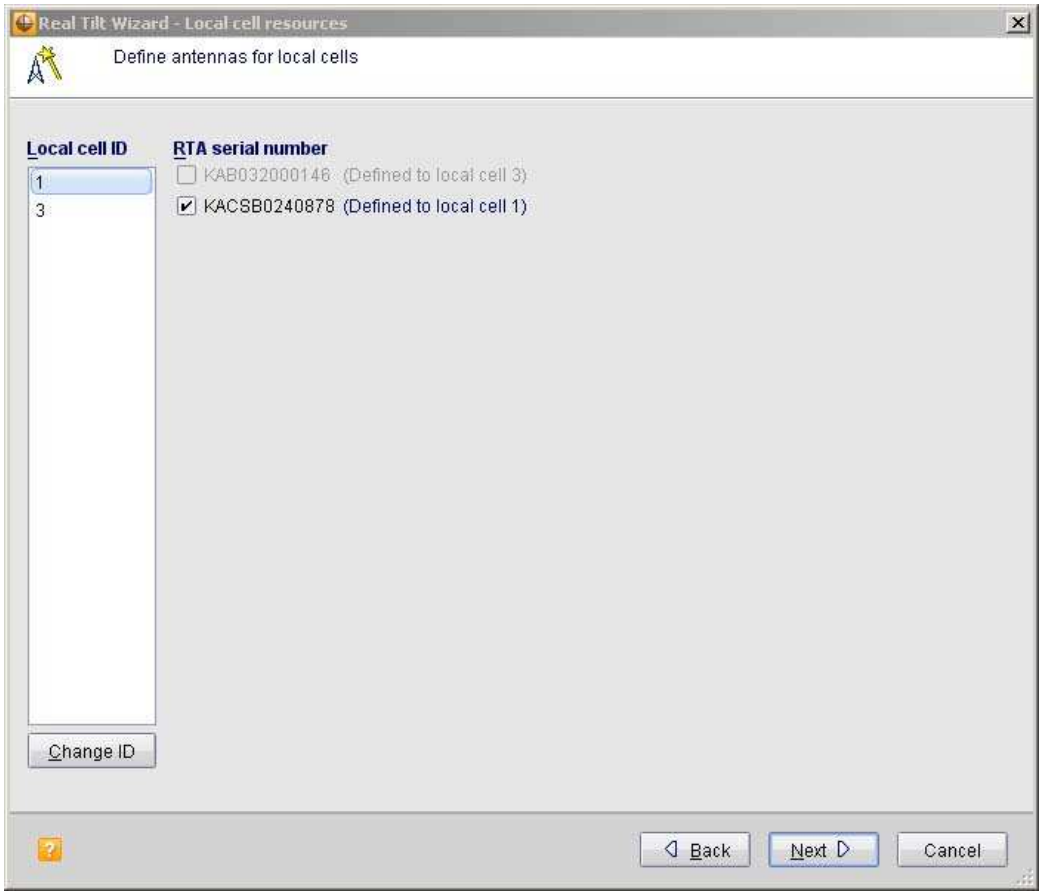

Figure 53 Real Tilt Wizard - Local Cell Resources page

Click the Next button.

5 Select antenna types and set initial tilt angles.

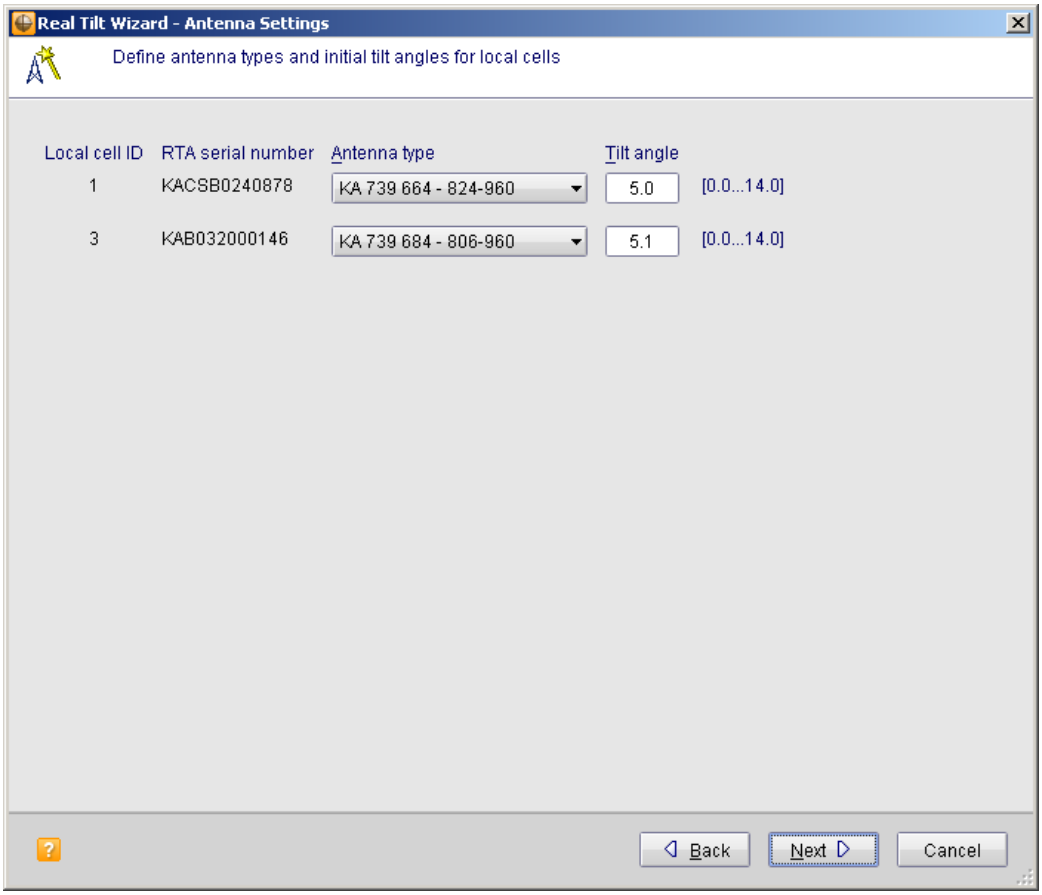

Figure 54 Real Tilt Wizard - Antenna Settings page

Click the Next button.

6 Click the Send Parameters button to send all the settings to the RCU.

The RCU is automatically reset after sending the parameter.

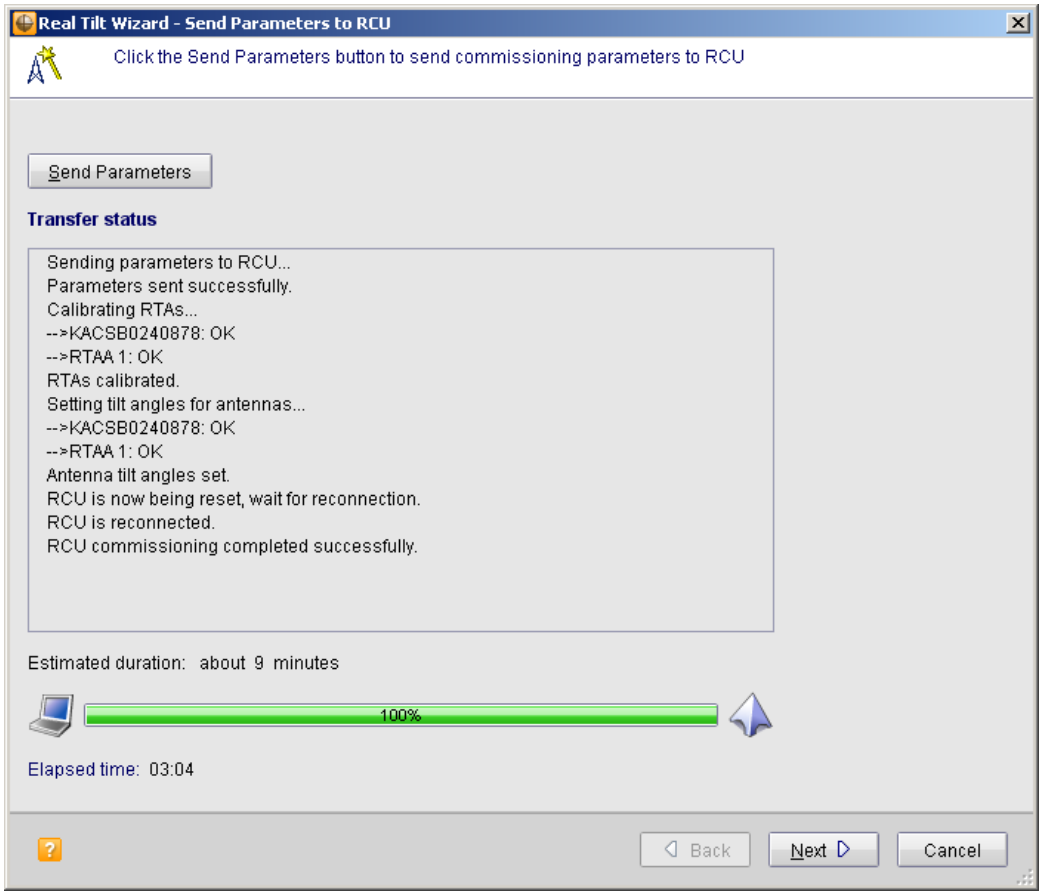

Figure 55 Commissioning ready

After the commissioning is ready, click the Next button.

7 Click the Save As button to save the Commissioning Report.

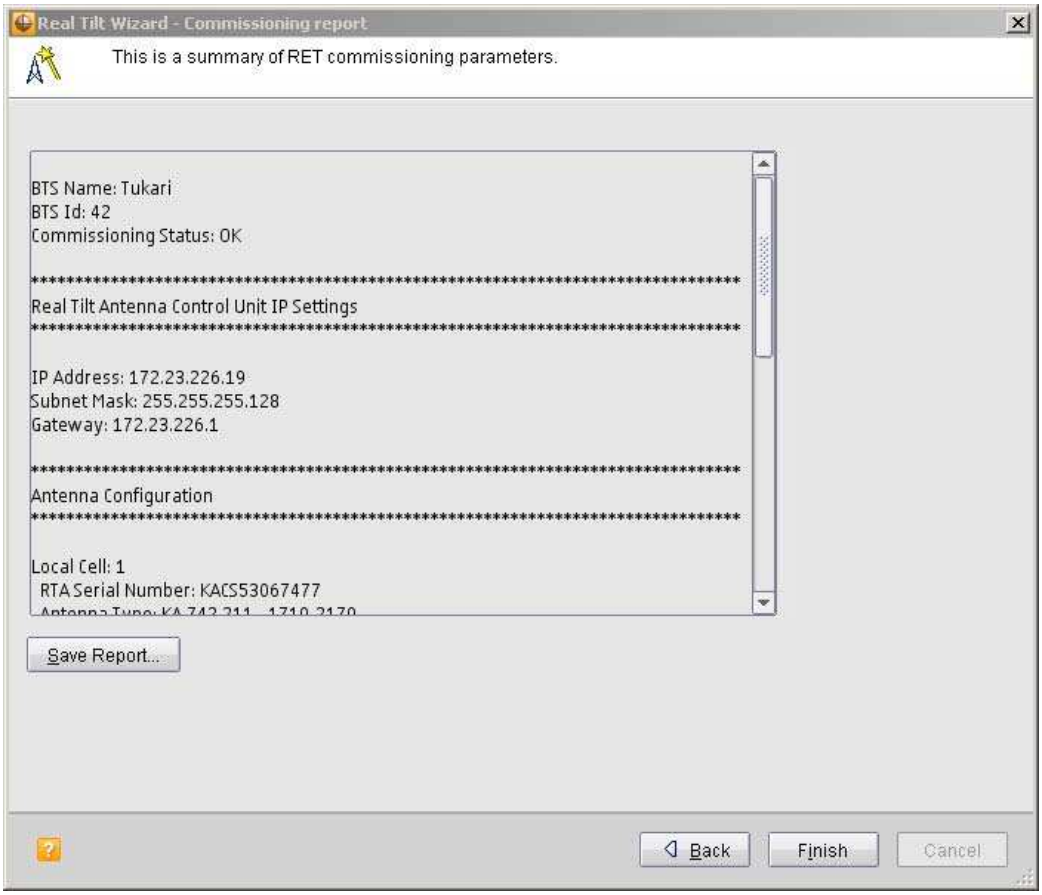

Figure 56 Real Tilt Wizard - Commissioning Report page

8 Click the Finish button to finish the commissioning and exit the Real Tilt Wizard.

Further information

To return the RCU IP settings back to their default values, reset the unit via its front panel. The default values are as follows:

- IP address 192.168.255.141
- Netmask 255.255.255.128
- Gateway 192.168.255.129

The IP settings of your PC must enable accessing the above IP addresses.

Ensure that the firewall in your PC does not prevent downloading the software.

11 BTS commissioning troubleshooting

In the case of a failure in any part of the whole commissioning procedure, a fault will appear in the **Faults view**. The descriptions for various alarms and faults can be found in the *LBTS Alarms* document and in the *BTS Site Manager Online Help*.

You can check the cause of a failure from the commissioning reports. Check also the LED states of modules. After a successful commissioning, the LED state is stable green.

The commissioning procedure may fail, for example, when:

- the autodetect feature did not find all modules in the BTS site
- there is no connection to the BTS - check that the BTS is powered up - the LED on a power supply module is a good indicator
- cabling is not connected correctly.

You can use a snapshot file for troubleshooting purposes. The snapshot file contains the current status of elements and BTS Site Manager: used HW configuration, logs, alarms, and HW and SW version information, for example. For more information on saving a snapshot file, see the Troubleshooting Flexi Multiradio BTS LTE document.

You can view all site information in the **Site Information** dialog box by choosing the **Tools** → **Site Information** menu item in BTS Site Manager.

BTS Site Manager installation

To set up and install the BTS Site Manager, see the instructions in Installing BTS Site Manager.

To connect the PC to the BTS, see Launching BTS Site Manager.

If the connection to the BTS is lost for some unexpected reason, it may take a few minutes before the reconnection is established.