Nokia Siemens Networks

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

Maintaining Flexi EDGE BTS Modules

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Contents

1 Overview of maintaining Flexi EDGE BTS modules

Purpose

This is an overview of maintenance tasks for Flexi EDGE BTS.

For troubleshooting instructions and alarm information, see *Trouble Management of Nokia Flexi EDGE BTS.*

See also *LED indications* sections in *Nokia Flexi EDGE System Module (ESMA) Description*, *Nokia Flexi EDGE Dual TRX Module Description*, *Nokia Flexi EDGE Dual Duplexer Module (ERxA) Description* and *Optional Items Description*.

For instructions on using the Flexi EDGE BTS Manager, see *Nokia Flexi EDGE BTS Manager Online Help.*

For expansion instructions, see *Configuration Reference Guide.*

Steps

1. **For instructions on routine maintenance tasks, see Performing routine maintenance tasks.**

2. **If you need to replace module fans, see Replacing module fans for EXxA and ECxA or Replacing module fans for ESMA and ESEA.**

3. **If you need to replace modules, see one of the following:**
   - *Replacing Dual TRX Module (EXxA)*
   - *Replacing Dual Duplexer Module (ERxA)*
   - *Replacing System Module (ESMA)*
   - *Replacing transmission sub-module*
   - *Replacing Wideband Combiner Sub-module (EWxx)*
   - *Replacing AC/DC sub-module (FPAA)*

- *Replacing battery sub-modules (FPBA)*
- *Replacing Remote Tune Combiner Module (ECxA)*
- *Replacing System Extension Module (ESEA)*
- *Replacing Flexi System External Alarm Module (FSEB)*
- Replacing LMU: see *LMU Product Documentation* in NOLS.

Further information

For cabinet maintenance instructions, see

- *Maintaining Flexi Cabinet for Indoor*
- *Maintaining Flexi Cabinet for Outdoor*

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*.

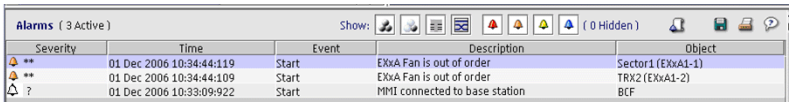


Figure 1. Alarms window of Nokia Flexi EDGE BTS Manager

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

3 Performing routine maintenance tasks

Purpose

Perform these steps during normal site visits to ensure that the base station stays in good condition.

Steps

1. **Check that the grounding cables are properly connected.**

2. **Check the fans and air circulation.**

   When needed, clean the fans of leaves and debris and free air inlets and outlets of obstructions to maintain proper air circulation and prevent overheating of the BTS. When cleaning the fans, first remove the power connector from the fan.

   Keep the BTS environment clean of dust.

3. **Check the connector seals (rubber boots).**

   Check that all unused connectors have seals installed properly. Check the existing connection seals visually and verify that seals are firmly in place. Replace worn or broken seals.

4. **Check the cable connectors.**

   Check that the RF cable and the antenna jumper cable connectors are firmly in place.

5. **Check the screws.**

   Check the tightness of the module fixing screws. Replace all damaged or missing screws.

4 Replacing module fans for EXxA and ECxA

Purpose

If a module fan fails or becomes degraded, replace it with a new one.

In stack, wall, pole and Flexi Cabinet for Indoor (FCIA) installation, fans can be replaced from the back of the module if there is enough space behind the BTS. For information on the required clearances for maintenance, see *Requirements for Installation and Operation*.

When removing fans from the back of FCIA, you need to remove the back panel. For instructions, see *Maintaining Flexi Cabinet for Indoor.*

If there is not enough space for replacing the fans from the back, you can also replace the fans from the front. In this case you need to disable power to the module and pull it out from the casing or cabinet. For instructions on how to remove the module, see *Replacing modules.*

In Flexi Cabinet for Outdoor (FCOA), fans are replaced from the front.

Note that when replacing fans, an alarm indicating a broken fan may be seen. After you have replaced the fan, the alarm is cancelled.

The product code of the fan plate assembly is 0831808.

Before you start

Shut down the module before replacing fans. See instructions in *Replacing modules.*

Warning

Risk of personal injury. Do not touch the rotating fans.

Caution

The modules may be damaged if operated for a long time in the upper ambient temperature range. Replace a faulty unit as soon as possible.

Summary

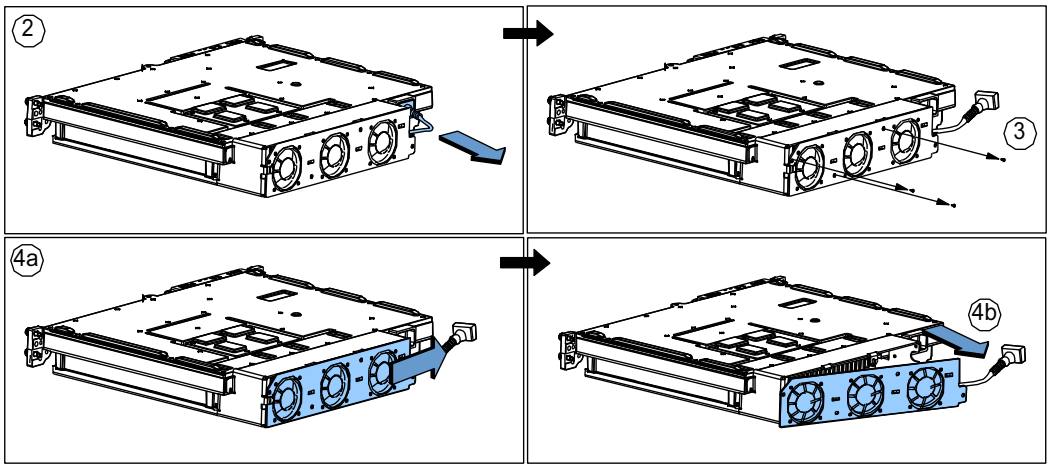


Figure 2. Replacing module fans (EXxA is shown)

Steps

1. **Block the TRXs associated with the module with the faulty fan assembly with Nokia Flexi EDGE BTS Manager or, if Baseband or Antenna Hopping is used, block the whole sector.**

   Alternatively, you can request to lock the TRXs/sector/BCF from the BSC.

   Note that Nokia Flexi EDGE BTS waits until the maximum timeout for the BSC to transfer calls before changing the LED status to indicate that the sector is locked.

2. **Connect the ESD wrist strap.**

3. **Wait for stable yellow LED to be displayed.**

4. **Disable power to the module with the Flexi EDGE BTS Manager.**

See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

5. **If this is a pole, wall, stack, or FCIA installation with back maintenance access, remove the back cover or wall.**

6. **If back maintenance access is not available, remove the module.**

   Note that if this is a pole, wall, or stack installation, you will need to also remove the front covers and cable entries before removing the module.

7. **Pull the fan connector out of the module.**

8. **Detach the three screws on the fan assembly.**

9. **Slide the fan assembly out.**

10. **Slide the new fan assembly in.**

11. **Tighten the screws.**

12. **Connect the fan connector.**

    Make sure the boot is properly connected and IP-sealed.

13. **If the module was removed, reinstall the module and its cables.**

14. **Enable power to the module with the Flexi EDGE BTS Manager.**

    See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

15. **Check that the new fans start to rotate.**

16. **Check that the fan alarm (which was activated when the faulty fan module was removed) is cancelled from Nokia Flexi EDGE BTS Manager.**

17. **Unblock the TRXs or sector with Nokia Flexi EDGE BTS Manager.**

18. **Re-install any removed cable entries, covers, or back wall.**

5 Replacing module fans for ESMA and ESEA

Purpose

If a module fan fails or becomes degraded, replace it with a new one.

In stack, wall, pole and Flexi Cabinet for Indoor (FCIA) installation, fans can be replaced from the back of the module if there is enough space behind the BTS. For information on the required clearances for maintenance, see *Requirements for Installation and Operation*.

When removing fans from the back of FCIA, you need to remove the back panel. For instructions, see *Maintaining Flexi Cabinet for Indoor.*

If there is not enough space for replacing the fans from the back, you can also replace the fans from the front. In this case you need to disable power to the module and pull it out from the casing or cabinet. For instructions on how to remove the module, see *Replacing modules.*

In Flexi Cabinet for Outdoor (FCOA), fans are replaced from the front.

Note that when replacing fans, an alarm indicating a broken fan may be seen. After you have replaced the fan, the alarm is cancelled.

The product code of the fan plate assembly is 0831808.

Before you start

Shut down the module before replacing fans. See instructions in *Replacing modules.*

Warning

Risk of personal injury. Do not touch the rotating fans.

Caution

The modules may be damaged if operated for a long time in the upper ambient temperature range. Replace a faulty unit as soon as possible.

Summary

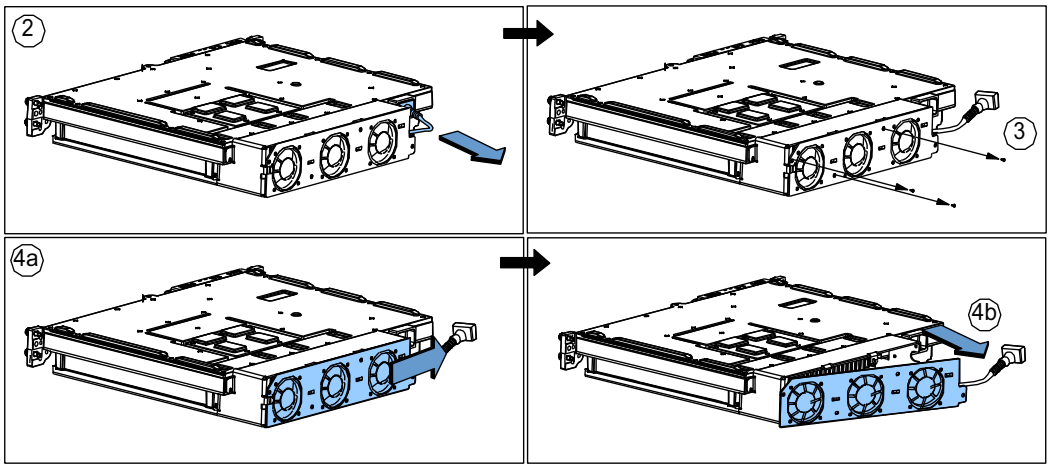


Figure 3. Replacing module fans (EXxA is shown)

Steps

1. **Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager.**

   Alternatively, you can request to block the BCF from the BSC.

   Note that Nokia Flexi EDGE BTS waits until the maximum timeout for the BSC to transfer calls before changing the LED status to indicate that the sector is locked.

2. **Connect the ESD wrist strap.**

3. **Wait for stable yellow LED to be displayed.**

4. **Switch off power from the power switch on the module.**

5. **Disconnect the power mains breaker of the module.**

6. **If this is a pole, wall, stack, or FCIA installation with back maintenance access, remove the back cover or wall.**

7. **If back maintenance access is not available, remove the module.**

   Note that if this is a pole, wall, or stack installation, you will need to also remove the front covers and cable entries before removing the module.

8. **Pull the fan connector out of the module.**

9. **Detach the three screws on the fan assembly.**

10. **Slide the fan assembly out.**

11. **Slide the new fan assembly in.**

12. **Tighten the screws.**

13. **Connect the fan connector.**

    Make sure the boot is properly connected and IP-sealed.

14. **If the module was removed, reinstall the module and its cables.**

15. **Connect the power mains breaker.**

16. **Switch on power from the power switch on the module.**

17. **Check that the new fans start to rotate.**

18. **Check that the fan alarm (which was activated when the faulty fan module was removed) is cancelled from Nokia Flexi EDGE BTS Manager.**

19. **Unblock the BCF with Nokia Flexi EDGE BTS Manager or from the BSC.**

20. **Re-install any removed cable entries, covers, or back wall.**

6 Disabling and enabling power with the Flexi EDGE BTS Manager

Purpose

You need to disable power from the Power Control dialog when adding modules to or removing modules from an operational BTS.

The power control from the BTS Manager allows each power output to be controlled independently so that a single module can be added or removed. First disable the power to that output, add or remove the module, and then restore power.

Before you start

You must have a local BTS Manager connection. With a remote connection, you cannot control the power outputs.

Steps

1. **Open the Power Control dialog (from BTS Control | Power Control).**

2. **If BTS is the Outputs Controller, click Change.**

   Expected outcome

   Outputs Controller is changed to User.

   In this mode, intelligent shutdown commands from the BSC will be ignored. You must set the correct power states before you switch control to the BTS.

3. **Click Turn Off to disable power from the modules needed.**

4. **Perform the maintenance needed, for example, add and remove modules.**

5. To enable power in the modules, click Turn On for each unit.

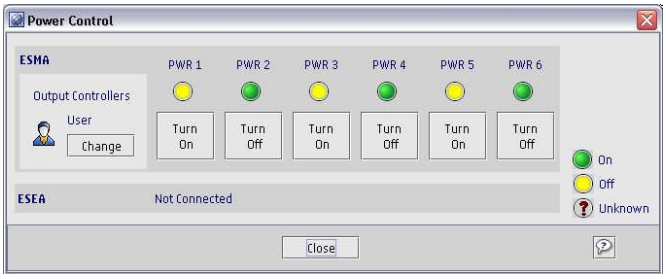


Figure 4. Power Control dialog, user control

6. Click Change to change Outputs Controller to BTS.

7. Click Close.

7 Replacing modules

7.1 Replacing Dual TRX Module (EXxA)

Purpose

If a module fails and you have carried out troubleshooting, replace the module with a new one.

For troubleshooting instructions and alarm information, see *Trouble Management of Nokia Flexi EDGE BTS.*

The module needs to be removed also when you are replacing a fan from the back of the module.

Before you start

Make sure you have the configuration-specific instructions available for checking how to re-connect the cables.

Caution

If the Dual TRX Module carries the BCCH TRX or provides power for the Dual Duplexer Module, the whole sector may be disabled. In these cases it is recommended to block the sector.

Note that the Dual TRX Module is HW reset when the bus cables are removed and reconnected.

Summary

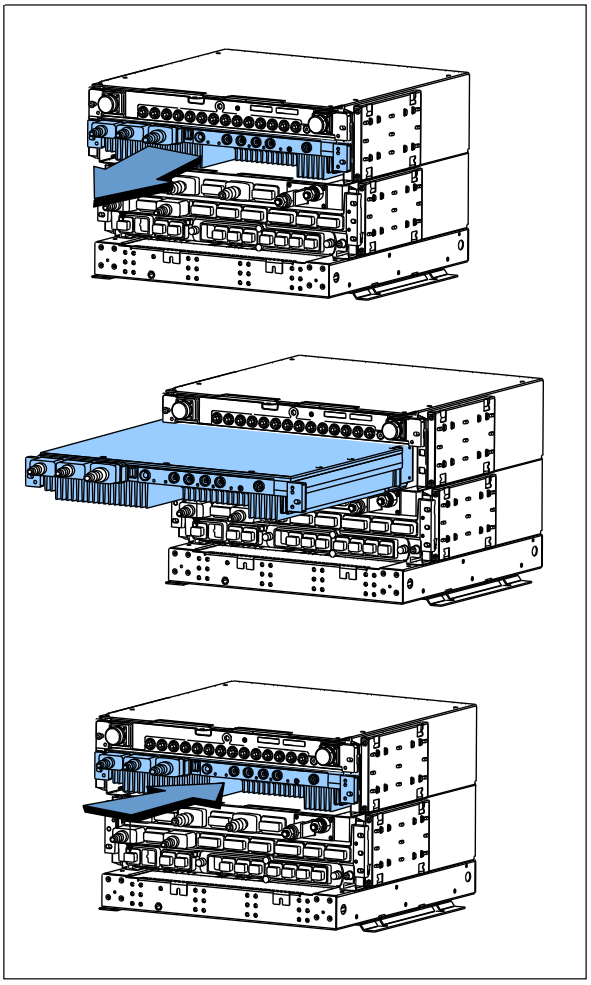


Figure 5. Replacing Dual TRX Module

Steps

1. **Notify the appropriate personnel and block the two TRXs with Nokia Flexi EDGE BTS Manager or, if Baseband or Antenna Hopping is used, block the whole sector.**

   Alternatively, you can request a TRX/sector lock from the BSC.

   Note that Nokia Flexi EDGE BTS waits until the maximum timeout for the BSC to transfer calls before changing the LED status to indicate that the sector is locked.

2. **Connect the ESD wrist strap.**

3. **If front covers are used, loosen the screws on the front cover of the module, and remove the cover.**

4. **If cable entries are used, remove them.**

5. **Wait for stable yellow LED to be displayed.**

6. **Disable power to the module with the Flexi EDGE BTS Manager.**

   See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

7. **Disconnect the cables on the module.**

8. **Loosen the screws on the module.**

9. **Pull out the module.**

10. **Remove the Wideband Combiner Sub-module(s), if used, and install them to the new Dual TRX Module.**

11. **Install the new module.**

12. **If cable entries are used, re-install them.**

13. **Connect the cables.**

14. **Enable power to the module with the Flexi EDGE BTS Manager.**

    See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

15. **If front covers are used, re-install them.**

16. **Unblock the TRXs or the sector with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the TRXs/sector from the BSC.

Further information

If you want to validate RF cabling immediately after you have carried out maintenance work, you first need to unlock/unblock the sector or the BCF object under which the work was carried out. After that, reset the sector or BCF from the BSC or from Nokia Flexi EDGE BTS Manager by selecting the With RF detection option.

7.2 Replacing Dual Duplexer Module (ERxA)

Purpose

If a module fails and you have carried out troubleshooting, replace the module with a new one.

For troubleshooting instructions and alarm information, see *Trouble Management of Nokia Flexi EDGE BTS*.

Before you start

Make sure you have the configuration-specific instructions available for checking how to re-connect the cables.

Caution

If the Dual Duplexer Module is connected to the Dual TRX Module which carries the BCCH TRX, the whole sector may be disabled. In this case it is recommended to block the sector.

Steps

1. **Notify the appropriate personnel and block the TRXs connected to the ERxA with Nokia Flexi EDGE BTS Manager or, if the module is in a sector where Baseband or Antenna Hopping is used, block the whole sector.**

   Alternatively, you can request a TRX/sector lock from the BSC.

2. **Connect the ESD wrist strap.**

3. **If front covers are used, loosen the screws on the front cover of the module, and remove the cover.**

4. **If cable entries are used, remove them.**

5. **Wait for stable yellow LED to be displayed on all Dual TRX Modules connected to the Dual Duplexer Module.**

6. **Disable power to the Dual TRX Module connected to the ERxA with the Flexi EDGE BTS Mananger.**

   See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

7. **Disconnect the cables on the module.**

8. **Loosen the screws on the module.**

9. **Pull out the module.**

10. **Install the new module.**

11. **If cable entries are used, re-install them.**

12. **Connect the cables.**

13. **Enable power to the module with the Flexi EDGE BTS Manager.**

    See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

14. **If front covers are used, re-install them.**

15. **Unblock the TRXs or the sector with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the TRXs/sector from the BSC.

Further information

If you want to validate RF cabling immediately after you have carried out maintenance work, you first need to unlock/unblock the sector or the BCF object under which the work was carried out. After that, reset the sector or BCF from the BSC or from Nokia Flexi EDGE BTS Manager by selecting the With RF detection option.

7.3 Replacing System Module (ESMA)

Purpose

If a module fails and you have carried out troubleshooting, replace the module with a new one.

For troubleshooting instructions and alarm information, see *Trouble Management of Nokia Flexi EDGE BTS.*

The module needs to be removed also when you are replacing a fan from the back of the module.

Before you start

Make sure you have the configuration-specific instructions available for checking how to re-connect the cables.

Note that the Dual TRX Module(s) and Remote Tune Combiner Module(s) are HW reset when the bus cables are removed and reconnected.

Steps

1. **Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager.**

   Alternatively, you can request a BCF lock from the BSC.

2. **Save SCF file to PC's hard disk by selecting Fetch SCF from BTS from the Commission menu.**

3. **Connect the ESD wrist strap.**

4. **If module covers are used, loosen the screws on the front cover of the module, and remove the cover.**

5. **If cable entries are used, remove them.**

6. **Wait for stable yellow LED to be displayed.**

   It takes one minute for the LED to change to yellow.

7. **Switch off power from the BTS by pressing the PWR button on the System Module front panel.**

8. **Disconnect the power mains breaker.**

9. **Disconnect the cables on the module.**

10. **Loosen the screws on the module.**

11. **Pull out the module.**

12. **Remove the transmission sub-module, and install it to the new System Module.**

13. **Install the new System Module.**

14. **If cable entries are used, re-install them.**

15. **Connect the cables.**

16. **If front covers are used, re-install them.**

17. **Connect the power mains breaker.**

18. **Commission the BTS with Nokia Flexi EDGE BTS Manager by using the SCF file you fetched in step 2.**

19. **Unblock the BCF with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the BCF from the BSC.

7.4 Replacing transmission sub-module

Purpose

If the transmission sub-module fails, or the transmission media changes, the transmission sub-module needs to be replaced with a new one.

Before you start

Caution

New transmission sub-modules may be damaged and will not operate correctly if the sub-modules are replaced when the BTS power is switched on. Switch off the Nokia Flexi EDGE BTS before replacing the transmission sub-modules.

Steps

1. **Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager.**

   Alternatively, you can request a BCF lock from the BSC.

2. **Connect the ESD wrist strap on the plinth.**

3. **If covers are used, loosen the screws on the front cover of the System Module, and remove the cover.**

4. **If cable entries are used, remove them from the System Module.**

5. **Wait for stable yellow LED to be displayed on the System Module.**

   It takes one minute for the LED to change to yellow.

6. **Disconnect the cables on the transmission sub-module.**

7. **Loosen the 4 x M5 screws and detach the transmission sub-module.**

8. **Align the new transmission sub-module with the two guide pins in the System Module, and push the sub-module in place.**

9. **Fix the transmission sub-module with 4 x M5 screws.**

10. **If cable entries are used, re-install them on the System Module.**

11. **Connect the cables on the transmission sub-module.**

12. **If front covers are used, re-install them on the System Module.**

13. **Unblock the BCF with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the BCF from the BSC.

14. **Do one of the following, depending on whether the transmission sub-module type was changed:**

- If the transmission sub-module type was not changed, perform site reset.
- If the transmission sub-module type was changed, perform undo commissioning with removal of bypass traffic after the new transmission sub-module is inserted. Then commission the BTS.

7.5 Replacing Wideband Combiner Sub-module (EWxx)

Purpose

If the Wideband Combiner Sub-module (EWxx) is faulty, replace it with a new one.

Before you start

Make sure you have the configuration-specific instructions available for checking how to re-connect the cables.

Steps

1. **Notify the appropriate personnel and block the TRXs connected to the EWxx with Nokia Flexi EDGE BTS Manager or, if the module is in a sector where Baseband or Antenna Hopping is used, block the whole sector.**

   Alternatively, you can request a TRXs/sector lock from the BSC.

2. **Connect the ESD wrist strap.**

3. **If front covers are used, loosen the screws on the front cover of the Dual TRX Module, and remove the cover.**

4. **Wait for stable yellow LED to be displayed on all Dual TRX Modules connected to the Wideband Combiner Sub-module.**

5. **Remove the cables from the Wideband Combiner Sub-module.**

6. **Loosen the screws on the Wideband Combiner Sub-module.**

7. **Pull out the Wideband Combiner Sub-module.**

8. **Install the new sub-module.**

9. **Connect the cables on the Wideband Combiner Sub-module.**

10. **If front covers are used, re-install them.**

11. **Unblock the TRXs or the sector with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the TRXs/sector from the BSC.

Further information

If you want to validate RF cabling immediately after you have carried out maintenance work, you first need to unlock/unblock the sector or the BCF object under which the work was carried out. After that, reset the sector or BCF from the BSC or from Nokia Flexi EDGE BTS Manager by selecting the With RF detection option.

7.6 Replacing Flexi Power Module (FPMA)

7.6.1 Replacing AC/DC sub-module (FPAA)

Before you start

Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager. Alternatively, you can request a BCF lock from the BSC.

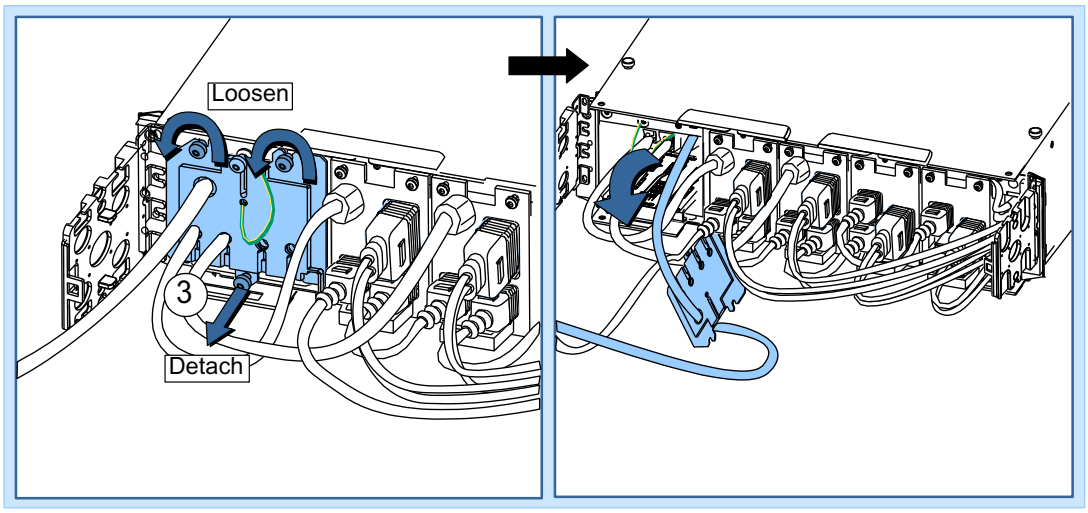
It is recommended that power is switched off from the AC mains breaker. However, there can still be hazardous voltage in case batteries are used.

Steps

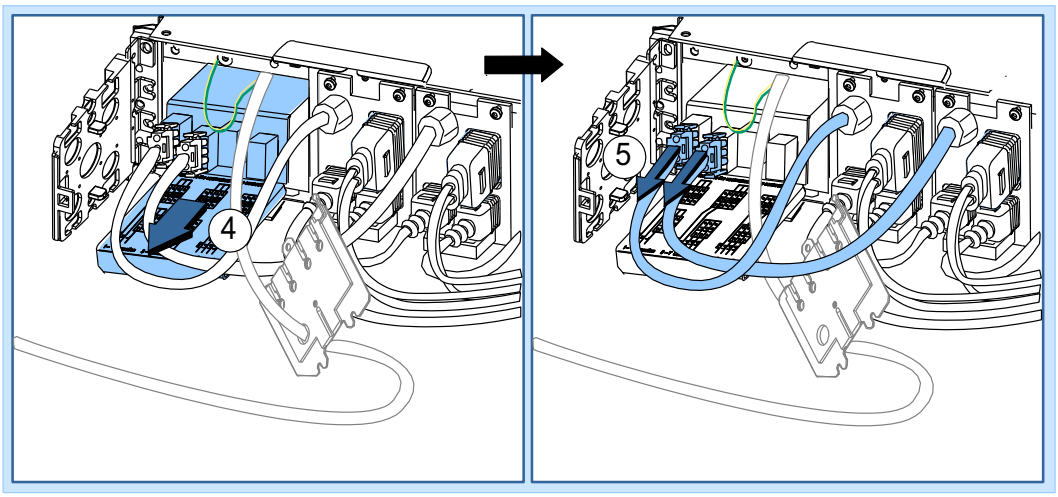
1. **Remove the FPMA module front cover.**

2. **Switch off the power from the stand-by switch.**

3. **Remove the ingress protection plate.**

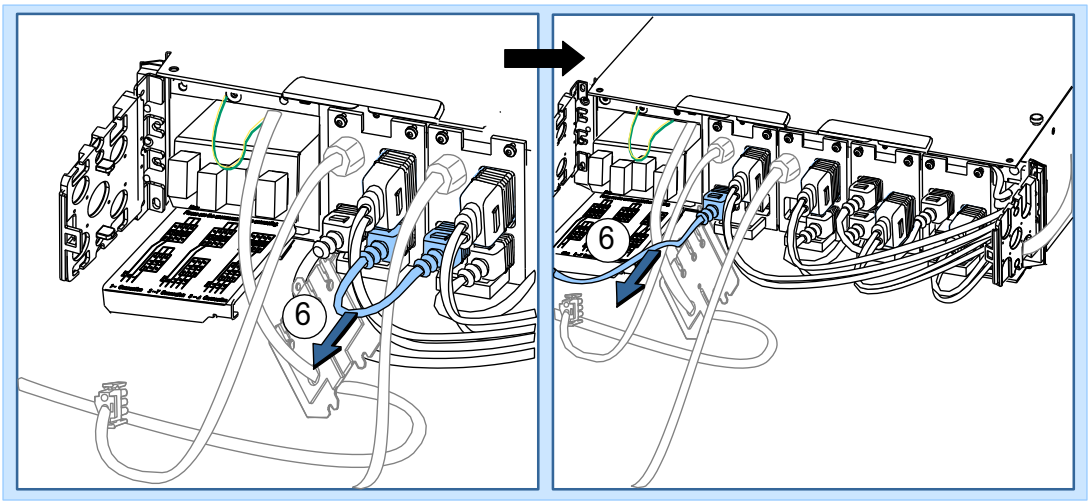


4. Pull out the AC terminal plate.

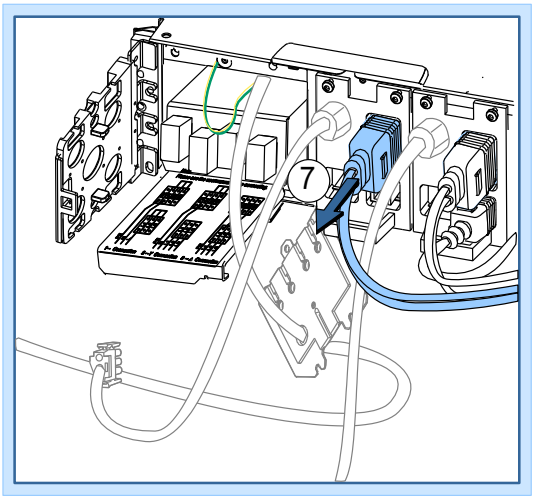


5. Disconnect the AC cable of the faulty FPAA.

6. Disconnect the alarm cable, if used.



7. Disconnect the DC cable.



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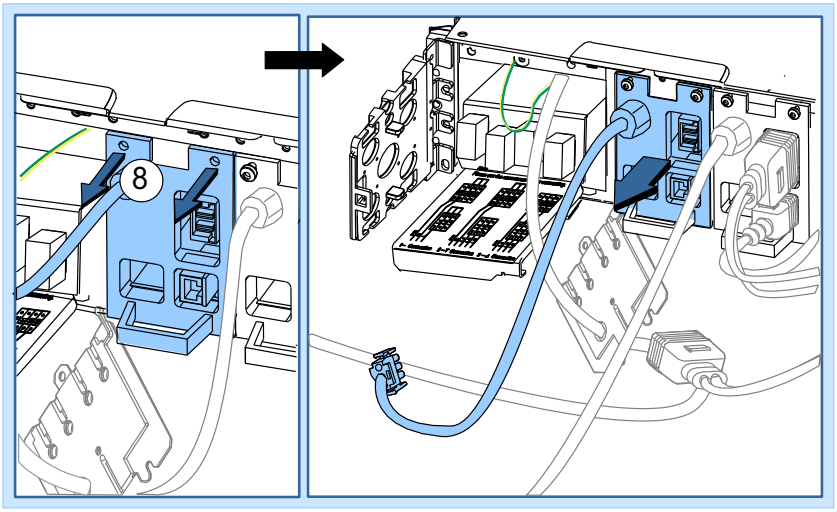
8. Remove the FPAA screws (2 pcs).



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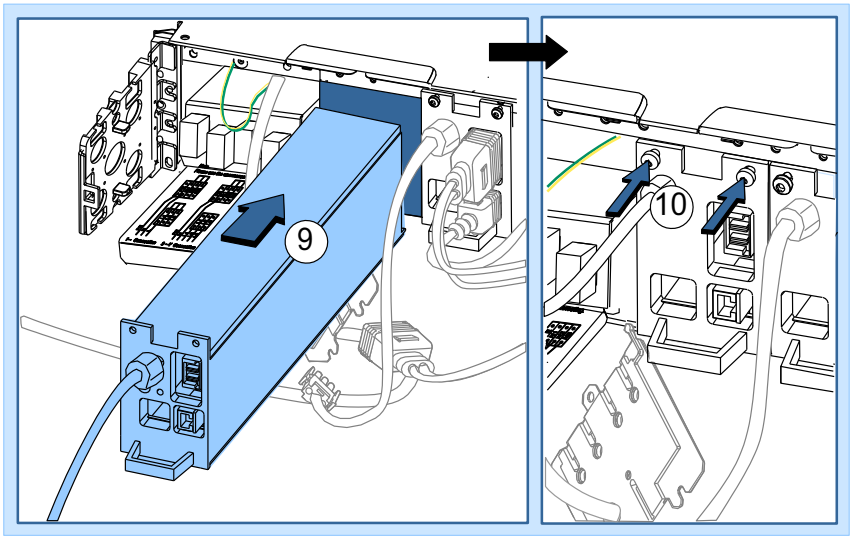
9. Replace the FPAA with a new one.



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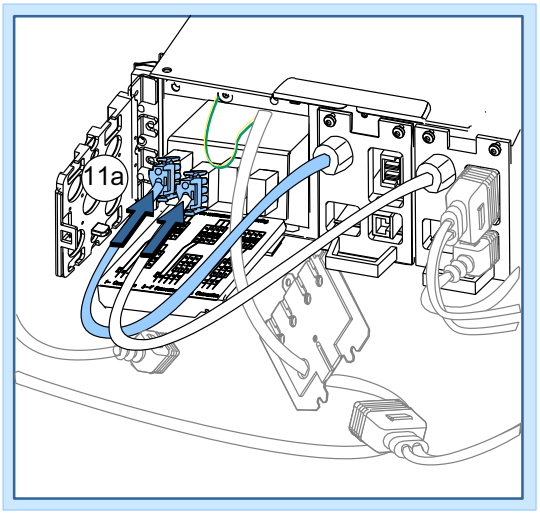
10. Fix the screws.

11. Re-connect the cables.

a. Re-connect the AC cables.



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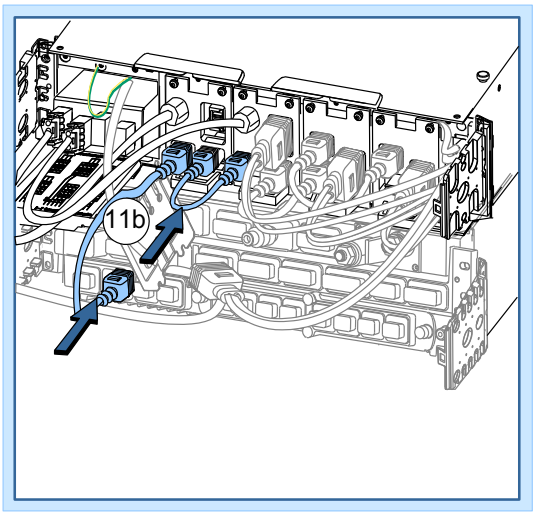
b. Re-connect the alarm cables.



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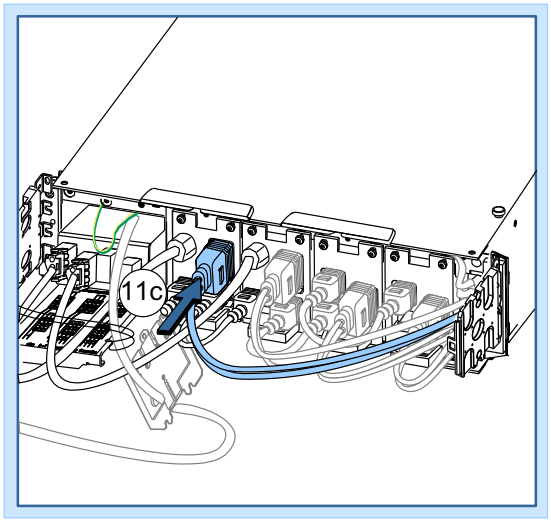
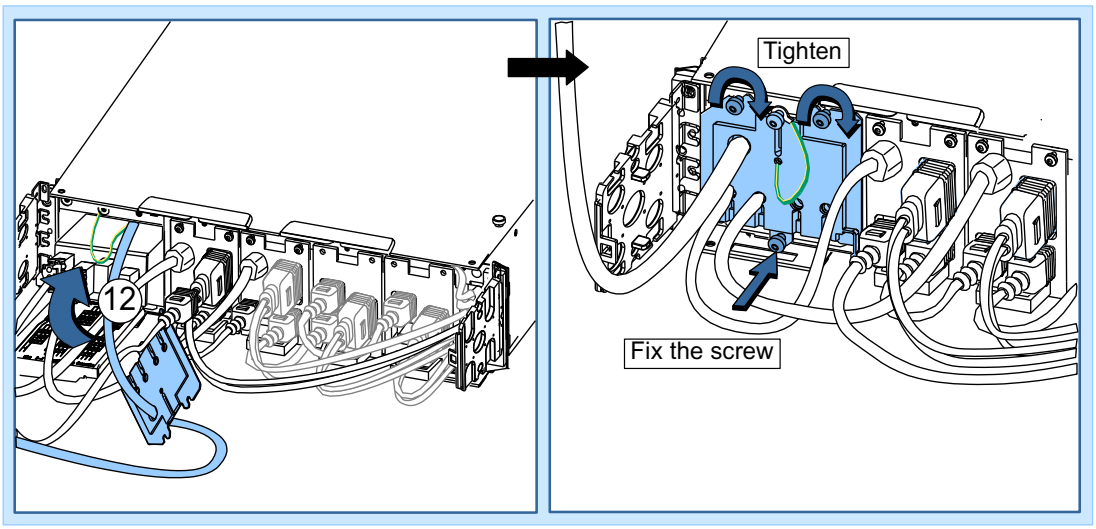
c. Re-connect the DC cables.



Make sure that the LED is yellow at this point.

12. Re-install the ingress protection plate.



13. Turn on the unit by pushing the power switch for one second.

Make sure that the LED is stable green.

14. Install the FPMA module front cover.

15. Unblock the BCF with Nokia Flexi EDGE BTS Manager.

Alternatively, you can request to unlock the BCF from the BSC.

7.6.2 Replacing battery sub-modules (FPBA)

Before you start

The FPBA is a Lithium-Ion battery and its transportation is classified as dangerous. Therefore only an approved brand-new UN class 9 package can be used for transportation of the FPBA unit. An opened package cannot be used any more. An approved package can be ordered from the Nokia Service Center. If there are any visible damages in the FPBA unit, it cannot be transported at all. In that case, contact the Nokia Service Center.

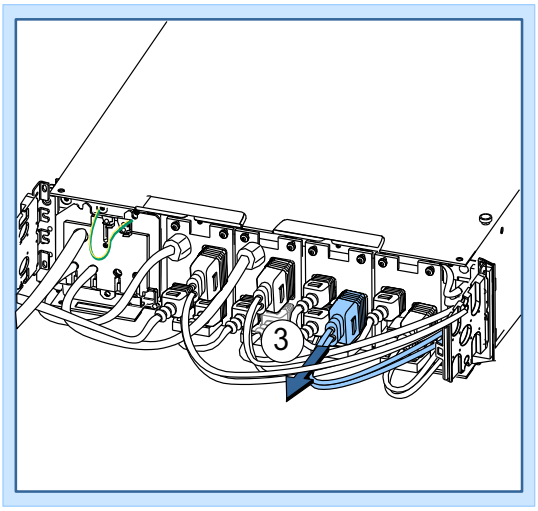
Note

Transport the Flexi Power Battery sub-module (FPBA) unit according to the international Dangerous Goods Requirement (DGR) regulations.

Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager. Alternatively, you can request a BCF lock from the BSC.

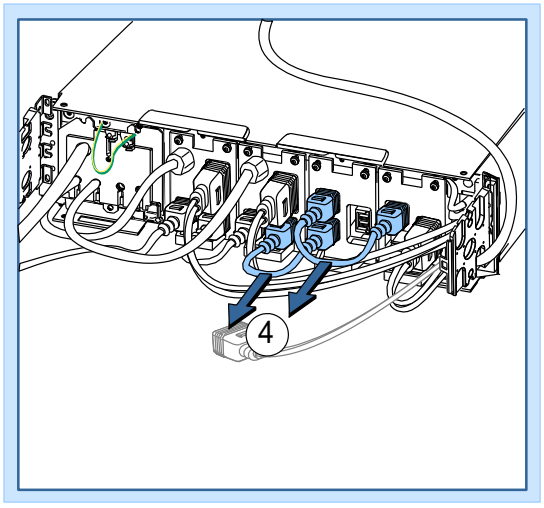
Steps

1. **Remove the FPMA module front cover.**
2. **Switch off the power from the FPAA stand-by switch.**
3. **Disconnect the DC cable from the faulty FPBA.**



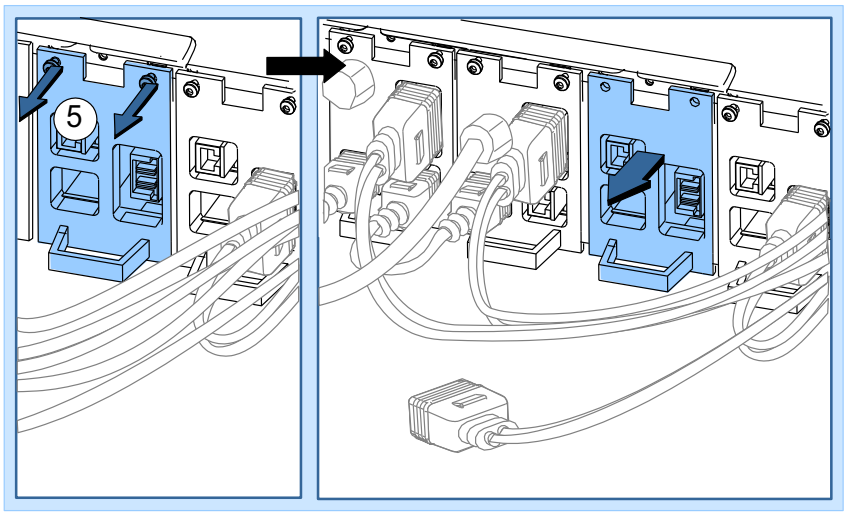
DN70142764

4. Disconnect the alarm cable, if used.



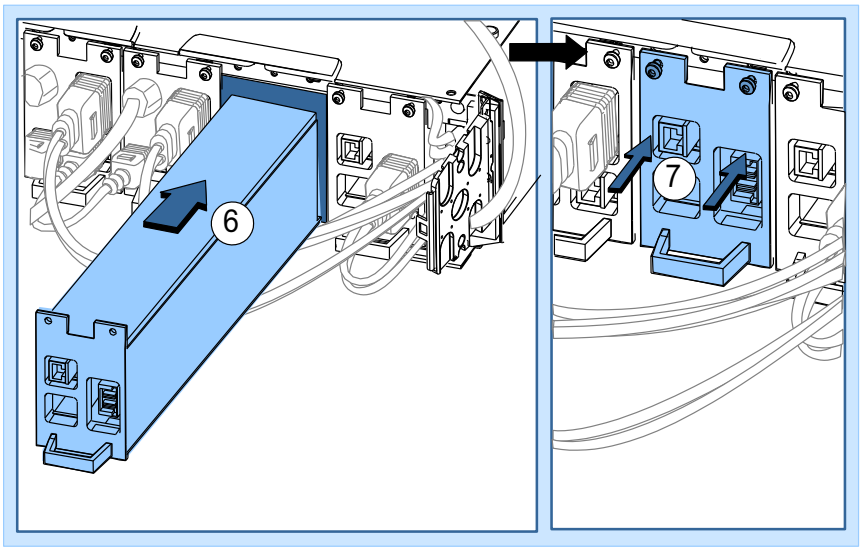
DN70142776

5. Remove the FPBA screws (2 pcs).



DN70142791

6. Replace the FPBA with a new one.

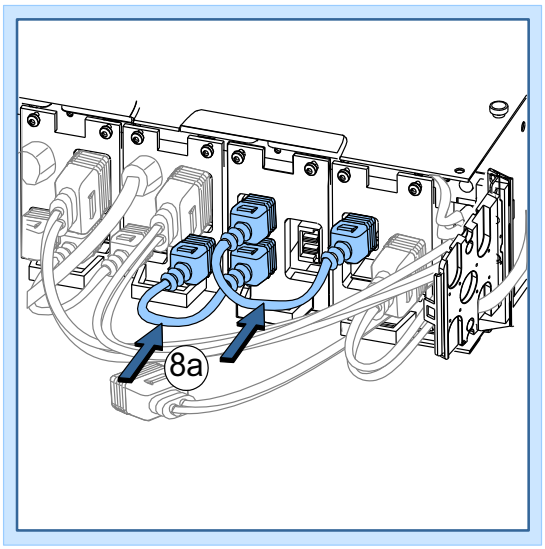


DN70142822

7. Fix the screws.

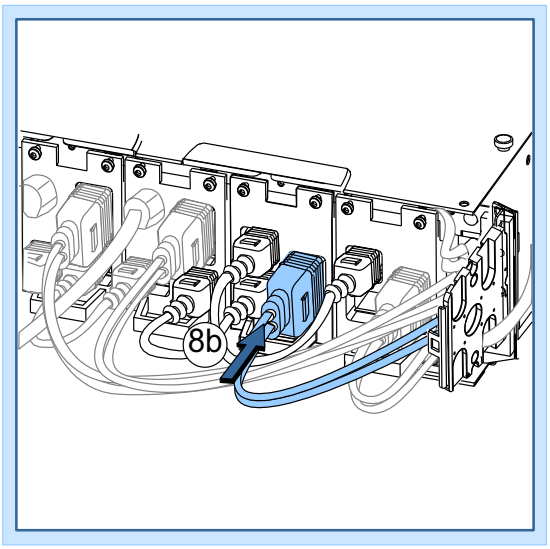
8. Re-connect the cables.

a. Re-connect the alarm cable.



DN70142846

b. Re-connect the DC cable.



DN70143003

Make sure that the LED is yellow at this point.

9. **Turn on the unit by pushing the power switch for one second.**

   The LED is blinking slowly green as the FPBA goes into the charging mode. Once the FPBA is fully charged (approx. 8 hours), the LED is stable green.

10. **Install the FPMA module front cover.**

11. **Unblock the BCF with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the BCF from the BSC.

7.7 Replacing Remote Tune Combiner Module (ECxA)

Purpose

If a module fails and you have carried out troubleshooting, replace the module with a new one.

For troubleshooting instructions and alarm information, see *Trouble Management of Nokia Flexi EDGE BTS*.

The module needs to be removed also when you are replacing a fan from the back of the module.

Before you start

Make sure you have the configuration-specific instructions available for checking how to re-connect the cables.

Caution

If the Remote Tune Combiner Module is connected to the Dual TRX Module which carries the BCCH TRX, the whole sector may be disabled. In this case it is recommended to block the sector.

Note that the Remote Tune Combiner Module is HW reset when the bus cables are removed and reconnected.

Steps

1. **Notify the appropriate personnel and block the TRXs connected to the ECxA with Nokia Flexi EDGE BTS Manager or, if the module is in a sector where Baseband or Antenna Hopping is used, block the whole sector.**

   Alternatively, you can request a TRX/sector lock from the BSC.

2. **Connect the ESD wrist strap.**

3. **Wait for stable yellow LED to be displayed on all Dual TRX Modules connected to the Remote Tune Combiner Module.**

4. **Disable power to the module with the Flexi EDGE BTS Manager.**

   See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

5. **Disconnect the cables on the module.**

6. **Loosen the screws on the module.**

7. **Pull out the module.**

8. **Install the new module.**

9. **Connect the cables.**

10. **Enable power to the module with Nokia Flexi EDGE BTS Manager.**

    See *Disabling and enabling power with the Flexi EDGE BTS Manager*.

11. **Unblock the TRXs or the sector with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the TRXs/sector from the BSC.

Further information

If you want to validate RF cabling immediately after you have carried out maintenance work, you first need to unlock/unblock the sector or the BCF object under which the work was carried out. After that, reset the sector or BCF from the BSC or from Nokia Flexi EDGE BTS Manager by selecting the With RF detection option.

7.8 Replacing System Extension Module (ESEA)

Purpose

If a module fails and you have carried out troubleshooting, replace the module with a new one.

For troubleshooting instructions and alarm information, see *Trouble Management of Nokia Flexi EDGE BTS*.

The module needs to be removed also when you are replacing a fan from the back of the module.

Before you start

Make sure you have the configuration-specific instructions available for checking how to re-connect the cables.

Note that the System Extension Module should be powered on either before or simultaneously with the System Module power-on, to make sure that the site configuration is correctly detected at start-up.

Steps

1. **Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager.**

   Alternatively, you can request a BCF lock from the BSC.

2. **Connect the ESD wrist strap.**

3. **Wait for stable yellow LED on the ESMA to be displayed.**

   It takes one minute for the LED to change to yellow.

4. **Power off the System Module with the power switch.**

5. **Switch off power from the power switch on the System Extension Module.**

6. **Disconnect the power mains breaker of the System Extension Module.**

7. **Disconnect the cables on the module.**

8. **Loosen the screws on the module.**

9. **Pull out the module.**

10. **Install the new module.**

11. **Connect the power mains breaker of the System Extension Module.**

12. **Connect the cables.**

13. **Power on the System Module.**

14. **Unblock the BCF with Nokia Flexi EDGE BTS Manager.**

    Alternatively, you can request to unlock the BCF from the BSC.

7.9 Replacing Flexi System External Alarm Module (FSEB)

Purpose

If a module fails and you have carried out troubleshooting, replace the module with a new one.

When replacing the Flexi System External Alarm Module (FSEB), some alarms may be seen (depending on user-defined settings). The alarms will be cancelled once you have replaced the module.

Steps

1. **Connect the ESD wrist strap.**

2. **Disconnect the cables on the module.**

3. **Loosen the screws on the module.**

4. **Pull out the module.**

5. **Install the new module.**

6. **Check that jumper X1103 is set to EDGE.**

7. **Connect the cables.**

8 Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with 48V DC power

Before you start

This section contains instructions for expanding up to three sectors from a 1+1+1/2+2+2 2-way 2UD configuration. You will need the following modules, depending on the number of expansion sectors:

- One sector
  - 1 Dual TRX Module (EXxA)
  - 2 Wideband Combiner Sub-module (EWxx)
  - With stack installation, one 2U casing kit (EMTA)
- Two sectors
  - 2 Dual TRX Modules (EXxA)
  - 4 Wideband Combiner Sub-module (EWxx)
  - With stack installation, two 2U casing kits (EMTA) and one upgrade cable kit (EUCA)
- Three sectors
  - 3 Dual TRX Modules (EXxA)
  - 6 Wideband Combiner Sub-module (EWxx)
  - With stack installation, three 2U casing kits (EMTA) and two upgrade cable kits (EUCA)

Summary

The figures below show the module installation order for expanding all three sectors for FCIA, FCOA, and stack installations. The modules that need to be added are indicated in the figures.

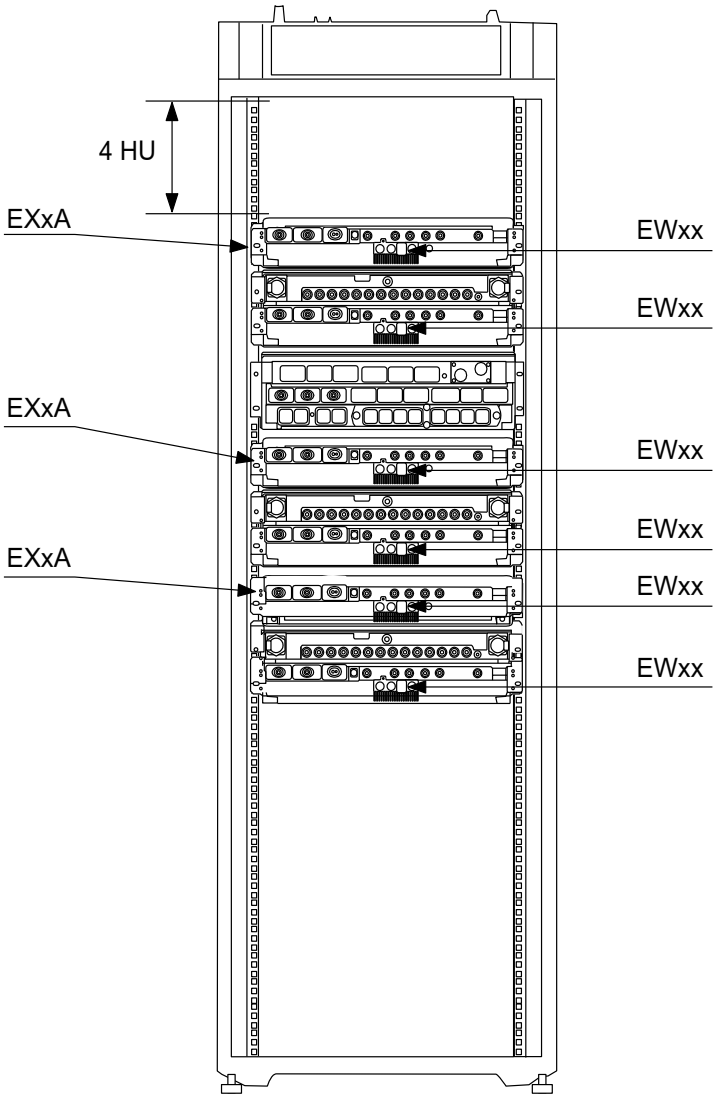


Figure 6. Modules for 3+3+3/4+4+4 expansion in FCIA

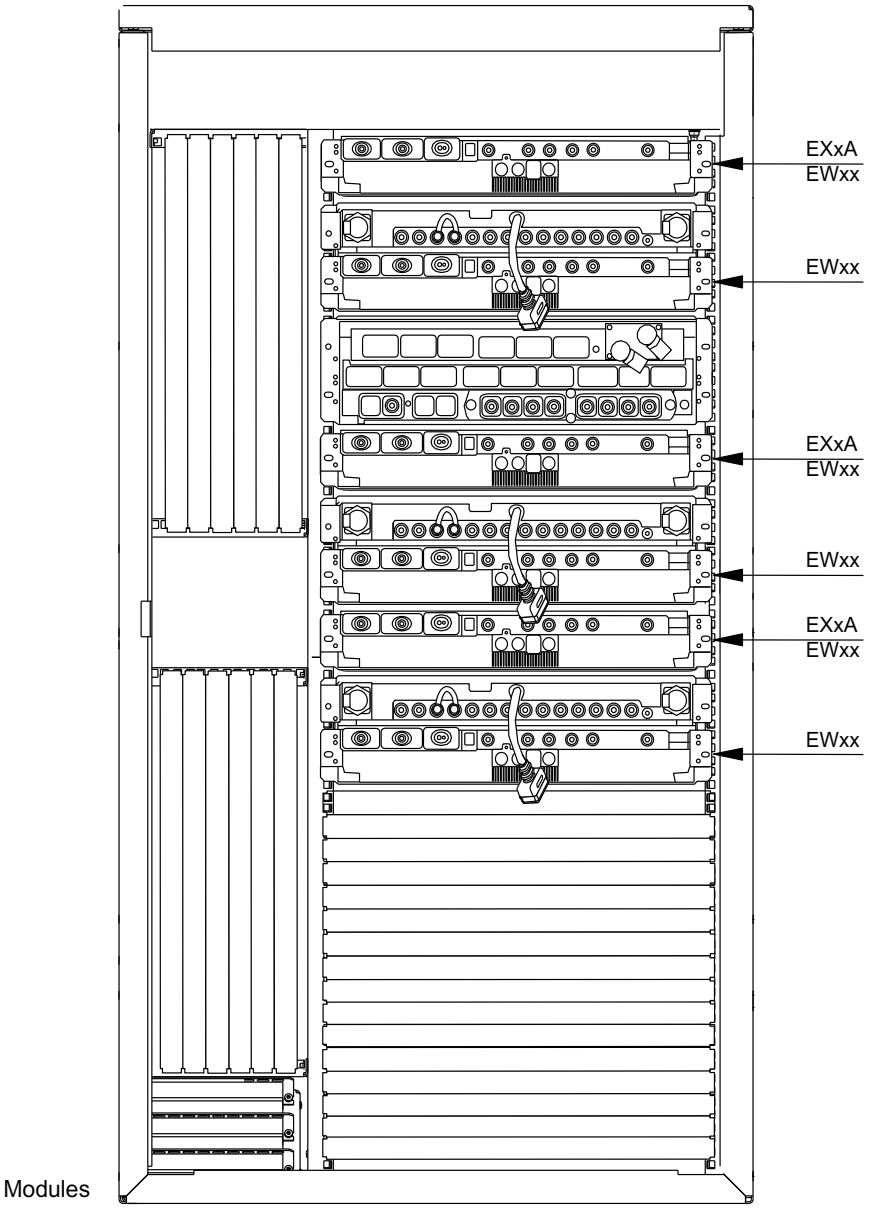


Figure 7. Modules for 3+3+3/4+4+4 expansion in FCOA

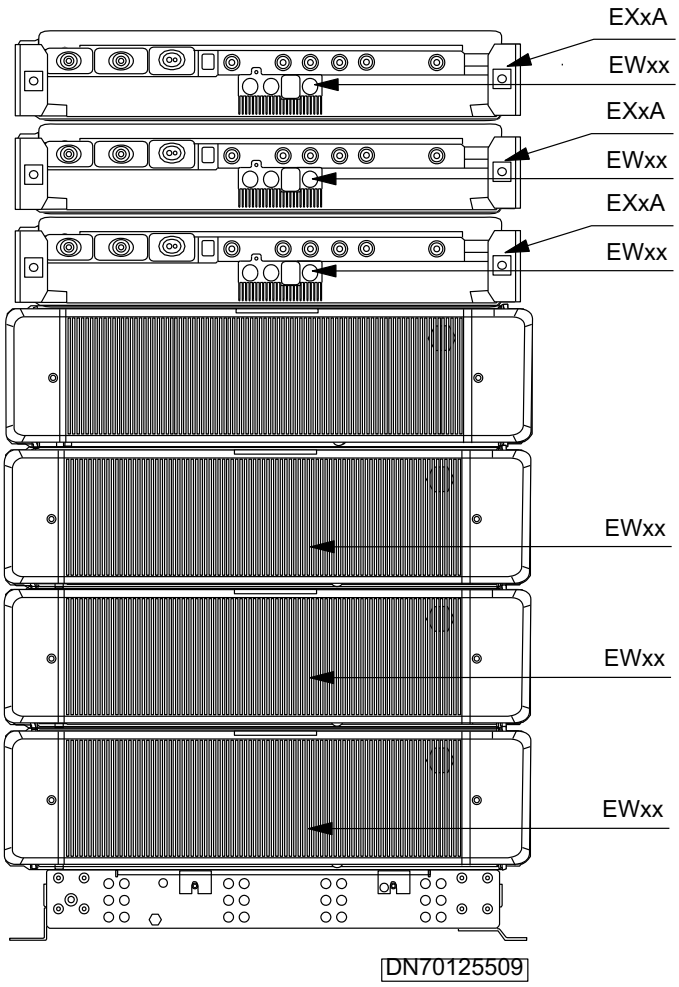


Figure 8. Modules for 3+3+3/4+4+4 expansion in stacks

Steps

1. **If this is a stack installation, install the casing for the new Dual TRX Module.**

2. **If this is a stack installation, remove the front covers from the System Module and Dual TRX Module in the sector being expanded.**

3. **Install the new Dual TRX Module.**

4. If this is a stack installation, install the cable entries on the new Dual TRX Module.

5. Install the Wideband Combiner Sub-modules.

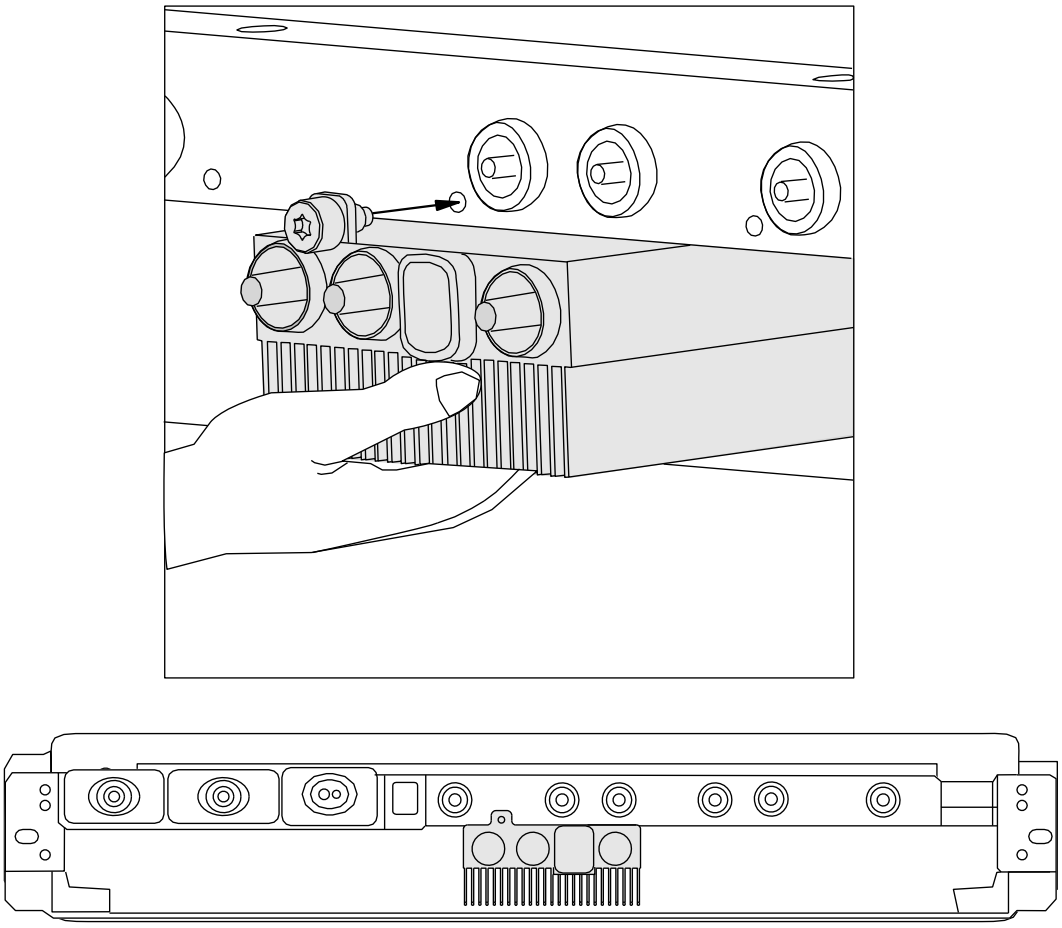


Figure 9. Installing Wideband Combiner Sub-module

6. Connect the bus cable for the new Dual TRX Module.

7. Notify the appropriate personnel and block the sector with Nokia Flexi EDGE BTS Manager.

Alternatively, you can request a sector lock from the BSC.

8. Wait for stable yellow LED to be displayed on the existing Dual TRX Module.

9. Using Nokia Flexi EDGE BTS Manager, disable power to the System Module port on the existing and new Dual TRX Modules.

10. Connect the power cable for the new Dual TRX Module.

11. For sectors using standard RF cables, connect the cables as shown in the picture below.

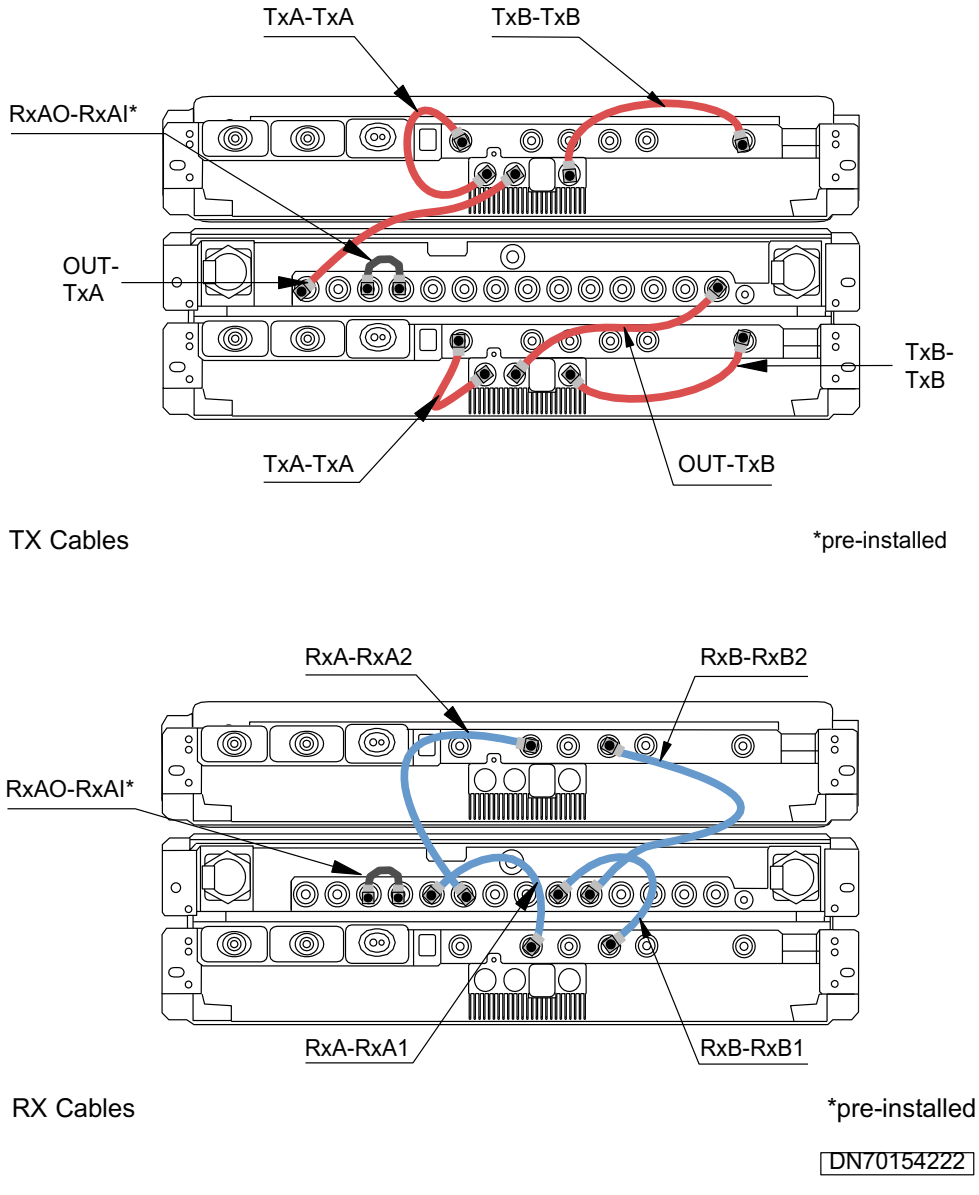


Figure 10. RF cables in 3+3+3/4+4+4 2-way 2UD

Table 1. Expansion kits needed

From	To	Expansion cable kits needed
2+2+2	2+2+4	0
2+2+2	2+4+4	1
2+2+2	4+4+4	2

12. For sectors using the Upgrade Cable Kit (EUCA), connect the cables as shown in the picture below.

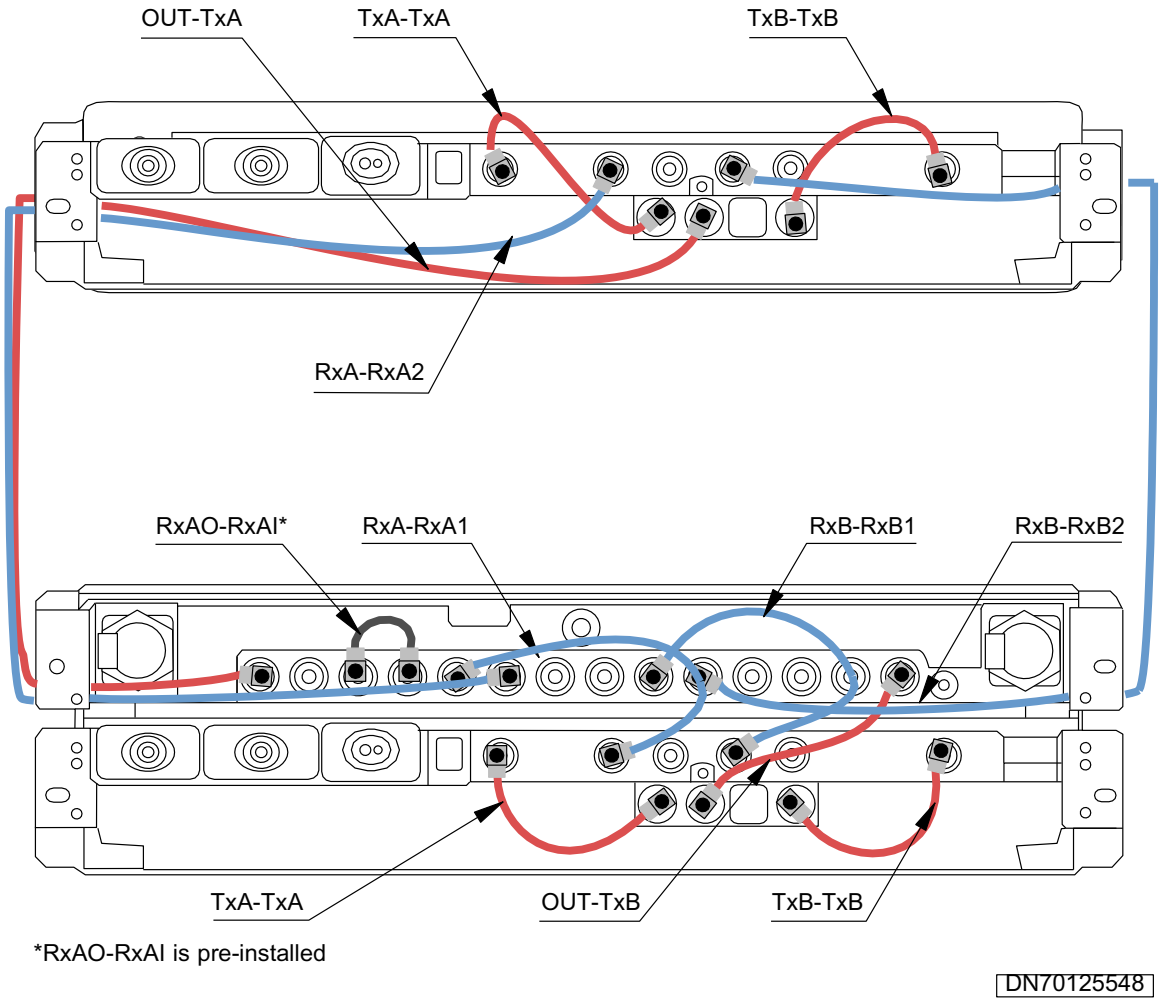


Figure 11. RF cables in 3+3+3/4+4+4 2-way 2UD expansion

Table 2. Connecting TX cables

Number	*Cable*	*From - to*
1	994931	TxA (ERxA) - TxA (EWxx)
2	994931	TxB (ERxA) - TxB (EWxx)
3	994931	OUT (EWxx) - TxB (ERxA)
4	994931	TxA (EXxA) - TxA (EWxx)
5	994931	TxB (EXxA) - TxB (EWxx)
6	994936	OUT (EWxx) - TxA (ERxA)

Table 3. Connecting RX cables

Number	*Cable*	*From - to*
7	994936	RxA (EXxA) - RxA1 (ERxA)
8	994936	RxB (ERxA) - RxB4 (EXxA)
9	994931	RxA (ERxA) - RxA2 (EXxA)
10	994931	RxB (ERxA) - RxB1 (EXxA)

13. Enable power to the Dual TRX Modules.

14. Unblock the sector with Nokia Flexi EDGE BTS Manager.

Alternatively, you can request to unlock the sector from the BSC.

15. Reset the sector with Nokia Flexi EDGE BTS Manager.

16. If front covers are used, re-install them.

9 Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with AC or 24V DC power

Before you start

This section provides instructions for expanding all three sectors from a 1 +1+1/2+2+2 2-way 2UD configuration with 24V DC or AC power.

Separate instructions are needed because an additional power module needs to be installed, which requires mains power to the BTS to be turned off.

Note that if only 1 or 2 sectors are being expanded, then an additional power module is not needed and you should follow same the instructions in *Expanding to a 3+3+3/4+4+4 2-way 2UD configuration with 48V DC power*.

The following HW is needed, depending on the configuration:

- 3 Dual TRX Modules (EXxA)
- 6 Wideband Combiner Sub-module (EWxx)
- If 24 V DC power is used, an additional FPDA and three upgrade cable kits (EUCA) are needed
- If AC power is used, then an additional FPAA is needed and two upgrade cable kits (EUCA) are needed.
- If the BTS is using short-term battery backup (FPBA), then an FPBA needs to be added, along with the FPAA. Follow the same instructions for adding FPAA.

Steps

1. **Notify the appropriate personnel and block the BCF with Nokia Flexi EDGE BTS Manager.**

   Alternatively, you can request a BCF lock from the BSC.

2. Disconnect the mains power breaker.

3. Connect the ESD wrist strap.

4. If this is a stack installation, remove the front covers.

5. If 24V DC power is used, do as follows:

a. Install the new FPDA directly on top of the existing FPDA.

b. Connect the external DC power cables to the DC inputs of the new FPDA.

c. Connect the DC output of the new FPDA to the DC output of the existing FPDA. Route the cables using the double rubber boot provided in the FPDA delivery.

d. Chain the alarm cable for the new FPDA to the existing FPDA.

6. If AC power is used, install and cable the new FPAA sub-module as described in Replacing AC DC sub-module FPAA.

7. If this is a stack installation, install the casing for the new Dual TRX Module.

8. Install the new Dual TRX Module.

9. If this is a stack installation, install the cable entries.

10. Install the Wideband Combiner Sub-modules.

11. Connect the power and bus cable for the new Dual TRX Module.

12. For sectors using RF cables, connect the RF cables as shown in the figure below.

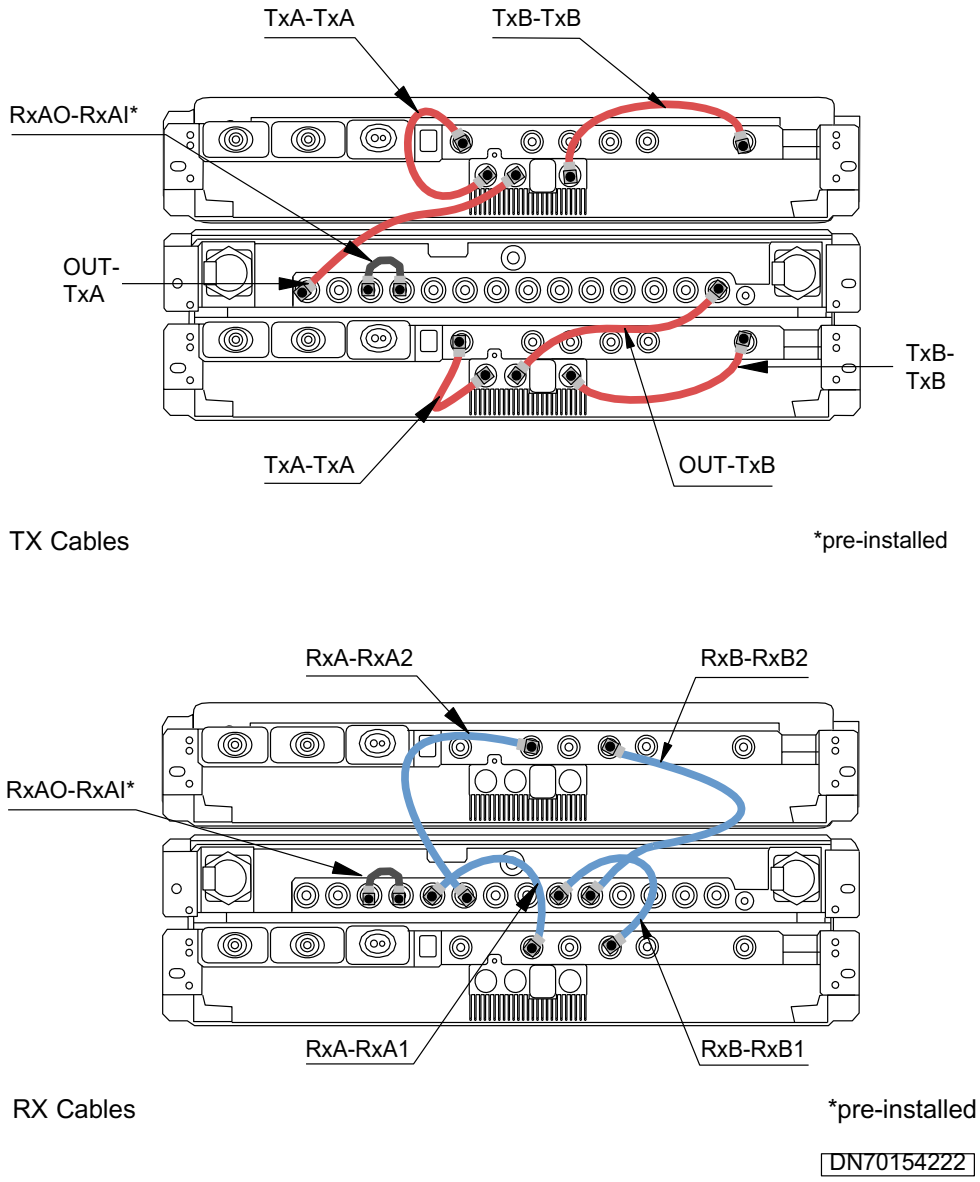


Figure 12. RF cables in 3+3+3/4+4+4 2-way 2UD

13. For sectors using the Upgrade Cable Kit (EUCA), connect the cables as shown in the picture below.

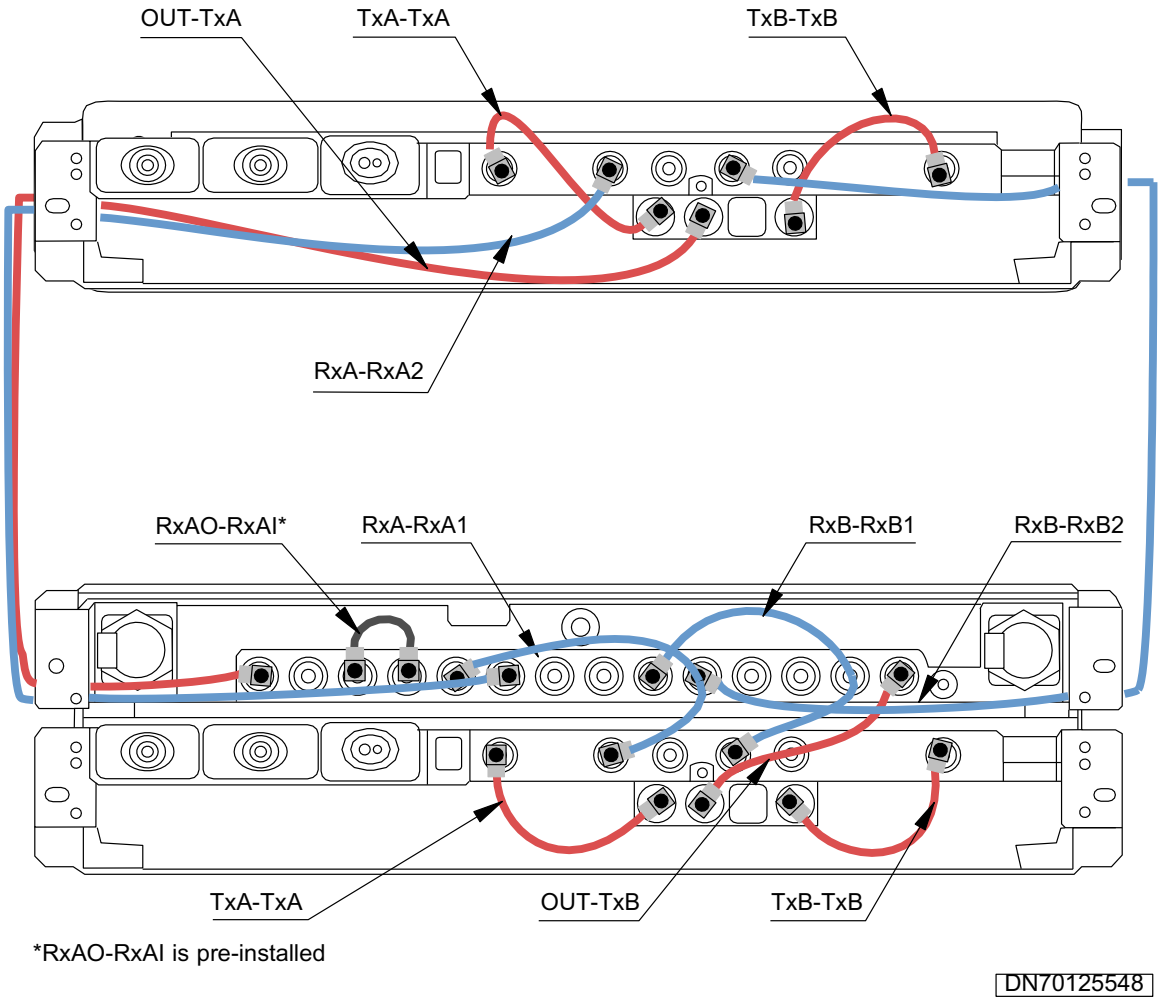


Figure 13. RF cables in 3+3+3/4+4+4 2-way 2UD expansion

Table 4. Connecting TX cables

Number	*Cable*	*From - to*
1	994931	TxA (ERxA) - TxA (EWxx)
2	994931	TxB (ERxA) - TxB (EWxx)
3	994931	OUT (EWxx) - TxB (ERxA)
4	994931	TxA (EXxA) - TxA (EWxx)
5	994931	TxB (EXxA) - TxB (EWxx)

Table 4. Connecting TX cables (cont.)

6	994936	OUT (EWxx) - TxA (ERxA)

Table 5. Connecting RX cables

Number	*Cable*	*From - to*
7	994936	RxA (EXxA) - RxA1 (ERxA)
8	994936	RxB (ERxA) - RxB4 (EXxA)
9	994931	RxA (ERxA) - RxA2 (EXxA)
10	994931	RxB (ERxA) - RxB1 (EXxA)

14. Connect the mains power breaker.

15. Switch on the power to the FPDAs or FPAAs.

16. Unblock the BCF with Nokia Flexi EDGE BTS Manager.

Alternatively, you can request to unlock the BCF from the BSC.

17. Reset the sector with Nokia Flexi EDGE BTS Manager.

18. If this is a stack configuration, re-install the front covers.