

**Nokia Flexi EDGE Base Station
BTS SW EP2**

Trouble Management of Nokia Flexi EDGE BTS

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1

Summary of changes

Changes between issues 5-0 and 4-0

Modified the entire document structure: reduced the number of chapters and renamed them.

New sections added:

- Troubleshooting PseudoWire operation
- Transmission alarms are not shown in BSC (PWE mode)
- Monitoring FIPA, FIEA, FIQA (TDM mode) and FIYA (TDM mode)
- Monitoring FIQA and FIYA in PWE mode

New alarms added:

- 8003 Loss of remote power supply
- 8064 Alarm signal is received
- 8272 Position not locked
- 8273 Licence for Flexi EDGE Abis over IP/Ethernet is not available
- 8274 Licence for Flexi EDGE Additional 2 E1/T1 is not available
- 8275 Licence for Flexi EDGE TRS Abis Grooming is not available
- 8276 Licence for Flexi EDGE TRS Loop Protection is not available
- 8277 Ethernet Physical link layer is lost
- 8278 Pseudowire Down
- 8280 Pseudowire remote packet loss
- 8281 Fault in optical interface (SFP)

New alarm fault reasons added:

- 7600 Critical license missing from BSC
- 7605 ECxx RTC module cooling fan(s) report no rotation
- 7605 ECxx RTC module temperature dangerously high
- 7605 ECxx RTC unable to read internal temperature sensors
- 7606 RF cable autodetection failed
- 7606 Both Tx cables missing for DPTRX
- 7606 ERxx DDU module connected to wrong EXxx TRX module
- 7606 Mismatch between SCF and actual ECxx RTC module position
- 7607 ECxx RTC module has detected VSWR above minor limit at antenna
- 7607 HW incompatibility detected during DPTRX configuration
- 7607 Two Rx diversity branches lost with 4UD
- 7607 HW incompatibility detected during IDD configuration
- 7607 Phase Detector cable missing with DPTRX
- 7607 Incorrect Tx cabling with DPTRX
- 7607 Phase difference between Tx signals is too high with DPTRX
- 7607 Incorrect Tx cabling with IDD
- 7607 Incorrect Rx cabling with 4UD
- 7607 ERxx DDU module frequency band mismatch with 4UD
- 7607 ERxx DDU module has detected VSWR above minor limit at antenna B
- 7607 Incorrect Tx combining with DPTRX
- 7607 Rx cables split across sectors with 4UD
- 7607 DPTRX initialisation fails

Updated fault reasons or alarm instructions for the following alarms:

7606, 7607 and 7995.

Updated sections:

- *Failed commissioning*: updated potential cause *Wrong PIU type*.
- *Partially failed commissioning*: added corrective action information on FIQA and FIYA under potential cause *Missing OMUSIG*.
- *Partially failed commissioning*: added potential cause "In PWE mode, PW is used as a synchronisation source and the adaptive clock recovery state has not reached Tracking state within 13 minutes".
- *Partially failed commissioning*: added potential cause "PCU synchronisation not achieved on GPRS timeslot".

Changes between issues 4-0 and 3-0

New section added: TRX test run from the BSC

Updated fault reasons or alarm instructions for the following alarms:

7401-7412, 7413-7424, 7601, 7602, 7606, 7607, 7608, 7612, 7613, 7614, and 7621.

Updated sections:

- *Nokia Flexi EDGE BTS alarm examples*: added information on remote BTS Manager connection use.
- *Failed commissioning*: added potential cause "Error message 'Expected tag is missing FILE :::scope' pops up when sending SCF to BTS".

Changes between issues 3-0 and 2-0

New section added: Troubleshooting Q1 management

New alarm fault reasons added:

- 7600 ESEA System Extension module SW upgrade failed
- 7601 ESEA System Extension Module fan(s) out of order
- 7602 EOCA Optical module connected to wrong port
- 7606 XEOCA optical module reported incoming clock failure
- 7606 XEOCA Optical module reported HW failure
- 7606 XEOCA Optical module detected extreme temperature
- 7608 ESMA System module has lost connection to XEOCA Optical module

- 7608 XEOCA Optical module detected over current on its output power port(s)
- 7608 Temperature inside XEOCA exceeds specified temperature range
- 7608 XEOCA Optical module detected temperature sensor problem
- 7608 XEOCA Optical module detected cooling fan speed degradation
- 7801 Remote MMI connected

Updated fault reasons or alarm instructions for the following alarms:

7600, 7602, 7605, and 7607.

Updated sections:

- *Nokia Flexi EDGE Base Station alarm examples:* Added information on FIFA alarm numbering.
- *Completing troubleshooting:* More failure details added to the note.
- *Troubleshooting packet switched data transfer:* New troubleshooting case for BSC related configuration problems added.
- *Troubleshooting TRX test and TRX loop test failures with BTS Manager:* New troubleshooting case for 'Invalid command' added.

Removed alarms:

- FIFA: 113
- NE/FED: 99, 103, 128, 185, 256, 257, 258, 259, 260, 261, 262, 263.

2

Overview of troubleshooting Nokia Flexi EDGE BTS

2.1 Troubleshooting process

Before you start

Before you start, see section *Alarms for Nokia Flexi EDGE BTS*.

If a fault occurs during BTS operation, connect Nokia Flexi EDGE BTS Manager laptop PC to the System Module (ESMA). Flexi EDGE BTS Manager windows, Supervision, BTS Events, and Alarms, can help you identify the problem.



Steps

1. Troubleshooting the BTS.

Depending on the problem, see one of the following troubleshooting sections:

- *Troubleshooting commissioning*
- *Troubleshooting electrical power*
- *Troubleshooting Nokia Flexi EDGE BTS Manager connection*
- *Troubleshooting Dual TRX Module (EXxA) operation*
- *Troubleshooting TRX test and TRX loop test failures*
- *Troubleshooting illegal modules*
- *Troubleshooting local software download from Flexi EDGE BTS Manager*
- *Troubleshooting (E)GPRS packet switched data transfer*
- *Troubleshooting Q1 management*
- *Troubleshooting PseudoWire operation*

2. **After having replaced the faulty module/unit, send it to hardware service.**



Note

When returning replaced modules or units to the hardware services, remember to provide the exact failure details, such as the alarm number, environmental information and configuration information (such as dusty, hot SITE, large configuration) and the exact alarm description for all modules except for the EXxx DTRX modules. EXx DTRX modules are capable of recording internally to nonvolatile memory the fault condition, including the environmental information and TRX-level configuration information in case a blocking alarm has occurred.

3. **If a fault still exists after troubleshooting, contact your local Nokia Siemens Networks representative.**

Further information

Report all damages, failures, or faults to Nokia Siemens Networks using the Failure Report Form (FRF) that your local Nokia Siemens Networks representative has provided.

For more information on possible faults and appropriate corrective actions, see the *List of Generic Faults* document in NOLS Maintenance Documentation section.

3 Troubleshooting alarms

3.1 Nokia Flexi EDGE Base Station alarm examples

Nokia Flexi EDGE Base Station alarms issued at the BSC or NetAct have a four-digit alarm number and an alarm name, and an optional fault reason (see the figure below). For other fields in the figure below, refer to BSC/ TCSM Product Documentation.

See the following example printout for an example of active alarms as seen at the BSC.

```
EOL:40;

BTS ALARM LISTING

          LINDA          BCF-0040          ENVIR          2007-03-13  10:33:24.12
*   ALARM
(11496) 7801 MMI CONNECTED TO BASE STATION
          FF FF FF FF FF FF

          LINDA          BCF-0040  BTS-0041  EQUIPM          2007-03-13  14:27:42.05
**  ALARM  BCF -040
(11500) 7602 BCF NOTIFICATION
          ESMA System Module cooling fan speed has reduced from the set speed
          00 00 00 00 01 01

END OF BTS ALARM LISTING

COMMAND EXECUTED
```

The text under the alarm name gives the fault reason that has caused the alarm, for example in the printout above:

ESMA System Module cooling fan speed has reduced from the set speed.

One alarm can have more than one fault reason, although the alarm number remains the same. Different faults may have the same effect on the operation of a base station object, which is why they have the same alarm number and name. The fault reason specifies the fault and helps in troubleshooting.

In Nokia Flexi EDGE BTS Manager, the fault reason is reported in the **Description** column, as shown in the following figure.

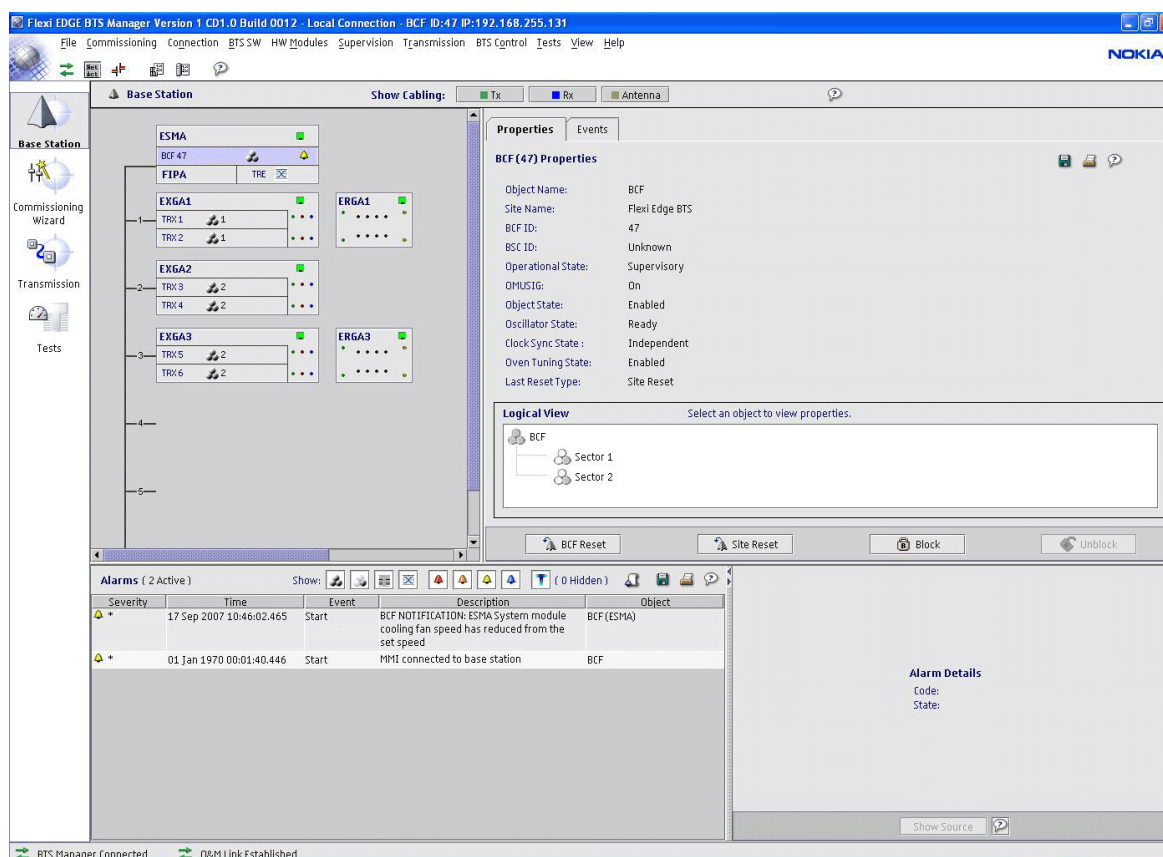


Figure 1. Alarm examples, Nokia Flexi EDGE BTS Manager view

Alarm descriptions can also be viewed with a remote BTS Manager connection. During troubleshooting, remote BTS Manager connection supports all the features available via a local connection, except the Control Abis interface (enable/disable) commands and initial base station commissioning. This minimizes needs for on-site troubleshooting.

FIFA alarms

Note that FIFA's alarms have number 8 in front of the alarm number when the alarm is read from the BTS Manager or the BSC.

3.2 Identifying faulty modules

You can identify faulty Nokia Flexi EDGE BTS modules with Nokia Flexi EDGE BTS Manager.

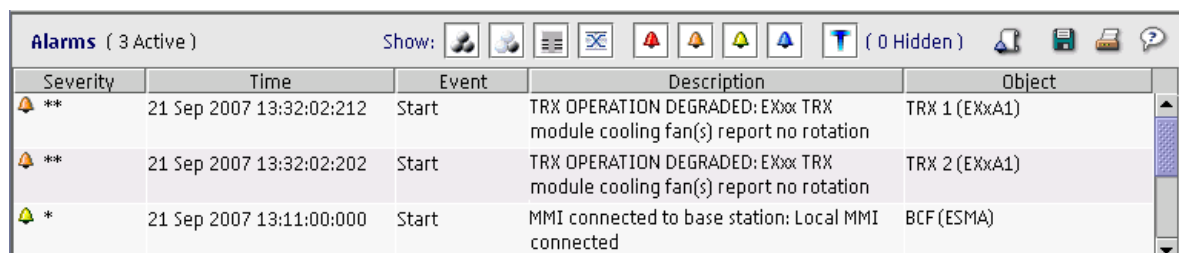
In the Alarms window of Nokia Flexi EDGE BTS Manager, you can see the object that the alarm refers to in the Object column. When troubleshooting the alarm at the site, follow the troubleshooting instructions in *Nokia Flexi EDGE BTS Trouble Management*. It is not always the alarming module that is faulty, it may also be the connected cable or the interworking module that causes the alarm.

At the site, you can easily locate the alarming module by checking the colour of the LED. Depending on the unit, a fault can be indicated by a red LED, a blinking red LED or, in some cases, a blinking yellow LED. For more information, refer to the Nokia Flexi EDGE module description documents.

If the module does not have a LED (for example the Wideband Combiner sub-module EWxx) or the module is not responding and no LED colour is displayed, read *carefully* the alarm description to locate the module causing the alarm.

For identifying a faulty transmission sub-module connected to the Q1 bus and its alarms, follow the troubleshooting instructions in the sub-module product documentation.

For the location of the fan and other modules, see module descriptions in *Nokia Flexi EDGE BTS Product Documentation*.



Severity	Time	Event	Description	Object
**	21 Sep 2007 13:32:02:212	Start	TRX OPERATION DEGRADED: EXxx TRX module cooling fan(s) report no rotation	TRX 1 (EXxA1)
**	21 Sep 2007 13:32:02:202	Start	TRX OPERATION DEGRADED: EXxx TRX module cooling fan(s) report no rotation	TRX 2 (EXxA1)
*	21 Sep 2007 13:11:00:000	Start	MMI connected to base station: Local MMI connected	BCF (ESMA)

Figure 2. Alarms window of Nokia Flexi EDGE BTS Manager

As a useful addition to troubleshooting, you can also locate units (faulty or not) by a highlighting functionality in Nokia Flexi EDGE BTS Manager. For more information on highlighting, see the instructions in *Nokia Flexi EDGE BTS Manager Online Help*.

3.3 Nokia Flexi EDGE Base Station alarm reclassification

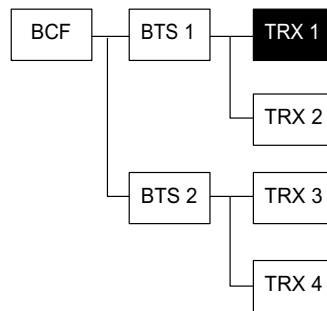
In fault situations, Nokia Flexi EDGE Base Station runs an automatic reclassification procedure for major (**) and critical (***) alarms before it sends an alarm to the BSC. When an object becomes faulty, only one critical (***) alarm from a BCF/BTS object or only one major (**) alarm from a faulty TRX can be active at a time. See also *7604 BTS OPERATION DEGRADED* to verify that TRX faulty is a major alarm.

In reclassification, the alarm handling detects which logical base station object is affected by a module level fault.

After reclassification, only one object level alarm with only one fault reason is sent to the BSC. However, the same alarm can be caused by several different fault reasons.

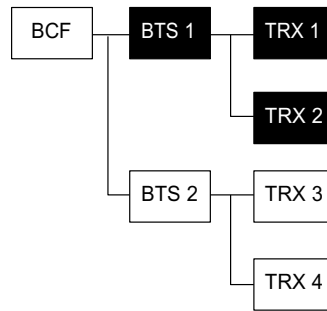
① Alarm Output

7606 TRX FAULTY (TRX 1)



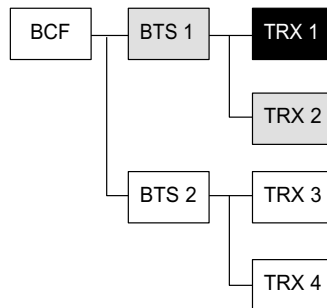
② Alarm Output, in this order

7606 TRX FAULTY (TRX 1)
7603 BTS FAULTY (BTS 1)



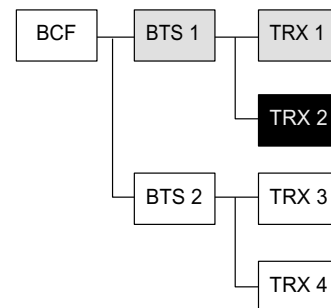
③ Alarm Output, in this order

7606 TRX FAULTY (TRX 1)
7604 BTS OPERATION DEGRADED
(BTS 1)



④ Alarm Output, in this order

7607 TRX DEGRADED (TRX 1) start
7607 TRX FAULTY (TRX 2)
7607 TRX DEGRADED (TRX 1) cancel
7607 BTS OPERATION DEGRADED
(BTS 1)



- ☐ Functioning object
- ☐ Degraded object
- ☒ Faulty object

Figure 3. Faulty and degraded object alarm reclassification

Fault situation 1:

1. TRX 1 becomes faulty and ceases to operate. 7606 TRX FAULTY alarm is issued.

Fault situation 2:

1. TRX 1 becomes faulty and ceases to operate. 7606 TRX FAULTY alarm is issued.
2. TRX 2 becomes faulty and ceases to operate.
3. Now both TRXs are not operating, which causes BTS 1 cease to operate. A BTS alarm, 7603 BTS FAULTY, is issued.

Fault situation 3:

1. TRX 1 becomes faulty and ceases to operate. 7606 TRX FAULTY alarm is issued.
2. TRX 2 becomes partially faulty but calls are getting through.
3. Now the sector is partially faulty, and a BTS alarm, 7604 BTS OPERATION DEGRADED, is issued.

Fault situation 4:

1. TRX 1 becomes partially faulty but calls are getting through. 7607 TRX DEGRADED alarm is issued.
2. TRX 2 becomes faulty and ceases to operate. 7606 TRX FAULTY alarm is issued for TRX 2. 7607 TRX DEGRADED alarm is cancelled for TRX 1.
3. Now the sector is partially faulty and a BTS alarm, 7604 BTS OPERATION DEGRADED, is issued.

3.4 Alarms for Nokia Flexi EDGE BTS

3.4.1 Troubleshooting with the help of alarm tables

Purpose

The alarm tables show the faults and instructions on how to correct the fault (see an example of an alarm table below):

Table 1. Description of the fields in the alarm table

1234 ALARM NAME			
Severity:	Object affected:	Object state:	Module/Unit:
Shows the alarm severity as displayed at the BSC or NetAct. The options are: <ul style="list-style-type: none"> Warning (W) Minor (*) Major (**) Critical (***) User definition 	The logical object affected by the fault. The options are: BCF, BTS, TRX, TRE, RTS	The state of the affected object at the time the alarm is issued. The options are: <ul style="list-style-type: none"> Enabled Disabled 	The alarm origin(s). The unit is given an acronym, for example: ESMA, ESEA, ECxA, ERxA, EXxA
Fault reason:	Instruction:		Alarm cancelling:
This field describes the cause of the alarm, for example: ESMA System module temperature high.	This field describes the cause of the alarm in more detail, and gives instructions on how to correct the fault reason causing the alarm, for example: <ol style="list-style-type: none"> 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check if any fan alarms are also active. If active, refer to fan alarm instructions to resolve. 3. Replace the ESMA 		This field describes how the alarm is cancelled. The options are: <ul style="list-style-type: none"> Automatic Manual Conditional Conditional cancelling means that the alarm can be cancelled either manually or automatically. There are alarm-specific conditions for conditional alarm cancelling which are described in the alarm description table.

For instructions on how to replace a module, see *Nokia Flexi EDGE BTS Product Documentation*.



Steps

1. Check the alarm number and alarm name to find the correct alarm description.
2. Find the fault reason in the *Fault reason* field in the alarm description table.
3. Follow the instructions in the order given in the *Instruction* field.

See also alarm cancelling information in the *Cancelling* field.

3.4.2 7208 LOCAL BLOCK

Table 2. 7208 LOCAL BLOCK

7208 LOCAL BLOCK			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BCF, BTS, or TRX	Disabled	
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>An object (TRX, Sector or BCF) is locally blocked by a BTS Manager command.</p> <p>No repair actions required, alarm is cancelled when object is locally deblocked by BTS Manager.</p>		Automatic.

3.4.3 7401-7412 EXTERNAL ALARM

Table 3. 7401 EXTERNAL ALARM 7401-7412, EXTERNAL ALARM 1-12

7401 EXTERNAL ALARM 7401 - 7412, EXTERNAL ALARM 1 - 12			
Severity:	Object affected:	Object state:	Module/Unit:
User definition			
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>This is an external user-defined alarm. This alarm is activated at the external equipment.</p> <ol style="list-style-type: none"> 1. Check equipment connected to alarming EAC line. 2. Check that the relevant EAC line is correctly configured at the BSC (MML command ZEFO:<id>: IOP;). 3. Check that the cable is correctly mated between EAC port of ESMA (or EAC port of optional FSEx module, if used) and the external equipment. 4. Check the FSEx and replace it if faulty. 5. Check the ESMA and replace it if faulty. 		Automatic.

3.4.4 7413-7424 EXTERNAL ALARM

Table 4. 7413 EXTERNAL ALARM 7413-7424, EXTERNAL ALARM 13-24

7413 EXTERNAL ALARM 7413-7424, EXTERNAL ALARM 13-24			
Severity:	Object affected:	Object state:	Module/Unit:
User definition			
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>This is an external user-defined alarm. This alarm is activated at the external equipment.</p> <ol style="list-style-type: none"> 1. Check equipment connected to EAC line. 2. Check that the relevant EAC line is correctly configured at the BSC (MML command ZEFO:<id>: IOP;). 3. Check that the cable is correctly mated between FSEx External alarm (EAC) extension module and the external equipment. 4. Check the FSEx and replace it if faulty. 5. Check the ESMA and replace it if faulty. 		Automatic.

3.4.5 7600 BCF FAULTY

Table 5. 7600 BCF FAULTY

7600 BCF FAULTY			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	BCF	Disabled	ESEA, ESMA
Fault reason:	Instruction:		Alarm cancelling:
Air i/f reference clock 26 MHz not available.	<p>ESMA System module detected that its Oven Controlled 26 MHz Oscillator is broken.</p> <ol style="list-style-type: none"> 1. Issue a HW reset to ESMA from BTS Manager. Note: This site's bypass transmission will be cut for 1-2 minutes. 2. Replace ESMA. 		Automatic.

Table 5. 7600 BCF FAULTY (cont.)

7600 BCF FAULTY		
BSS synchronisation failed.	<p>ESMA System module detected no synchronisation signal at synchronisation input (SIN) port at startup.</p> <ol style="list-style-type: none"> 1. Check that the BCF synchronisation related settings are correct at the BSC via MML command(s) (ZEFO...). 2. If LMU provides the synchronisation, check if alarm 8202 is active and resolve. 3. If another BTS is the synchronisation master, check if that it is up and alive. 4. Check that the synchronisation cabling is correctly mated between the units. If LMU is used, check also Q1 cabling and power supply to the LMU unit. 5. Replace ESMA. 	Automatic.
ESMA System module has lost connection to Flxx transmission submodule.	<p>FIEA/FIPA/FIFA Transport sub-module is not detected. This alarm is reported to the BTS Manager only.</p> <ol style="list-style-type: none"> 1. Check that the PIU (FIPA/FIEA/FIFA) is properly inserted into the ESMA. 2. Check the LED status: If LED is not lit (all PIU types) or Yellow (for FIPA/FIEA), check the back connector of the PIU. 3. Replace PIU. 4. Replace ESMA. Note: At the BSC, alarms 7767 BCCH Missing, 7706 BTS O&M link failure may be active for the alarming BCF. 	Automatic.
Flxx type mismatch between commissioning file and detected hardware.	<p>FIEA/FIPA/FIFA Transport sub-module is of wrong type. This alarm is reported to the BTS Manager only.</p> <ol style="list-style-type: none"> 1. Option 1: Replace PIU module with a correct type (as defined in SCF) and issue a HW reset to ESMA. <p>OR</p> <ol style="list-style-type: none"> 1. Option 2: Set PIU type in SCF according to the actual PIU module type and re-commission the site. 2. Replace the PIU and issue a HW reset to ESMA. 	Automatic.
ESMA System module has lost connection to all ECxx RTCs and EXxx TRXs.	<p>None of the BTS modules respond to ESMA polling command.</p> <ol style="list-style-type: none"> 1. Reset BCF. 2. Check all cable connections between ESMA and ECxx RTC and EXxx TRX modules. 3. If the fault persists, replace ESMA. 	Automatic.
ESEA System Extension module reported HW failure.	<p>ESMA System module detected that a hardware failure has occurred in the ESEA System Extension module.</p> <ol style="list-style-type: none"> 1. Issue HW reset to ESEA from BTS Manager. 2. If fault persists, replace ESEA and reset the BCF. 	Automatic.

Table 5. 7600 BCF FAULTY (cont.)

7600 BCF FAULTY		
ESMA System module has lost connection to ESEA System Extension module.	ESEA System Extension module does not respond to polling command from ESMA System module. 1. Check the power distribution to ESEA. 2. Check that the bus cable is correctly mated between ESMA and ESEA. 3. Replace ESEA. 4. Replace ESMA.	Automatic.
ESMA System module temperature dangerously high.	Internal temperature of ESMA System module has exceeded +95C/+203F. 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check if any fan alarms are also active. If active, refer to fan alarm instructions to resolve. 3. Replace ESMA.	Automatic.
Mismatch between the commissioned configuration and actual configuration.	There is a conflict between the SCF and the actual configuration during commissioning or at start up: 1. SCF contains ESEA, but it is not detected in the actual configuration. 2. SCF does not contain ESEA, but it was detected to port 6 of ESMA a. Modify SCF to match the actual configuration OR b. Modify actual configuration to match the SCF. 3. Replace ESEA. 4. Replace ESMA.	Conditional Automatic - Commission the site through append/Re commissioning.
		Manual - (Dis)connect ESEA to bring the Autodetected configuration in sync with the SCF. Issue a BCF /SITE /System Module HW reset thereafter.
ESEA System Extension module SW upgrade failed.	ESMA System module detected that SW download to ESEA System Extension module failed at startup. 1. Issue a HW reset to ESEA. 2. Issue a HW reset to ESMA. 3. If alarm persists, replace ESEA. 4. Replace ESMA.	Manual.
Critical license missing from BSC.	Either 'Flexi EDGE Abis over IP/Ethernet' or 'Flexi EDGE Additional 2 E1/T1' licence has not been installed in the BSC. 1. Check which transmission licence alarm (8273 or 8274) is active and follow the alarm specific instructions given.	Automatic.

3.4.6 7601 BCF OPERATION DEGRADED

Table 6. BCF OPERATION DEGRADED

7601 BCF OPERATION DEGRADED			
Severity:	Object affected:	Object state:	Module/Unit:
Major	BCF	Enabled	ESEA, ESMA
Fault reason:	Instruction:		Alarm cancelling:
Difference between PCM and BTS frequency reference.	<p>There is over 5 Hz difference to the 2MHz reference clock due to Abis link instability.</p> <ol style="list-style-type: none"> 1. Check that Synchronisation priority list has correct Rx clock sources. 2. Check the Abis link quality (G.826 performance statistics via BTS Manager/NetAct). Check the alarm history for 8xxx alarms reported and resolve any link problems occurred. 3. Check the network synchronisation between the BSC and the base station. 4. If alarm is active at multiple sites, check the quality of synchronisation for the whole BSS. 		Automatic.
ESMA System module has lost connection to FSEx External Alarm (EAC) module.	<p>FSEx External Alarm (EAC) module does not respond to poll message of the ESMA System module.</p> <ol style="list-style-type: none"> 1. Check that FSEx is set to Active Mode by connecting pins 3-4 of X1103 jumper. 2. Check that the cabling is correctly mated between ESMA and FSEx. 3. Replace FSEx. 4. Replace ESMA. 		Automatic.
ESMA System module cooling fan(s) report no rotation.	<p>One or more fans of the ESMA System module are not rotating. There is a danger of overheating.</p> <ol style="list-style-type: none"> 1. Check that the fan unit cable is correctly mated to ESMA. 2. Check that there are no obstacles preventing the fan(s) from rotating. 3. Clean the fan unit of dust and/or dirt. 4. Replace the fan unit. 5. Replace ESMA. 		Automatic.

Table 6. BCF OPERATION DEGRADED (cont.)

7601 BCF OPERATION DEGRADED		
Commissioning failed due to BCF ID mismatch between commissioning file and BSC	<p>Incorrect BCF ID between the BSC and the Commissioning File (SCF).</p> <ol style="list-style-type: none"> 1. Check the transmission path of the traffic allocated to the site against the network plan. 2. Using the BTS Manager, recommission the BTS with correct BCF ID. <p>(Steps on the BTS Manager: Commissioning Wizard Change Settings Manually --> Amend the BCF ID, as needed)</p> <p>Note: The alarm is sent only when the BTS is uncommissioned and a mismatch has been detected. In any other cases, for example, after a BCF reset, the alarm is not sent. If in Append commissioning, the mismatch of BCF id is visible only in the commissioning report.</p> <p>Note that this alarm is not supported in EP1.1 CD1.0.</p>	Automatic.
ESMA System module FLASH memory writing error.	<p>Memory write failure occurred at SW download and is not valid, previously active SW is taken into use.</p> <ol style="list-style-type: none"> 1. Issue a HW reset to ESMA from BTS Manager. 2. Attempt the SW download again. 3. If this alarm persists, replace ESMA. 	Manual.
All external Q1 devices fail to respond.	<p>None of the configured Q1 devices in the Q1 bus are responding to a polling command.</p> <ol style="list-style-type: none"> 1. Check that Q1 addresses and baud rate match between the Q1 devices and BSC. 2. If FIFA is used and BTS is polling Q1 equipment, check that Q1 switch towards the Q1 bus is closed with FlexiHub Manager. 3. Check that the Q1 cables are correctly mated between the ESMA and Q1 devices. 4. Replace ESMA. 	Automatic.
ESMA System module has detected no fans.	<p>ESMA System module has not detected a fan unit at start up. There is a danger of overheating.</p> <ol style="list-style-type: none"> 1. Check that the fan unit cable is correctly mated to ESMA. 2. Replace the fan unit. 3. Replace the ESMA. 	Manual.

Table 6. BCF OPERATION DEGRADED (cont.)

7601 BCF OPERATION DEGRADED		
Module power cable connections are incorrectly configured.	<p>One or more of the internal power cable connections does not match power cabling rules. Intelligent shutdown feature may not operate correctly.</p> <ol style="list-style-type: none"> 1. Check the internal power and bus cabling against the product documentation set. 2. Issue a BCF reset. 	Manual.
ESEA System Extension Module fan(s) out of order.	<p>ESEA System Extension module detected reduced speed or no rotation of fan(s) against commanded speed.</p> <ol style="list-style-type: none"> 1. Check that the fan unit cable is correctly mated to ESEA. 2. Check that there are no obstacles preventing the fan(s) from rotating. 3. Clean the fan unit of dust and/or dirt. 4. Replace the fan unit. 5. Replace ESEA. 	Automatic.

3.4.7 7602 BCF NOTIFICATION

Table 7. 7602 BCF NOTIFICATION

7602 BCF NOTIFICATION			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BCF	Enabled	ECxA, EOCA, ESEA, ESMA, EXxA
Fault reason:	Instruction:		Alarm cancelling:
External synchronisation signals disabled.	<p>LMU has operated without GPS signal over specified time and is turning its FCLK output off.</p> <ol style="list-style-type: none"> 1. Check the GPS antenna fix status is OK with LMUManager. Adjust the GPS antenna so that satellites become visible. 2. Check that the GPS cable is correctly mated to LMU. 3. Check that the latest LMU SW is being used. Download newer SW if necessary. 4. Replace LMU. 		Automatic.

Table 7. 7602 BCF NOTIFICATION (cont.)

7602 BCF NOTIFICATION		
BSS synchronisation failed.	<p>ESMA System module has lost synchronisation signal at synchronisation input (SIN) port.</p> <ol style="list-style-type: none"> 1. If LMU provides the synchronisation, check if alarm 8202 is active and resolve it. 2. If another BTS is the synchronisation master, check if that it is up and alive. 3. Check that the synchronisation cabling is correctly mated between the units. If LMU is used, check also Q1 cabling and power supply to the LMU unit. 4. Replace ESMA. 	Automatic.
ESMA System module cooling fan speed has reduced from the set speed.	<p>The cooling fan speed has reduced substantially from the commanded fan speed.</p> <ol style="list-style-type: none"> 1. Check that nothing obstructs the fan(s) from rotating. 2. Clean the fan unit of dust and/or dirt. 3. Replace the fan unit. 4. Replace ESMA. <p>Note: If "Temperature high/dangerously high" and/or 7621 alarm(s) are also active, perform these actions as soon as possible.</p>	Automatic.
ESMA System module cooling fan speed has increased from the set speed.	<p>The cooling fan speed of System module has increased substantially from the commanded fan speed.</p> <ol style="list-style-type: none"> 1. Check the ESMA operational voltage as an increased ESMA voltage could lead to overspeeding of the fans. 2. Replace the fan unit. 3. Replace ESMA. 	Automatic.
ESMA System module temperature high.	<p>ESMA System module has detected that its internal temperature has exceeded +90C/+194F.</p> <ol style="list-style-type: none"> 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check if any fan alarms are also active. If active, refer to fan alarm instructions to resolve. 3. Replace the ESMA. <p>Note that this alarm remains active if the temperature still increases and the "temperature dangerously high" alarm is activated.</p>	Automatic.
ECxx RTC module connected to wrong port.	<p>ECxx RTC module is not connected to port 1/2/3 of ESMA System module.</p> <ol style="list-style-type: none"> 1. Connect ECxx to ESMA port 1,2 or 3 and issue a BCF reset. 	Automatic.

Table 7. 7602 BCF NOTIFICATION (cont.)

7602 BCF NOTIFICATION		
EXxx TRX module connected to wrong port.	EXxx TRX Module is not connected to ESEA System Extension module. 1. Connect EXxx module to ESEA.	Automatic.
ESEA System Extension module connected to wrong port.	ESEA System Extension module is not connected to port 6 of ESMA System Module. 1. Connect ESEA to port 6 of ESMA, and issue a BCF reset.	Automatic.
Unknown module connected to ESxx System (Extension) module.	ESMA System module does not recognise the module connected to this port. SW release incompatibility with the connected HW. 1. Check the HW \ SW compatibility from the SW release binder. a. If the module is compatible with the current SW running in the BTS, replace the module. b. If the module is not compatible with the current SW running in the BTS, check which SW version supports the module. Upgrade the BTS SW to the version that supports the module. 2. Remove the unknown module	Automatic.
ESEA System Extension module temperature high.	Internal temperature of ESEA System Extension module has exceeded +85C/+185F. 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check if fan alarm is also active. If active, refer to fan alarm instructions to resolve. 3. Replace ESEA. Note that this alarm remains active if the temperature still increases and the "temperature dangerously high" alarm is activated.	Automatic.
ESMA System module unable to read internal temperature sensors.	There is no temperature measurement in the ESMA System module. All temperature sensors inside the module are broken. Fans are rotating at maximum speed. 1. Replace the ESMA. Note: If fan alarm(s) are active at ESMA, perform this action as soon as possible.	Automatic.

Table 7. 7602 BCF NOTIFICATION (cont.)

7602 BCF NOTIFICATION		
EOCA Optical module connected to wrong port.	EOCA Optical module is connected to both an ESMA System module and an ESEA System Extension module at the same time. EXxx TRX modules cannot be connected to ESMA system module when an ESEA System Extension module is equipped, so the ESMA System module connection (s) to the EOCA Optical Unit are incorrect. 1. Connect Local Optical BUS connections to ESEA only, when ESEA is equipped.	Automatic.

3.4.8 7603 BTS FAULTY

Table 8. 7603 BTS FAULTY

7603 BTS FAULTY			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	BTS	Disabled	DDU, ECxx, ERxx
Fault reason:	Instruction:		Alarm cancelling:
Other faults.	1. Check whether either of the following alarms is active: 7606 TRX FAULTY 7607 TRX OPERATION DEGRADED and follow the instructions given for the active alarm(s).		Automatic.

3.4.9 7604 BTS OPERATION DEGRADED

Table 9. 7604 BTS OPERATION DEGRADED

7604 BTS OPERATION DEGRADED			
Severity:	Object affected:	Object state:	Module/Unit:
Major	BTS	Enabled	DDU, ECxx, ERxx
Fault reason:	Instruction:		Alarm cancelling:

Table 9. 7604 BTS OPERATION DEGRADED (cont.)

7604 BTS OPERATION DEGRADED		
Other faults.	<ol style="list-style-type: none"> 1. Check whether either of the following alarms is active: 7606 TRX FAULTY 7607 TRX OPERATION DEGRADED and follow the instructions given for the active alarm(s). 	Automatic.

3.4.10 7605 BTS NOTIFICATION

Table 10. 7605 BTS NOTIFICATION

7605 BTS NOTIFICATION			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BTS	Enabled	ECxA
Fault reason:	Instruction:		Alarm cancelling:
ECxx RTC module cooling fan speed has reduced from the set speed.	<p>The cooling fan speed has reduced substantially from the commanded fan speed.</p> <ol style="list-style-type: none"> 1. Check that nothing obstructs the fan(s) from rotating. 2. Clean the fan unit of dust and/or dirt. 3. Replace the fan unit. 4. Replace ECxx. <p>Note: If "Temperature high/dangerously high" and/or 7621 alarm(s) are also active, perform these actions as soon as possible.</p>		Automatic.
ECxx RTC module cooling fan speed has increased from the set speed.	<p>The cooling fan speed has increased substantially from the commanded fan speed.</p> <ol style="list-style-type: none"> 1. Check the ESMA operational voltage as an increased ESMA voltage could lead to overspeeding of the fans. 2. Replace the fan unit. 3. Replace ECxx. 		Automatic.

Table 10. 7605 BTS NOTIFICATION (cont.)

7605 BTS NOTIFICATION		
ECxx RTC module cooling fan(s) report no rotation.	<p>One or more fans of the ECxx RTC module are not rotating. There is a danger of overheating.</p> <ol style="list-style-type: none"> 1. Check that the fan unit cable is correctly mated to ECxx. 2. Check that nothing obstructs the fan(s) from rotating. 3. Clean the fan unit of dust and/or dirt. 4. Replace the fan unit. 5. Replace ECxx. 	Automatic.
ECxx RTC module has detected no fans.	<p>ECxx RTC module has not detected a fan unit at start up. There is a danger of overheating.</p> <ol style="list-style-type: none"> 1. Check that the fan unit cable is correctly mated to ECxx. 2. Replace the fan unit. 3. Replace ECxx. 	Manual.
ECxx RTC module temperature dangerously high.	<p>ECxx RTC module has detected that its internal temperature has exceeded + 65C/+ 149F.</p> <ol style="list-style-type: none"> 1. Ensure that the ambient temperature of the base station is below + 50C/+ 122F. 2. Check if any fan alarms are also active. If active, refer to fan alarm instructions to resolve. 3. Replace ECxx. 	Automatic.
ECxx RTC unable to read internal temperature sensors.	<p>There is no temperature measurement in the ECxx RTC module. All temperature sensors inside the module are broken. Fans are rotating at maximum speed.</p> <ol style="list-style-type: none"> 1. Replace the RTC. <p>Note: If fan alarm(s) are active at the RTC, perform this action as soon as possible.</p>	Automatic.

3.4.11 7606 TRX FAULTY

Table 11. 7606 TRX FAULTY

7606 TRX FAULTY			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRX	Disabled	ECxA, ERxA, ESMA, EXxA
Fault reason:	Instruction:		Alarm cancelling:

Table 11. 7606 TRX FAULTY (cont.)


7606 TRX FAULTY		
Hardware incompatibility detected during EXxx TRX module configuring.	<p>Frequency band/channel or BTS configuration mismatch between the BTS units and BSC configuration.</p> <ol style="list-style-type: none"> 1. Check that frequency number defined at the BSC match with the used ECxx/ERxx at the BTS site. 2. Check that RF hopping is not used when ECxx is installed. 3. Modify TRX object parameters (MML command ZERM:...) against the actual configuration at the site. 4. Replace ERxx or ECxx. 	Automatic
EXxx TRX module has no combiner ERxx DDU or ECxx RTC module present.	<p>There is no ERxx DDU module or ECxx RTC module detected for the sector at start up.</p> <ol style="list-style-type: none"> 1. Depending on the configuration: <ol style="list-style-type: none"> a. Connect/check ER_A cable between ERxx and EXxx for the associated sector(s) and issue a sector reset. <p>OR</p> <ol style="list-style-type: none"> b. Connect/check the bus cable between the ECxx and ESMA and issue a sector reset. 2. Replace ERxx/ECxx. 3. Replace EXxx. <p>Note that if the DDU is shared across two sectors, a BCF reset is needed.</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Note </div> <p>If the configuration is 1+X containing only one ERxx DDU module, it has to be connected to the split EXxx TRX module shared between the two sectors.</p>	Manual.

Table 11. 7606 TRX FAULTY (cont.)



7606 TRX FAULTY		
EXxx TRX module incoming frame clock FCLK missing.	<p>EXxx TRX module has detected that the Frame Clock coming from the ESMA System module is missing. FCLK is generated by ESMA System module which is distributed to EXxx TRX modules either directly or via ESEA.</p> <ol style="list-style-type: none"> 1. Check the bus cable chain from ESMA to EXxx. <p> Caution</p> <p>If bus cables are looped back to the same module, ongoing calls may be dropped or a module may freeze until the loop is removed. Do not loop bus cables back to the same module.</p> <ol style="list-style-type: none"> 2. Replace EXxx. 3. Replace ESEA if alarming TRX is connected to it. 4. Replace ESMA. 	Automatic
EXxx TRX module failed to synchronize to incoming frame clock FCLK.	<p>EXxx TRX module has detected that it cannot synchronise to the Frame Clock. FCLK is generated by ESMA System module which is distributed to EXxx TRX modules either directly or via ESEA.</p> <ol style="list-style-type: none"> 1. Check the bus cable chain from ESMA to EXxx. Issue a HW Reset to EXxx. <p> Caution</p> <p>If bus cables are looped back to the same module, ongoing calls may be dropped or a module may freeze until the loop is removed. Do not loop bus cables back to the same module.</p> <ol style="list-style-type: none"> 2. Replace EXxx. 3. Replace ESMA. 4. Replace ESEA. 	Manual.

Table 11. 7606 TRX FAULTY (cont.)


7606 TRX FAULTY		
EXxx TRX module incoming 6.5 MHz reference clock missing.	<p>EXxx TRX module has detected that the 6.5 MHz reference clock coming from the ESMA System module is missing. The 6.5 MHz reference is generated by ESMA System module which is distributed to EXxx TRX modules either directly or via ESEA.</p> <ol style="list-style-type: none"> 1. Check the bus cable chain from ESMA to EXxx. <p> Caution</p> <p>If bus cables are looped back to the same module, ongoing calls may be dropped or a module may freeze until the loop is removed. Do not loop bus cables back to the same module.</p> <ol style="list-style-type: none"> 2. Replace EXxx. 3. Replace ESEA if alarming TRX is connected to it. 4. Replace ESMA. 	Automatic.
EXxx TRX module temperature dangerously high.	<p>EXxx TRX module has detected that its internal temperature has exceeded +95C/+203F.</p> <ol style="list-style-type: none"> 1. Ensure that the ambient temperature of the base station is below +50C/+122F 2. Check if any fan alarms are also active. If active, refer to fan alarm instructions to resolve. 3. Replace the EXxx. 	Automatic.
Internal failure occurred during EXxx TRX module configuring.	<p>There was no internal response or timeout occurred during EXxx TRX module configuration.</p> <ol style="list-style-type: none"> 1. Reset the EXxx to allow unit reconfiguration. 2. If alarm persists, replace EXxx. 	Manual TRX lock/unlock.
ERxx DDU module SW activation fails.	<p>ERxx DDU module did not activate inactive SW and therefore it is running with current active package.</p> <ol style="list-style-type: none"> 1. Issue a HW reset to EXxx. 2. If alarm reappears after ERxx SW download, replace ERxx. 	Manual.
ERxx DDU module not supported.	<p>Connected module is either of wrong network type or device type.</p> <ol style="list-style-type: none"> 1. Check that the connected ERxx is of correct frequency band in respect to the used EXxx. 2. Check that ERxx is connected to EXxx. 3. Replace ERxx. 	Manual.
ERxx DDU module reported HW failure.	<p>At startup ERxx DDU module reported internal HW failure.</p> <ol style="list-style-type: none"> 1. Replace ERxx. 	Manual.

Table 11. 7606 TRX FAULTY (cont.)


7606 TRX FAULTY		
ESMA System module has lost connection to EXxx TRX module.	EXxx TRX module does not respond to polling command from ESMA System module. EXxx TRX module can be connected to ESMA either directly or via ESEA System Extension module. 1. Check the bus cable chain from ESMA to EXxx. 2. If the EXxx LED is off, replace the power cable. 3. Replace EXxx. 4. Replace ESEA if alarming TRX is connected to it. 5. Replace ESMA.	Automatic.
EXxx TRX module has lost connection to ERxx DDU module	ERxx DDU module is not responding to poll command from EXxx TRX module. 1. Check that the ER_A cable is correctly mated between EXxx and ERxx. 2. Replace ERxx. 3. Replace EXxx.	Automatic.
Internal failure occurred during ERxx DDU module configuring.	ERxx DDU module configuration (Gain or Bias-T) failed. 1. Reset the EXxx to allow ERxx unit reconfiguration. 2. If the alarm reappears, replace ERxx.	Manual.
EXxx TRX module has missing transmission time slot allocation.	TRXsig and/or TCH allocation for EXxx TRX module is missing from the Abis allocation. 1. Check that BTS configuration and Abis time slot allocation matches between the SCF, installed units and the BSC. 2. Add missing time slot allocation to the SCF/BTS by appending the commissioning file.	Automatic.
EXxx TRX module SW download from ESMA System module failed.	ESMA System Module detected that SW download to EXxx TRX module has failed repeatedly at TRX startup. EXxx TRX module can be connected to ESMA either directly or via ESEA System Extension module. 1. Check the bus cable chain from ESMA to EXxx.  Caution If bus cables are looped back to the same module, ongoing calls may be dropped or a module may freeze until the loop is removed. Do not loop bus cables back to the same module. 2. Replace EXxx.	Automatic.
ECxx RTC module internal HW failure.	At startup ECxx RTC module reported internal HW failure. 1. Replace ECxx.	Automatic.

Table 11. 7606 TRX FAULTY (cont.)


7606 TRX FAULTY		
ECxx RTC module SW download from ESMA System module failed.	<p>ESMA System Module detected that SW download to ECxx RTC module has failed at startup.</p> <ol style="list-style-type: none"> 1. Issue a HW reset to ESMA. 2. If alarm persists, replace ECxx. 3. Replace ESMA. 	Automatic.
ECxx RTC module incoming frame clock FCLK missing in startup.	<p>ECxx RTC module has detected that the Frame Clock coming from the ESMA System module is missing.</p> <ol style="list-style-type: none"> 1. Issue a HW reset to ESMA. 2. Check that the bus cable is correctly mated between the ECxx and ESMA. <p> Caution</p> <p>If bus cables are looped back to the same module, ongoing calls may be dropped or a module may freeze until the loop is removed. Do not loop bus cables back to the same module.</p> <ol style="list-style-type: none"> 3. Check whether other ECxx modules have the same alarm, replace ESMA. 4. Replace ECxx. 	Automatic.
ECxx RTC module received insufficient Tx power.	<p>ECxx RTC module detected insufficient power during cavity tuning. RTC is unable to perform cavity tuning.</p> <ol style="list-style-type: none"> 1. Issue a sector lock/unlock to allow ECxx RTC module reconfiguration. 2. Check that the Tx cabling between EXxx and ECxx is correctly mated. Check also the condition of cables. 3. If all the EXxx connected to the ECxx have raised this alarm, replace ECxx. 4. Replace EXxx. 5. Replace ECxx. 	Automatic.
EXxx TRX module Tx hopping synthesizer 1 fails to lock.	<p>Tx hopping synthesizer 1 in EXxx TRX module was unable to (maintain) lock to the given channel.</p> <ol style="list-style-type: none"> 1. Reset TRX/Sector. 2. Replace EXxx. 	Manual.
EXxx TRX module Tx hopping synthesizer 2 fails to lock.	<p>Tx hopping synthesizer 2 in EXxx TRX module was unable to (maintain) lock to the given channel.</p> <ol style="list-style-type: none"> 1. Reset TRX/Sector. 2. Replace EXxx. 	Manual.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
EXxx TRX module Rx hopping synthesizer 1 fails to lock.	Rx hopping synthesizer 1 in EXxx TRX module was unable to (maintain) lock to the given channel. 1. Reset TRX/Sector. 2. Replace EXxx.	Manual.
EXxx TRX module Rx hopping synthesizer 2 fails to lock.	Rx hopping synthesizer 2 in EXxx TRX module was unable to (maintain) lock to the given channel. 1. Reset TRX/Sector. 2. Replace EXxx.	Automatic.
EXxx TRX module Rx fixed frequency synthesizer fails to lock.	Rx fixed frequency synthesizer in EXxx TRX module was unable to (maintain) lock to the given channel. 1. Reset TRX/Sector. 2. Replace EXxx.	Manual.
EXxx TRX module Tx power is less than minimum at DPC.	Tx output power is less than +14.5dBm at Digital Power Control circuit block in EXxx TRX module. 1. Replace EXxx.	Manual.
EXxx TRX module Tx power overdriven at DPC.	Tx output power is over 2 dB higher than expected at Digital Power Control circuit block in EXxx TRX module. 1. Replace EXxx.	Manual.
EXxx TRX module detected no connection to ERxx DDU/ ECxx RTC via RF cable autodetection.	RF cable autodetection failed due to no Tx or Rx connectivity from EXxx TRX module to ERxx DDU/ ECxx RTC module. All Rx measurement report values for a TRX object were below connectivity threshold. 1. Check that the Tx and Rx cables between EXxx, EWxx and ERxx or ECxx are correctly mated and the connectors and cables are not damaged. Issue a sector reset to restart RF cable autodetection. 2. Replace EXxx. 3. In case of a shared DDU, reset the BCF. Note that if the DDU is shared across two sectors, a BCF reset is needed.	Manual.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
EXxx TRX module detected no Rx signal during RF cable autodetection.	<p>RF cable autodetection failed due to no Rx connectivity from EXxx TRX module to ECxx RTC module. All Rx measurement report values for a TRX object were below connectivity threshold.</p> <p>When this alarm is active, BTS Manager does not display any RF cabling.</p> <ol style="list-style-type: none"> 1. Check that the Rx cables between EXxx and ECxx are correctly mated with defined torque and the connectors are not damaged. Issue a sector reset to restart RF cable autodetection. 2. Check that ECxx and EXxx are of same frequency band. 3. If all the EXxx connected to the ECxx have raised this alarm, replace ECxx. 4. Replace EXxx. <p>Note that if the DDU is shared across two sectors, a BCF reset is needed.</p>	Manual.
Two or more ERxx DDU modules detected in 2- or 4-way combined sector.	<p>In this configuration, RF cable autodetection does not support more than one Erxx DDU module in a sector.</p> <ol style="list-style-type: none"> 1. Check that the Tx cabling from EXxx and EWxx modules in one sector is connected to the same ERxx module. 2. Depending on the desired configuration: <ol style="list-style-type: none"> a. If more than 1 ERxx is needed in a sector, change commissioning settings so that RF cables are defined manually. OR b. Remove extra ERxx from the sector. <p>Note that this alarm is not supported in EP2.</p>	Manual.
Path A of Rx LNA amplifier chain is broken in ERxx DDU module.	<p>Both low noise amplifiers in a balanced stage have failed for Path A of ERxx DDU module.</p> <ol style="list-style-type: none"> 1. Replace ERxx. 	Automatic.
Path B of Rx LNA amplifier chain is broken in ERxx DDU module.	<p>Both low noise amplifiers in a balanced stage have failed for Path B of ERxx DDU module.</p> <ol style="list-style-type: none"> 1. Replace ERxx. 	Automatic.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
ERxx DDU module has detected that MHA on its antenna A is broken.	<p>Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. Diversity is not in use or it is not working.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ERxx. 	<p>Conditional</p> <p>Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point.</p>
		<p>Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.</p>
ERxx DDU module has detected that MHA on its antenna B is broken.	<p>Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. Diversity is not in use or it is not working.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ERxx. 	<p>Conditional</p> <p>Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point.</p>
		<p>Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.</p>
ECxx RTC module has detected that MHA on main antenna is broken.	<p>Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. If diversity is used, diversity antenna is still working.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ECxx. 	<p>Conditional</p> <p>Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point.</p>
		<p>Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.</p>

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
ESMA System module has lost connection to ECxx RTC module.	ECxx RTC module does not respond to polling command from ESMA System module. 1. Check the bus cable chain from ESMA to ECxx. 2. If the ECxx LED is off, replace the power cable. 3. Replace ECxx. 4. Replace ESMA.	Automatic.
Main Rx LNA amplifier chain is broken in ECxx RTC module.	Both low noise amplifiers in a balanced stage have failed for main branch of ECxx RTC module. Diversity is not configured or is not working. 1. Replace ECxx.	Automatic.
Diversity Rx LNA amplifier chain is broken in ECxx RTC module.	Both low noise amplifiers in a balanced stage have failed for diversity branch of ECxx RTC module. 1. Replace ECxx.	Automatic.
ECxx RTC module has detected that MHA on diversity antenna is broken.	Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ECxx.	Conditional Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point.
		Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.
ERxx DDU module has detected no Tx power at TxA input.	There is no Tx power detected at TxA input of ERxx DDU module. 1. Check the whole Tx cabling chain between EXxx, EWxx (upon usage) and ERxx that they are correctly mated between the units. 2. Check that the cables are not damaged or bent too sharply. 3. Replace EXxx. 4. Replace ERxx. 5. Replace EWxx.	Manual Sector lock/unlock.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
ERxx DDU module has detected no Tx power at TxB input.	<p>There is no Tx power detected at TxB input of ERxx DDU module.</p> <ol style="list-style-type: none"> 1. Check the whole Tx cabling chain between EXxx, EWxx (upon usage) and ERxx that they are correctly mated between the units. 2. Check that the cables are not damaged or bent too sharply. 3. Replace EXxx. 4. Replace ECxx. 5. Replace EWxx. 	<p>Manual</p> <p>Sector lock/unlock.</p>
ERxx DDU module has detected VSWR above major limit at antenna A.	<p>User definable major alarm threshold for VSWR measurement has been exceeded. The default value is 3.1.</p> <ol style="list-style-type: none"> 1. Check the condition of the feeder and jumper cable, their connectors, sockets and connector seals starting from BTS end and proceed towards the antenna end. Replace damaged feeder cable. 2. If MHA is used, check that it is of correct (sub) band. 3. With external test equipment, measure the Return loss/VSWR of the antenna line. Perform step 1 again, if the measurement result is higher than expected. 4. Revise the VSWR alarm threshold by appending the commissioning. 5. Replace ERxx. <p>Note that the Dual Duplexer module is able to report Return Loss reliably if the TX (BCCH) power in its TxA or TxB input exceeds ca. +32 dBm.</p>	<p>Manual.</p>

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
ERxx DDU module has detected VSWR above major limit at antenna B.	<p>User definable major alarm threshold for VSWR measurement has been exceeded. The default value is 3.1.</p> <ol style="list-style-type: none"> 1. Check the condition of the feeder and jumper cable, their connectors, sockets and connector seals starting from BTS end and proceed towards the antenna end. Replace damaged feeder cable. 2. If MHA is used, check that it is of correct (sub) band. 3. With external test equipment, measure the Return loss/VSWR of the antenna line. Perform step 1 again, if the measurement result is higher than expected. 4. Revise the VSWR alarm threshold by appending the commissioning. 5. Replace ERxx. <p>Note that the Dual Duplexer module is able to report Return Loss reliably if the TX (BCCH) power in its TxA or TxB input exceeds ca. +32 dBm.</p>	Manual.
ERxx DDU module connected to wrong EXxx TRX module.	<p>There is a conflict in the antenna cabling (RF source unit) between the SCF and the actual configuration.</p> <ol style="list-style-type: none"> 1. Check that the antenna cabling information in the SCF refers to the correct and existing ERxx. 	Automatic.
Mismatch between SCF and actual ECxx RTC module position.	<p>There is a conflict in the antenna cabling (RF source unit) between the SCF and the actual configuration.</p> <ol style="list-style-type: none"> 1. Check that the antenna cabling information in the SCF refers to the correct and existing ECxx. 	Automatic.
ECxx RTC module has lost Tx power from all inputs.	<p>No Tx power detected from any of the TRXs connected to ECxx RTC module. Note: This alarm might take upto one hour to appear after RTC module is reset.</p> <ol style="list-style-type: none"> 1. Issue a sector reset and run a TRX test for each TRX. 2. Check the Tx cabling from all the TRXs and issue a sector reset. Run a TRX test for each TRX. 3. If the alarm persists, replace ECxx. 	Manual.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
ECxx RTC module has detected VSWR above major limit at antenna.	<p>User definable major alarm threshold for VSWR measurement has been exceeded. The default value is 3.1.</p> <ol style="list-style-type: none"> 1. Check the condition of the feeder and jumper cable, their connectors, sockets and connector seals starting from BTS end and proceed towards the antenna end. Replace damaged feeder cable. 2. If MHA is used, check that is of correct (sub)band. 3. With external test equipment, measure the Return loss/VSWR of the antenna line. Perform step 1 again, if the measurement result is higher than expected. 4. Revise the VSWR alarm threshold by appending the commissioning. 5. Replace ECxx. 	<p>Manual</p> <p>Sector lock/unlock.</p>
Main Rx LNA amplifier chain is broken in ECxx RTC module.	<p>Both low noise amplifiers in a balanced stage have failed for the main branch of the ECxx RTC module. The diversity branch is either not configured or it is broken.</p> <ol style="list-style-type: none"> 1. Replace ECxx. 	<p>Manual.</p>
XEOCA optical module reported incoming clock failure.	<p>Incoming clock errors or optical link failures either in Local or Remote EOCA Optical module.</p> <p>If on Local EOCA:</p> <ol style="list-style-type: none"> 1. Check the bus cable, the connectors or replace the cable between ESxx and Local EOCA. 2. Check optical transceiver plug-in unit of Local EOCA. 3. Replace Local EOCA. 4. Check optical transceiver plug-in unit of Remote EOCA. 5. Replace Remote EOCA. 6. Check the optical cable and its connector(s) and replace cable if faulty. <p>If on Remote EOCA:</p> <ol style="list-style-type: none"> 1. Check optical transceiver plug-in unit of Local EOCA. 2. Replace Local EOCA. 3. Check optical transceiver plug-in unit of Remote EOCA. 4. Replace Remote EOCA. 5. Check the optical cable and its connector(s) and replace cable if faulty. 	<p>Manual.</p>

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
XEOCA Optical module reported HW failure	<p>ESMA System module detected that hardware failure has occurred in EOCA Optical module at startup.</p> <p>If on Local EOCA:</p> <ol style="list-style-type: none"> 1. Replace Local EOCA. <p>If on Remote EOCA:</p> <ol style="list-style-type: none"> 1. Replace Remote EOCA. 	Manual.
XEOCA Optical module detected extreme temperature	<p>EOCA Optical module has detected that its internal temperature has exceeded +90C/+194F.</p> <ol style="list-style-type: none"> 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check if any fan alarm is also active. If active, refer to fan alarm instructions to resolve. 3. Replace the alarming EOCA. 	Automatic.
RF cable autodetection failed.	<p>RF cable autodetection fails due to inconclusive Rx levels received. Therefore, the BTS cannot determine RF cabling.</p> <ol style="list-style-type: none"> 1. Run RFCAD to the failing sector(s) by performing a sector lock/unlock or a sector reset from the BTS Manager. 2. Define the RF cabling manually through recommissioning. 3. Replace EWxx. 4. Replace Erxx/ECxx. 5. Replace EXxx. 6. Replace ESxx. <p>Note that if the DDU is shared across two sectors, a BCF reset is needed.</p>	Automatic.
Both Tx cables missing for DPTRX.	<p>Both Tx cables are detected to be missing from the DPTRX object.</p> <ol style="list-style-type: none"> 1. Check that all Tx cables are fully mated between the EXxx, EWxA and ERxx. 2. Replace EWxA. 3. Replace EXxx. 4. Replace ERxx. 	Automatic.

3.4.12 7607 TRX OPERATION DEGRADED

Table 12. 7607 TRX OPERATION DEGRADED

7607 TRX OPERATION DEGRADED			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRX	Enabled	ECxA, ERxA, EXxA
Fault reason:	Instruction:		Alarm cancelling:
Path A of Rx LNA amplifier chain is broken in ERxx DDU module.	Both low noise amplifiers in a balanced stage have failed for Path A of ERxx DDU module. If diversity is used, Path B is still working. 1. Replace ERxx.		Automatic.
Path B of Rx LNA amplifier chain is broken in ERxx DDU module.	Both low noise amplifiers in a balanced stage have failed for Path B of ERxx DDU module. If diversity is used, Path A is still working. 1. Replace ERxx.		Automatic.
Path A of Rx LNA amplifier chain is broken in ECxx RTC module.	Both low noise amplifiers in a balanced stage have failed for main branch of ECxx RTC module. If diversity is used, the diversity branch is still working. 1. Replace ECxx.		Automatic.
Path B of Rx LNA amplifier chain is broken in ECxx RTC module.	Both low noise amplifiers in a balanced stage have failed for diversity branch of ECxx RTC module. The main branch is still working. 1. Replace ECxx.		Automatic.
ERxx DDU module has detected that MHA on its antenna A is broken.	Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. If diversity is used, ANT B path is still working. 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ERxx.		Conditional
			Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point. Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
ERxx DDU module has detected that MHA on its antenna B is broken.	<p>Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. If diversity is used, ANT A path is still working.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ERxx. 	Conditional Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point.
		Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.
ECxx RTC module has detected that MHA on main antenna is broken.	<p>Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. If diversity is used, diversity antenna is still working.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ECxx. 	Conditional Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point.
		Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.
Frequency band mismatch between commissioning file and detected hardware.	<p>Mismatch between User specified Receiver Band in MHA information and actual network type of ECxx RTC module / ERxx DDU module.</p> <ol style="list-style-type: none"> 1. Modify MHA information of antenna settings in the Site Commissioning file according to the actual HW configuration. 2. Replace the ECxx/ERxx module to correspond to the MHA information of antenna settings in the Site Commissioning file. 	Automatic.
ERxx DDU module frequency band mismatch with 4UD.	<p>ERxx DDU module, which provides diversity cables for 4UD configuration, is of different frequency band.</p> <ol style="list-style-type: none"> 1. Make sure that the ERxx and/or EXxx are of correct frequency band. 	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
Hardware incompatibility detected during EXxx TRX module configuring	<p>Frequency band/channel or BTS configuration mismatch between the BTS units and BSC configuration.</p> <ol style="list-style-type: none"> 1. Check that the EXxx, ECxx/ERxx module is of correct frequency (sub-)band as configured in the BSC. 2. Check that RF hopping is not used when ECxx is installed. 3. Modify BSC parameters against the actual configuration at the site. 4. Replace EXxx or ERxx/ECxx. 	Automatic.
HW incompatibility detected during DPTRX configuration	<p>DPTRX object configured for a sector in which ECxx RTC module is present.</p> <ol style="list-style-type: none"> 1. Depending on the desired configuration: <ol style="list-style-type: none"> a. Disable the DPTRX feature from the TRX object (s) using the MML command ZERM...:DTRX=0; OR b. Remove ECxx and recommission with ERxx. 	Automatic.
HW incompatibility detected during IDD configuration.	<p>IDD TRX object configured for a sector in which ECxx RTC module is present.</p> <ol style="list-style-type: none"> 1. Depending on the desired configuration: <ol style="list-style-type: none"> a. Disable the IDD feature from the TRX object(s) using the MML command ZERM...:DTRX=0; OR b. Remove ECxx and recommission with ERxx. 	Automatic.
ESMA System module has lost connection to ECxx RTC module.	<p>ECxx RTC module does not respond to polling command from ESMA System module.</p> <ol style="list-style-type: none"> 1. Check the bus cable chain from ESMA to ECxx. 2. If the ECxx LED is off, replace the power cable. 3. Replace ECxx. 4. Replace ESMA. 	Automatic.
Main Rx LNA amplifier chain is broken in ECxx RTC module.	<p>Both low noise amplifiers in a balanced stage have failed for main branch of ECxx RTC module. If diversity is used, the diversity branch is still working.</p> <ol style="list-style-type: none"> 1. Replace ECxx. 	Automatic.
ECxx RTC module internal HW failure.	<p>At startup ECxx RTC module reported internal HW failure.</p> <ol style="list-style-type: none"> 1. Replace ECxx. 	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
EXxx TRX module cooling fan(s) report no rotation.	<p>One or more fans of the EXxx TRX module are not rotating. There is a danger of overheating.</p> <ol style="list-style-type: none"> 1. Check that the fan unit cable is correctly mated to EXxx. 2. Check that there are no obstacles preventing the fan (s) from rotating. 3. Clean the fan unit of dust and/or dirt. 4. Replace the fan unit. 5. Replace EXxx. 	Automatic.
One amplifier stage of Rx LNA Path A is broken in ERxx DDU module.	<p>One of the two low noise amplifiers in balanced stage failed in Path A of ERxx DDU module.</p> <ol style="list-style-type: none"> 1. Replace ERxx. 	Automatic.
One amplifier stage of Rx LNA Path B is broken in ERxx DDU module.	<p>One of the two low noise amplifiers in balanced stage failed in Path B of ERxx DDU module.</p> <ol style="list-style-type: none"> 1. Replace ERxx. 	Automatic.
Current used by MHA is out of range for ERxx DDU module (antenna A bypassed).	<p>Measured current consumption of Mast Head Amplifier has exceeded min or max threshold indicating broken amplifier. MHA is using its bypass circuit and antenna feeder cable loss is not compensated.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ERxx. 	Manual.
Current used by MHA is out of range for ERxx DDU module (antenna B bypassed).	<p>Measured current consumption of Mast Head Amplifier has exceeded min or max threshold indicating broken amplifier. MHA is using its bypass circuit and antenna feeder cable loss is not compensated.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ERxx. 	Manual.
ERxx DDU module SW upgrade failed.	<p>SW upgrade is aborted due to negative acknowledgement from ERxx DDU module during sw download.</p> <ol style="list-style-type: none"> 1. Issue a HW reset to ESMA. 2. If the alarm persists, replace ERxx. 	Manual.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
ERxx DDU module SW activation fails.	ERxx DDU module did not activate inactive SW and therefore it is running with current active package. 1. Issue a HW reset to EXxx. 2. If alarm reappears after ERxx SW download, replace ERxx.	Manual.
ERxx DDU module not supported.	Connected module is either of wrong network type or device type. 1. Check that the connected ERxx is of correct frequency band in respect to the used EXxx. 2. Check that ERxx is connected to EXxx. 3. Replace ERxx.	Manual.
ERxx DDU module reported HW failure.	At startup ERxx DDU module reported internal HW failure. 1. Replace ERxx.	Manual.
EXxx TRX module has lost connection to ERxx DDU module.	ERxx DDU module is not responding to poll command from EXxx TRX module. 1. Check that the ER_A cable is correctly mated between EXxx and ERxx. 2. Replace ERxx. 3. Replace EXxx.	Automatic.
Internal failure occurred during ERxx DDU module configuring.	ERxx DDU module configuration (Gain or Bias-T) failed. 1. Reset the EXxx to allow ERxx unit reconfiguration. 2. If the alarm reappears, replace ERxx.	Automatic.
ECxx RTC module cavity tuning synthesizer faulty. Tuning is only predicted.	The cavities are not fine tuned. ECxx RTC module tries to fine tune the cavities periodically. After successful fine tuning the alarm is cancelled. 1. Issue a sector lock/unlock to allow ECxx reconfiguration. 2. Replace ECxx.	Automatic.
Diversity Rx LNA amplifier chain is broken in ECxx RTC module.	Both low noise amplifiers in a balanced stage have failed for diversity branch of ECxx RTC module. The main branch is still working. 1. Replace ECxx.	Automatic.
Current used by MHA is out of range for ECxx RTC module (Div antenna bypassed).	Measured current consumption of Mast Head Amplifier has exceeded min or max threshold indicating broken amplifier. MHA is using its bypass circuit and antenna feeder cable loss is not compensated. 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ECxx.	Manual.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
ECxx RTC module SW download from ESMA System module failed.	ESMA System Module detected that SW download to ECxx RTC module has failed at startup. 1. Issue a HW reset to ESMA. 2. If alarm persists, replace ECxx. 3. Replace ESMA.	Automatic.
ECxx RTC module incoming frame clock FCLK missing in startup.	ECxx RTC module has detected that the Frame Clock coming from the ESMA System module is missing. 1. Issue a HW reset to ESMA. 2. Check that the bus cable is correctly mated between the ECxx and ESMA. 3. Check whether other ECxx modules have the same alarm, replace ESMA. 4. Replace ECxx.	Automatic.
One amplifier stage of Rx LNA Path A is broken in ECxx RTC module.	One of the two low noise amplifiers in balanced stage failed in Path A of ECxx RTC module. 1. Replace ECxx.	Automatic.
ECxx RTC module has detected that MHA on diversity antenna is broken.	Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA is not bypass capable or it was not configured correctly during commissioning. MHA bypass capability as well as the upper and lower limits are user definable during commissioning. Main antenna is still working. 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ECxx.	Conditional Automatic - if the current consumption returns back within defined limits and has not exceeded 1A at any point.
		Manual - if current consumption exceeded 1A, because Bias-T supply is switched off to prevent damage. Cancellation via Sector lock/unlock.
One amplifier stage of Rx LNA Path B is broken in ECxx RTC module.	One of the two low noise amplifiers in balanced stage failed in Path B of ECxx RTC module. 1. Replace ECxx.	Automatic.
EXxx TRX module has detected no fans.	EXxx TRX module has not detected a fan unit at start up. There is a danger of overheating. 1. Check that the fan unit cable is correctly mated to EXxx. 2. Replace the fan unit. 3. Replace the EXxx.	Manual.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
Current used by MHA is out of range for ECxx RTC module (Main antenna bypassed).	<p>Measured current consumption of Mast Head Amplifier has exceeded min or max threshold indicating broken amplifier. MHA is using its bypass circuit and antenna feeder cable loss is not compensated.</p> <ol style="list-style-type: none"> 1. Check that the current min/max limits and MHA settings correspond to the actual configuration. 2. Check the antenna line for any damage affecting the current supply to the MHA. 3. Replace MHA. 4. Replace ECxx. 	Manual.
EXxx TRX module Tx power is at least 3dB less than expected at DPC.	<p>Tx output power is over 3 dB lower than expected at Digital Power Control circuit block in EXxx TRX module.</p> <ol style="list-style-type: none"> 1. Reset TRX/Sector. 2. Replace EXxx. 	Manual.
EXxx TRX module detected only one Rx signal during RF cable autodetection.	<p>RF cable autodetection found Rx signal missing from the sector where Rx diversity is being used.</p> <ol style="list-style-type: none"> 1. Check that the Rx cabling between EXxx and ERxx are correctly mated. Check the condition of cables and connectors. Issue a sector reset. 2. Recommission the site with manual cabling, if Rx diversity is not to be used. 3. Replace ERxx. 4. Replace EXxx. 5. In case of a shared DDU, reset the BCF. <p>Note that if the DDU is shared across two sectors, a BCF reset is needed.</p>	Manual.
RF cable autodetection found mixed (bypass/2-/4-way) Tx combining in a sector.	<p>During RF cable autodetection, Tx combining is found to be imbalanced. The Rx measurement value differences between any of the two carriers in the sector is more than 6.5 dB.</p> <ol style="list-style-type: none"> 1. Check that the ERxx has equal number of EWxx modules in both Tx paths in 2-/4-way combined configuration. Issue a sector reset. 2. Check that the Tx cabling is correctly mated between units. Check the condition of cables and connectors. Issue a sector reset. 3. Replace EWxx. 4. Replace EXxx. 5. Replace ERxx. <p>Note that if the DDU is shared across two sectors, a BCF reset is needed.</p>	Manual.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
RSSI detected Rx signal difference exceeding threshold.	<p>The difference limit of Received Signal Strength Indicator measurement has exceeded between the main and diversity antennas. Supplementary information fields of RSSI alarm from the BSC history will give further details of which antenna has exceeded the threshold value.</p> <ol style="list-style-type: none"> 1. Check RSSI results with BTS Manager which antenna appears to have abnormal values. If abnormal values are lower than values from other antennas, it indicates a disconnected or faulty cable in the loop or a faulty LNA. If abnormal values are higher than values from other antennas, it indicates interference coming outside of the BTS or a faulty cable/module. 2. Check the actual RF cabling and connections against what is displayed in the BTS Manager. 3. Check whether the selectable RSSI Sample Count is correct considering the BTS site environment (EP1.1 and later releases). 4. Check that the RXDL parameter at the BSC is set to a reasonable value, taking into account the site condition in order to prevent unnecessary alarms. 5. Check and measure the antenna lines. 6. Check the antenna alignment. 7. Replace ERxx. 8. Replace EXxx. <p>Note that if the actual RF cabling and BTS Manager RF cabling view do not match and RFCAD is used to detect the RF cabling, run a sector reset with RFCAD. This alarm may result when EP1.1 is upgraded to EP2 and Rx diversity is enabled afterwards.</p> <p>Note that if the DDU is shared across two sectors, a BCF reset is needed.</p>	Automatic.
Illegal Diversity configured for a TRX in split EXxx TRX module.	<p>TRX objects of one EXxx module are split into two different sectors when Rx diversity is in use.</p> <ol style="list-style-type: none"> 1. If RFCAD is used to auto-detect RF cables, check whether it supports the used configuration (see <i>RF auto-detection supported configurations in Nokia Flexi EDGE BTS Commissioning</i> document). 2. If RFCAD is not supported, recommission the site and manually specify all RF cabling. 3. Check all RF cabling. <p>Note that this alarm is not supported since EP1.1 CD1.0.</p>	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
ERxx DDU module has detected VSWR above minor limit at antenna A.	<p>User definable minor alarm threshold for VSWR measurement has been exceeded. The default value is 2.1.</p> <ol style="list-style-type: none"> 1. Check the condition of the feeder and jumper cable, their connectors, sockets and connector seals starting from BTS end and proceed towards the antenna end. Replace the damaged feeder cable. 2. If MHA is used, check that it is of correct (sub)band. 3. With external test equipment, measure the Return loss/VSWR of the antenna line. If the measurement result is higher than expected, repeat step 1. 4. Revise the VSWR alarm threshold by appending the commissioning. 5. Replace ERxx. <p>Note that the Dual Duplexer module is able to report the Return Loss reliably if the TX (BCCH) power in its TxA or TxB input exceeds ca. +32 dBm.</p>	Automatic.
ERxx DDU module has detected VSWR above minor limit at antenna B.	<p>User definable minor alarm threshold for VSWR measurement has been exceeded. The default value is 2.1.</p> <ol style="list-style-type: none"> 1. Check the condition of the feeder and jumper cable, their connectors, sockets and connector seals starting from BTS end and proceed towards the antenna end. Replace the damaged feeder cable. 2. If MHA is used, check that it is of correct (sub)band. 3. With external test equipment, measure the Return loss/VSWR of the antenna line. If the measurement result is higher than expected, repeat step 1. 4. Revise the VSWR alarm threshold by appending the commissioning. 5. Replace ERxx. <p>Note that the Dual Duplexer module is able to report the Return Loss reliably if the TX (BCCH) power in its TxA or TxB input exceeds ca. +32 dBm.</p>	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
ECxx RTC module has detected VSWR above minor limit at antenna.	<p>User definable minor alarm threshold for VSWR measurement has been exceeded. The default value is 2.1.</p> <ol style="list-style-type: none"> 1. Check the condition of the feeder and jumper cable, their connectors, sockets and connector seals starting from the BTS end and proceed towards the antenna end. Replace the damaged feeder cable. 2. If MHA is used, check that it is of correct (sub)band. 3. With external test equipment, measure the Return loss/VSWR of the antenna line. Repeat step 1 if the measurement result is higher than expected. 4. Revise the VSWR alarm threshold by appending the commissioning. 5. Replace ECxx. 	Automatic.
Two Rx diversity branches lost with 4UD.	<p>ERxx DDU module that supplies the two additional diversity Rx signals for 4UD is lost.</p> <ol style="list-style-type: none"> 1. Check that the bus and power cables are correctly mated between ESxx, EXxx and ERxx. 2. Replace ERxx. 3. Replace EXxx. 	Automatic.
Phase difference between Tx signals is too high with DPTRX.	<p>Phase difference between the combined Tx signals is too high, resulting in reduced Tx output power.</p> <ol style="list-style-type: none"> 1. Check that the Phase Detector cable is correctly mated between EWxA and EXxx. 2. Replace the Phase Detector cable. 3. Replace EWxA. 4. Replace EXxx. 	Automatic.
Incorrect Tx combining with DPTRX.	<p>DPTRX is configured with 4-way combining.</p> <ol style="list-style-type: none"> 1. Two alternative options depending on the desired configuration: <ol style="list-style-type: none"> a. Disable the DPTRX feature from the TRX object (s) using the MML command ZERM...:DTRX=0; OR b. Remove the second EWxA from the HW configuration. 	Automatic.
Phase Detector cable missing with DPTRX.	<p>The Phase Detector cable is missing between the EXxx TRX module and EWxA WBC when the DPTRX is configured.</p> <ol style="list-style-type: none"> 1. Check that the Phase Detector cable is correctly mated between EWxA and EXxx. 2. Replace the Phase Detector cable. 3. Replace EWxA. 4. Replace EXxx. 	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
Incorrect Tx cabling with DPTRX.	<p>One of the two Tx cables between the EXxx TRX module and EWxA WBC is missing or they are not connected to the same combiner.</p> <ol style="list-style-type: none"> 1. Check that both Tx cables are fully mated between modules and connected to the same EWxA. 2. Check that the Tx cabling shown on the BTS Manager view corresponds to the actual Tx cabling. 3. Replace EWxA. 4. Replace EXxx. 	Automatic.
Incorrect Tx cabling with IDD.	<p>One of the two Tx cables between the EXxx TRX module and the ERxx DDU module is missing or they are combined to the same antenna path.</p> <ol style="list-style-type: none"> 1. Check that both Tx cables are fully mated between the modules and connected to a different ERxx. 2. Check that the Tx cabling shown on the BTS Manager view corresponds to the actual Tx cabling. 3. Replace ERxx. 4. Replace EXxx. 	Automatic.
Incorrect Rx cabling with 4UD.	<p>In a 4UD configuration, one or more (not all) Rx cables are either missing or connected to the same antenna.</p> <ol style="list-style-type: none"> 1. Check that the bus, power and RF cables are correctly mated between the ESxx, EXxx and ERxx. 2. In case RFCAD is used, make sure that the ERxx which provides the additional Rx diversity signals has at least one Tx cable connected to EXxx. 3. Check that the ERxx which provides the additional Rx diversity signals is of the same frequency band with the 4UD TRX. 4. Check that all four Rx paths are connected to different antennas. 	Automatic.
Rx cables split across sectors with 4UD.	<p>One or more Rx cables in a 4UD sector are connected to the ERxx DDU module which is part of another sector.</p> <ol style="list-style-type: none"> 1. Two alternative options depending on the desired configuration: <ol style="list-style-type: none"> a. Disable the 4UD feature from the TRX object(s) using the MML command ZERM...: DTRX=<value>; OR b. Check the Rx cabling. 	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
DPTRX initialisation fails.	<p>DPTRX initialisation fails due to loose cables, or faulty or incorrect hardware, which results in reduced Tx output power.</p> <ol style="list-style-type: none"> 1. Check that the Phase Detector cable is correctly mated between EXxx and EWxA. 2. Check that the RF cables connected between EXxx and EWxA are of the same length. 3. Replace EWxA. 4. Replace EXxx. 	Automatic.

3.4.13 7608 TRX NOTIFICATION



Table 13. 7608 TRX NOTIFICATION

7608 TRX NOTIFICATION			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRX	Enabled	ECxA, ERxA, EXxA
Fault reason:	Instruction:		Alarm cancelling:
EXxx TRX module temperature high.	<p>EXxx TRX module has detected that its internal temperature has exceeded +90C/+194F.</p> <ol style="list-style-type: none"> 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check if any fan alarms are also active. If active, refer to fan alarm instructions to resolve. 3. Replace the EXxx. <p>Note that this alarm remains active if the temperature still increases and the "temperature dangerously high" alarm is activated.</p>		Automatic.
ERxx DDU module SW upgrade impossible, unknown manufacturer.	<p>EXxx TRX module cannot identify connected ERxx DDU module. SW release incompatibility with connected HW.</p> <ol style="list-style-type: none"> 1. Download and activate the latest release of the BTS SW to ESMA System Module. 2. Replace ERxx. 		Manual.

Table 13. 7608 TRX NOTIFICATION (cont.)

7608 TRX NOTIFICATION		
EXxx TRX module cooling fan speed has reduced from the set speed.	<p>The cooling fan speed has reduced substantially from the commanded fan speed.</p> <ol style="list-style-type: none"> 1. Check that nothing obstructs the fan(s) from rotating. 2. Clean the fan unit of dust and/or dirt. 3. Replace the fan unit. 4. Replace ECxx. <p>Note: If "Temperature high/dangerously high" and/or 7621 alarm(s) are also active, perform these actions as soon as possible.</p>	Automatic.
EXxx TRX module cooling fan speed has increased from the set speed.	<p>The cooling fan speed of TRX module has increased substantially from the commanded fan speed.</p> <ol style="list-style-type: none"> 1. Check the ESMA operational voltage as an increased ESMA voltage could lead to overspeeding of the fans. 2. Replace the fan unit. 3. Replace EXxx. 	Automatic.
ERxx DDU module loop synthesizer fails to lock.	<p>The RF loop synthesizer in ERxx DDU module has not achieved phase lock state after several attempts.</p> <ol style="list-style-type: none"> 1. Replace ERxx. 	Automatic.
ECxx RTC module incoming frame clock FCLK lost during runtime.	<p>RTC module has detected that the Frame Clock coming from the ESMA System module is missing. Air3 loop services are unavailable.</p> <ol style="list-style-type: none"> 1. Reset the BCF to allow ECxx to attempt resynchronisation to incoming FCLK. 2. Replace ECxx. 3. If alarm is raised for all ECxx modules connected to ESMA, replace ESMA. 	Automatic.
EXxx TRX module unable to read internal temperature sensors.	<p>There is no temperature measurement in the EXxx TRX module. All temperature sensors inside the module are broken. Fans are rotating at maximum speed.</p> <ol style="list-style-type: none"> 1. Replace the EXxx. Note: If fan alarm(s) are active at EXxx, perform this action as soon as possible. 	Automatic.
ECxx RTC module loop synthesizer fails to lock.	<p>The RF loop synthesizer in ECxx RTC module has not achieved phase lock state after several attempts.</p> <ol style="list-style-type: none"> 1. Replace ECxx. 	Automatic.
ESMA System module has lost connection to XEOCA Optical module.	<p>EOCA Optical module is not responding to ESMA System module.</p> <p>If on Local EOCA:</p> <ol style="list-style-type: none"> 1. Check the bus cable, cable connectors between ESxx and Local EOCA. <p>If on Remote EOCA:</p> <ol style="list-style-type: none"> 1. Replace Remote EOCA. 	Automatic.

Table 13. 7608 TRX NOTIFICATION (cont.)

7608 TRX NOTIFICATION		
XEOCA Optical module detected over current on its output power port(s)	<p>Over current occurred on the output power port(s) of Remote EOCA Optical module. Affected EXxx TRX module(s) are powered down.</p> <ol style="list-style-type: none"> 1. Check the power cable between Remote EOCA and EXxx. 2. Replace EXxx. 3. Replace Remote EOCA. 	Automatic.
Temperature inside XEOCA exceeds specified temperature range	<p>Internal temperature of EOCA Optical module has exceeded +85C/+185F.</p> <ol style="list-style-type: none"> 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check if fan alarm is also active. If active, refer to fan alarm instructions to resolve. 3. Replace the alarming EOCA. 	Automatic.
XEOCA Optical module detected temperature sensor problem	<p>There is no temperature measurement in the EOCA Optical module. All temperature sensors inside the module are broken. The fan is rotating at maximum speed.</p> <ol style="list-style-type: none"> 1. Replace the alarming EOCA. <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Note </div> <p>If EOCA fan alarm is active, perform this action as soon as possible.</p>	Automatic.
XEOCA Optical module detected cooling fan speed degradation	<p>EOCA Optical module detected reduced or no rotation of fan against commanded speed.</p> <ol style="list-style-type: none"> 1. Check that nothing obstructs the fan from rotating. 2. Clean the fan unit of dust and/or dirt. 3. Replace the fan unit. 4. Replace the alarming EOCA. <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Note </div> <p>If temperature alarms are also active, perform these actions as soon as possible.</p>	Automatic.

3.4.14 7612 SITE POWERING FAULTY

Table 14. 7612 SITE POWERING FAULTY

7612 SITE POWERING FAULTY			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	BCF	Enabled	
Fault reason:	Instruction:		Alarm cancelling:
Battery backup Alarm 1.	Critical alarm is activated in external site support equipment. 1. Connect to the external site support equipment to find the alarming unit and resolve the fault.		Automatic.

3.4.15 7613 SITE POWERING OPERATION DEGRADED

Table 15. 7613 SITE POWERING OPERATION DEGRADED

7613 SITE POWERING OPERATION DEGRADED			
Severity:	Object affected:	Object state:	Module/Unit:
Major	BCF	Enabled	
Fault reason:	Instruction:		Alarm cancelling:
Battery backup Alarm 2.	Major alarm is activated in external site support equipment. 1. Connect to the external site support equipment to find the alarming unit and resolve the fault.		Automatic.
PSF Battery backup maintenance alarm	Alarm of severity major is activated in FPxx Power module. 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. Check that nothing obstructs the fan(s) from rotating. 3. Clean the fan unit of dust and/or dirt. 4. Check that power consumption of the BTS is lower than nominal output power provided by FPMA. 5. Replace the alarming submodule.		Automatic.

3.4.16 7614 SITE POWERING NOTIFICATION

Table 16. 7614 SITE POWERING NOTIFICATION

7614 SITE POWERING NOTIFICATION			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BCF	Enabled	
Fault reason:	Instruction:		Alarm cancelling:
Battery backup Alarm 3.	Minor alarm is activated in external site support equipment. 1. Connect to the external site support equipment to find the alarming unit and resolve the fault.		Automatic.

3.4.17 7615 RTS IN TEST USE

Table 17. 7615 RTS IN TEST USE

7615 RTS IN TEST USE			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	RTS	Disabled	EXxA
Fault reason:	Instruction:		Alarm cancelling:
Radio TS is in test use.	Radio Time Slot(s) of EXxx TRX module are undergoing a TRX (loop) test started from BTS Manager. No actions required. The alarm is cancelled automatically once the test is completed.		Automatic.

3.4.18 7616 OSCILLATOR ADJUSTMENT TEMPORARILY INTERRUPTED

Table 18. 7616 OSCILLATOR ADJUSTMENT TEMPORARILY INTERRUPTED

7616 OSCILLATOR ADJUSTMENT TEMPORARILY INTERRUPTED			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BCF	Enabled	ESMA

Table 18. 7616 OSCILLATOR ADJUSTMENT TEMPORARILY INTERRUPTED (cont.)

7616 OSCILLATOR ADJUSTMENT TEMPORARILY INTERRUPTED		
Fault reason:	Instruction:	Alarm cancelling:
Clock tuning DAC word reaching min/max limit.	<p>Oven oscillator DAC word is within 5% of the min/max limit. Alarm is activated if the DAC word is between 0-204 or 3891-4095. This alarm can be activated due to incorrect synchronisation settings in transmission network.</p> <ol style="list-style-type: none"> 1. Check the Abis synchronisation that there are valid Rx clock sources available. <ol style="list-style-type: none"> a. If the reference clock is ok, tune the ESMA clock to the correct frequency. b. If the reference clock is not ok, check the alarm history for 8xxx alarms for the possible reason for the incorrect reference clock. Follow the instructions on 8xxx alarms. After correcting the reference clock tune ESMA clock to the correct frequency. 	Automatic.

3.4.19 7621 Intolerable conditions on site

Table 19. 7621 Intolerable conditions on site

7621 Intolerable conditions on site			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BCF	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 19. 7621 Intolerable conditions on site (cont.)

7621 Intolerable conditions on site		
Base Station ambient temperature outside operating range.	<p>Ambient temperature of the Base Station is either below -35°C/-31°F or over +50°C/+122°F.</p> <ol style="list-style-type: none"> 1. Ensure that the ambient temperature at the site is within the limits (between -35...+50°C/-31...+122°F). 2. If the fault persists, replace ESMA. <p>The temperature sensor for ambient temperature is located in the System module. An offset is used to calculate the ambient temperature outside of the casings or cabinet. The offset is optimised for configurations for when the BTS is transmitting. If the actual ambient temperature is -35°C to -26°C and the BTS is started up, this alarm could be generated for up to one hour after BCCH transmission is started. More time may be needed for configurations with less than three EXxx TRX modules.</p>	Automatic.

3.4.20 7801 MMI CONNECTED TO BASE STATION

Table 20. 7801 MMI CONNECTED TO BASE STATION

7801 MMI CONNECTED TO BASE STATION			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BCF	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Local MMI connected.	<p>BTS Manager is connected to the BTS.</p> <p>No actions required. The alarm is cancelled automatically once BTS Manager is disconnected.</p>		Automatic.
Remote MMI connected	<p>Remote BTS Manager is connected to the BTS.</p> <p>No actions required. The alarm is cancelled automatically once BTS Manager is disconnected.</p>		Automatic.

3.4.21 7995 MAINS BREAKDOWN WITH BATTERY BACK-UP

Table 21. 7995 MAINS BREAKDOWN WITH BATTERY BACK-UP

7995 MAINS BREAKDOWN WITH BATTERY BACK-UP			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	BCF	Enabled	FPxx / MIBBU / Other Battery Backup Unit
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>One or more AC phases of the mains supply are faulty and site is operating on battery backup.</p> <ol style="list-style-type: none"> 1. Check the mains supply coming to the site support equipment. <ol style="list-style-type: none"> a. If the mains supply is ok, Check the EAC cabling between ESMA and the site support equipment. OR b. Check that the cable is completely mated between FPA and the power module. 3. Repair the site support equipment. 		Automatic.

3.4.22 8003 Loss of remote power supply

Table 22. 8003 Loss of remote power supply

8003 Loss of remote power supply			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>The LMUB cannot achieve the GPS FIX, less than 4 satellite signals are received.</p> <p>Refer to the Nokia Location Measurement Unit (LMUB) product documentation for troubleshooting information.</p>		Automatic.

3.4.23 8020 Blocked from use

Table 23. 8020 Blocked from use

8020 Blocked from use			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>A cross-connection is configured to an interface which is not in use.</p> <ol style="list-style-type: none"> 1. Check that all interfaces where cross connection termination points have been set are in use. In cross connection window, blocked cross connections are highlighted in <i>Italic font</i>. 2. Remove any unnecessary cross connections that have termination point(s) to non-existing or unused interfaces. 		Automatic.

3.4.24 8021 Loop to interface

Table 24. 8021 Loop to interface

8021 Loop to interface			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>PDH test-loop to Interface activated.</p> <p>No Actions required, alarm is cancelled when interface loop is deactivated by the user with BTS Manager or after defined timeout.</p>		Automatic.

3.4.25 8022 Loop to equipment

Table 25. 8022 Loop to equipment

8022 Loop to equipment			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	PDH test-loop to Equipment activated. No Actions required, alarm is cancelled when interface loop is deactivated by the user with BTS Manager or after defined timeout.		Automatic.

3.4.26 8048 Loss of incoming signal

Table 26. 8048 Loss of incoming signal

8048 Loss of incoming signal			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	External Q1 device does not receive signal at its interface (e.g. LMU has lost its GPS signal). 1. Find out the alarming Q1 device and refer to its product documentation for more details on this alarm.		Automatic.

3.4.27 8050 Loss of incoming 2 M signal

Table 27. 8050 Loss of incoming 2 M signal

8050 Loss of incoming 2 M signal			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 27. 8050 Loss of incoming 2 M signal (cont.)

8050 Loss of incoming 2 M signal		
Field not used.	<p>Flxx PIU has detected no incoming signal on E1 interface. Far End Alarm bit indication (TS0/b3) is sent in Tx direction.</p> <ol style="list-style-type: none"> 1. Check that interface settings are the same at both ends of the link. 2. Check that the E1 cable is connected to right interface and cable is correctly mated to the PIU. Check the condition of cables, connectors and in case FIPA is used, check the correct polarities of the wire pairs. 3. Replace Flxx 	Automatic.

3.4.28 8056 Loss of incoming 1.5 M signal

Table 28. 8056 Loss of incoming 1.5 M signal

8056 Loss of incoming 1.5 M signal			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>Flxx PIU has detected no incoming signal on T1 interface. Yellow Alarm is sent in Tx direction.</p> <ol style="list-style-type: none"> 1. Check that interface settings correspond to the actual link characteristics. 2. Check that the T1 cable is connected to right interface and cable is correctly mated to the PIU. Check the condition of cables, connectors and correct polarities of the wire pairs. 3. Replace FIPA. 		Automatic.

3.4.29 8064 Alarm signal is received

Table 29. 8064 Alarm signal is received

8064 Alarm signal is received			
Severity:	Object affected:	Object state:	Module/Unit:

Table 29. 8064 Alarm signal is received (cont.)

8064 Alarm signal is received			
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>The TDM signal is cut, deteriorated or a equipment loop is set in the TDM far-end equipment. Alarm Indication Signal (AIS) is indicated as "1111 1111" in all received TDM time slots and signalled by the L bit of the CESoPSN control Word.</p> <ol style="list-style-type: none"> 1. Check the TDM transmission path to find where the AIS insertion occurs. 2. Check the alarms at the TDM far-end. Refer to the product documentation of the TDM far-end equipment. 3. Replace Flxx.. 		Automatic.

3.4.30 8066 AIS 2 M

Table 30. 8066 AIS 2 M

8066 AIS 2 M			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>The signal is cut, deteriorated or a equipment loop is set in the far-end equipment. Alarm Indication Signal (AIS) is indicated as "1111 1111" in all received time slots.</p> <ol style="list-style-type: none"> 1. Check the transmission path to find where AIS insertion occurs. 2. Check the alarms at the far-end. Refer to the product documentation of the far-end equipment. 3. In case FIFA PIU is used, check that the microwave link is commissioned and operational. Check that 2M cross connections are configured at FIFA. Refer to the FIFA product documentation for further instructions. 4. Replace Flxx. 		Automatic.

3.4.31 8073 AIS 1.5 M

Table 31. 8073 AIS 1.5 M

8073 AIS 1.5 M			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>The signal is cut, deteriorated or a equipment loop is set in the far-end equipment. Alarm Indication Signal (AIS) is indicated as "1111 1111" in all received time slots.</p> <ol style="list-style-type: none"> 1. Check the transmission path to find where AIS insertion occurs. 2. Check the alarms at the far-end. Refer to the product documentation of the far-end equipment. 3. Replace FIPA. 		Automatic.

3.4.32 8081 Loss of frame alignment

Table 32. 8081 Loss of frame alignment

8081 Loss of frame alignment			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 32. 8081 Loss of frame alignment (cont.)

8081 Loss of frame alignment		
Field not used.	<p>Framing error has been detected in the received signal. This alarm can be caused by bad quality of the E1/T1 signal or the device at the far-end is not sending valid E1/T1 signal due to misconfiguration.</p> <ol style="list-style-type: none"> 1. If FIFA PIU is used, Refer to the FIFA product documentation for instructions. 2. Check that the interface settings are correct for the link. 3. Check quality of the E1/T1 line by enabling a Loop to Interface (line) at the far end equipment. If the alarm is cancelled during the loop test, check the far-end equipment. 4. Equip an external cable loop to the interface to check that the interface in Flxx is ok. If the alarm is still active during the loop test, go to step 6. 5. Check the condition of cables, connectors and correct polarities of the wire pairs. 6. Check that Flxx is fully inserted in to ESMA. 7. Replace Flxx. 8. Check the signal quality of the transmission path to the alarming equipment. 	Automatic.

3.4.33 8086 Loss of CRC multiframe alignment

Table 33. 8086 Loss of CRC multiframe alignment

8086 Loss of CRC multiframe alignment			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 33. 8086 Loss of CRC multiframe alignment (cont.)

8086 Loss of CRC multiframe alignment		
Field not used.	<p>CRC multiframe alignment signal lost or not received on PDH interface. CRC multiframe alignment word is conveyed in TS0 spread over a multiframe consisting of 16 E1 frames. Far End Alarm bit indication (TS0/b3) is sent in Tx direction.</p> <ol style="list-style-type: none"> 1. Check that the interface settings are the same at both ends and the CRC is set in use. 2. Check that the far-end device is able to transmit signal with CRC multiframe alignment enabled. 3. Check the condition of cables, connectors and correct polarities of the wire pairs. 4. Check the signal quality of the transmission path to the alarming equipment. 5. Replace Flxx. 	Automatic.

3.4.34 8099 Error rate > 1 E-3

Table 34. 8099 Error rate > 1 E-3

8099 Error rate > 1 E-3			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE		ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 34. 8099 Error rate > 1 E-3 (cont.)

8099 Error rate > 1 E-3		
Field not used.	<p>Received signal has degraded on E1/T1 interface. Bit Error Ratio (BER) is over 1E-3.</p> <ol style="list-style-type: none"> 1. If FIFA PIU is used, Refer to the FIFA product documentation for instructions. 2. Check that the interface settings are correct for the link. 3. Check quality of the E1/T1 line by enabling a Loop to Interface (line) at the far end equipment. If the alarm is cancelled during the loop test, check the far-end equipment. 4. Equip an external cable loop to the interface to check that the interface in Flxx is ok. If the alarm is still active during the loop test, go to step 6. 5. Check the condition of cables, connectors and correct polarities of the wire pairs. 6. Check that Flxx is fully inserted in to ESMA. 7. Replace Flxx. 8. Check the signal quality of the transmission path to the alarming equipment. 	Automatic.

3.4.35 8102 Error rate > 1 E-6

Table 35. 8102 Error rate > 1 E-6

8102 Error rate > 1 E-6			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 35. 8102 Error rate > 1 E-6 (cont.)

8102 Error rate > 1 E-6		
Field not used.	<p>Received signal has degraded on E1/T1 interface. Bit Error Ratio (BER) is over 1E-6.</p> <ol style="list-style-type: none"> 1. If FIFA PIU is used, Refer to the FIFA product documentation for instructions. 2. Check that the interface settings are correct for the link. 3. Check quality of the E1/T1 line by enabling a Loop to Interface (line) at the far end equipment. If the alarm is cancelled during the loop test, check the far-end equipment. 4. Equip an external cable loop to the interface to check that the interface in Flxx is ok. If the alarm is still active during the loop test, go to step 6. 5. Check the condition of cables, connectors and correct polarities of the wire pairs. 6. Check that Flxx is fully inserted in to ESMA. 7. Replace Flxx. 8. Check the signal quality of the transmission path to the alarming equipment. 	Automatic.

3.4.36 8112 Frequency error

Table 36. 8112 Frequency error

8112 Frequency error			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 36. 8112 Frequency error (cont.)

8112 Frequency error		
Field not used.	<p>The node is running on the internal clock as configured in the timing priority list. This alarm can also be raised in case synchronisation protection is configured, when the Rx source signals from both directions have its MCBs in state '1' .</p> <ol style="list-style-type: none"> 1. Check that synchronisation priority list has Rx clock entries for used interfaces. 2. In case FIFA PIU is used, check that the microwave link is commissioned and operational. Refer to FIFA product documentation for further instructions. 3. If any of the alarms 8050, 8066, 8081, 8099, 8056 or 8073 are active, follow the instructions on them. 4. Check that interface cables are correctly mated to Flxx. Check also condition of the connectors. 5. If BTS is part of Nokia PDH loop protection configuration, check MCB/LCB configuration and operational state of loop network. 	Automatic.

3.4.37 8125 Loss of synchronization signal (s)

Table 37. 8125 Loss of synchronization signal (s)

8125 Loss of synchronization signal (s)			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 37. 8125 Loss of synchronization signal (s) (cont.)

8125 Loss of synchronization signal (s)		
Field not used.	<p>All defined synchronisation sources in the synchronisation priority list are invalid or the list is empty. Node is running on its internal clock.</p> <ol style="list-style-type: none"> 1. Check that synchronisation priority list has Rx clock entries for used interfaces. 2. In case FIFA PIU is used, check that the microwave link is commissioned and operational. Refer to FIFA product documentation for further instructions. 3. If any of the alarms 8050, 8066, 8081, 8099, 8056 or 8073 are active, follow the instructions on them. 4. Check that interface cables are correctly mated to Flxx. Check also condition of the connectors. 5. Replace Flxx. 	Automatic.

3.4.38 8148 Equipment reset

Table 38. 8148 Equipment reset

8148 Equipment reset			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>This warning is issued by Q1 device when reset has occurred.</p> <ol style="list-style-type: none"> 1. Find out the alarming Q1 device and refer to its product documentation for more details on this warning message. 		This is a warning and no cancellation sent.

3.4.39 8162 Database full

Table 39. 8162 Database full

8162 Database full			
Severity:	Object affected:	Object state:	Module/Unit:

Table 39. 8162 Database full (cont.)

8162 Database full			
Warning	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>This warning is sent when the polling master (BTS/BSC) is either unable to poll alarms from the Q1 device(s) or it has not cleared the alarm history. Alarm history database has become full.</p> <p>1. Find out the alarming Q1 device and refer to its product documentation for more details on this warning message.</p>		This is warning and no cancellation is sent.

3.4.40 8165 Real time lost fault

Table 40. 8165 Real time lost fault

8165 Real time lost fault			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>Q1 device has not received real time from the polling master (BTS/BSC). Time stamps are not displayed correctly.</p> <p>1. Find out the alarming Q1 device and refer to its product documentation for more details on this alarm.</p>		Automatic.

3.4.41 8172 Yellow alarm

Table 41. 8172 Yellow alarm

8172 Yellow alarm			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 41. 8172 Yellow alarm (cont.)

8172 Yellow alarm		
Field not used.	<p>The yellow alarm is sent by the equipment in the far-end, it indicates a serious fault in the received signal of the far-end equipment.</p> <ol style="list-style-type: none"> 1. Check the far end equipment for alarms 8056, 8073, 8081. See the instructions on them. 2. Apply Loop to interface (line) at far end to check that link is ok. If 8056/8073/8081 alarm is not active at near-end during the loop test the problem is at the far-end receiver. Note: 8172 Yellow alarm will be cancelled during this test. 3. Equip an external cable loop to the interface to check that the interface in Flxx is ok. If 8056/8073/8081 alarm is active during the loop test, go to step 5. Note: 8172 Yellow alarm will be cancelled during this test. 4. Check the condition of cables, connectors and correct polarities of the wire pairs. 5. Check that Flxx is fully inserted in to ESMA. 6. Replace Flxx. 	Automatic Cancellation is done automatically when Yellow alarm (RAI) clearance is detected according to ANSI T1.231.

3.4.42 8179 Far-end alarm

Table 42. 8179 Far-end alarm

8179 Far-end alarm			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 42. 8179 Far-end alarm (cont.)

8179 Far-end alarm		
Field not used.	<p>Sent by the equipment in the far-end (TS0 Bit 3), which indicates that far-end equipment is unable to receive the signal.</p> <ol style="list-style-type: none"> 1. Check the far end equipment for alarms 8050, 8066, 8081 and 8086. See the instructions on them. 2. Apply Loop to interface (line) at far end to check that link is ok. If 8050/8066/8081/8086 alarm is not active at near-end during the loop test the problem is at the far-end receiver. Note: 8179 Far-end alarm will be cancelled during this test. 3. Equip an external cable loop to the interface to check that the interface in Flxx is ok. If 8050/8066/8081/8086 alarm is active during the loop test, go to step 5. Note: 8179 Far-end alarm will be cancelled during this test. 4. Check the condition of cables, connectors and correct polarities of the wire pairs. 5. Check that Flxx is fully inserted in to ESMA. 6. Replace Flxx. 	Automatic.

3.4.43 8202 Loss of supervision connection

Table 43. 8202 Loss of supervision connection

8202 Loss of supervision connection			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 43. 8202 Loss of supervision connection (cont.)

8202 Loss of supervision connection		
Field not used.	<p>Q1 device doesn't respond to poll command sent by the polling master (BTS/BSC).</p> <ol style="list-style-type: none"> 1. Check that Q1 baud rate and Q1 address of the Q1 device matches with what is configured at the BSC. 2. Check if alarm 7601 "Q1 bus faulty" is active. Check that the cable is correctly mated with the ESMA and Q1 device. Check also condition of the Q1 cable connectors. 3. Check that Q1 switches are set to enable polling master (BTS/BSC) to access the microprocessor (up) of the Q1 device. 4. Replace ESMA. 	Automatic.

3.4.44 8240 Active alarm point

Table 44. 8240 Active alarm point

8240 Active alarm point			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>This is an external user-defined alarm. This alarm is activated at the external equipment. Alarm line number is mapped to Supervision Block number. EAC lines can be routed via EAC port at ESMA or via FSEx connected to ESMA.</p> <ol style="list-style-type: none"> 1. Check that the relevant EAC line is correctly configured at the BSC (MML command ZEFO: <id>:IOP;). 2. Check equipment connected to alarming EAC line. 3. Check that the cable chain is correctly mated between ESMA and the external equipment. 4. Check the ESMA and replace it if faulty. 		Automatic.

3.4.45 8272 Position not locked

Table 45. 8272 Position not locked

8272 Position not locked			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>The LMUB power is out of its normal operating limits or the fuse-link is blown due to over-current.</p> <p>Refer to the Nokia Location Measurement Unit (LMUB) product documentation for troubleshooting information.</p>		Automatic.

3.4.46 8273 Licence for Flexi EDGE Abis over IP/Ethernet is not available

Table 46. 8273 Licence for Flexi EDGE Abis over IP/Ethernet is not available


8273 Licence for Flexi EDGE Abis over IP/Ethernet is not available			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>Transmission is commissioned to be in Pseudowire (PWE) mode without a licence.</p> <ol style="list-style-type: none"> 1. Install and activate the 'Flexi EDGE Abis over IP/Ethernet' licence at the BSC. 2. Recommission the site to use TDM mode. 		Automatic.

3.4.47 8274 Licence for Flexi EDGE Additional 2 E1/T1 is not available

Table 47. 8274 Licence for Flexi EDGE Additional 2 E1/T1 is not available

8274 Licence for Flexi EDGE Additional 2 E1/T1 is not available			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA

Table 47. 8274 Licence for Flexi EDGE Additional 2 E1/T1 is not available (cont.)


8274 Licence for Flexi EDGE Additional 2 E1/T1 is not available		
Fault reason:	Instruction:	Alarm cancelling:
Field not used.	<p>The number of used E1/T1 interfaces with terminated Abis traffic is higher than the number of licensed E1/T1 interfaces.</p> <ol style="list-style-type: none"> 1. Install and activate the 'Flexi EDGE Additional 2 E1/T1' licence at the BSC. 2. Increase the number of licensed E1/T1 interfaces at the BSC. 3. Reduce the number of E1/T1 interfaces exceeding the licence: <ol style="list-style-type: none"> a. Remove the terminated Abis allocations from the number of exceeded interfaces. <p>OR</p> <ol style="list-style-type: none"> b. Set the exceeded number of interfaces to 'Not in Use' state. <p> Note</p> <p>Only two E1/T1 interfaces are licence free. One licence will increase the number of E1/T1 interfaces by two.</p>	Automatic.

3.4.48 8275 Licence for Flexi EDGE TRS Abis Grooming is not available

Table 48. 8275 Licence for Flexi EDGE TRS Abis Grooming is not available


8275 Licence for Flexi EDGE TRS Abis Grooming is not available			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 48. 8275 Licence for Flexi EDGE TRS Abis Grooming is not available (cont.)

8275 Licence for Flexi EDGE TRS Abis Grooming is not available		
Field not used.	<p>Bypass cross-connections are configured in used E1/T1 interfaces without a licence.</p> <ol style="list-style-type: none"> 1. Install and activate the 'Flexi EDGE TRS Abis Grooming' licence at the BSC. 2. Disable all the cross-connections which are controlled by 'Flexi EDGE TRS Abis Grooming'. <p> Note</p> <p>Bi-directional cross-connections controlled by 'Flexi EDGE TRS Abis Grooming' are of the following granularities: 8 kBit/s, 16 kBit/s, 32 kBit/s, 64 kBit/s and n*64 kBit/s.</p>	Automatic.

3.4.49 8276 Licence for Flexi EDGE TRS Loop Protection is not available

Table 49. 8276 Licence for Flexi EDGE TRS Loop Protection is not available

8276 Licence for Flexi EDGE TRS Loop Protection is not available			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>Abis protection and/or protected cross-connections are configured in used E1/T1 interfaces without a licence.</p> <ol style="list-style-type: none"> 1. Install and activate the 'Flexi EDGE TRS Loop Protection' licence at the BSC. 2. Disable all cross-connections which are controlled by 'Flexi EDGE TRS Loop Protection'. <p> Note</p> <p>Protected bi-directional cross-connections, Masked bi-directional cross-connections and Abis protection are controlled by 'Flexi EDGE TRS Loop Protection'.</p>		Automatic.

3.4.50 8277 Ethernet Physical link layer is lost

Table 50. 8277 Ethernet Physical link layer is lost

8277 Ethernet Physical link layer is lost			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	Physical Ethernet link is detected to be down. 1. Check that the Ethernet cable is connected to the right interface and the cable is correctly mated to the PIU. Check the condition of cables and connectors. Check that the length/type of the cable does not introduce excessive attenuation. 2. Check that the device connected to the Flxx PIU supports 100 Base-T (EIF1 used) or 1000 Base SX/LX (EIF3 used), full duplex mode and autonegotiation. 3. Check that the device connected to the Flxx PIU has correct settings, such as autonegotiation and Ethernet interface enabled. 4. If using EIF3, check that the inserted SFP module matches the fibre type and wavelength of the Gigabit Ethernet link provided. 5. Replace Flxx..		Automatic.

3.4.51 8278 Pseudowire Down

Table 51. 8278 Pseudowire Down

8278 Pseudowire Down			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:

Table 51. 8278 Pseudowire Down (cont.)

8278 Pseudowire Down		
Field not used.	<p>The incoming pseudowire connection is down. There is a fault in the connection of the pseudowire. R bit is set at the CESoPSN control word and sent in the Tx direction.</p> <ol style="list-style-type: none"> 1. Check the pseudowire and pseudowire tunnel configuration settings at both ends. 2. Check the conditions in the transmission path of the pseudowire tunnel at the packet switched network. 3. Replace Flxx.. 	Automatic.

3.4.52 8280 Pseudowire remote packet loss

Table 52. 8280 Pseudowire remote packet loss

8280 Pseudowire remote packet loss			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	<p>Signalled by the equipment in the far-end; indicates a serious fault in the received signal at the far-end equipment.</p> <ol style="list-style-type: none"> 1. Check for alarms at the far-end equipment. See instructions on them. 2. Check the condition of the cables and connectors, and the correct polarities of the wire pairs at both ends. 3. Check that the pseudowire and pseudowire tunnel settings are correct at both ends. 4. Check the transmission path of the pseudowire tunnel from the alarming interface to the far end. 		Automatic.

3.4.53 8281 Fault in optical interface (SFP)

Table 53. 8281 Fault in optical interface (SFP)

8281 Fault in optical interface (SFP)			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	ESMA
Fault reason:	Instruction:		Alarm cancelling:
Field not used.	A fault is detected at the Ethernet SFP interface. 1. Check that the SFP module is correctly installed. 2. Check that the SFP module is of supported type (Ethernet 1000 Base-SX or 1000 Base-LX). 3. Check that the electrical contacts of the SFP module are clean from dust, dirt or water. 4. Replace the SFP module. 5. Replace Flxx.		Automatic.

3.5 Alarms for FIFA Flexbus Transmission Sub-module

3.5.1 Functional entity: FIFA

3.5.1.1 258 15 min G826 BBE threshold crossed

Table 54. 258 15 MIN G826 BBE THRESHOLD CROSSED

258 15 MIN G826 BBE THRESHOLD CROSSED			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	FIFA • Flexbus (1-2) • Protected hop
Fault reason:	Instruction:		Alarm cancelling:

Table 54. 258 15 MIN G826 BBE THRESHOLD CROSSED (cont.)

258 15 MIN G826 BBE THRESHOLD CROSSED		
The 15 min G.826 BBE threshold has been crossed.	<p>Check other alarms.</p> <ul style="list-style-type: none"> This alarm is a longer-term (15 min) consequence of another alarm and related to temporary disturbance, which may already be automatically cancelled. 	<p>Automatic</p> <p>The alarm is cancelled when the signal has been good enough (= BBE under the reset threshold) for a 15-minute period.</p> <p>Alarm suppression:</p> <ul style="list-style-type: none"> the alarm can be suppressed

3.5.1.2 256 15 min G826 ES threshold crossed

Table 55. 256 15 MIN G826 ES THRESHOLD CROSSED

256 15 MIN G826 ES THRESHOLD CROSSED			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
The 15 min G.826 ES threshold has been crossed.	<p>Check other alarms.</p> <ul style="list-style-type: none"> This alarm is a longer-term (15 min) consequence of another alarm and related to temporary disturbance, which may already be automatically cancelled. 		<p>Automatic</p> <p>The alarm is cancelled when the signal has been good enough (= BBE under the reset threshold) for a 15-minute period.</p> <p>Alarm suppression:</p> <ul style="list-style-type: none"> the alarm can be suppressed

3.5.1.3 257 15 min G826 SES threshold crossed

Table 56. 257 15 MIN G826 SES THRESHOLD CROSSED

257 15 MIN G826 SES THRESHOLD CROSSED			
Severity:	Object affected:	Object state:	Module/Unit:

Table 56. 257 15 MIN G826 SES THRESHOLD CROSSED (cont.)

257 15 MIN G826 SES THRESHOLD CROSSED			
Major	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
The 15 min G.826 SES threshold has been crossed.	Check other alarms. <ul style="list-style-type: none"> This alarm is a longer-term (15 min) consequence of another alarm and related to temporary disturbance, which may already be automatically cancelled. 		Automatic The alarm is cancelled when the signal has been good enough (= SES under the reset threshold) for a 15-minute period. Alarm suppression: <ul style="list-style-type: none"> the alarm can be suppressed

3.5.1.4 261 24 h G826 BBE threshold crossed

Table 57. 261 24 H G826 BBE THRESHOLD CROSSED

261 24 H G826 BBE THRESHOLD CROSSED			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
The 24 h G.826 BBE threshold has been crossed.	Check other alarms. <ul style="list-style-type: none"> This warning is a longer-term (24 h) consequence of another alarm and related to temporary disturbance, which may already be automatically cancelled. 		Automatic The warning resets automatically. Alarm suppression: <ul style="list-style-type: none"> the warning can be suppressed

3.5.1.5 259 24 h G826 ES threshold crossed

Table 58. 259 24 H G826 ES THRESHOLD CROSSED

259 24 H G826 ES THRESHOLD CROSSED			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
The 24 h G.826 ES threshold has been crossed.	Check other alarms. <ul style="list-style-type: none"> This warning is a longer-term (24 h) consequence of another alarm and related to temporary disturbance, which may already be automatically cancelled. 		Automatic The warning resets automatically. Alarm suppression: <ul style="list-style-type: none"> the warning can be suppressed

3.5.1.6 260 24 h G826 SES threshold crossed

Table 59. 260 24 H G826 SES THRESHOLD CROSSED

260 24 H G826 SES THRESHOLD CROSSED			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
The 24 h G.826 SES threshold has been crossed.	Check other alarms. <ul style="list-style-type: none"> This alarm is a longer-term (24 h) consequence of another alarm and related to temporary disturbance, which may already be automatically cancelled. 		Automatic The warning resets automatically. Alarm suppression: <ul style="list-style-type: none"> the warning can be suppressed

3.5.1.7 64 Alarm signal is received

Table 60. 64 ALARM SIGNAL IS RECEIVED

64 ALARM SIGNAL IS RECEIVED			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	FIFA • Flexbus (1-2)
Fault reason:	Instruction:		Alarm cancelling:
The Flexbus RX signal contains a pseudo frame, generated in the OU (the OU not locked to RX signal). Typically the OU RX signal is missing or faulty.	Check the level of OU RX signal and verify the status of the outdoor units at both ends of the hop. Check that the far-end Tx power is on and operating frequency and other settings are similarly configured at both ends of the hop.		Automatic Alarm suppression: • the alarm can be suppressed

3.5.1.8 186 Configuration error

Table 61. 186 CONFIGURATION ERROR

186 CONFIGURATION ERROR			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	FIFA 1. Identifications 2. SW setup
Fault reason:	Instruction:		Alarm cancelling:

Table 61. 186 CONFIGURATION ERROR (cont.)

186 CONFIGURATION ERROR		
<ol style="list-style-type: none"> No backup is available for this unit. Backup is available for this unit and needs activation. One or more of the following identifications is missing: <ul style="list-style-type: none"> FE type string FE product code string FE product version string FE serial number string FE user's manual product code string FE user's manual product version string TX clock calibration missing or illegal 	<ol style="list-style-type: none"> Store the configuration backup from FlexiHub Manager. Activate the restored backup manually. Go to FlexiHub Manager Tools and select Configuration Backup. Restoring can be done only for one unit at a time. Unit is faulty. Contact your Nokia Siemens Networks representative. 	<p>Automatic</p> <p>The alarm resets automatically after the configuration backup has been restored.</p>

3.5.1.9 185 Connection or settings have changed

Table 62. 185 CONNECTION OR SETTINGS HAVE CHANGED

185 CONNECTION OR SETTINGS HAVE CHANGED			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	FIFA 1. Flexbus (1-2) 2. FM setup 3. Identifications 4. Protected hop
Fault reason:	Instruction:		Alarm cancelling:

Table 62. 185 CONNECTION OR SETTINGS HAVE CHANGED (cont.)

185 CONNECTION OR SETTINGS HAVE CHANGED		
1. The fault management settings have changed. 2. New unit(s) have been added, removed, or replaced in the system. 3. The identifications have changed. 4. The G.826 settings have changed.	This alarm is only a notification of a change. No action is required.	Automatic The warning resets automatically. Alarm suppression: <ul style="list-style-type: none"> the alarm can be suppressed

3.5.1.10 162 Database full

Table 63. 162 DATABASE FULL

162 DATABASE FULL			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	All NEs
Fault reason:	Instruction:		Alarm cancelling:
Overflow in event history.	The alarm history is flushed by NMS alarm polling. When the Q1 alarm polling is used, the alarm poller flushes the used port's alarm history. The FIFA software flushes the LMP port's alarm history to avoid Database full when the history is read through the LMP port. The alarm history can be emptied with FlexiHub Manager. Go to Tools and select Clear Alarm History .		Automatic The warning resets automatically.

3.5.1.11 148 Equipment reset

Table 64. 148 EQUIPMENT RESET

148 EQUIPMENT RESET			
Severity:	Object affected:	Object state:	Module/Unit:

Table 64. 148 EQUIPMENT RESET (cont.)

148 EQUIPMENT RESET			
Warning	TRE	Enabled	FIFA / OU • HW setup
Fault reason:	Instruction:		Alarm cancelling:
The unit is starting up after power-on or reset. Traffic is interrupted until the unit has started up again. This may take few minutes.	This is only a notification of a reset. No action is required.		Automatic The warning resets automatically.

3.5.1.12 99 Error rate > 1 E-3

Table 65. 99 ERROR RATE > 1 E-3

99 ERROR RATE > 1 E-3			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA • Flexbus (1-2) • Protected hop
Fault reason:	Instruction:		Alarm cancelling:
The received signal BER is over the alarm threshold. Possible reasons: 1. The signal from the radio path is attenuated (for example, heavy rain, false alignment). 2. There is a hardware fault in the Flexbus cable or interface.	1. Check the level of Rx signal. If the level of Rx signal is good, then see item 2. If Rx signal is poor, then check the fine alignment and also take into account the possible effect of current weather condition. In such a case check also the Tx power of the far-end outdoor unit and if possible, adjust it to maximum (temporarily) 2. Check the Flexbus cable and the connectors. The cable must be properly connected to both the indoor and the outdoor unit.		Automatic The alarm is automatically cancelled when BER is steadily under the alarm threshold for 10 seconds.

3.5.1.13 100 Error rate > 1 E-4

Table 66. 100 ERROR RATE > 1 E-4

100 ERROR RATE > 1 E-4			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
<p>The received signal BER is over the alarm threshold. Possible reasons:</p> <ol style="list-style-type: none"> The signal from the radio path is attenuated (for example, heavy rain, false alignment). There is a hardware fault in the Flexbus cable or interface. 	<ol style="list-style-type: none"> Check the level of Rx signal. If the level of Rx signal is good, then see item 2. If Rx signal is poor, then check the fine alignment and also take into account the possible effect of current weather condition. In such a case check also the Tx power of the far-end outdoor unit and if possible, adjust it to maximum (temporarily). Check the Flexbus cable and the connectors. The cable must be properly connected to both the indoor and the outdoor unit. 		<p>Automatic</p> <p>The alarm is cancelled when BER is under the alarm threshold.</p> <p>Alarm suppression:</p> <ul style="list-style-type: none"> the alarm can be suppressed

3.5.1.14 103 Error rate > 1 E-7

Table 67. 103 ERROR RATE > 1 E-7

103 ERROR RATE > 1 E-7			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:

Table 67. 103 ERROR RATE > 1 E-7 (cont.)

103 ERROR RATE > 1 E-7		
<p>The received signal BER is over the alarm threshold. Possible reasons:</p> <ol style="list-style-type: none"> 1. The signal from the radio path is attenuated (for example, heavy rain, false alignment). 2. There is a hardware fault in the Flexbus cable or interface. 	<ol style="list-style-type: none"> 1. Check the level of Rx signal. If the level of Rx signal is good, then see item 2. If Rx signal is poor then check the fine alignment and also take into account the possible effect of current weather condition. In such a case check also the Tx power of the far-end outdoor unit and if possible, adjust it to maximum (temporarily). 2. Check the Flexbus cable and the connectors. The cable must be properly connected to both the indoor and the outdoor unit. 	<p>Automatic</p> <p>The alarm is automatically cancelled when BER is steadily under the alarm threshold for 10 seconds.</p> <p>Alarm suppression:</p> <ul style="list-style-type: none"> • the alarm can be suppressed

3.5.1.15 179 Far-end alarm

Table 68. 179 FAR-END ALARM

179 FAR-END ALARM			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	FIFA / OU • Flexbus (1-2)
Fault reason:	Instruction:		Alarm cancelling:
<p>The traffic is cut in one direction.</p> <p>The far-end IU is not receiving data transmitted by the near-end IU, but the near-end IU is receiving data transmitted by the far-end IU.</p>	<p>Check with FlexiHub Manager that the TX Power is on in near end.</p> <p>Check also operating frequency and other settings at both ends of the hop.</p>		<p>Automatic</p> <p>The alarm is cancelled when data transmission functions in both directions.</p> <p>Alarm suppression:</p> <ul style="list-style-type: none"> • the alarm can be suppressed

3.5.1.16 128 Fault in equipment

Table 69. 128 FAULT IN EQUIPMENT

128 FAULT IN EQUIPMENT			
Severity:	Object affected:	Object state:	Module/Unit:

Table 69. 128 FAULT IN EQUIPMENT (cont.)

128 FAULT IN EQUIPMENT			
Major	TRE	Enabled	FIFA / OU <ul style="list-style-type: none"> SW setup Protected units
Fault reason:	Instruction:		Alarm cancelling:
1. The protection is lost due to faulty unit(s) and the use of the redundant signal path. The reason can be one of the following: <ul style="list-style-type: none"> OU transmitter error OU receiver error IU TX oscillator error IU hardware register error IU cannot lock to the Flexbus signal 2. Signal is not received from the radio on the far end. 3. File system error.	1.-2. Check other faults present in the node to determine the actual reason for the alarm. Check the alarms of the radio at the other end of the hop. 2. The alarm is caused most probably by a failure in the far-end radio. If the far end is ok, then check the Tx signal level of the near-end radio. 3. Replace the unit.		Automatic 1. The alarm is cancelled when the faulty unit has been changed. 2.-3. The alarm is cancelled as the unit is replaced.

3.5.1.17 142 Fault in installation of equipment

Table 70. 142 FAULT IN INSTALLATION OF EQUIPMENT

142 FAULT IN INSTALLATION OF EQUIPMENT			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) HW setup
Fault reason:	Instruction:		Alarm cancelling:

Table 70. 142 FAULT IN INSTALLATION OF EQUIPMENT (cont.)

142 FAULT IN INSTALLATION OF EQUIPMENT		
1. Flexbus has not been set into use, but the OU (or IU) is connected to it. 2. Incompatible unit.	1. When Flexbus and radio are commissioned, set Flexbus field <i>In use</i> to <i>ON</i> . 2. Check that the unit is properly commissioned. Check the SW compatibility. If SW is incompatible, download and update new software. When the new SW is activated, also the indoor unit is automatically restarted. Check other alarms.	Automatic 1. The alarm is cancelled when <i>In use</i> is set to <i>ON</i> . 2. The alarm is cancelled after the situation is corrected and the indoor unit is restarted.

3.5.1.18 137 Fault in oscillator

Table 71. 137 FAULT IN OSCILLATOR

137 FAULT IN OSCILLATOR			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA
Fault reason:	Instruction:		Alarm cancelling:
The internal oscillator is faulty.	Check other alarms. This alarm should always cause other alarms, for example, Fault in power supply. If no other alarms, reset the unit.		Automatic

3.5.1.19 0 Fault in power supply

Table 72. 0 FAULT IN POWER SUPPLY

0 FAULT IN POWER SUPPLY			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA 1. Flexbus (1-2) 2. Power supply
Fault reason:	Instruction:		Alarm cancelling:

Table 72. 0 FAULT IN POWER SUPPLY (cont.)

0 FAULT IN POWER SUPPLY		
1. Short circuit in the Flexbus cable. 2. The power supply voltage is below or above the limit. 3. Failure in FIFA power supply.	1. Check the Flexbus cable connections. 2. Check status of BTS system module power supply. If system module's power supply is ok, the failure is most probably in FIFA power supply. 3. Replace the unit.	Automatic

3.5.1.20 267 Licence expired

Table 73. 267 LICENCE EXPIRED

267 LICENCE EXPIRED			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA / OU • Flexbus 2
Fault reason:	Instruction:		Alarm cancelling:
The time-limited licence of an active feature has expired. 1. FIFA has a time-limited licence of 60 days which is automatically activated when Flexbus 2 interface is commissioned into use. This time-limited licence has expired. 2. Outdoor unit's time-limited licence(s) has expired (capacity or modulation).	1. Obtain a licence file for Flexbus 2 interface (Additional Flexbus interface licence) or take Flexbus 2 out of use. 2. Obtain a capacity or modulation licence file for outdoor unit or change the capacity or modulation settings.		Automatic The alarm is cancelled when a non-time limited licence has been installed or the feature is no longer in use.

3.5.1.21 269 Licence for feature is not available

Table 74. 269 LICENCE FOR FEATURE IS NOT AVAILABLE

269 LICENCE FOR FEATURE IS NOT AVAILABLE			
Severity:	Object affected:	Object state:	Module/Unit:

Table 74. 269 LICENCE FOR FEATURE IS NOT AVAILABLE (cont.)

269 LICENCE FOR FEATURE IS NOT AVAILABLE			
Critical	TRE	Enabled	FIFA / OU • Flexbus 2
Fault reason:	Instruction:		Alarm cancelling:
<p>A licence for the enabled feature is not available.</p> <ol style="list-style-type: none"> 1. A used FIFA card with no Flexbus 2 interface time-limited licence period left (60 days) is installed and Flexbus 2 interface is set into <i>Use</i>. 2. A used radio with no time-limited licence period left is installed and capacity is set too high or modulation mode is wrong. 	<ol style="list-style-type: none"> 1. Obtain a licence file for Flexbus 2 interface (Additional Flexbus interface licence) or take Flexbus 2 out of use. 2. Obtain a capacity or modulation licence file for outdoor unit or change the capacity or modulation settings. 		<p>Automatic</p> <p>The alarm is cancelled when a non-time limited licence has been installed or the feature is no longer in use.</p>

3.5.1.22 268 Licence will expire in near future

Table 75. 268 LICENCE WILL EXPIRE IN NEAR FUTURE

268 LICENCE WILL EXPIRE IN NEAR FUTURE			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	FIFA / OU • Flexbus 2
Fault reason:	Instruction:		Alarm cancelling:
<ol style="list-style-type: none"> 1. A time-limited licence for FIFA's Flexbus 2 interface will expire in the near future. 2. A time-limited licence for OU's capacity or modulation will expire in the near future. 	<ol style="list-style-type: none"> 1. Obtain a licence file for Flexbus 2 interface (Additional Flexbus interface licence) or take Flexbus 2 out of use before the expiry time. 2. Obtain either a capacity or modulation licence file for the outdoor unit or change the capacity or modulation settings. 		<p>Automatic</p> <p>The alarm is cancelled when a non-time limited licence has been installed or the feature is no longer in use.</p>

3.5.1.23 81 Loss of frame alignment

Table 76. 81 LOSS OF FRAME ALIGNMENT

81 LOSS OF FRAME ALIGNMENT			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA • Flexbus (1-2)
Fault reason:	Instruction:		Alarm cancelling:
1. Flexbus has received a faulty or erroneous signal. 2. There is a fault in the Flexbus cable interface.	1.-2. Check the Flexbus 1 and Flexbus 2 status. If Flexbus 1 and/or Flexbus 2 are in use but no Outdoor Unit installed, the alarm is raised. If there are radio hop(s) installed, make sure that Flexbus 1 or/and Flexbus 2 is/are in use and Outdoor Unit Power <i>on</i> . If Flexbus interfaces are in use and power has been turned on but alarm remains active, then the Flexbus cable or the unit may be faulty. Replace the Flexbus cable. If the alarm still remains active, then replace the outdoor unit.		Automatic The alarm is cancelled when Flexbus receives faultless or errorless signal.

3.5.1.24 48 Loss of incoming signal

Table 77. 48 LOSS OF INCOMING SIGNAL

48 LOSS OF INCOMING SIGNAL			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA / OU • Flexbus (1-2)
Fault reason:	Instruction:		Alarm cancelling:
1. The Flexbus RX clock is missing. 2. The Flexbus RX clock oscillator is faulty.	1.-2. Check the Flexbus 1 and Flexbus 2 status. If Flexbus 1 and/or Flexbus 2 are in use but no Outdoor Unit is installed, the alarm is raised. If there are radio hop(s) installed, make sure that Flexbus 1 or/and Flexbus 2 is/are in use and Outdoor Unit Power <i>on</i> . If Flexbus interfaces are in use and power has been turned on but alarm remains active, then the Flexbus cable or the unit may be faulty. Replace the Flexbus cable. If alarm still remains active, then replace the outdoor unit.		Automatic The alarm is cancelled when the incoming signal is restored.

3.5.1.25 144 Operating error

Table 78. 144 OPERATING ERROR

144 OPERATING ERROR			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA / OU • SW setup
Fault reason:	Instruction:		Alarm cancelling:
1. File system error. 2. Internal SW error.	1.-2. Replace the unit.		Automatic

3.5.1.26 165 Real time lost fault

Table 79. 165 REAL TIME LOST FAULT

165 REAL TIME LOST FAULT			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	FIFA / OU • Real time clock
Fault reason:	Instruction:		Alarm cancelling:
The RTC (Real Time Clock) has not been set after reset.	Set the RTC with FlexiHub Manager. The RTC is set by NMS. Make sure that FIFA is properly commissioned for NMS.		Automatic The alarm is cancelled when the RTC is set. Alarm suppression: • the alarm can be suppressed

3.5.1.27 184 Real time updated

Table 80. 184 REAL TIME UPDATED

184 REAL TIME UPDATED			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	FIFA / OU • Real time clock
Fault reason:	Instruction:		Alarm cancelling:

Table 80. 184 REAL TIME UPDATED (cont.)

184 REAL TIME UPDATED		
The updated RTC (Real Time Clock) difference is more than 5 s.	This warning requires no direct action. After RTC update FlexiHub Manager may notify about incorrectness in performance data during the recent measurement period.	Automatic The warning resets automatically. Alarm suppression: • the alarm can be suppressed

3.5.1.28 263 Statistics reset

Table 81. 263 STATISTICS RESET

263 STATISTICS RESET			
Severity:	Object affected:	Object state:	Module/Unit:
Warning	TRE	Enabled	FIFA • Flexbus (1-2) • Protected hop
Fault reason:	Instruction:		Alarm cancelling:
The G.826 error counters (current measurement) are reset.	This warning is only a notification of a change performed with FlexiHub Manager. After statistics reset FlexiHub Manager may notify about incorrectness in performance data during the recent measurement period.		Automatic The warning resets automatically. Alarm suppression: • the alarm can be suppressed

3.5.1.29 262 Unavailability

Table 82. 262 UNAVAILABILITY

262 UNAVAILABILITY			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA • Flexbus (1-2) • Protected hop
Fault reason:	Instruction:		Alarm cancelling:

Table 82. 262 UNAVAILABILITY (cont.)

262 UNAVAILABILITY		
The number of erroneous blocks has been more than 30% for at least 10 consecutive seconds. The reason may be related to, for example, weather conditions, poor installation or faulty cable or units.	<p>Monitor the status of the hop and alarms to see if the fault is temporary or longer-term. If the alarm is temporary, the reason is most likely weather condition or another non-equipment related interruption.</p> <p>If the alarm is triggered continuously, check the Flexbus cable installation. If the alarm is not cancelled, then check other alarms for verifying the fault in the equipment.</p>	<p>Automatic</p> <p>The alarm is cancelled when the number of erroneous blocks has been less than 30% for 10 consecutive seconds.</p> <p>Alarm suppression:</p> <ul style="list-style-type: none"> the alarm can be suppressed

3.5.2 Functional entity: NE/FE0

3.5.2.1 101 Error rate > 1 E-5

Table 83. 101 ERROR RATE > 1 E-5

101 ERROR RATE > 1 E-5			
Severity:	Object affected:	Object state:	Module/Unit:
Major	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
<p>The received signal BER is over the alarm threshold. Possible reasons:</p> <ol style="list-style-type: none"> The signal from the radio path is attenuated. There is a hardware fault in the Flexbus cable or interface. 	<ol style="list-style-type: none"> Check the level of Rx signal. If the level of Rx signal is good, then see item 2. If Rx signal is poor, then check the fine alignment and also take into account the possible effect of current weather condition. In such a case check also the Tx power of the far-end outdoor unit and if possible, adjust it to maximum (temporarily). Check the Flexbus cable and the connectors. The cable must be properly connected to both the indoor and the outdoor unit. 		<p>Automatic</p> <p>The alarm is automatically cancelled when BER is steadily under the alarm threshold for 10 seconds.</p> <p>Alarm suppression:</p> <ul style="list-style-type: none"> the alarm can be suppressed

3.5.2.2 102 Error rate > 1 E-6

Table 84. 102 ERROR RATE > 1 E-6

102 ERROR RATE > 1 E-6			
Severity:	Object affected:	Object state:	Module/Unit:
Minor	TRE	Enabled	FIFA <ul style="list-style-type: none"> Flexbus (1-2) Protected hop
Fault reason:	Instruction:		Alarm cancelling:
<p>The received signal BER is over the alarm threshold. Possible reasons:</p> <ol style="list-style-type: none"> The signal from the radio path is attenuated (for example, heavy rain, false alignment). There is a hardware fault in the Flexbus cable or interface. 	<ol style="list-style-type: none"> Check the level of Rx signal. If the level of Rx signal is good, then see item 2. If Rx signal is poor, then check the fine alignment and also take into account the possible effect of current weather condition. In such a case check also the Tx power of the far-end outdoor unit and if possible, adjust it to maximum (temporarily). Check the Flexbus cable and the connectors. The cable must be properly connected to both the indoor and the outdoor unit. 		<p>Automatic</p> <p>The alarm is automatically cancelled when BER is steadily under the alarm threshold for 10 seconds.</p>

3.5.2.3 143 Fault in change-over function

Table 85. 143 FAULT IN CHANGE-OVER FUNCTION

143 FAULT IN CHANGE-OVER FUNCTION			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA / OU <ul style="list-style-type: none"> Operation mode
Fault reason:	Instruction:		Alarm cancelling:
<p>The OU configuration is incompatible with the protection mode (for example, the TX frequency is not the same in both radios in the HSB mode).</p>	<p>Correct the settings of the outdoor unit or restore the configuration backup of the OU with FlexiHub Manager (Tools - Configuration Backup).</p>		<p>Automatic</p> <p>The alarm is cancelled when the settings are corrected.</p>

3.5.2.4 141 Forced control on

Table 86. 141 FORCED CONTROL ON

141 FORCED CONTROL ON			
Severity:	Object affected:	Object state:	Module/Unit:
Critical	TRE	Enabled	FIFA / OU • Flexbus (1-2)
Fault reason:	Instruction:		Alarm cancelling:
<ol style="list-style-type: none"> 1. Fading margin measurement is ongoing. 2. The user has set the TX power off. This is a factory default setting of an outdoor unit. 	<ol style="list-style-type: none"> 1. Wait for the fading margin measurement to finish. 2. Set the TX power on with FlexiHub Manager. 		<p>Automatic</p> <p>The alarm is cancelled when fading margin measurement is finished or TX power is set on.</p>

4 Troubleshooting problem situations

4.1 Troubleshooting commissioning

4.1.1 Failed commissioning

Summary

Fault - The commissioning of Nokia Flexi EDGE BTS fails.



Steps

1. Determine the cause and corrective action.

Table 87. Troubleshooting failed commissioning



Potential cause	Corrective action
Wrong PIU type, an error message ("Invalid Parameter TRE_NE1/TRE_NE: piuType - Errors in SCF") is displayed	<p>Check that the PIU type contained in SCF is the same as inserted to the system box.</p> <p> Caution</p> <p>New transmission plug-in units (PIU) may be damaged if the plug-in units are replaced when the base transceiver station (BTS) power is switched on. Switch off the Nokia Flexi EDGE BTS before replacing the transmission PIUs.</p> <p> Note</p> <p>In case the transmission plug-in unit (PIU) module type changes, perform undo commissioning with removal of bypass traffic after the new PIU is inserted. After that, commission the Nokia Flexi EDGE BTS.</p> <p>If no transmission plug-in sub-module type is stored in the ESMA System Module (a new ESMA) and the ESMA module is powered on with a transmission sub-module (for example, FIEA) fitted, the sub-module is auto-detected and stored in the ESMA during power up.</p> <p>If the same ESMA is later commissioned with another type of transmission sub-module (for example, FIPA), an error message ("Invalid Parameter TRE_NE1/TRE_NE: piuType - Errors in SCF") is displayed and the commissioning fails.</p> <ul style="list-style-type: none"> • First, switch off the power in ESMA, disconnect the transmission cables and remove the old transmission sub-module. • Then, fit the new type of transmission sub-module into the ESMA, connect the new transmission cables and switch the power back on. • Thirdly, run Undo Commissioning with "erase bypass traffic" selected. • Finally, check that the hardware status of the transmission sub-module is "Working" in the TRS PIU Properties view, and run the commissioning again.

Table 87. Troubleshooting failed commissioning (cont.)

Potential cause	Corrective action
Error message 'Expected tag is missing FILE ::scope' pops up when sending SCF to BTS	BTS Manager is not compatible with BTS SW. Use the same version of BTS Manager as the BTS SW is.

2. Recomission the site.

See *Nokia Flexi EDGE BTS Commissioning*.

4.1.2 Partially failed commissioning

Summary

Fault - The commissioning of Nokia Flexi EDGE BTS partially fails.



Steps

1. Determine the cause and corrective action.



Tip

In the commissioning report you can see any BTS alarms that were active during commissioning. Follow the troubleshooting instructions for each alarm in section *Alarms Nokia Flexi EDGE BTS*.

Table 88. Troubleshooting partially failed commissioning

Potential cause	Corrective action
Wrong BCF ID.	Check the troubleshooting instructions for the 7601 alarm BCF OPERATION DEGRADED 'Commissioning failed due to BCF ID mismatch between Commissioning file and BSC'.
One of the configured TRXs is missing.	Check the troubleshooting instructions for the 7606 alarm TRX FAULTY, 'ESMA System module has lost connection to EXxx TRX module'.
TRX commissioning test failure.	Check the troubleshooting instructions for TRX test failures.

Table 88. Troubleshooting partially failed commissioning (cont.)

Potential cause	Corrective action
Power cable test failure.	<ul style="list-style-type: none"> Check that the power cables are correctly mated. Check the condition of cables and connectors. Check the troubleshooting instructions for the 7601 alarm 'Module power cable connections are incorrectly configured'.
Error occurred in bringing TRS into use.	<ul style="list-style-type: none"> Check that the transmission sub-module (FlxA) settings match those in the SCF file. Replace the faulty FlxA transmission sub-module.
The TRX and Remote Tune Combiner Module (ECxA) or Dual Duplexer Module (ERxA) do not match.	Check the troubleshooting instructions for the 7606 alarm TRX FAULTY, 'Hardware incompatibility detected during EXxx TRX module configuring'.
The TRX band in the HW report does not match the one in BTS_CONF_DATA (from the BSC).	Check the troubleshooting instructions for the 7606 alarm TRX FAULTY, 'Hardware incompatibility detected during EXxx TRX module configuring.'

Table 88. Troubleshooting partially failed commissioning (cont.)


Potential cause	Corrective action
Missing OMUSIG.	<ul style="list-style-type: none"> • Check that the BCF has been created at the BSC. • Check that the transmission chain from the BSC to the BTS is correctly configured and no alarm(s) exists. • Check that the transmission cable is correctly connected to the transmission sub-module (FlxA). • Check that the OMUSIG allocation in the BSC matches the one in the SCF file. • Check that the OMUSIG is correctly cross-connected in the transmission sub-module (FlxA). • If FIFA transmission sub-module is used, check the radio hop condition. • If FIQA or FIYA transmission submodule is used in PWE mode, check if the PW configuration, the BTS and the Far-end PW device match. Check in the PWE Tunnel Settings if the Peer Status is Reachable. It is recommended to use the Monitor PWE function during commissioning, in order to check the PW configuration. <p> Note</p> <p>Commissioning will partially fail if there is no Abis connection to the base station controller (BSC) because operation and maintenance unit signalling (OMUSIG) is missing. The base transceiver station (BTS) can be used in local mode, with no Abis connection, despite the partial failure.</p>
The BSC did not complete all commissioning tests within 130 seconds (as indicated by the commissioning report partial failure reason 'Commissioning test timer expired').	<ul style="list-style-type: none"> • Run manual commissioning tests from the Flexi EDGE BTS Manager to confirm the correct operation of TRXs that were not tested automatically. • Run Abis Loop tests from the BSC to confirm the network connection between the BSC and the BTS.

Table 88. Troubleshooting partially failed commissioning (cont.)

Potential cause	Corrective action
In PWE mode, a PW is used as a synchronisation source and the adaptive clock recovery state has not reached Tracking state within 13 minutes.	<ul style="list-style-type: none"> If the clock recovery state of the synchronisation source has reached Acquisition state, the clock recovery state will most likely eventually reach the Tracking state after a few more minutes. The BCF will then reach Supervisory state without any further interaction. The network conditions of the packet switched network may prevent the BTS from successfully reaching the Tracking state. It is recommended to use the Monitor PWE feature during commissioning to validate if the network conditions allow the use of adaptive clock recovery. If the network conditions are not sufficient for the adaptive clock recovery, an alternative synchronisation source must be used. It is recommended to use the Monitor PWE function during commissioning, in order to check the state of the adaptive clock recovery algorithm. The SCF should only be sent when the Tracking state has already been reached to prevent failed commissioning.
PCU synchronisation not achieved on GPRS timeslot.	<ul style="list-style-type: none"> Verify the Abis allocations are correct. Issue a TRX reset, or lock/unlock or block/deblock to trigger a TRX reset.

2. Report damage, failure of fault.

If after the corrective actions the site is recommissioned, the commissioning report will be updated and will show no commissioning failure. However, recommissioning is not mandatory for an operational site.

4.2 Troubleshooting electrical power

Summary

Fault - No power to Nokia Flexi EDGE BTS



Steps

1. Determine the cause and corrective action.

Table 89. Troubleshooting electrical power

Potential cause	Corrective action
Site mains power supply fault (all LEDs are off).	<ul style="list-style-type: none"> Turn the mains switch on. Check the site mains power source and fuses.
Wrong DC voltage polarity in System Module (ESMA) input.	Change polarity.
A defective mains power cable.	Replace the power cable.
A defective DC Power Distribution Sub-module (FEPD) in the System Module (ESMA): the System Module LED is red or off).	<ul style="list-style-type: none"> A single power port or all power ports may be faulty. Replace the System Module. A red LED may also indicate that the System Module is overheated. Check the site's ambient temperature and active fan alarms.
Short circuit in one of the modules.	Replace the faulty module. Note that the Power Distribution Sub-module (FEPD) has short circuit protection, and only the faulty module is off. The other modules have 48 V and are working normally.
The input 48 V DC voltage varies outside the acceptable range. The Dual TRX Modules are switched off. When the situation is restored, they are again switched on.	If this occurs recurrently, inspect the current feeding capacity of the power supply. It may be underestimated, and requires an enhancement.

Table 90. Additional troubleshooting steps if optional power module(s) are used

Potential cause	Corrective action
An optional power module or sub-module is in STAND BY mode (yellow LED active).	Turn the switch to the ON position (green LED).

Table 90. Additional troubleshooting steps if optional power module(s) are used (cont.)

Potential cause	Corrective action
A defective power module or sub-module (the 7613 alarm is active and/or the red LED is active in the optional power module).	<ul style="list-style-type: none"> Follow the troubleshooting instructions for the alarm. A red LED may also indicate that the power modules are overheated. Check the site's ambient temperature and the modules' fans.
Output power demand is too high (the 7613 alarm and/or a red LED is active in the optional power module or sub-module).	<ul style="list-style-type: none"> Decrease the number of used modules in the BTS, or Install more power modules or sub-modules.
Short circuit in one of the modules.	<p>Replace the faulty module.</p> <p>Note that the Power Distribution Sub-module (FEPD) has short circuit protection, and only the faulty module is off. The other modules have 48 V and are working normally.</p>

2. Report damage, failure, or fault.

4.3 Troubleshooting Nokia Flexi EDGE BTS Manager connection

Summary

Fault - Cannot establish a connection between the System Module (ESMA) and Nokia Flexi EDGE BTS Manager



Steps

1. Determine the cause and corrective action.

Table 91. Troubleshooting BTS Manager connection

Potential cause	Corrective action
Wrong BTS IP address.	Check that the correct BTS IP address is specified in Nokia Flexi EDGE BTS Manager. The BTS IP address for a local connection is 192.168.255.131.

Table 91. Troubleshooting BTS Manager connection (cont.)

Potential cause	Corrective action
Wrong BTS TCP port.	Check that the correct BTS TCP port is specified in Nokia Flexi EDGE BTS Manager. The normal BTS IP port for a local connection is 27500.
Wrong PC IP address.	Check the IP address of the PC's LAN card. The address should be in the same sub-network as the BTS IP address. Example: if the BTS IP address is 192.168.255.131, the PC IP address could be 192.168.255.130.
The LMP cable is broken or not properly connected.	<ul style="list-style-type: none"> • Check that the cable has been connected to the LMP port of the System Module (ESMA). • Replace or repair the cable.
Old or incorrectly installed Nokia Flexi EDGE BTS Manager SW.	<ul style="list-style-type: none"> • Use the same or a newer version of Nokia Flexi EDGE BTS Manager SW compared to the BTS SW. • (Re)install Nokia Flexi EDGE BTS Manager SW.
A faulty or damaged System Module.	<ul style="list-style-type: none"> • Power cycle the System Module. • Replace the System Module.
All IP traffic is routed through the dedicated VPN gateway	Disable VPN or allow IP traffic including BTS Manager IP traffic to go to other gateways than the VPN gateway.
Transmission sub-module not correctly inserted or broken.	<ul style="list-style-type: none"> • Check if the transmission sub-module is fully inserted. • Replace the transmission sub-module.

Table 91. Troubleshooting BTS Manager connection (cont.)

Potential cause	Corrective action
LMP cable changed to another System Module at the site.	<p>The ARP routing table on the PC needs to be refreshed with the new MAC address. There are three alternative actions:</p> <ul style="list-style-type: none"> • Execute the DOS command <code>arp -d 192.168.255.131</code> to clear the old BTS's MAC address from the PC's operating system. This may require administrator privileges to complete successfully. • Disable and re-enable the Local Area Connection from the PC's operating system, or • Wait from ten seconds to a couple of minutes until the operating system automatically refreshes the ARP routing table.

2. Report damage, failure, or fault.

4.4 Troubleshooting Dual TRX Module (EXxA) operation

Summary

Fault – Dual TRX Module is not operating correctly



Steps

1. Determine the cause and corrective action.

Table 92. Troubleshooting Dual TRX Module operation

Potential cause	Corrective action
Objects are locked from the BSC, NMS/2000 or NetAct.	<ul style="list-style-type: none"> • Request the state from the BSC or NetAct. • Request an unlock from the BSC or NetAct.
Objects are blocked from Nokia Flexi EDGE BTS Manager.	Unblock the object using Nokia Flexi EDGE BTS Manager.

Table 92. Troubleshooting Dual TRX Module operation (cont.)

Potential cause	Corrective action
Dual TRX Module is not properly connected, no electric power, or the LED is broken (the front LED does not light up).	<ul style="list-style-type: none"> Check the power cable connections between the System Module (ESMA) or the System Extension Module (ESMA) and the Dual TRX Module. Check all RF cable connections between the Dual TRX Module and the Dual Duplexer Module (ERxA), Wideband Combiner Sub-module (EWxA) or Remote Tune Combiner Module (ECxA). Check the instructions in <i>Troubleshooting electrical power</i>. Replace the Dual TRX Module.
After a recovery from the intelligent shutdown, the administrative state of TRX object(s) remain BL-RSL at the BSC.	<p>Check if the 7601 'Module power cable connections are incorrectly configured' alarm is active and follow the related troubleshooting instructions, if needed.</p> <p>Note that during the intelligent shutdown, the BTS software cuts off the power supply from the 'PWR' port of the System Module and the LAPD links for the affected TRX's. During the recovery, the BTS software turns them back on.</p> <p>If the Dual TRX Module power cabling from the System Module is incorrect (the power cable of the Dual TRX Module is not connected to the correct 'PWR' port on the System Module), some TRX objects remain in blocked state as the recovery actions are routed to the wrong Dual TRX Module. In this case, make a TRX reset for the affected TRX objects.</p>

Table 92. Troubleshooting Dual TRX Module operation (cont.)

Potential cause	Corrective action
After the TRX/BTS/BCF reset, it takes one hour to activate the 7606 'EXxx TRX module Tx power is less than minimum at DPC' alarm for the traffic channel (TCH) TRX.	Follow the troubleshooting instructions for the alarm. When antenna boosting is used, only the TCH TRXs are connected to an antenna. Antenna boosting transmits adequate TX power from one TCH TRX to its antenna port once an hour when the transmission is observed as inadequate for this time period. The one hour timer is fixed and is not configurable. Antenna boosting does not interrupt the possibly ongoing traffic. If an antenna-related problem is observed during antenna boosting, the alarm can only be generated for the Dual Duplexer Module (ERxA), and only when neither the baseband (BB) hopping nor the antenna hopping is configured.
Active alarm on TRX.	Check the alarm-specific troubleshooting instructions in chapter <i>Alarms for Nokia Flexi EDGE BTS</i> the Reference/Alarms category.

2. Report damage, failure, or fault.

4.5 Troubleshooting TRX test and TRX loop test failures

4.5.1 TRX test run from the BSC (S12)

Summary

TRX Test can be run from the BTS Manager and from the BSC.

When the test is run from the BTS Manager, the sub test results (TX Power, BER, RX Result) are compared against the BTS SW internal limits and the final test results (pass/fail) will be determined by the BTS accordingly.

When the test is run from the BSC, the BTS SW runs the same test (as above) and reports the sub test results back to the BSC, together with the final pass/fail result. However, the BSC performs further comparisons against its own thresholds. If any of the sub test results fail against the BSC thresholds, alarm 7735 - TRX TEST FAILED is raised for the tested TRX object, even if the final test result reported by the BTS was passed.

In other Nokia 2G BTS types, the loopback point for the TRX test is located inside the TRX unit. However, in Flexi EDGE BTS it is located inside the ERxA DDU and ECxA RTC modules (near the BTS antenna connector) so the test coverage is much wider.

It should be noted that the reported TX Power result is indicative only and a certain tolerance (up to +/- 6 dB compared to the actual value) can be expected, depending on the used TX combining.

If the default Flexi EDGE BTS TX power (PWRE) threshold value +47 dBm is used on the BSC (S12), the TRX test result may be FAILED and alarm 7735 is raised although there is nothing wrong with the BTS HW.

To avoid unnecessary failures with any TX combining option, the PWRE threshold should be set as follows:

PWRE +41 dBm (PMAX=0)

This leaves room for the expected tolerances. The PWRE threshold applies to all Flexi EDGE BTSs under the same BSC.

The PWRE threshold can be checked with MML command as follows:

```
ZUCV:TRP,CURRENT;
```

and adjusted with:

```
ZUCV:TRP,MODIFY:PWRE=<new value>;
```

Note that the proposed value above is valid for PMAX=0 only. If a lower PMAX is used (even in one BTS (sector) on the same BSC), the PWRE should be lowered accordingly. For instance, if PMAX=2 is used even in one BTS, the PWRE should be set to +39 dBm (each PMAX step equals to 2 dB).

When the test is run by using (remote) BTS Manager, only the BTS SW internal thresholds are used. This way, unnecessary failures due to the above-mentioned BSC (S12) threshold issue cannot be caused.

The PWRE threshold is removed in S13, so then the BSC relies on the final test result reported by the BTS. The other BSC thresholds (for example, BER and RX RESULT) are still used with S13 as well.



Steps

1. Determine the cause and the corrective action.

Table 93. Troubleshooting TRX test run from the BSC

Potential cause	Corrective action
TRX TEST fails with BSC default threshold values	<p>There are two alternative steps:</p> <ul style="list-style-type: none"> Adjust the threshold on the BSC as described above. Re-run the TRX test from (remote) BTS Manager.

2. Report damage, failure, or fault.

Further information

For details of the 7735 TRX TEST FAILED alarm, please refer to BSC documentation in NOLS.

4.5.2 TRX test run from Flexi EDGE BTS Manager

Summary

Fault - TRX test or TRX loop test fails when the test is executed locally or remotely with Nokia Flexi EDGE BTS Manager.



Steps

1. Determine the cause in TRX test/TRX loop test result column and the corrective action.

After each troubleshooting step in the table below, run the TRX (loop) test again, and if the problem still exists, go to the next troubleshooting step.

If the Wideband Combiner Sub-module (EWxx) is used, the related RF cables and the Wideband Combiner Sub-module should also be checked in all cases where the instruction says to check all RF cabling between the Dual TRX Module and the Dual Duplexer Module or the Remote Tune Combiner Module.

Table 94. Troubleshooting TRX test/TRX loop test failures

Fault reason	Description	Corrective action
'High power in Abis1-Air3 loop'	The Dual TRX Module (EXxA) detects high power when receiving a loop signal back from the Dual Duplexer Module (ERxA) or the Remote Tune Combiner Module (ECxA). Either a loopback switch in the Dual Duplexer or Remote Tune Module, or the Dual TRX Module is causing the failure.	<ul style="list-style-type: none"> • Replace the Dual TRX Module. • Replace the Dual Duplexer Module or the Remote Tune Combiner Module.
'Failure due to Forced Reset'	Either the Dual TRX Module or the Remote Tune Combiner Module was reset during the test.	<ul style="list-style-type: none"> • Wait until the module recovers from the reset. • Run the TRX (loop) test again.
'Low BCCH Power levels'	The Dual TRX Module received too low power looped back from the Dual Duplexer Module or the Remote Tune Combiner Module.	<ul style="list-style-type: none"> • Check all RF cabling between the Dual TRX Module and the Dual Duplexer Module or the Remote Tune Combiner Module. • Replace the Dual TRX Module. • Replace the Dual Duplexer Module or the Remote Tune Combiner Module.
'RF cables missing'	The Dual TRX Module did not receive any loop signal back from the Dual Duplexer Module or the Remote Tune Combiner Module.	<ul style="list-style-type: none"> • Check all RF cabling between the Dual TRX Module and the Dual Duplexer Module or the Remote Tune Combiner Module. • Replace the Dual TRX Module. • Replace the Dual Duplexer Module or the Remote Tune Combiner Module.
'Failure due to TRX reconfiguration'	The test failed as the TRX was reconfiguring. Wait until the reconfiguration is finished.	<ul style="list-style-type: none"> • Run the TRX (loop) test again.

Table 94. Troubleshooting TRX test/TRX loop test failures (cont.)

Fault reason	Description	Corrective action
'Timeslot is busy'	The test failed as the timeslot (and/or its pair timeslot) was busy.	<ul style="list-style-type: none"> Wait until the timeslot is free or run the test again on a different timeslot. <p>The timeslot and its offset timeslot (-3) must both be free before the test can be run.</p>
'Bad channel configuration'	The TRX Test was attempted on the broadcast control channel (BCCH) or stand-alone dedicated control channel (SDCCH) timeslot.	<ul style="list-style-type: none"> Find free non-BCCH/non-SDCCH timeslot, and run the test again.
'Invalid AGC'	Internal software error occurred during the test.	<ul style="list-style-type: none"> Reset the BCF. <p>Note that this does not indicate a hardware error - do <i>not</i> replace module(s).</p>
'Channel mode is neither PS nor CS'	Internal software error occurred during the test.	<ul style="list-style-type: none"> Reset the BCF. <p>Note that this does not indicate a hardware error - do <i>not</i> replace module(s).</p>
'Failed to set/clear air loop point as invalid path information'	Internal software error occurred during the test.	<ul style="list-style-type: none"> Reset the BCF. <p>Note that this does not indicate a hardware error - do <i>not</i> replace module(s).</p>
'Failed to clear air loop point as TS already free'	Internal software error occurred during the test.	<ul style="list-style-type: none"> Reset the BCF. <p>Note that this does not indicate a hardware error - do <i>not</i> replace module(s).</p>
'No response for block request for a timeslot'	Internal software error occurred during the test.	<ul style="list-style-type: none"> Reset the BCF. <p>Note that this does not indicate a hardware error - do <i>not</i> replace module(s).</p>
'Phase loop lock (PLL) has alarm on it'	TRX loop synthesiser failure detected in the Dual Duplexer or Remote Tune Combiner Module.	<ul style="list-style-type: none"> Replace the Dual Duplexer Module or the Remote Tune Combiner Module.
'Not able to set the loop point on connected DDU/RTC or on ABIS within the predefined time'	Internal software error occurred during the test.	<ul style="list-style-type: none"> Reset the BCF. <p>Note that this does not indicate a hardware error - do <i>not</i> replace module(s).</p>
'Failure in setting air loop point as DDU synthesizer not able to achieve Lock state'	TRX loop synthesiser failure detected in the Dual Duplexer or Remote Tune Combiner Module.	<ul style="list-style-type: none"> Replace the Dual Duplexer Module or the Remote Tune Combiner Module.

Table 94. Troubleshooting TRX test/TRX loop test failures (cont.)

Fault reason	Description	Corrective action
'Failure due to high bit error ratio'	The Dual TRX Module detected a high bit error ratio (BER) during the TRX test.	<ul style="list-style-type: none"> • Check all RF cabling between the Dual TRX Module and the Dual Duplexer Module or the Remote Tune Combiner Module. • Replace the Dual TRX Module. • Replace the Dual Duplexer Module or the Remote Tune Combiner Module.
'Failure due to invalid loop gain'	The Dual TRX Module received too high power looped back from the Dual Duplexer or Remote Tune Combiner Module.	<ul style="list-style-type: none"> • Replace the Dual TRX Module. • Replace the Dual Duplexer Module or the Remote Tune Combiner Module.
'Unable to measure power level'	The Dual TRX Module received too low power looped back from Dual Duplexer or Remote Tune Combiner Module.	<ul style="list-style-type: none"> • Replace the Dual Duplexer Module or the Remote Tune Combiner Module. • Replace the Dual TRX Module.
'Failure due to balance failure in Rx branches'	The Dual TRX Module detected that Diversity and Main RX levels differed too much during the TRX test.	<ul style="list-style-type: none"> • Check all RF cabling between the Dual TRX Module and the Dual Duplexer Module or the Remote Tune Combiner Module. • Replace the Dual TRX Module. • Replace the Dual Duplexer Module or the Remote Tune Combiner Module.
'Unable to measure Rx sensitivity'	Background noise could not be measured due to too high interference. The problem is probably caused by external interference (for example the same frequency is used nearby on another BTS).	<ul style="list-style-type: none"> • Run the TRX test again. • If the test fails persistently, the test should be run on a different frequency. <p>Note that sensitivity (RX result) is not based on the bit error ratio. It is estimated from the background noise and interference level detected by the Dual TRX Module at a tested RX frequency.</p>
'Failure in BB module'	Hardware failure was detected in the Dual TRX Module.	<ul style="list-style-type: none"> • Replace the Dual TRX Module.

Table 94. Troubleshooting TRX test/TRX loop test failures (cont.)

Fault reason	Description	Corrective action
'No ARFN passed in loop command in configuring state'	Internal software error occurred during the TRX test.	<ul style="list-style-type: none"> Reset the BCF. <p>Note that this does not indicate a hardware error - do <i>not</i> replace module(s).</p>
'Loop test error more than specified limit'	The Dual TRX Module detected a BER > 2 % during the TRX test.	<ul style="list-style-type: none"> Check all RF cabling between the Dual TRX Module and the Dual Duplexer Module or the Remote Tune Combiner Module. Replace the Dual TRX Module. Replace the Dual Duplexer Module or the Remote Tune Combiner Module. If the test fails persistently, the test should be run on a different frequency.
'TRX is in shutdown state'	The test failed as the TRX was in the shutdown state.	<ul style="list-style-type: none"> Wait until the TRX is back in the supervisory state. Run the TRX test again.
'RTC not in Supervisory State'	Test failed as the Remote Tune Combiner Module was not in the supervisory state during the TRX test.	<ul style="list-style-type: none"> Wait until the Remote Tune Combiner Module reached the supervisory state. Run the TRX test again.
'Invalid command'	<p>If TX/RX cables are not manually defined during commissioning, then one successful RF Cable Autodetection (RFCAD) is needed before the TRX test can be run. RFCAD is run on supported configurations, if Abis connection is available.</p> <p>However, if the first commissioning is done without Abis and cabling has not been defined manually in the Site Configuration File (SCF), then RFCAD is not run due to missing BTS_CONF_DATA. Therefore, TRX Tests fail as there is no TX/RX cabling information in the SCF.</p>	<p>Two alternative options:</p> <ul style="list-style-type: none"> Define RF cabling manually during commissioning or Connect Abis and ensure that RFCAD is run once. <p>Note that this works only with supported configurations.</p>

2. Report damage, failure, or fault.

4.6 Troubleshooting illegal modules

Summary

Fault - Flexi EDGE BTS modules have been incorrectly connected to the System Module (ESMA), or System Extension Module (ESEA).



Steps

1. Determine the cause and corrective action.

Table 95. Troubleshooting illegal modules

Potential cause	Corrective action
The System Extension Module (ESEA) is connected to the System Module (ESMA) BUS port 1, 2, 3, 4 or 5. Flexi EDGE BTS Manager displays the module as illegal.	Connect the System Extension Module only to the BUS port 6 of the System Module.
The Remote Tune Combiner Module (ECxA) is connected to the System Extension Module (ESEA). Flexi EDGE BTS Manager displays the module as illegal.	Connect the Remote Tune Combiner Module only to the BUS port 1, 2 or 3 of the System Module.
The Remote Tune Combiner Module is connected to the System Module BUS port 4, 5 or 6. Flexi EDGE BTS Manager displays the module as illegal.	Connect the Remote Tune Combiner Module only to the BUS port 1, 2 or 3 of the System Module.
The Remote Tune Combiner Module is connected to the System Module BUS port 1, 2 or 3. Flexi EDGE BTS Manager displays the module as illegal.	Connect a System Extension Module to BUS port 6 of the System Module. The Remote Tune Combiner Module can only be used with a System Extension Module present.

Table 95. Troubleshooting illegal modules (cont.)

Potential cause	Corrective action
<p>The Dual TRX Module (EXxA) is connected to the System Module BUS port 1, 2, 3, 4 or 5.</p> <p>Flexi EDGE BTS Manager displays the module as illegal.</p>	<p>Check if a System Extension Module is connected to the BUS port 6 of the System Module.</p> <p>If present:</p> <ul style="list-style-type: none"> Remove the System Extension Module, or Reconnect the Dual TRX Module to the System Extension Module. <p>When a System Extension Module is present, every Dual TRX Module must connect only to the System Extension Module.</p>
<p>Flexi EDGE BTS Manager displays an (illegal) unknown module.</p>	<p>Remove the unknown module.</p> <p>Check the Hardware – Software compatibility to confirm if the module is supported by the active BTS software.</p>

2. Report damage, failure of fault.

4.7 Troubleshooting local software download from Flexi EDGE BTS Manager

Summary

Software download fails when attempted from a locally connected Flexi EDGE BTS Manager.



Steps

1. Determine the cause and corrective action.

Table 96. Troubleshooting local software download from Flexi EDGE BTS Manager

Potential cause	Corrective action
<p>The firewall of the PC running the BTS Manager prevents connection from the BTS to the BTS Manager.</p>	<p>Check that the correct software download TCP port is open, as per the PC's firewall (s). The software download TCP port for local software download is 27501.</p>

2. Report damage, failure of fault.

4.8 Troubleshooting (E)GPRS packet switched data transfer

Summary

Fault - Packet switched data transfer does not work



Steps

1. Determine the cause and corrective action.

Table 97. Troubleshooting packet switched data transfer

Potential cause	Corrective action
Mismatch of the EGPRS dynamic Abis pool (EDAP) size between the BSC and the BTS.	Check that the EDAP size is the same at the BTS and the BSC. Note that the BTS software does not check the start and end timeslots of the EDAP because of possible cross-connections between the BTS and the BSC.
Mismatch of the EDAP location at the E1/T1.	<ul style="list-style-type: none"> Check that the EDAP start and end timeslots are correct at the BSC and the BTS. Check that cross-connections between the BSC and the BTS are made correctly.
Mismatch of the E1/T1 interface port.	<ul style="list-style-type: none"> Check that the correct transmission line is connected to the correct E1/T1 interface port at the BTS. Check that the EDAP is configured to the correct exchange terminal (ET) card at the BSC; especially with large configurations where more than one ET card is used per BCF.
EDGE licence does not exist, or more licence capacity is needed at the BSC.	Order and install new licences.

Table 97. Troubleshooting packet switched data transfer (cont.)

Potential cause	Corrective action
There may be BSC related configuration problems especially when the performance is degraded because of congestion, radio propagation issues or poor timing.	Refer to BSC's packet data troubleshooting instructions.

2. Report damage, failure, or fault.

4.9 Troubleshooting Q1 management

4.9.1 Alarms of FIFA Flexbus transmission sub-module not shown in BTS or BSC

Summary

Fault - Alarms of FIFA Flexbus transmission sub-module not shown in BTS or BSC (Q1 polling does not work)



Steps

1. Determine the cause and corrective action.

Table 98. Troubleshooting FIFA Flexbus transmission sub-module alarms

Potential cause	Corrective action
Wrong Q1 address	<ul style="list-style-type: none"> Check the Q1 address: Fixed Q1 addressing is used when Nokia Flexi EDGE BTS is the Q1 bus master. The fixed Q1 address for FIFA is 4087. Nokia FlexiHub Manager fixes the address to the correct one if the BTS Polling selection is selected on the Q1 settings page. (BTS Polling) If the BSC is the Q1 bus master, the user must configure a unique Q1 address for FIFA. The Q1 addresses range from 0 to 3999. Each address must be unique on the same Q1 bus, starting from the BSC. (BSC Polling)

Table 98. Troubleshooting FIFA Flexbus transmission sub-module alarms (cont.)

Potential cause	Corrective action
Wrong Q1 baud rate	Check the baud rate. The baud rate must always match the value configured in the BSC.
Wrong Q1 switch settings	<ul style="list-style-type: none"> Check the switch settings with FlexiHub Manager. In BTS polling, the Q1 switch settings must be so that at least the Processor switch is connected so that FIFA can be managed. Flexbus switches must be set if a management connection to the far end is needed through a Q1 channel in the radio overhead.
Wrong Q1 master	<ul style="list-style-type: none"> Check if BTS is correctly configured dependent if BTS or BSC shall have control of Q1 bus FIFA is connected to. Check the Q1 address of the BTS integrated transmission (TRE-1) at BSC using ZQWL command for related BCF. BTS is master of Q1 Bus if TRE-1 Q1 address is equal to 4080. BTS has released control of Q1 Bus if TRE-1 Q1 address is equal to 0-3999.
Q1 bus access conflict	Check your Q1 bus setup. Only one Q1 master is allowed to be connected to a Q1 bus. If two or more Q1 master accessing the same Q1 bus, then replan Q1 bus setup of the BSS network and ensuring that only 1 Q1 bus master connects to a Q1 bus.
Equipment (FIFA) not added to BCF	<ul style="list-style-type: none"> If BTS shall be master of Q1 BUs FIFA is connected to, check if FIFA is part of BCF transmission equipment list using ZQWL command. Displayed ID of FIFA is "2GBTSFIU". If FIFA is not present at list, add FIFA to list at BSC using ZQWA command.
Equipment (FIFA) not added to service channel	<ul style="list-style-type: none"> Check that the service channel is created (BSC command ZQWI;) Check that the service channel is activated (the state must be AL) Check that FIFA is added to the service channel (ZQWI:<channel number>: ALL;)

Table 98. Troubleshooting FIFA Flexbus transmission sub-module alarms (cont.)

Potential cause	Corrective action
Faulty FIFA	Replace FIFA.

2. Report damage, failure, or fault.

4.9.2 Alarms of external transmission equipment not shown in BTS or BSC

Summary

Fault - Alarms of external transmission equipment not shown in BTS or BSC (Q1 polling does not work)



Steps

1. Determine the cause and corrective action.

Table 99. Troubleshooting external transmission equipment alarms

Potential cause	Corrective action
Wrong Q1 address	Check that the Q1 address of the Q1 device matches that configured at the BSC. The Q1 address must be between 0-3999 for external transmission equipment (such as FIU19-E or MetroHub).
Wrong Q1 baud rate	Check the baud rate. The baud rate must always match the value configured in the BSC.

Table 99. Troubleshooting external transmission equipment alarms (cont.)

Potential cause	Corrective action
Wrong Q1 switch settings	<ul style="list-style-type: none"> • Check the switch settings with the node manager of the external equipment. • Settings, for example, for FIU19-E locally via Q1 interface: <ul style="list-style-type: none"> • Q1-1 & Q1-2 switches ON • Processor switch ON • All other switches OFF • FIU19-E remotely via EOC in radio frame: <ul style="list-style-type: none"> • Q1-1 and Q1-2 switches ON • Processor switch ON • Flexbus switch ON • FB1 & FB2 switches ON
Wrong Q1 master	<ul style="list-style-type: none"> • Check if BTS is correctly configured dependent if BTS or BSC shall have control of Q1 bus the external equipment is connected to. • Check the Q1 address of the BTS integrated transmission (TRE-1) at BSC using ZQWL command for related BCF. • BTS is master of Q1 Bus if TRE-1 Q1 address is equal to 4080. • BTS has released control of Q1 Bus if TRE-1 Q1 address is equal to 0-3999.
Q1 bus access conflict	<ul style="list-style-type: none"> • Check your Q1 bus setup. Only one Q1 master is allowed to be connected to a Q1 bus. If two or more Q1 master accessing the same Q1 bus, then replan Q1 bus setup of the BSS network and ensuring that only 1 Q1 bus master connects to a Q1 bus.
External equipment not added to BCF	<ul style="list-style-type: none"> • If BTS shall be master of Q1 Bus external equipment is connected to, check if external equipment is part of BCF transmission equipment list using ZQWL command. Displayed ID of external equipment should match with the corresponding Network Element ID. • If external equipment is not present at the list, add external equipment to the list at the BSC using ZQWA command.

Table 99. Troubleshooting external transmission equipment alarms (cont.)

Potential cause	Corrective action
External equipment not added to service channel	<ul style="list-style-type: none"> Check that service channel is created (BSC command :ZQWI;) Check that service channel is activated (state must be AL). Check that external equipment is added to service channel (ZQWI:<channel number>:ALL;)
Q1 connection does not work remotely via EOC	<ul style="list-style-type: none"> Check the Q1 EOC allocation with BTS Manager. Only one EOC channel is possible for each interface.
Q1 connection does not work locally via Q1 cable (physical Q1 connection)	<ul style="list-style-type: none"> Check that the Q1 cables are correctly mated between the ESMA and external Q1 device (such as FIU19E). Check the condition of the Q1 cable connectors. Check that the right cable is installed (V.11 standard).
Q1 polling does not work	Check that OMUSIG or cross-connections are configured.
Faulty external equipment	Replace the external equipment, for example FIU19-E.

2. Report damage, failure, or fault.

4.9.3 Transmission alarms are not shown in BSC (PWE mode)

Summary

Fault - Transmission alarms are not reported to the BSC but BTS alarms are visible in the BSC.



Steps

1. Determine the cause and corrective action.

Table 100. Troubleshooting transmission alarms

Potential cause	Corrective action
BSC is configured for BSC polling	The BTS does not support BSC polling in PWE mode. Configure the BSC to use BTS polling.

2. Report damage, failure, or fault.

4.10 Troubleshooting PseudoWire operation

Summary

Fault - PseudoWire is not operating correctly.



Steps

1. Determine the cause and corrective action.

Table 101. Troubleshooting PseudWire operation

Potential cause	Corrective action
Ethernet Link is down.	<ul style="list-style-type: none"> Ensure that the Ethernet cable is connected to EIF1 only. EIF2 is not supported. For Optical interface (EIF3), the correct optical cable is used MultiMode or Single mode according to the SFP module.

Table 101. Troubleshooting PseudWire operation (cont.)

Potential cause	Corrective action
PseudoWire is down.	<ul style="list-style-type: none"> Try to ping from the BTS Manager (Refresh button in the PW tunnel settings). Verify that the correct ARP entry is created. There is no IP conflict. Verify that the channel group contains the same number of time slots on both sides, the BTS and the Far-end PW device. Configure the same number of frames per packet. Jitter buffer needs to be increased. Check the packet loss counters from the Performance monitoring.
Commissioning with PWE mode fails after about 13 minutes when PW is selected as priority 1 synchronisation source.	<ul style="list-style-type: none"> Check the clock recovery state of the PW used as a Synchronization Source in the Transmission Manager. If the clock recovery state has reached Acquiring state, it may reach Tracking state even after the commissioning has failed. Once the Tracking state is reached, the BTS should be fully operational. If you have configured more than one PW in use, check the clock recovery states of these PWs. If any of the PWs has reached Tracking state, select this PW as a synchronisation source. Check the Performance counters for early and late packets. If they occur, increasing the jitter buffer size may help.
Synch Recovery failed, that is, no PW reaches tracking state.	<ul style="list-style-type: none"> Increase jitter buffer. External synchronisation might be needed. In case of synch IN on E1/T1 interface, connect the cable to the correct interface as selected in the BTS Manager.

2. Report damage, failure, or fault.

5 Transmission monitoring

5.1 Monitoring FIPA, FIEA, FIQA (TDM mode) and FIYA (TDM mode)

Purpose

With Nokia Flexi EDGE BTS Manager, you can monitor the performance of a transmission interface.



Steps

1. To open the Performance Monitoring view, select **Transmission** → **Performance Monitoring**.

Choosing the **Transmission** → **Performance Monitoring** command opens the **Performance Monitoring** view for the selected interface in the Transmission Equipment view. This function is only available in the online mode. You can view values of the counters and reset them.

The following counters are displayed:

- Errored Blocks (EB)
- Background Block Errors (BBE)
- Total Time (TT)
- Available Time (AT)
- Error Seconds (ES)
- Severely Errored Seconds (SES)
- Frame Synchronization Bit Error Events
- Controlled Slip Events (available only in case of FIPA and FIEA)
- Line Code Violation Events (available only in case of FIPA and FIEA)

Performance Report for <interface> displays the interface selected from the **Transmission Equipment** view.

From **Performance** you can choose whether the **G.826 History Report** or the **Counters** is displayed in the view.

2. To display the G.826 History, select Performance → G.826 History.

If the selected Performance option is **G.826 History Report**, the following information is displayed:

- **Report Interval** - You can select the report interval: 15 Minutes or 24 Hours.
- **Report Format** - You can select how the information is shown: Graph or Table.
- **Fetch Report** - Fetches the current performance report for the selected interface from the BTS.

If the selected Report Format is **Graph**, the counters fetched from the BTS are displayed as a line graph. With the **EB**, **BBE**, **TT**, **AT**, **ES** and **SES** check boxes below the graph, you can show (select a check box) or hide (clear a check box) the counter values in the graph.

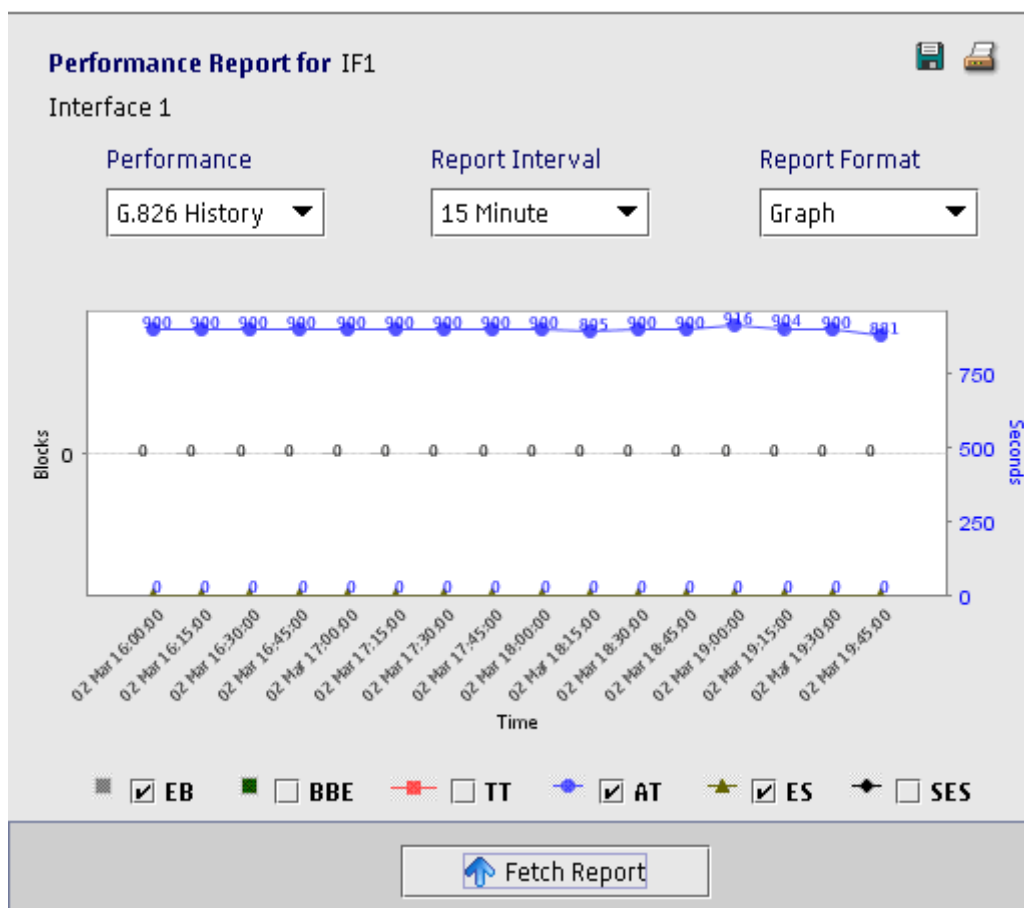


Figure 4. Report Format: Graph

If the selected Report Format is **Table**, the counters fetched from the BTS are displayed in a table.

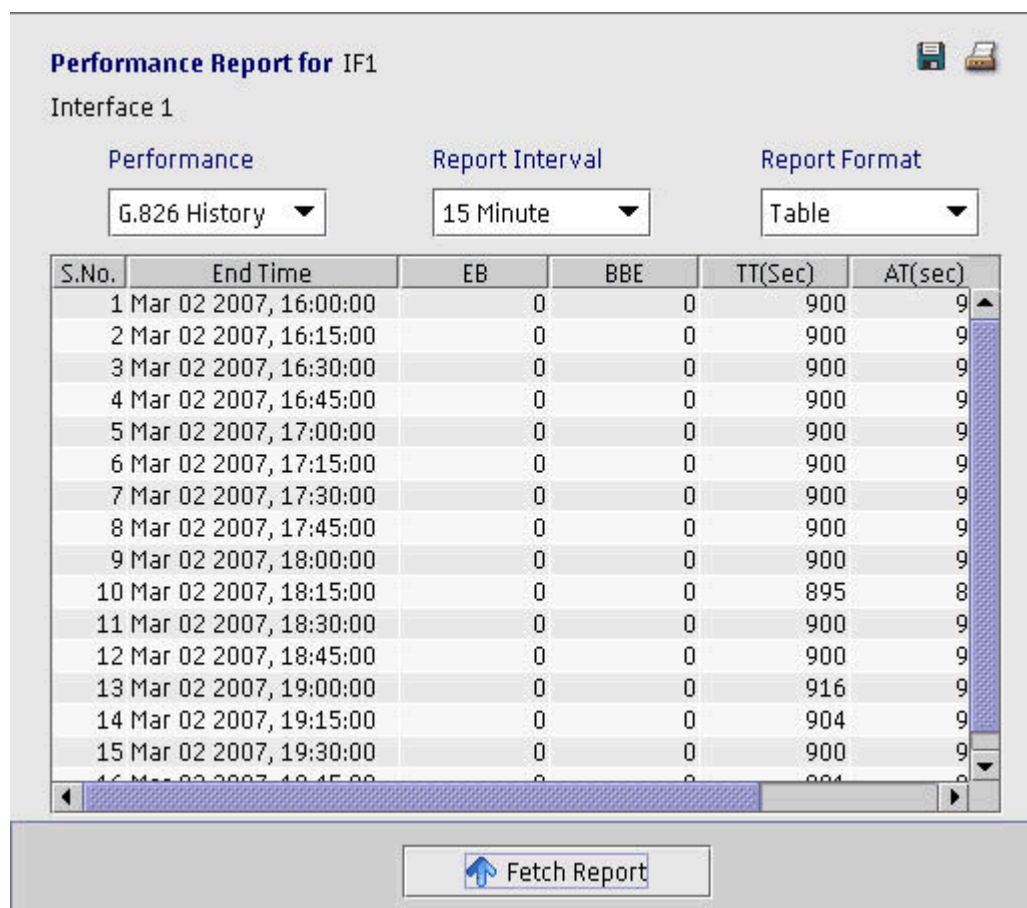


Figure 5. Report Format: Table

3. To display the Counters, select Performance → Counters.

If the selected Performance option is **Counters**, the counters and the following buttons are displayed in the view:

- **Fetch Counters** - Fetches the current values of the performance counters from the TRS.
- **Reset Counters** - Resets all performance counters.

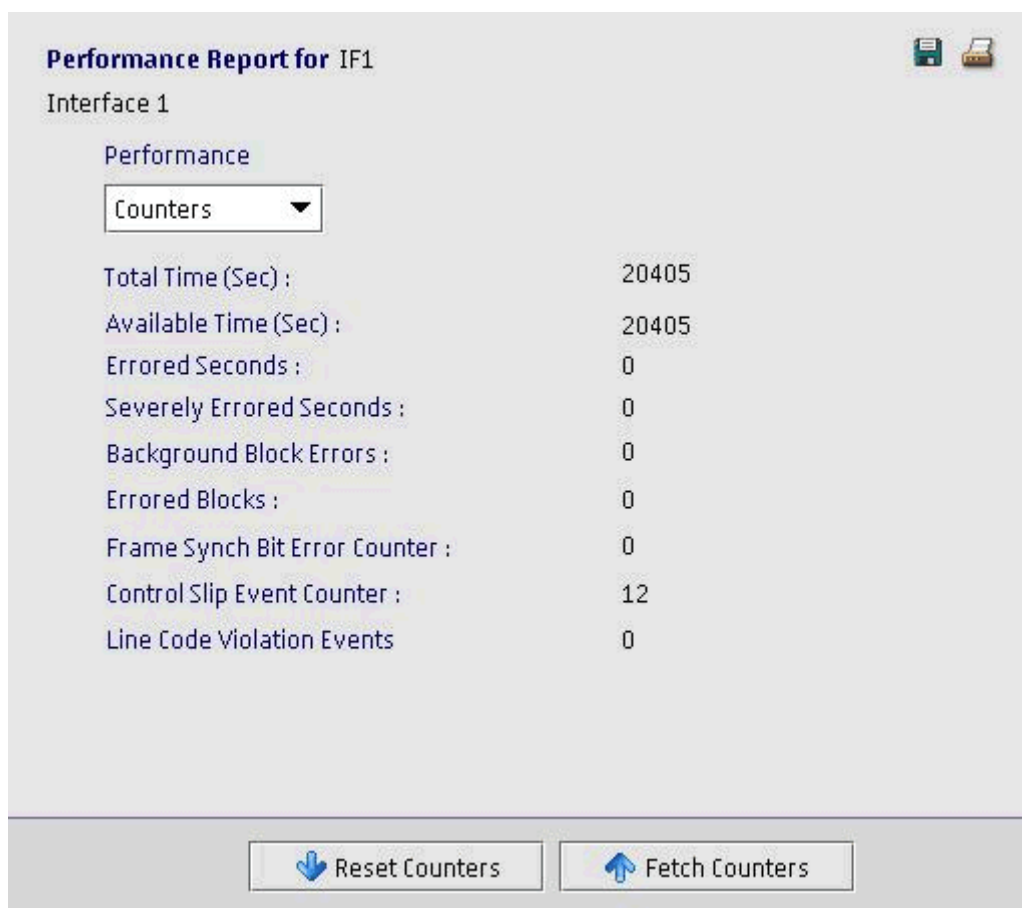


Figure 6. Performance view: Counters

5.2 Monitoring FIQA and FIYA in PWE mode

Purpose

With Nokia Flexi EDGE BTS Manager, you can monitor the performance of a PseudoWire (PW) transmission.



Steps

1. To open the Performance Monitoring view, select Transmission → Performance Monitoring.

Choosing the **Transmission → Performance Monitoring** command opens the **Performance Monitoring (PM)** view in the Transmission Equipment view. The **Performance Monitoring** view allows you to select the display of G.826, SLA, PWE and Ethernet performance monitoring data.

This function is only available in the online mode. Performance monitoring data is available as counter and history values. You can reset the counter values.

G.826 PM data

The following PM data is displayed:

- Errored Blocks (EB)
- Background Block Errors (BBE)
- Total Time (TT)
- Available Time (AT)
- Error Seconds (ES)
- Severely Errored Seconds (SES)

You need to select the PW before the performance monitoring data is displayed.

SLA PM data

The following PM data is displayed:

- Delay Variation Average (in microseconds)
- Delay Variation Minimum (in microseconds)
- Delay Variation Maximum (in microseconds)

Delay Variation is one of the key performance indicators for monitoring the end-to-end performance of a packet switched network. The SLA counter values are provided as current counter values and cannot therefore be reset.

PW PM data

The following PM data is displayed:

- Received PW packets in tunnel
- Transmitted PW packets in tunnel
- Packets not matching any PW
- Number of PW packets lost
- Early Packets

- Late Packets
- Received PW packets with L bit set

For the last four performance values in the above list, you need to select the PW before the performance monitoring data is displayed.

The 'Packets not matching any PW' PM data allows determining if the PW tunnel configuration is correct.

The 'Number of PW packets lost' PM data is one of the key performance indicators for monitoring the end-to-end performance of a packet switched network.

The 'Received PW packets with L bit set' PM data indicates a problem with the TDM link connected to the Far-end PW device.

The 'Early Packets' and 'Late Packets' PM data is required in analysing the 'Number of PW packets lost' PM data. Otherwise, it is not possible to determine if packets are lost due to bad network condition, wrong jitter buffer configuration or a long-running synchronisation that is deteriorated.

The 24 Hours report of the 'Received PW packets in tunnel' and the 'Transmitted PW packets in tunnel' PM data shows each 1000th packet.

Ethernet PM data

The following counters are displayed:

- Received Ethernet Packets
- Transmitted Ethernet Packets
- Ethernet Received Errored Packets

The 'Received Ethernet Packets' PM data indicates network misconfiguration or a malicious attack on the BTS. It is helpful with troubleshooting or for determining if the Ethernet link is working.

The 'Ethernet Received Errored Packets' PM data indicates problems with the physical Ethernet link or with the packet switched network itself.

The 24 Hours report of the 'Received Ethernet Packets' and the 'Transmitted Ethernet Packets' PM data shows each 1000th packet.

2. To display the History values, select History or Tunnel History.

You can select the information to be displayed:

- **Report Interval** - You can select the report interval: 15 Minutes or 24 Hours.
- **Report Format** - You can select how the information is shown: Table or Graph.
- **Fetch Report** - Fetches the performance report for the selected PM data and PW from the BTS.

If the selected Report Format is **Graph**, the PM data fetched from the BTS is displayed as a line graph. With the check boxes below the graph, you can select if the dedicated PM data is visible (check box marked) or not (check box cleared).

3. To display the Counter values, select Counters.

The counter values or 'Unknown' are displayed. With the **Fetch Counters** button you can display the current value of the counter values. The **Reset Counters** button allows you to reset the displayed counter values.

5.3 Monitoring FIFA

5.3.1 Reading performance information

Before you start

Note that having valid performance data depends on the network element time being set correctly.



Steps

1. Start FlexiHub Manager.

For instructions, see *Starting FlexiHub Manager*.

2. Establish a connection to the node.

For more information about establishing a connection, see *Connecting locally* and *Connecting remotely*.

3. On the FlexiHub Manager menu, select View → Performance, or select Performance from the View Bar.

The **Performance View** opens.

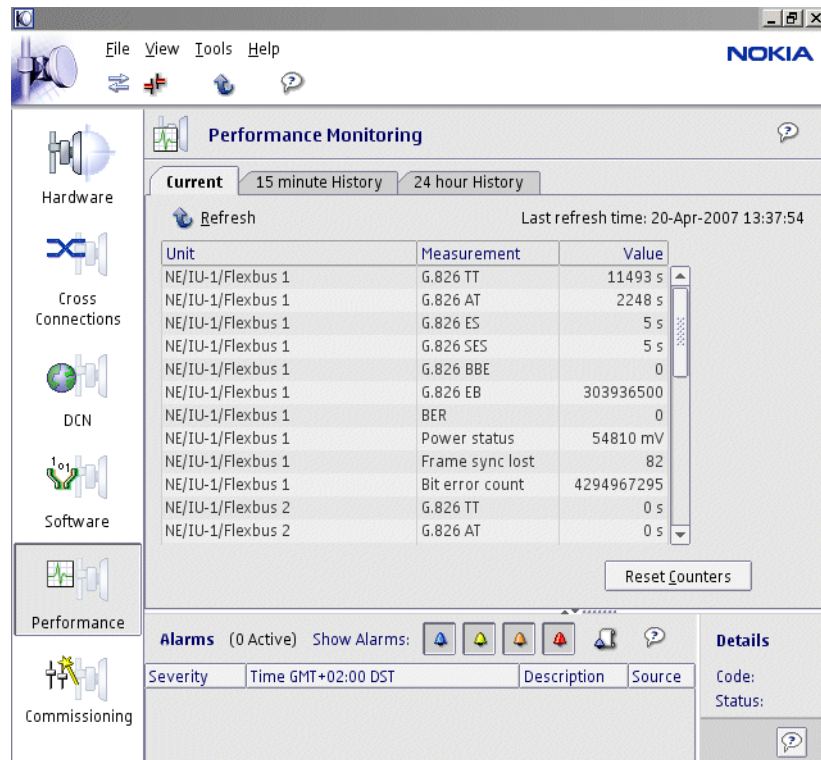


Figure 7. Performance View

4. Select the tab (*Current*, *15 Minute History* or *24 Hour History*).

Click on the tab to check the performance statistics.

5. Click Refresh to display or refresh the values.

6. To reset all current counter values, click Reset Counters.

Expected outcome

The latest performance information of all the units on the node has been displayed.

Further information

For more information, see *Measuring performance* under *Descriptions - Performance Management* in *Product Description for FIFA Flexbus Transmission Sub-module for Nokia Siemens Networks Flexi EDGE BTS*.

5.3.2 Resetting the counters

Before you start

The counters of the indoor unit and the outdoor unit must also be reset immediately after commissioning.

Note that only the current values of the counters are reset; the history records are not reset, because it would cause inconsistency in the records.



Steps

1. Start FlexiHub Manager.

For instructions, see *Starting FlexiHub Manager*.

2. Establish a connection to the node.

For more information about establishing a connection, see *Connecting locally* and *Connecting remotely*.

3. To reset the counters, select Performance → Current tab and click Reset Counters.

Expected outcome

The counters are reset and the current values are refreshed.