Nokia Siemens Networks

470318A
Nokia Flexi EDGE Base Station, Rel. EP1, Product Documentation, v.1

Trouble Management of Nokia Flexi EDGE BTS

DN70128112
Issue 1-0 en
27/06/2007

Contents

1 Overview of Nokia Flexi EDGE BTS alarms

1.1 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 deviated 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 deviated from the set speed`.

Note

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.

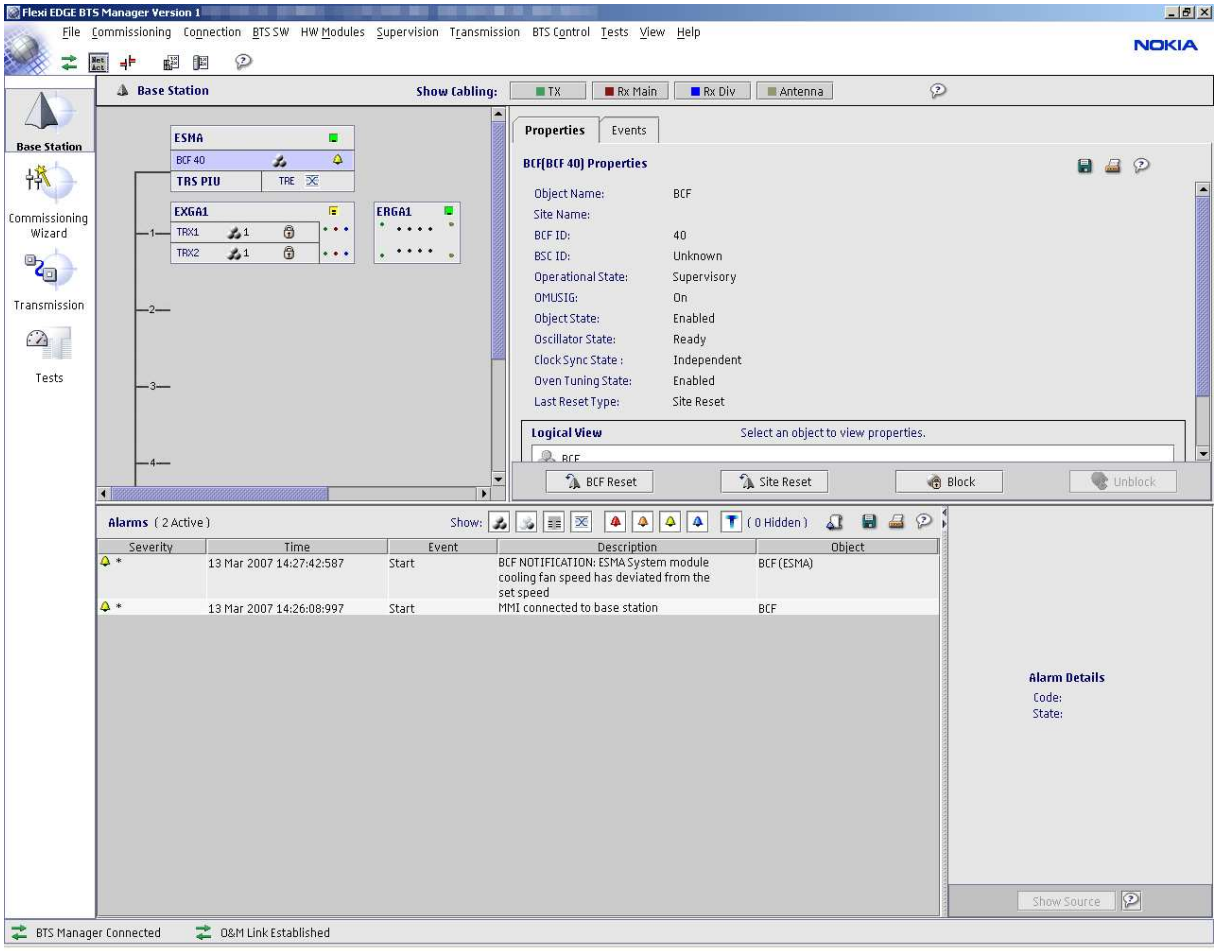

Figure 1. Alarm examples, Nokia Flexi EDGE BTS Manager view

1.2 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*.

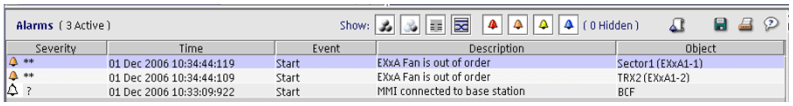

Figure 2. Alarms window of Nokia Flexi EDGE BTS Manager

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*.

1.3 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 the object can be active at a time.

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

Note

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.

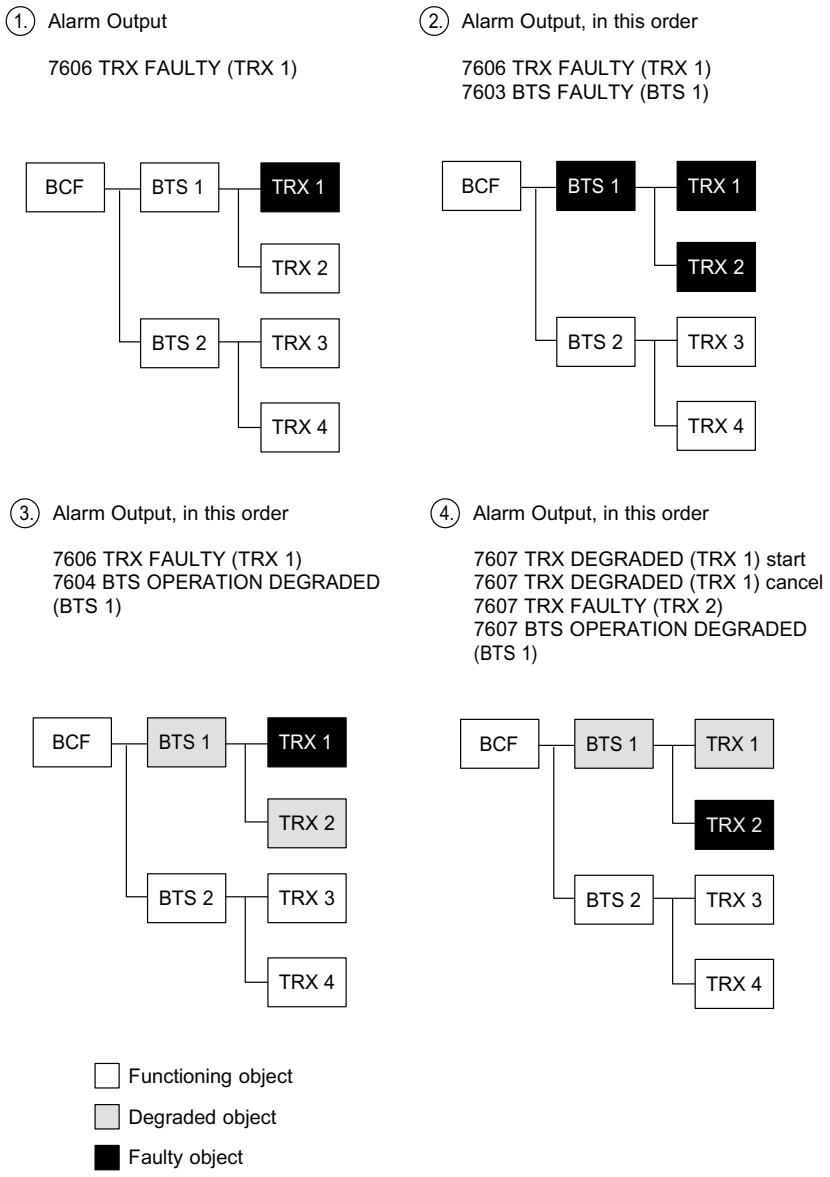

Figure 3. Faulty and degraded object alarm reclassification

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. 7607 TRX DEGRADED alarm is cancelled for TRX 1. 7606 TRX FAULTY alarm is issued for TRX 2.
3. Now the sector is partially faulty and a BTS alarm, 7604 BTS OPERATION DEGRADED, is issued.

2 Alarms for Nokia Flexi EDGE BTS

2.1 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: • 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: • Enabled • Disabled	The alarm origin(s). The unit is given an acronym, for example: ESMA, ESEA, ECxA, ERxA, EXxA
Fault reason:	**Instruction:**		**Alarm cancelling:**

Table 1. Description of the fields in the alarm table (cont.)

1234 ALARM NAME			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
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: 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: • Automatic • Manual • Conditional Conditional cancelling means that the alarm can be cancelled either manually or automatically. There are alarm-specific conditions for automatic alarm cancelling which are described in the alarm description table.

For instructions on how to replace 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.

2.2 7208 LOCAL BLOCK

Table 2. 7208 LOCAL BLOCK

7208 LOCAL BLOCK			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Minor	BCF, BTS, or TRX	Disabled	

Table 2. 7208 LOCAL BLOCK (cont.)

7208 LOCAL BLOCK		
Fault reason:	**Instruction:**	**Alarm cancelling:**
Field not used.	An object (TRX, Sector or BCF) is locally blocked by a BTS Manager command. No repair actions required, alarm is cancelled when object is locally deblocked by BTS Manager.	Automatic.

2.3 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.	This is an external user-defined alarm. This alarm is activated at the external equipment. 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 is correctly mated between EAC port of ESMA and the external equipment. 4. Check the ESMA and replace it if faulty.		Automatic.

2.4 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:**

Table 4. 7413 EXTERNAL ALARM 7413-7424, EXTERNAL ALARM 13-24 (cont.)

7413 EXTERNAL ALARM 7413-7424, EXTERNAL ALARM 13-24		
Field not used.	This is an external user-defined alarm. This alarm is activated at the external equipment. 1. Check that the relevant EAC line is correctly configured at the BSC (MML command ZEFO:<id>: IOP;). 2. Check equipment connected to EAC line. 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.

2.5 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.	ESMA System module detected that its Oven Controlled 26 MHz Oscillator is broken. 1. Issue a HW reset to ESMA from (remote) 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.	ESMA System module detected no synchronisation signal at synchronisation input (SIN) port at startup. 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 FIxx transmission submodule.	FIEA/FIPA/FIFA Transport sub-module is not detected. This alarm is normally reported to the local BTS Manager only. 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.
FIxx type mismatch between commissioning file and detected hardware.	FIEA/FIPA/FIFA Transport sub-module is of wrong type. This alarm is normally reported to the local BTS Manager only. 1. Option 1: Replace PIU module with a correct type (as defined in SCF) and issue a HW reset to ESMA. OR 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.	None of the BTS modules respond to ESMA polling command. 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.

Table 5. 7600 BCF FAULTY (cont.)

7600 BCF FAULTY		
ESEA System Extension module reported HW failure.	ESMA System module detected that a hardware failure has occurred in the ESEA System Extension module. 1. Issue HW reset to ESMA from BTS Manager. 2. If fault persists, replace ESEA and reset the BCF.	Automatic.
ESMA System module has lost connection to ESEA System Extension module.	ESEA System Extension module does not respond to ESMA polling command. 1. Check the power distribution to ESEA. 2. Check that the bus cable is correctly mated between ESMA and ESEA. 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. 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.
Simple/cascaded HW configuration and commissioning mismatch.	1. If simple configuration, remove ESEA module from Ethernet port 6 at ESMA module. 2. If cascaded configuration, add ESEA module to Ethernet port 6 at ESMA module.	Automatic.

2.6 7601 BCF OPERATION DEGRADED

Table 6. BCF OPERATION DEGRADED

7601 BCF OPERATION DEGRADED			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Major	BCF	Enabled	ESMA
Fault reason:	**Instruction:**		**Alarm cancelling:**
Difference between PCM and BTS frequency reference.	There is over 5 Hz difference to the 2MHz reference clock due to Abis link instability. 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 synchonisation 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.	FSEx External Alarm (EAC) module does not respond to poll message of the ESMA System module. 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.	One or more fans of the ESMA System module are not rotating. There is a danger of overheating. 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.
Commissioning failed due to BCF ID mismatch between commissioning file and BSC	Incorrect BCF ID between the BSC and the Commissioning File (SCF). 1. Check the transmission path of the traffic allocated to the site against the network plan. 2. Using the (remote) BTS Manager, recommission the BTS with correct BCF ID.		Automatic.

Table 6. BCF OPERATION DEGRADED (cont.)

7601 BCF OPERATION DEGRADED		
ESMA System module FLASH memory writing error.	Memory write failure occurred at SW download and is not valid, previously active SW is taken into use. 1. Issue a HW reset to ESMA from (remote) BTS Manager. 2. Attempt the SW download again. 3. If this alarm persists, replace ESMA.	Manual.
All external Q1 devices fail to respond.	None of the configured Q1 devices in the Q1 bus are responding to a polling command. 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.
Commissioning file climate control profile mismatch, no fans detected.	Climate control profile indicates an installed fan unit but it is missing from the actual configuration. There is a danger of overheating. 1. If none of the modules at the site require fan units, change the fan profile to "No Fans" in the SCF and re-commission the site. 2. Check that the fan unit cable is correctly mated to ESMA. 3. Replace the fan unit. 4. Replace the ESMA.	Automatic.
Module power cable connections are incorrectly configured.	One or more of the internal power cable connections does not match power cabling rules. Intelligent shutdown feature may not operate correctly. 1. Check the internal power and bus cabling against the product documentation set. 2. Issue a BCF reset.	Manual.

2.7 7602 BCF NOTIFICATION

Table 7. 7602 BCF NOTIFICATION

7602 BCF NOTIFICATION			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Minor	BCF	Enabled	ECxA, ESEA, ESMA, EXxA
Fault reason:	**Instruction:**		**Alarm cancelling:**
External synchronisation signals disabled.	LMU has operated without GPS signal over specified time and is turning its FCLK output off. 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.
BSS synchronisation failed.	ESMA System module has lost synchronisation signal at synchronisation input (SIN) port. 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 deviated from the set speed.	There is more than 20% deviation in fan speed between commanded and actual value. 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. Note: If "Temperature high/ dangerously high" and/or 7621 alarm(s) are also active, perform these actions as soon as possible.		Automatic.
ESMA System module temperature high.	ESMA System module has detected that its internal temperature has exceeded +90C/+194F. 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.		Automatic.

Table 7. 7602 BCF NOTIFICATION (cont.)

7602 BCF NOTIFICATION		
ECxx RTC module connected to wrong port.	ECxx RTC module is not connected to port 1/2/3 of ESMA System module. 1. Connect ECxx to ESMA port 1,2 or 3 and issue a BCF reset.	Automatic.
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 +90C/+194F. 1. Ensure that the ambient temperature of the base station is below +50C/+122F. 2. If the fault persists, replace ESEA.	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.

2.8 7603 BTS FAULTY

Table 8. 7603 BTS FAULTY

7603 BTS FAULTY			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Critical	BTS	Disabled	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.

2.9 7604 BTS OPERATION DEGRADED

Table 9. 7604 BTS OPERATION DEGRADED

7604 BTS OPERATION DEGRADED			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Critical	BTS	Enabled	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.

2.10 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 temperature dangerously high.	ECxx RTC module has detected that its internal temperature has exceeded +65C/+149F. 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 ECxx.		Automatic.
ECxx RTC module cooling fan(s) report no rotation.	One or more fans of the ECxx RTC module are not rotating. There is a danger of overheating. 1. Check that the fan unit cable is correctly mated to ECxx. 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 ECxx.		Automatic.
ECxx RTC module cooling fan speed has deviated from the set speed.	There is more than 20% deviation in fan speed between commanded and actual value. 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. Note: If "Temperature high/ dangerously high" and/or 7621 alarm(s) are also active, perform these actions as soon as possible.		Automatic.

2.11 7606 TRX FAULTY

Table 11. 7606 TRX FAULTY

7606 TRX FAULTY			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY			
Major	TRX	Disabled	ECxA, ERxA, ESMA, EXxA
Fault reason:	**Instruction:**		**Alarm cancelling:**
Hardware incompatibility detected during EXxx TRX module configuring.	Frequency band/channel or BTS configuration mismatch between the BTS units and BSC configuration. 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
EXxx TRX module has no combiner ERxx DDU or ECxx RTC module present.	There is no ERxx DDU module or ECxx RTC module detected for the sector at start up. 1. Depending on the desired configuration: a. Connect/check ER_A cable between ERxx and EXxx for the associated sector and issue a sector reset. OR b. Connect/check bus cable between ECxx and ESMA and issue a sector reset. 2. Replace ERxx/ECxx. 3. Replace EXxx.		Manual.
EXxx TRX module incoming frame clock FCLK missing.	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. 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. 3. Replace ESEA if alarming TRX is connected to it. 4. Replace ESMA.		Automatic

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
EXxx TRX module failed to synchronize to incoming frame clock FCLK.	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. 1. Check the bus cable chain from ESMA to EXxx. Issue a HW Reset 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. 3. Replace ESMA. 4. Replace ESEA.	Manual.
EXxx TRX module incoming 6.5 MHz reference clock missing.	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. 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. 3. Replace ESEA if alarming TRX is connected to it. 4. Replace ESMA.	Automatic.
EXxx TRX module temperature dangerously high.	EXxx TRX module has detected that its internal temperature 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 the EXxx.	Automatic.
Internal failure occurred during EXxx TRX module configuring.	There was no internal response or timeout occurred during EXxx TRX module configuration. 1. Reset the EXxx to allow unit reconfiguration. 2. If alarm persists, replace EXxx.	Manual TRX lock/ unlock.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
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.
ESMA System module has lost connection to EXxx TRX module.	EXxx TRX or ECxx RTC 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. DTRX Case: 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. 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. RTC Case: 1. Check the bus cable chain from ESMA to ECxx. 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. If the ECxx LED is off, replace the power cable. 3. Replace ECxx. 4. Replace ESMA.	Automatic.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
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.
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.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
EXxx TRX module failed to synchronize to incoming frame clock FCLK.	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. **! 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. 3. Check whether other ECxx modules have the same alarm, replace ESMA. 4. Replace ECxx.	Automatic.
ECxx RTC module received insufficient Tx power.	ECxx RTC module detected insufficient power during cavity tuning. RTC is unable to perform cavity tuning. 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.	Tx 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 Tx hopping synthesizer 2 fails to lock.	Tx hopping synthesizer 2 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 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.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
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 via RF cable autodetection.	RF cable autodetection failed due to no Tx or Rx connectivity from EXxx TRX module to ERxx DDU 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.	Manual.
EXxx TRX module detected no Rx signal during RF cable autodetection.	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. When this alarm is active, BTS Manager does not display any RF cabling. 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.	Manual.
Two or more ERxx DDU modules detected in 2- or 4-way combined sector.	RF cable autodetection detected that current combining method does not allow more than one ERxx DDU module in a sector. 1. Check that the Tx cabling from EXxx and EWxx modules in one sector are connected to the same ERxx module. 2. Remove extra ERxx from the sector.	Manual.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
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 ECxx. 5. Replace EWxx.	Manual Sector lock/ unlock.
ERxx DDU module has detected no Tx power at TxB input.	There is no Tx power detected at TxB 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 ECxx. 5. Replace EWxx.	Manual Sector lock/ unlock.
ERxx DDU module has detected VSWR above major limit at antenna A.	User definable major alarm threshold for VSWR measurement has been exceeded. The default value is 3.1. 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.	Manual.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
ERxx DDU module has detected VSWR above major limit at antenna B.	User definable major alarm threshold for VSWR measurement has been exceeded. The default value is 3.1. 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.	Manual.
ECxx RTC module has lost Tx power from all inputs.	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. 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.
ECxx RTC module has detected VSWR above major limit at antenna.	User definable major alarm threshold for VSWR measurement has been exceeded. The default value is 3.1. 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.	Manual Sector lock/ unlock.
Main Rx LNA amplifier chain is broken in ECxx RTC module.	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. 1. Replace ECxx.	Manual.

Table 11. 7606 TRX FAULTY (cont.)

7606 TRX FAULTY		
ECxx RTC module has detected that MHA on ANT A is broken.	Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA bypass is not configured/equipped. 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.	Manual.
ECxx RTC module has detected that MHA on ANT B is broken	Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA bypass is not configured/equipped. 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.	Manual.
ECxx RTC module has detected no Tx power during RF cable autodetection.	RF cable autodetection failed due to no Tx connectivity from EXxx TRX module to ECxx RTC module. 1. Check that the Tx and Rx cables between EXxx and ECxx are correctly mated and the connectors and cables are not damaged. Issue a sector reset from EM to restart RF cable autodetection. 2. Check that ECxx and EXxx are of same frequency band. 3. Check that bus cable and internal power cable is correctly mated between ECxx and ESMA. 4. If all the EXxx connected to the ECxx have raised this alarm, replace ECxx. 5. Replace EXxx. 6. Replace ECxx.	Manual.

2.12 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 bypass is not configured/equipped. 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 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.	Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA bypass is not configured/equipped. 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 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 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 bypass is not configured/equipped. The upper and lower limits are user definable during commissioning. If diversity is used, diversity 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.
ECxx RTC module has detected that MHA on its antenna B is broken.	Measured current consumption of Mast Head Amplifier has either exceeded the upper limit or dropped below the lower limit. MHA bypass is not configured/equipped. 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.
Frequency band mismatch between commissioning file and detected hardware.	Mismatch between User specified Receiver Band in MHA information and actual network type of ECxx RTC module / ERxx DDU module. 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.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
EXxx TRX module cooling fan(s) report no rotation.	One or more fans of the EXxx TRX module are not rotating. There is a danger of overheating. 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.	One of the two low noise amplifiers in balanced stage failed in Path A of ERxx DDU module. 1. Replace ERxx.	Automatic.
One amplifier stage of Rx LNA Path B is broken in ERxx DDU module.	One of the two low noise amplifiers in balanced stage failed in Path B of ERxx DDU module. 1. Replace ERxx.	Automatic.
Current used by MHA is out of range for ERxx DDU module (antenna A 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 ERxx.	Manual.
Current used by MHA is out of range for ERxx DDU module (antenna B 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 ERxx.	Manual.
ERxx DDU module SW upgrade failed.	SW upgrade is aborted due to negative acknowledgement from ERxx DDU module during sw download. 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		
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.
Current used by MHA is out of range for ECxx RTC module (antenna B 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.
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.
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.
Commissioning file climate control profile mismatch, no fans detected.	Climate control profile indicates an installed fan unit but it is missing from the actual configuration. There is a danger of overheating. 1. If none of the modules at the site require fan units, change the fan profile to "No Fans" in the SCF and re-commission the site. 2. Check that the fan unit cable is correctly mated to EXxx. 3. Replace the fan unit. 4. Replace the EXxx.	Conditional. Can only be automatically cancelled when Site is commissioned with "no fans climate control profile".
Current used by MHA is out of range for ECxx RTC module (antenna A 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		
EXxx TRX module Tx power is at least 3dB less than expected at DPC.	Tx output power is over 3 dB lower than expected at Digital Power Control circuit block in EXxx TRX module. 1. Reset TRX/Sector. 2. Replace EXxx.	Manual.
EXxx TRX module detected only one Rx signal during RF cable autodetection.	RF cable autodetection found Rx signal missing from the sector where Rx diversity is being used. 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.	Manual.
RF cable autodetection found mixed (bypass/2-/4-way) Tx combining in a sector.	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 2.5 dB. 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.	Manual.
RSSI detected Rx signal difference exceeding threshold.	The difference limit of Received Signal Strength Indicator measurement has exceeded between the main and diversity antennas. 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 RF cables and connections. 3. 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. 4. Check and measure the antenna lines. 5. Check the antenna alignment. 6. Replace ERxx. 7. Replace EXxx.	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
TRX objects of an EXxx TRX module are illegally split between 2 sectors.	TRX objects of one EXxx module are split into two different sectors when Rx diversity is in use. 1. Revise the RF cabling according to the actual configuration required (SCF/BSC). Issue a BCF reset to allow restart of RF cable autodetection. 2. If the target is to split TRX objects across sectors, perform recommissioning and manually specify the cabling including the split.	Automatic.
ERxx DDU module has detected VSWR above minor limit at antenna A.	User definable minor alarm treshold for VSWR measurement has been exceeded. The default value is 2.1. 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.	Automatic.
ERxx DDU module has detected VSWR above minor limit at antenna B.	User definable minor alarm threshold for VSWR measurement has been exceeded. The default value is 2.1. 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.	Automatic.

Table 12. 7607 TRX OPERATION DEGRADED (cont.)

7607 TRX OPERATION DEGRADED		
ECxx RTC module has detected VSWR above minor limit at antenna.	User definable minor alarm threshold for VSWR measurement has been exceeded. The default value is 2.1. 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 ECxx.	Automatic.

2.13 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.	EXxx TRX module has detected that its internal temperature has exceeded +90C/+194F. 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.
ERxx DDU module SW upgrade impossible, unknown manufacturer.	EXxx TRX module cannot identify connected ERxx DDU module. SW release incompatibility with connected HW. 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 deviated from the set speed.	There is more than 20% deviation in fan speed between commanded and actual value. 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. Note: If "Temperature high/ dangerously high" and/or 7621 alarm(s) are also active, perform these actions as soon as possible.	Automatic.
ERxx DDU module loop synthesizer fails to lock.	The RF loop synthesizer in ERxx DDU module has not achieved phase lock state after several attempts. 1. Replace ERxx.	Automatic.
ECxx RTC module incoming frame clock FCLK lost during runtime.	RTC module has detected that the Frame Clock coming from the ESMA System module is missing. Air3 loop services are unavailable. 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.	There is no temperature measurement in the EXxx TRX module. All temperature sensors inside the module are broken. Fans are rotating at maximum speed. 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.	The RF loop synthesizer in ECxx RTC module has not achieved phase lock state after several attempts. 1. Replace ECxx.	Automatic.

2.14 7612 SITE POWERING FAULTY

Table 14. 7612 SITE POWERING FAULTY

7612 SITE POWERING FAULTY			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Critical	BCF	Enabled	FPBA
Fault reason:	**Instruction:**		**Alarm cancelling:**

Table 14. 7612 SITE POWERING FAULTY (cont.)

7612 SITE POWERING FAULTY		
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.

2.15 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	FPBA
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.

2.16 7614 SITE POWERING NOTIFICATION

Table 16. 7614 SITE POWERING NOTIFICATION

7614 SITE POWERING NOTIFICATION			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Minor	BCF	Enabled	FPBA
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.

2.17 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 (remote) BTS Manager. No actions required. The alarm is cancelled automatically once the test is completed.		Automatic.

2.18 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
Fault reason:	**Instruction:**		**Alarm cancelling:**
Clock tuning DAC word reaching min/max limit.	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. 1. Check the Abis synchronisation that there are valid Rx clock sources available. 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.

2.19 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:**
Base Station ambient temperature outside operating range.	Ambient temperature of the Base Station is either below -35C/-31F or over +50C/+122F. 1. Ensure that the ambient temperature at the site is within the limits (between -35…+50C/-31…+122F). 2. If the fault persists, replace ESMA.		Automatic.

2.20 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.	BTS Manager is connected to the BTS. No actions required. The alarm is cancelled automatically once BTS Manager is disconnected.		Automatic.

2.21 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	FPBA
Fault reason:	**Instruction:**		**Alarm cancelling:**
Field not used.	One or more AC phases of the mains supply are faulty and site is operating on battery backup. 1. Check the mains supply coming to the site support equipment. 2. If the mains supply is ok, Check the EAC cabling between ESMA and the site support equipment. 3. Repair the site support equipment.		Automatic.

2.22 8020 Blocked from use

Table 22. 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.	A cross-connection is configured to an interface which is not in use. 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 Italic font. 2. Remove any unnecessary cross connections that have termination point(s) to non-existing or unused interfaces.		Automatic.

2.23 8021 Loop to interface

Table 23. 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.	PDH test-loop to Interface activated. No Actions required, alarm is cancelled when interface loop is deactivated by the user with BTS Manager or after defined timeout.		Automatic.

2.24 8022 Loop to equipment

Table 24. 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.

2.25 8048 Loss of incoming signal

Table 25. 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.

2.26 8050 Loss of incoming 2 M signal

Table 26. 8050 Loss of incoming 2 M signal

8050 Loss of incoming 2 M signal			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**

Table 26. 8050 Loss of incoming 2 M signal (cont.)

8050 Loss of incoming 2 M signal			
Critical	TRE	Enabled	ESMA
Fault reason:	**Instruction:**		**Alarm cancelling:**
Field not used.	FIxx PIU has detected no incoming signal on E1 interface. Far End Alarm bit indication (TS0/b3) is sent in Tx direction. 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 FIxx		Automatic.

2.27 8056 Loss of incoming 1.5 M signal

Table 27. 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.	FIxx PIU has detected no incoming signal on T1 interface. Yellow Alarm is sent in Tx direction. 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.

2.28 8066 AIS 2 M

Table 28. 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.	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. 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 FIxx.		Automatic.

2.29 8073 AIS 1.5 M

Table 29. 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.	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. 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.

2.30 8081 Loss of frame alignment

Table 30. 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:**
Field not used.	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. 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 FIxx 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 FIxx is fully inserted in to ESMA. 7. Replace FIxx. 8. Check the signal quality of the transmission path to the alarming equipment.		Automatic.

2.31 8086 Loss of CRC multiframe alignment

Table 31. 8086 Loss of CRC multiframe alignment

8086 Loss of CRC multiframe alignment			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Critical	TRE	Enabled	ESMA

Table 31. 8086 Loss of CRC multiframe alignment (cont.)

8086 Loss of CRC multiframe alignment		
Fault reason:	**Instruction:**	**Alarm cancelling:**
Field not used.	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. 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 FIxx.	Automatic.

2.32 8099 Error rate > 1 E-3

Table 32. 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 32. 8099 Error rate > 1 E-3 (cont.)

8099 Error rate > 1 E-3		
Field not used.	Received signal has degraded on E1/T1 interface. Bit Error Ratio (BER) is over 1E-3. 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 FIxx 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 FIxx is fully inserted in to ESMA. 7. Replace FIxx. 8. Check the signal quality of the transmission path to the alarming equipment.	Automatic.

2.33 8102 Error rate > 1 E-6

Table 33. 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 33. 8102 Error rate > 1 E-6 (cont.)

8102 Error rate > 1 E-6		
Field not used.	Received signal has degraded on E1/T1 interface. Bit Error Ratio (BER) is over 1E-6. 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 FIxx 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 FIxx is fully inserted in to ESMA. 7. Replace FIxx. 8. Check the signal quality of the transmission path to the alarming equipment.	Automatic.

2.34 8112 Frequency error

Table 34. 8112 Frequency error

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

Table 34. 8112 Frequency error (cont.)

8112 Frequency error		
Field not used.	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' . 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 FIxx. 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.

2.35 8125 Loss of synchronization signal (s)

Table 35. 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 35. 8125 Loss of synchronization signal (s) (cont.)

8125 Loss of synchronization signal (s)		
Field not used.	All defined synchronisation sources in the synchronisation priority list are invalid or the list is empty. Node is running on its internal clock. 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 FIxx. Check also condition of the connectors. 5. Replace FIxx.	Automatic.

2.36 8148 Equipment reset

Table 36. 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.	This warning is issued by Q1 device when reset has occurred. 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.

2.37 8162 Database full

Table 37. 8162 Database full

8162 Database full			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Warning	TRE	Enabled	ESMA
Fault reason:	**Instruction:**		**Alarm cancelling:**
Field not used.	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. 1. Find out the alarming Q1 device and refer to its product documentation for more details on this warning message.		This is warning and no cancellation is sent.

2.38 8165 Real time lost fault

Table 38. 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.	Q1 device has not received real time from the polling master (BTS/BSC). Time stamps are not displayed correctly. 1. Find out the alarming Q1 device and refer to its product documentation for more details on this alarm.		Automatic.

2.39 8172 Yellow alarm

Table 39. 8172 Yellow alarm

8172 Yellow alarm			
Severity:	**Object affected:**	**Object state:**	**Module/Unit:**
Major	TRE	Enabled	ESMA
Fault reason:	**Instruction:**		**Alarm cancelling:**
Field not used.	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. 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 FIxx 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 FIxx is fully inserted in to ESMA. 6. Replace FIxx.		Automatic Cancellation is done automatically when Yellow alarm (RAI) clearance is detected according to ANSI T1.231.

2.40 8179 Far-end alarm

Table 40. 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 40. 8179 Far-end alarm (cont.)

8179 Far-end alarm		
Field not used.	Sent by the equipment in the far-end (TS0 Bit 3), which indicates that far-end equipment is unable to receive the signal. 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 FIxx 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 FIxx is fully inserted in to ESMA. 6. Replace FIxx.	Automatic.

2.41 8202 Loss of supervision connection

Table 41. 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 41. 8202 Loss of supervision connection (cont.)

8202 Loss of supervision connection		
Field not used.	Q1 device doesn't respond to poll command sent by the polling master (BTS/BSC). 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.

2.42 8240 Active alarm point

Table 42. 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.	This is an external user-defined alarm. This alarm is activated at the external equipment. Alarrm line number is mapped to Supervision Block number. EAC lines can be routed via EAC port at ESMA or via FSEx connected to ESMA. 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 Alarms for FIFA Flexbus Transmission Sub-module

3.1 Functional entity: FIFA

3.1.1 258 15 min G826 BBE threshold crossed

Severity

Minor

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 258

Alarm explanation: The 15 min G.826 BBE threshold has been crossed.

Instructions

N/A

Cancelling

The alarm is cancelled when the signal has been good enough (= BBE under the reset threshold) for a 15-minute period.

3.1.2 256 15 min G826 ES threshold crossed

Severity

Minor

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 256

Alarm explanation: The 15 min G.826 ES threshold has been crossed.

Instructions

N/A

Cancelling

The alarm is cancelled when the signal has been good enough (= ES under the reset threshold) for a 15-minute period.

3.1.3 257 15 min G826 SES threshold crossed

Severity

Major

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 257

Alarm explanation: The 15 min G.826 SES threshold has been crossed.

Instructions

N/A

Cancelling

The alarm is cancelled when the signal has been good enough (= SES under the reset threshold) for a 15-minute period.

3.1.4 261 24 h G826 BBE threshold crossed

Severity

Warning

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 261

Alarm explanation: The 24 h G.826 BBE threshold has been crossed.

Instructions

N/A

Cancelling

The warning resets automatically.

3.1.5 259 24 h G826 ES threshold crossed

Severity

Warning

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 259

Alarm explanation: The 24 h G.826 ES threshold has been crossed.

Instructions

N/A

Cancelling

The warning resets automatically.

3.1.6 260 24 h G826 SES threshold crossed

Severity

Warning

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 260

Alarm explanation: The 24 h G.826 SES threshold has been crossed.

Instructions

N/A

Cancelling

The warning resets automatically.

3.1.7 64 Alarm signal is received

Severity

Critical

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 64

Alarm explanation: 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.

Instructions

N/A

Cancelling

N/A

3.1.8 113 Buffer overflow (or underflow)

Severity

Critical

Fault reason

SB: BFI (1&3) channel (1-16)

Description

Fault code: 113

Alarm explanation: The bit rate of received 2M signal is not within limits.

Instructions

N/A

Cancelling

N/A

3.1.9 186 Configuration error

Severity

Minor

Fault reason

SB 1: Identifications

SB 2: SW setup

Description

Fault code: 186

Alarm explanation 1: One or more of the following identifications missing:

1. FE type string
2. FEproduct code string
3. FE product version string
4. FEserial number string
5. FEuser's manual product code string
6. FE user's manual product version string
7. TX clock calibration missing or illegal

Alarm explanation 2:

1. No backup available.
2. Backup available for this unit, needs activation.

Instructions

Instructions 1: Contact the manufacturer.

Instructions 2: N/A

Cancelling

N/A

3.1.10 185 Connection or settings have changed

Severity

Warning

Fault reason

SB 1: Flexbus (1-2)

SB 2: FM setup

SB 3: Identifications

Description

Fault code: 185

Alarm explanation 1: The G.826 settings have changed.

Alarm explanation 2: The fault management settings have changed.

Alarm explanation 3:: The identifications have changed.

Instructions

N/A

Cancelling

The warning resets automatically.

3.1.11 162 Database full

Severity

Warning

Fault reason

SB: Event history

Description

Fault code: 162

Alarm explanation: Overflow in event history

Instructions

The alarm history is flushed by NMS alarm polling.

When the (new) Nokia 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.

When the (old) Q1 alarm polling is used, the network master never flushes the alarm history. When FIFA receives an alarm polling (Get Fault Condition) command, it flushes the alarm history for all ports (usually one or more Q1Ps and one LMP).

If the Old Q1 Support mode (use the old style fault handler setting) is enabled, the FIFA software regularly flushes the alarm histories of all ports.

Cancelling

The warning resets automatically.

3.1.12 148 Equipment reset

Severity

Warning

Fault reason

SB: HW setup

Description

Fault code: 148

Alarm explanation: The unit is starting up after power-on or reset.

Consequence: Traffic interruption until the unit has started up again (max. 60 seconds).

Instructions

N/A

Cancelling

The warning resets automatically.

3.1.13 99 Error rate > 1 E–3

Severity

Critical

Fault reason

SB 1: Flexbus (1-2)

Description

Fault code: 99

Alarm explanation: The received signal BER is over the alarm threshold. Possible reasons:

1. The signal from the radio path is attenuated.
2. There is a hardware fault in the Flexbus cable or interface.

Instructions

N/A

Cancelling

Cancelling: Cancelled when BER is under the alarm threshold.

3.1.14 100_101_102 Error rate > 1 E–4, Error rate > 1 E–5, Error rate > 1 E–6

Severity

Major

Fault reason

SB 1: Flexbus (1-2)

Description

Fault code: 100, 101, 102

Alarm explanation: The received signal BER is over the alarm threshold. Possible reasons:

1. The signal from the radio path is attenuated.
2. There is a hardware fault in the Flexbus cable or interface.

Instructions

N/A

Cancelling

Cancelling: Cancelled when BER is under the alarm threshold.

3.1.15 103 Error rate > 1 E–7

Severity

Minor

Fault reason

SB 1: Flexbus (1-2)

Description

Fault code: 103

Alarm explanation: The received signal BER is over the alarm threshold. Possible reasons:

1. The signal from the radio path is attenuated.
2. There is a hardware fault in the Flexbus cable or interface.

Instructions

N/A

Cancelling

Cancelling: Cancelled when BER is under the alarm threshold.

3.1.16 179 Far-end alarm

Severity

Major

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 179

Alarm explanation: The traffic is broken in one direction.

Possible reasons:

Either the far-end IU is not receiving data transmitted by the near-end IU, but the near-end IU is receiving data transmitted the far-end IU, or vice versa.

Instructions

N/A

Cancelling

Cancelled when data transmission functions in both directions.

3.1.17 128 Fault in equipment

Severity

Major

Fault reason

SB: SW setup

Description

Fault code: 128

Alarm explanation: File system error

Instructions

Replace the unit.

Cancelling

N/A

3.1.18 142 Fault in installation of equipment

Severity

Critical

Fault reason

SB 1: -Flexbus (1-2)

SB 2: HW setup

Description

Fault code: 142

Alarm explanation 1: Flexbus has not been set in use, but the OU (or IU) is connected to it

Alarm explanation 2: Incompatible unit

Instructions

Instructions 1: When Flexbus and radio are commissioned, set *In use* to *ON*.

Instructions 2: Check the Nokia FlexiHub Manager troubleshooting instructions to find out which unit is faulty:

- If the HW module is faulty, replace the module.
- If the SW is incompatible, download new software.

Cancelling

Cancelling 1: Cancelled when *In use* is set *ON.*

Cancelling 2: Cancelled after the situation is corrected and the indoor unit restarted.

3.1.19 137 Fault in oscillator

Severity

Critical

Fault reason

SB: Clock monitor

Description

Fault code: 137

Alarm explanation: The internal oscillator is faulty.

Instructions

N/A

Cancelling

N/A

3.1.20 0 Fault in power supply

Severity

Critical

Fault reason

SB 1: Flexbus (1-2)

SB 2: Power supply

Description

Fault code: 0

Alarm explanation 1: There is a power supply fault in the Flexbus OU. Possible reasons:

1. Failure in power supply.
2. Short circuit in the Flexbus cable.

Alarm explanation 2: The power supply voltage is below or above the limit. See measurements.

Instructions

N/A

Cancelling

N/A

3.1.21 267 Licence expired

Severity

Critical

Fault reason

SB: SW setup

Description

Fault code: 267

Alarm explanation: The short-term licence of an active feature has expired.

Instructions

Obtain a new licence file for this feature or turn off the feature.

Cancelling

The alarm is cancelled when a new licence has been installed or the feature is no longer in use.

3.1.22 269 Licence for feature is not available

Severity

Critical

Fault reason

SB: SW setup

Description

Fault code: 269

Alarm explanation: A license for the enabled feature is not available. The feature was most likely activated from a configuration backup during a unit replacement and the replacement unit does not contain a licence.

Instructions

Obtain a new licence file for this feature or turn off the feature.

Cancelling

The alarm is cancelled when a new licence has been installed or the feature is no longer in use.

3.1.23 268 Licence will expire in near future

Severity

Major

Fault reason

SB: SW setup

Description

Fault code: 268

Alarm explanation: The time limited licence for the feature will expire in the near future.

Instructions

Obtain a new licence file for this feature or turn off the feature before the expiry time.

Cancelling

The alarm is cancelled when a new licence has been installed or the feature is no longer in use.

3.1.24 81 Loss of frame alignment

Severity

Critical

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 81

Alarm explanation:

1. Flexbus received a faulty or errored signal.

2. There is a fault in the Flexbus cable interface.

Instructions

N/A

Cancelling

N/A

3.1.25 48 Loss of incoming signal

Severity

Critical

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 48

Alarm explanation:

1. The Flexbus RX clock is missing.
2. The Flexbus RX clock oscillator is faulty.

Instructions

N/A

Cancelling

N/A

3.1.26 144 Operating error

Severity

Critical

Fault reason

SB: SW setup

Description

Fault code: 144

Alarm explanation:

1. File system error
2. Internal SW error

Instructions

Replace the unit.

Cancelling

N/A

3.1.27 165 Real time lost fault

Severity

Major

Fault reason

SB: Real time clock

Description

Fault code: 165

Alarm explanation: The Real Time Clock (RTC) has not been set after reset.

Instructions

Instructions:

1. Set the RTC with Nokia FlexiHub Manager.
2. The RTC is set by NMS.

Cancelling

Cancelled when the RTC is set.

3.1.28 184 Real time updated

Severity

Warning

Fault reason

SB: Real time clock

Description

Fault code: 184

Alarm explanation: The updated RTC difference is more than 5 s.

Instructions

N/A

Cancelling

The warning resets automatically.

3.1.29 263 Statistics reset

Severity

Warning

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 263

Alarm explanation: The G.826 error counters (current measurement) are reset.

Instructions

N/A

Cancelling

The warning resets automatically.

3.1.30 262 Unavailability

Severity

Critical

Fault reason

SB: Flexbus (1-2)

Description

Fault code: 262

Alarm explanation: The amount of errored blocks has been more than 30% for at least 10 consecutive seconds.

Instructions

N/A

Cancelling

Cancelled when the amount of errored blocks has been less than 30% for 10 consecutive seconds.

3.2 Functional entity: NE/FE0

3.2.1 258 15 min G826 BBE threshold crossed

Severity

Minor

Fault reason

SB: Protected hop

Description

Fault code: 258

Alarm explanation: The 15 min G826 BBE threshold has been crossed.

Instructions

N/A

Cancelling

The alarm is cancelled when the signal has been good enough for 15 minutes (BBE less than the reset threshold).

3.2.2 256 15 min G826 ES threshold crossed

Severity

Minor

Fault reason

SB: Protected hop

Description

Fault code: 256

Alarm explanation: The 15 min G.826 ES threshold has been crossed.

Instructions

N/A

Cancelling

The alarm is cancelled when the signal has been good enough (= ES under the reset threshold) for a 15-minute period.

3.2.3 257 15 min G826 SES threshold crossed

Severity

Major

Fault reason

SB: Protected hop

Description

Fault code: 257

Alarm description: The 15 min G.826 SES threshold has been crossed.

Instructions

N/A

Cancelling

The alarm is cancelled when the signal has been good enough (= SES under the reset threshold) for a 15-minute period.

3.2.4 261 24 h G826 BBE threshold crossed

Severity

Warning

Fault reason

SB: Protected hop

Description

Fault code: 261

Alarm explanation: The 24 h G.826 BBE threshold has been crossed.

Instructions

N/A

Cancelling

The warning resets automatically.

3.2.5 259 24 h G826 ES threshold crossed

Severity

Warning

Fault reason

SB: Protected hop

Description

Fault code: 259

Alarm explanation: The 24 h G.826 ES threshold has been crossed.

Instructions

N/A

Cancelling

The warning resets automatically.

3.2.6 260 24 h G826 SES threshold crossed

Severity

Warning

Fault reason

SB: Protected hop

Description

Fault code: 260

Alarm explanation: The 24 h G.826 SES threshold has been crossed.

Instructions

N/A

Cancelling

The warning resets automatically.

3.2.7 185 Connection or settings have changed

Severity

Warning

Fault reason

SB 1: FM setup

SB 2: HW setup

SB 3: Identifications

SB 4: Protected hop

Description

Fault code: 185

Alarm explanation 1: The fault management settings have changed.

Alarm explanation 2: New unit(s) have been added, removed, or replaced in the system.

Alarm explanation 3: The identifications have changed.

Alarm explanation 4: The G.826 settings have changed.

Instructions

Instructions 1, 3 and 4: N/A

Instructions 2: Refresh Hopper Manager's equipment view.

Cancelling

Cancelling 1 - 4: The warning resets automatically.

3.2.8 99 Error rate > 1 E-3

Severity

Critical

Fault reason

SB: Protected hop

Description

Fault code: 99

Alarm explanation: The received signal BER is over the alarm threshold. Possible reasons:

1. The signal from the radio path is attenuated.
2. There is a hardware fault in the Flexbus cable or interface.

Instructions

N/A

Cancelling

Cancelled when BER is under the alarm threshold.

3.2.9 100_101_102 Error rate > 1 E-4, Error rate > 1 E-5, Error rate > 1 E-6

Severity

Major

Fault reason

SB: Protected hop

Description

Fault code: 100, 101, 102

Alarm explanation: The received signal BER is over the alarm threshold. Possible reasons:

1. The signal from the radio path is attenuated.
2. There is a hardware fault in the Flexbus cable or interface.

Instructions

N/A

Cancelling

Cancelled when BER is under the alarm threshold.

3.2.10 103 Error rate > 1 E–7

Severity

Minor

Fault reason

SB: Protected hop

Description

Fault code: 103

Alarm explanation: The received signal BER is over the alarm threshold. Possible reasons:

1. The signal from the radio path is attenuated.
2. There is a hardware fault in the Flexbus cable or interface.

Instructions

N/A

Cancelling

Cancelled when BER is under the alarm threshold.

3.2.11 143 Fault in change-over function

Severity

Critical

Fault reason

SB: Operation mode

Description

Fault code: 143

Alarm explanation:

1. 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).

2. The OU software is incompatible with the used operation mode.

Instructions

1. Restore the configuration backup of the OU or correct the settings.

2. Download the new software to the OU.

3. Follow the commissioning procedure.

4. Restore the configuration backup of the IU or correct the settings. Wait 60 seconds after each setting change.

Cancelling

N/A

3.2.12 128 Fault in equipment

Severity

Major

Fault reason

SB: Protection lost

Description

Fault code: 128

Alarm explanation: The protection is lost due to faulty unit(s) and the redundant signal path is in use. The reason is one of the following:

1. OU transmitter error
2. OU receiver error
3. IU TX oscillator error
4. IU hardware register error
5. IU cannot lock to the Flexbus signal

Instructions

Instructions:

1. Check other faults present in the node to determine the actual reason for the alarm, and replace the faulty unit.
2. Check other faults present in the node to determine the actual reason for the alarm, and replace the faulty unit.
3. Check other faults present in the node to determine the actual reason for the alarm, and replace the faulty unit.
4. Check other faults present in the node to determine the actual reason for the alarm, and replace the faulty unit.
5. Check other faults present in the node to determine the actual reason for the alarm, and replace the faulty unit.

Cancelling

The alarm is cancelled when the fault is corrected.

3.2.13 141 Forced control on

Severity

Critical

Fault reason

SB: Operation mode

Description

Fault code: 141

Alarm explanation:

1. Automatic fading margin measurement on.

Instructions

N/A

Cancelling

The alarm is cancelled after the automatic fading margin measurement has finished.

3.2.14 263 Statistics reset

Severity

Warning

Fault reason

SB: Protected hop

Description

Fault code: 263

Alarm explanation: The G.826 error counters (current measurement) have been reset.

Instructions

N/A

Cancelling

The warning resets automatically.

3.2.15 262 Unavailability

Severity

Critical

Fault reason

SB: Protected hop

Description

Fault code: 262

Alarm explanation: The amount of errored blocks has been more than 30% for at least 10 consecutive seconds.

Instructions

N/A

Cancelling

Cancelled when the amount of errored blocks has been less than 30% for 10 consecutive seconds.

4 Troubleshooting Nokia Flexi EDGE BTS

4.1 Overview of troubleshooting the BTS

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

For additional information on the BTS status when troubleshooting, use a mobile phone to contact the Base Station Controller (BSC) personnel.

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.

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 with BTS Manager*

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

For more information on possible faults and appropriate corrective actions, see the Generic Failure Status Report document in the SW Release Documentation.

4.2 Troubleshooting commissioning

4.2.1 Failed commissioning

Summary

Fault - The commissioning of Nokia Flexi EDGE BTS fails.

Steps

1. Determine the cause and corrective action.

Table 43. Troubleshooting failed commissioning

Potential cause	Corrective action
Wrong PIU type	Check that the PIU type contained in SCF is the same as inserted to the system box. **Caution** 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. **Note** 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.

2. Recomission the site.

See *Nokia Flexi EDGE BTS Commissioning.*

4.2.2 Partially failed commissioning

Summary

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

Steps

1. Determine the cause and corrective action.

Note

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 for the Flexi EDGE BTS.*

Table 44. 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.
Power cable test failure	• 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.	• Check that the transmission sub-module (FIxA) settings match those in the SCF file. • Replace the faulty FIxA transmission sub-module.

Table 44. Troubleshooting partially failed commissioning (cont.)

Potential cause	Corrective action
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.'
Missing OMUSIG	• 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 (FIxA). • Check that 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 (FIxA). • In case of FIFA, check radio hop condition.

2. Report damage, failure of fault.

Note

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.

4.3 Troubleshooting electrical power

Summary

Fault - No power to Nokia Flexi EDGE BTS

Steps

1. Determine the cause and corrective action.

Table 45. Troubleshooting electrical power

Potential cause	Corrective action
Site mains power supply fault (all LEDs are off).	• 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).	• 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.

Table 46. 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).
A defective power module or sub-module (the 7613 alarm is active and/or the red LED is active in the optional power module).	• 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.

Table 46. Additional troubleshooting steps if optional power module(s) are used (cont.)

Potential cause	Corrective action
Output power demand is too high (the 7613 alarm and/or a red LED is active in the optional power module or sub-module).	• Decrease the number of used modules in the BTS, or • Install more power modules or sub-modules.
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.

2. Report damage, failure, or fault.

4.4 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 47. 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 normal BTS IP address for a local connection is 192.168.255.131.
Wrong BTS IP port.	Check that the correct BTS IP port is specified in Nokia Flexi EDGE BTS Manager. The normal BTS IP address for a local connection is 27500.

Table 47. Troubleshooting BTS Manager connection (cont.)

Potential cause	Corrective action
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 192.168.255.129.
The LMP cable is broken or not properly connected.	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.	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.	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.

2. Report damage, failure, or fault.

4.5 Troubleshooting Dual TRX Module (EXxA) operation

Summary

Fault – Dual TRX Module is not operating correctly

Steps

1. Determine the cause and corrective action.

Table 48. Troubleshooting Dual TRX Module operation

Potential cause	Corrective action
Objects are locked from the BSC, NMS/ 2000 or NetAct.	• 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.
Dual TRX Module is not properly connected, no electric power, or the LED is broken (the front LED does not light up).	• 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 *Troubleshooting electrical power*. • Replace the Dual TRX Module.
After recovery from Intelligent Shutdown, the administrative state of TRX object(s) remain BL-RSL on BSC.	First, check if 7601 - 'Module power cable connections are incorrectly configured' alarm is active and follow the related troubleshooting instructions, if needed. Note: During Intelligent shutdown, the BTS SW cuts off the power supply (from ESMA System Module's 'PWR' port) and LapD links for the affected TRX's and during recovery, turns them back on. Now, if the DTRX power cabling from the ESMA is incorrect (DTRX's power cable is not connected to the right 'PWR' port on ESMA), some TRX objects are left to blocked state as the recovery actions are routed to wrong DTRX. In this case, give TRX reset for the affected TRX objects.

Table 48. Troubleshooting Dual TRX Module operation (cont.)

Potential cause	Corrective action
After TRX/BTS/BCF reset, it takes one hour to activate Alarm 7606 TRX FAULTY "EXxx TRX module Tx power is less than minimum at DPC" for TCH TRX.	Flexi EDGE BTS has an antenna boosting feature when only TCH TRXs are connected to an antenna. The feature transmits shortly adequate TX power from one TCH TRX to its antenna port once in an hour when the transmission is observed as inadequate for this time period. One hour timer is fixed and is not configurable. Note that the antenna boosting does not interrupt possibly ongoing traffic. If observed antenna related problem during antenna boosting, the alarm can only be generated for Dual Duplexer Module (ERxA) and only when BB nor antenna hopping is not configured. • Follow the troubleshooting instructions for the alarm.

2. Report damage, failure, or fault.

4.6 Troubleshooting TRX test and TRX loop test failures with BTS Manager

Summary

Fault - TRX test or TRX loop test fails when 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 corrective action.

Table 49. Troubleshooting TRX test/TRX loop test failures

TRX test/TRX loop test result	Reason for failure result	Corrective action
"High power in Abis1-Air3 loop"	DTRX detects high power when receiving loop signal back from DDU/RTC. Either loopback switch in DDU/RTC or DTRX is causing the failure.	• Replace the Dual TRX module (EXxA). • Replace the DDU module (ERxA) / RTC module (ECxA).
"Failure due to Forced Reset"	Either the DTRX or the RTC module was reset during the test.	• Wait until the module recovers from the reset. • Run the TRX (loop) test again.
"Low BCCH Power levels"	The DTRX module received too low power looped back from DDU or RTC.	• Check all RF cabling between the DTRX module (EXxA) and DDU module (ERxA) / RTC module (ECxA). • Replace the Dual TRX module (EXxA). • Replace the DDU module (ERxA) / RTC module (ECxA).
"RF cables missing"	The DTRX did not receive any loop signal back from DDU or RTC.	• Check all RF cabling between the DTRX module (EXxA) and DDU module (ERxA) / RTC module (ECxA). • Replace the Dual TRX module (EXxA). • Replace the DDU module (ERxA) / RTC module (ECxA).
"Failure due to TRX reconfiguration"	Test failed as TRX was reconfiguring. Wait until reconfiguration is finished.	• Run the TRX (loop) test again.
"Timeslot is busy"	Test failed as the timeslot (and/or its pair timeslot) was busy.	• Wait until the timeslot is free or run the test again on a different timeslot. • Note: Timeslot and its offset timeslot (-3) must both be free before the test can be run.
"Bad channel configuration"	TRX Test was attempted on BCCH or SDCCH timeslot.	• Find free non-BCCH / non-SDCCH timeslot and run the test again.

Table 49. Troubleshooting TRX test/TRX loop test failures (cont.)

TRX test/TRX loop test result	Reason for failure result	Corrective action
"Invalid AGC"	Internal SW error occurred during the test.	• Reset BCF. Note that this does not indicate a HW error - do NOT replace HW module(s).
"Channel mode is neither PS nor CS"	Internal SW error occurred during the test.	• Reset BCF. Note that this does not indicate a HW error - do NOT replace HW module(s).
"Failed to set/clear air loop point as invalid path information"	Internal SW error occurred during the test.	• Reset BCF. Note that this does not indicate a HW error - do NOT replace HW module(s).
"Failed to clear air loop point as TS already free"	Internal SW error occurred during the test.	• Reset BCF. Note that this does not indicate a HW error - do NOT replace HW module(s).
"No response for block request for a timeslot"	Internal SW error occurred during the test.	• Reset BCF. Note that this does not indicate a HW error - do NOT replace HW module(s).
"Phase loop lock (PLL) has alarm on it"	TRX loop synthesizer failure detected in DDU/RTC module.	• Replace the DDU module (ERxA) / RTC module (ECxA).
"Not able to set the loop point on connected DDU/RTC or on ABIS within the predefined time"	Internal SW error occurred during the test.	• Reset BCF. Note that this does not indicate a HW error - do NOT replace HW module(s).
"Failure in setting air loop point as DDU synthesizer not able to achieve Lock state"	TRX loop synthesizer failure detected in DDU/RTC module.	• Replace the DDU module (ERxA) / RTC module (ECxA).

"Failure due to high bit error ratio"	DTRX detected high BER during the TRX test.	• Check all RF cabling between the DTRX module (EXxA) and DDU module (ERxA) / RTC module (ECxA). • Replace the Dual TRX module (EXxA). • Replace the DDU module (ERxA) / RTC module (ECxA).
"Failure due to invalid loop gain"	DTRX received too high power looped back from DDU or RTC.	• Replace the Dual TRX module (EXxA). • Replace the DDU module (ERxA) / RTC module (ECxA).
"Unable to measure power level"	DTRX received too low power looped back from DDU or RTC.	• Replace the DDU module (ERxA) / RTC module (ECxA). • Replace the Dual TRX module (EXxA).
"Failure due to balance failure in Rx branches"	DTRX detected that Diversity and Main RX levels differed too much during the TRX test.	• Check all RX cabling between the DTRX module (EXxA) and DDU module (ERxA) / RTC module (ECxA). • Replace the Dual TRX module (EXxA). • Replace the DDU module (ERxA) / RTC module (ECxA).
"Unable to measure Rx sensitivity"	Background noise could not be measured due to too high interference. Problem is probably caused by external interference (e.g. same frequency used nearby on another BTS).	• Run the TRX test again. • If the test fails persistently , the test should be run on a different frequency. Note that sensitivity (RX result) is not based on BER. It is estimated from the background noise and interference level detected by DTRX at tested RX frequency.
"Failure in BB module"	HW failure was detected in DTRX.	• Replace the Dual TRX module (EXxA).
"No ARFN passed in loop command in configuring state"	Internal SW error occurred during the TRX test.	• Reset BCF. Note that this does not indicate a HW error - do NOT replace HW module(s).

"Loop test error more than specified limit"	DTRX detected BER > 2 % during the TRX test.	• Check all RF cabling between the DTRX module (EXxA) and DDU module (ERxA) / RTC module (ECxA), replace faulty cables. • Replace the Dual TRX module (EXxA). • Replace the DDU module (ERxA) / RTC module (ECxA). • If the test fails persistently , the test should be run on a different frequency.
“TRX is in shutdown state”	Test failed as TRX was in shutdown state.	• Wait until TRX is back in supervisory state. • Run the TRX test again.
"RTC not in Supervisory State"	Test failed as RTC was not in supervisory state during the TRX test.	• Wait until the RTC reached Supervisory state. • Run the TRX test again.

Further information

Note that after each troubleshooting step, run the TRX (loop) test again and if the problem still exists, go to the next troubleshooting step.

If WBC (EWxA) module is used, then the related RF cables and the WBC module should be checked as well in all cases where the instruction says: “Check and correct all the RF cabling between the DTRX module (EXxA) and DDU module (ERxA) / RTC module (ECxA), replace faulty cables”.

2. Report damage, failure, or fault.

5 Monitoring FIFA

5.1 Reading performance information

Before you start

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

Steps

1. **Start Nokia FlexiHub Manager.**

   For instructions, see *Starting Nokia 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 Nokia FlexiHub Manager menu, select View → Performance, or select Performance from the View Bar.**

   The **Performance View** opens.

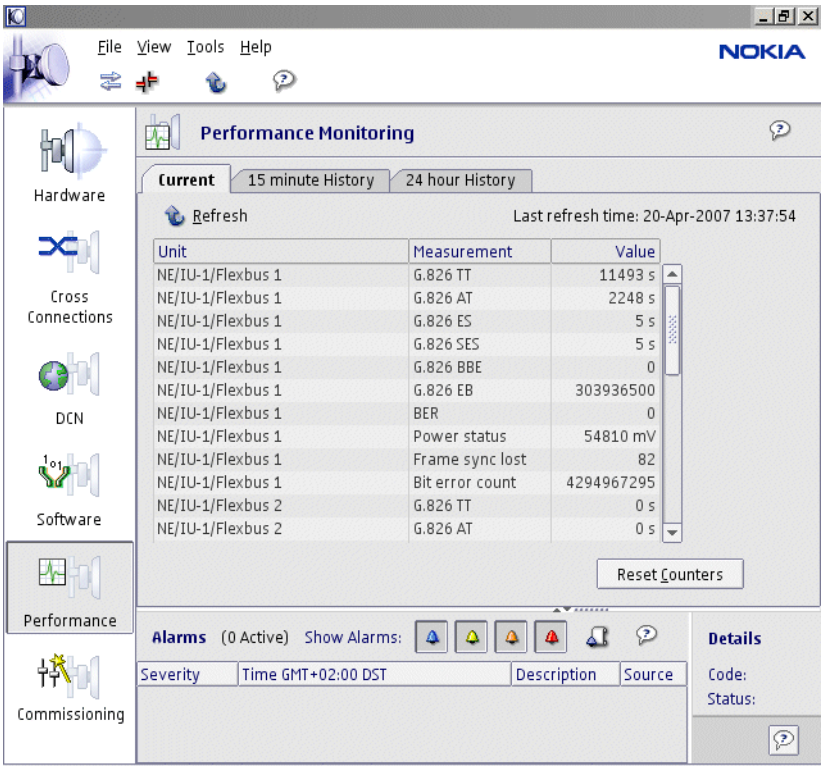

Figure 4. Performance View

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 performance information has been read.

Further information

For more information, see *Measuring performance*.

5.2 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 Nokia FlexiHub Manager.**

   For instructions, see *Starting Nokia 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.

6 Completing troubleshooting

Steps

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

2. **If a fault still exists after troubleshooting, contact your local Nokia representative.**