

9.4.3 Filling in the Checklist

This section describes the checklist to be filled in after the integration has been completed.

The following checklist is not mandatory but it is strongly recommended. Local procedures and safety regulations must be evaluated and included in this checklist.

Table 60 Checklist

Check the following:	OK
1. The indicators on the RRU, IXU, and PSTU (optional) are in the approved status.	
2. The test equipment has been disconnected from the RBS.	
3. The RBS cabinet and the mounting base are free from foreign objects.	
4. All cables are free of damage.	
5. Top and bottom of cabinet are free of obstructions (for airflow).	
6. The cabinet has been locked, and the screws have been tightened.	
7. All tools have been accounted for.	
8. All paperwork has been completed.	

9.4.4 Network Element Acceptance Certificate

This section contains a Network Element Acceptance Certificate to be filled in by the person responsible. *See Figure below.*

NETWORK ELEMENT ACCEPTANCE CERTIFICATE

This is to certify that Ericsson AB has delivered, installed and tested the Network Element as defined in contract

The Network element acceptance has been performed in accordance with the procedures described in the above mentioned contract. Further reference should be made to the acceptance documents. The Network element passed acceptance with remarks per attached test report.

Number of remarks within Ericsson's responsibilities, that have been made on this site:.....

Date:.....

The Buyer	The Contractor
Company Name:	Company Name: Ericsson AB
Person Responsible:	Person Responsible:

P004631C

Figure 71 Example of a Network Element Acceptance Certificate

10 Maintenance

This chapter describes the maintenance procedures for the RBS 2308 and RBS 2309.

10.1 Introduction

10.1.1 Target Group

The target group for this document is maintenance personnel. To perform maintenance work in a safe and professional way, the work must be done by skilled personnel.

The following qualifications are minimum requirements:

- Good understanding of radio and telephone engineering
- Good understanding of engineering English

10.2 Preconditions

This section describes the preconditions that apply to the maintenance procedures, including tools and safety.

10.2.1 Health and Safety Information

Ensure that the chapters *Personal Health and Safety Instructions* and *System Safety Information* in this manual has been read and fully understood.

10.2.2 Tools

This section presents the recommended torque settings for screws, nuts and connectors.

Torque Values

Table 61 Screws and Nuts

Dimension	Torque Nm	Remark
M4	2.6 Nm \pm 0.15 Nm	Normal

Dimension	Torque Nm	Remark
M4	1.7 Nm \pm 0.15 Nm	Reduced torque for captive screw
M8	21 Nm \pm 1.3 Nm	Earth nut

Table 62 Connectors

Connector	Torque Nm	Remark
TNC	1.7 Nm \pm 0.15 Nm	–
N	2.7 Nm \pm 0.2 Nm	–

10.3 Fault Localization Using OMT

This section contains information on how to localize a fault when handling an alarm in the OMT. Ericsson recommends that the OMT is used, but if no OMT is available, or it is not possible to connect to the RBS, see *Section 10.4 Troubleshooting Using the RBS Indicators on page 193*.

The section is based on the Replacement Unit Map (RU Map) connected to an alarm. The RU Map consists of two different kinds of RUs:

- Physical Units

The following RUs are mapped to one single physical unit that can be replaced in the field.

- IXU
- RRU
- TIM (only if an IXU with R-state lower than R5A is used)
- PSTU
- Fan unit

- Logical units

The following RUs are handled as one unit, but can actually be one or more physical units.

- Antenna: The logical path from the RRU to (and including) the antenna
- Battery: The battery backup system including batteries
- Environment: External conditions (ambient temperature and site power)
- GPS receiver: The synch. signal received and distributed by the GPS receiver

- GPS receiver DXU cable: The logical link between the GPS receiver and the IXU
- IDB: The installation database stored in the RBS, not the physical storage
- Y link: The logical link between IXU and RRU(s)

For supplementary information about RU maps, see:



Fault List Micro

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10.3.1

Reading Fault Status

This section describes how to read the fault status, using the OMT. If any fault indicator on the RBS is on, then the fault status must be read.

Connect the OMT

1. Remove the lid from the OMT port on the IXU.
2. Connect the OMT cable from the PC serial port 1 to the OMT port on the right-hand side of the IXU. If an extended OMT cable is connected to the OMT port, then connect the OMT cable to the end of the extended OMT cable.

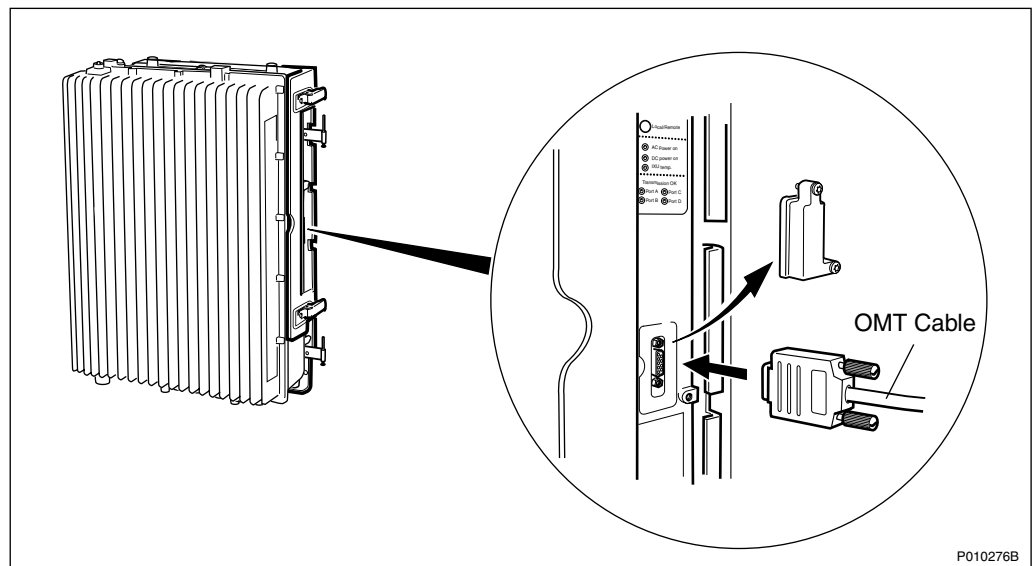
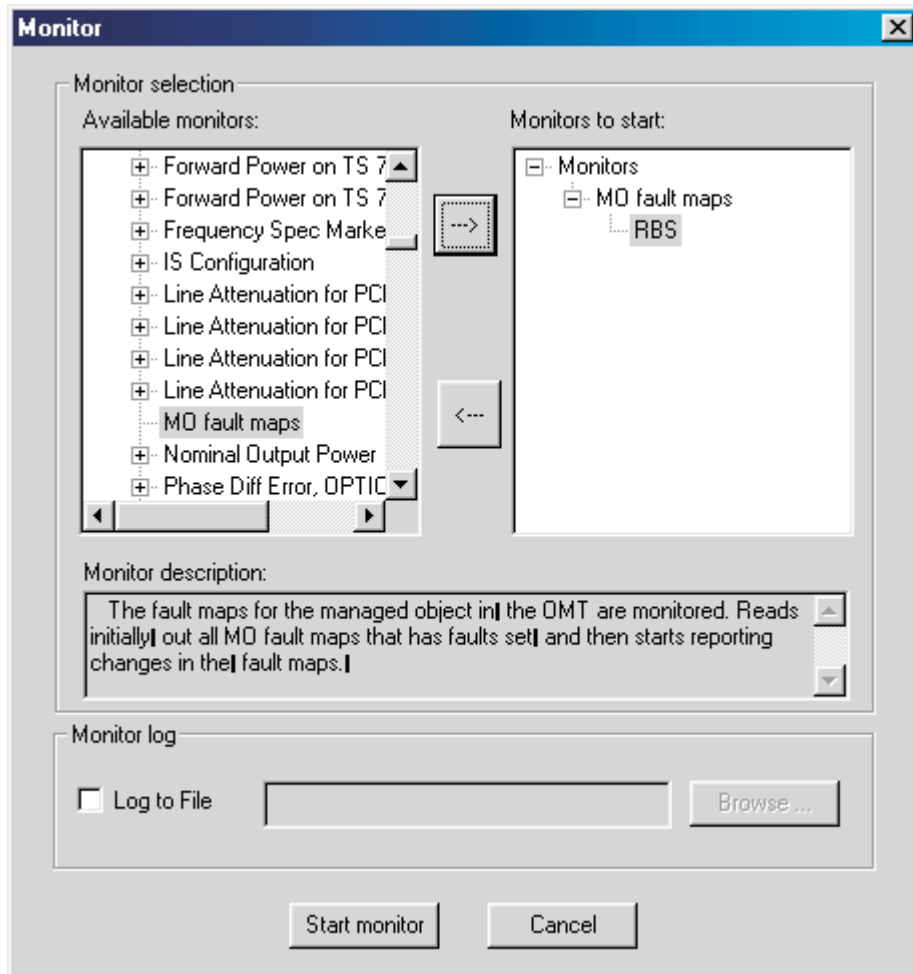


Figure 72 Connecting OMT to IXU

3. Start the OMT

Reading the IDB

4. In the **RBS 2000** menu, select **Connect** to logically connect the OMT to the RBS.
5. In the **Configuration** menu, select **Read IDB**
6. On the **Maintenance** menu, click **Monitor** to open the Monitor window. See figure below.



P010476A

Figure 73 Reading Fault Status

7. In the Available monitors box, select "MO fault maps" and click → to add "RBS" into the Monitors to start box.
8. Click **Start monitor**.
9. In the RBS Event Monitor window, check the MO faults box to see if there are any faults. If there are, then correct these before continuing.

When an MO fault is selected, corresponding fault description, action and related faults are displayed. See also:



Fault List Micro

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10. When all faults are corrected, close the RBS Event Monitor window.

10.3.2 SO CF RU:0/ IXU

This section describes how to localize an SO CF RU:0/ IXU fault.

Related RUs

The RUs listed below have higher priority than the RU described in this section. If they are present, then proceed to the related section before handling this RU.

- If “SO CF RU:34/ IDB” appears in the OMT, then proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*.
- If “SO CF RU:3/ Y link” appears in the OMT, then proceed with *Section 10.3.3 SO CF RU:3/ Y Link on page 179*.

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*

Perform the following actions step-by-step until the fault ceases:

Resetting IXU

1. Press the **IXU reset** button on the IXU interface panel.

Loading Software in the RBS

2. Load software and IDB.
3. Replace the flash card, proceed with *Section 10.5.2 Replacing a Flash Card on page 210*.

Replacing IXU

4. Replace the IXU, proceed with *Section 10.5.4 Replacing an IXU on page 219*.

10.3.3 SO CF RU:3/ Y Link

This section describes how to localize an SO CF RU:3/ Y Link fault. The Y-link cable is connected between the IXU and the RRU(s).

Related RUs

The RU listed below has higher priority than the RU described in this section. If it is present, proceed to the related section before handling this RU.

- If "SO CF RU:34/ IDB" appears in the OMT, proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*.

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Checking IDB Configuration

1. In the **Maintenance** menu in OMT, select **Check IDB** to display possible inconsistencies between the HW and the IDB. Ensure that the IDB is in accordance with the HW cabinet configuration.

Checking RRU Power

Perform the following actions step-by-step until the fault ceases, or until the RRU power is confirmed.

Note: This is only valid for an RRU connected to the Y-link generated alarm.

2. Check that the indicators **AC Power on/DC Power on** on the RRU interface panel are on.
3. Open the RBS and check that the RRU power is switched on.
4. Check that the power cable from the MBU to the RRU is correctly connected.
5. Disconnect the power cable from the RRU and use a multimeter to check that the correct voltage is being supplied to the RRU, *see figure and table below*.

For more information about correct voltage, *see*:



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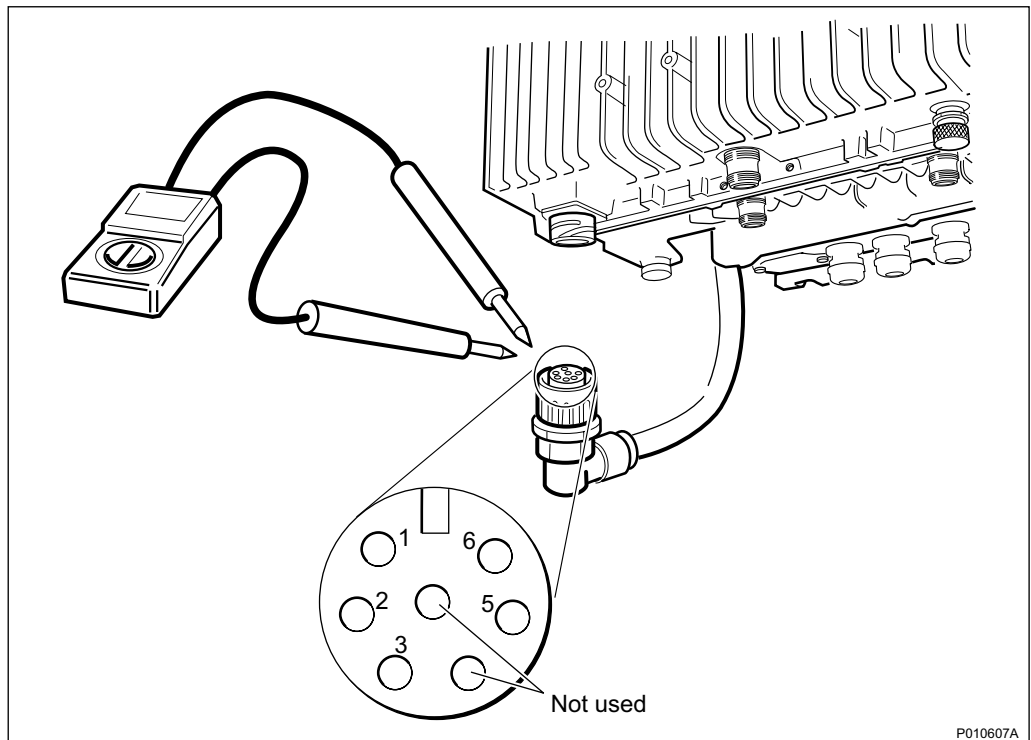


Figure 74 Measuring Voltage on RRU Power Cable

Table 63 Pins and Functions

Connector Pin	Function
1	DC_P
2	DC_N
3	PE
5	AC_L2
6	AC_L1

Resetting RRU

6. Press the **RRU reset** button on the RRU interface panel connected to the faulty Y link

Resetting IXU

7. Press the **IXU reset** button on the IXU interface panel

Checking Y-Link Cable

Perform the following actions step-by-step until the fault ceases:

8. Check that the Y-link cable is correctly connected to both the IXU and the RRU

9. Check that the cable is free from damage
10. If the Y-link cable is damaged, replace it *according to Section 10.5.12 Replacing a Y-Link Cable on page 250*

Replacing the RRU

11. Replace the RRU, *see Section 10.5.8 Replacing an RRU on page 235*

Replacing the IXU

12. Replace the IXU, *see Section 10.5.4 Replacing an IXU on page 219*

10.3.4 SO CF RU:4/ TIM

This section describes how to localize an SO CF RU:4/ TIM fault.

Related RUs

The RUs listed below have higher priority than the RU described in this section. If they are present, go to the related section before handling this RU.

- If "SO CF RU:0/ IXU" appears in the OMT, *proceed with Section 10.3.2 SO CF RU:0/ IXU on page 179*
- If "SO CF RU:3/ Y link" appears in the OMT, *proceed with Section 10.3.3 SO CF RU:3/ Y Link on page 179*
- If "SO CF RU:34/ IDB" appears in the OMT, *proceed with Section 10.3.8 SO CF RU:34/ IDB on page 187*
- If "SO TRXC RU:0/ RRU" appears in the OMT, *proceed with Section 10.3.12 SO TRXC RU:0/ RRU on page 192*

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Checking Contacts on TIM and IXU

1. Check that the TIM is correctly installed, and that all connector pins on both IXU and TIM are free from damage.

Replacing TIM

2. Replace the TIM, *see Section 10.5.4 Replacing an IXU on page 219* .

Resetting IXU

3. Press the **IXU reset** button on the IXU interface panel.

Replacing IXU

4. Replace the IXU, see *Section 10.5.4 Replacing an IXU on page 219*.

10.3.5

SO CF RU:14/ Battery

This section describes how to localize an SO CF RU:14/ Battery fault.

Related RUs

- If “SO CF RU:31/ Environment” appears in the OMT, together with “SO CF EC2:10/ Mains fail (external power source fail)”, then proceed with *Section 10.3.7 SO CF RU:31/ Environment on page 185*.

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Checking HW/IDB

1. Check the DC power indicator on the IXU, and the RRU interfaces, to locate the cabinet issuing the alarm.
2. In the **Maintenance** menu in OMT, select **Check IDB** to display possible inconsistencies between the HW and the IDB. Ensure that the IDB configuration is correct, according to the HW cabinet configuration, regarding defined climate system.

Checking Cabinet Power

3. Open the RBS and check that the DC power is switched on.
4. Open the MBU cover and check that the incoming DC cable is correctly connected.

Checking the Battery Backup System

5. Check the backup power chain from the IXU to the battery backup system, including any optional fuses.
6. Check the battery backup system according to the manufacturer's documentation.

10.3.6 SO CF RU:15/ Fan

This section describes how to localize an SO CF RU:15/ Fan fault.

Related RU

The RU listed below has higher priority than the RU described in this section. If it is present, go to the related section before handling this RU.

- If "SO CF RU:34/ IDB" appears in the OMT, then proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases.

Checking IDB Configuration

1. In the **Maintenance** menu in OMT, select **Check IDB** to display possible inconsistencies between the HW and the IDB. Ensure that the IDB configuration is in accordance with the HW cabinet configuration regarding defined climate system.

Checking Fan Unit



Caution!

Rotating fan blades can cause injury to body parts that come into contact with the blades. Blades in fan units continue to rotate for a period of time, even after the fan has been switched off. Wait until fans have stopped rotating completely before starting work on or near fans.

2. Remove the fan unit cover.
3. Ensure that the fans rotate freely and without obstruction.

Resetting Fan Unit

4. Press the **Test** button on the fan unit.

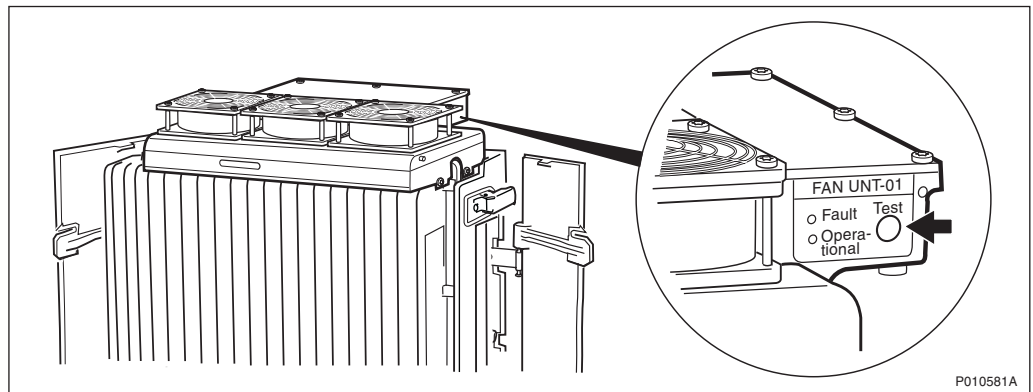


Figure 75 Fan Unit Test Button

5. Check that the test sequence below is carried out:
 - The fans run at maximum speed for approximately 5 seconds
 - The fans run at nominal speed for approximately 5 seconds
 - The fans stop within approximately 5 seconds
6. Ensure that the indicator status of the fan unit is in accordance with the table below:

Table 64 Fan Unit Indicators After Test

Fan Unit Indicators	Status
Fault	Off
Operational	On

Replacing Fan Unit

7. Replace the fan unit, see *Section 10.5.1 Replacing a Fan Unit on page 207*.

10.3.7 SO CF RU:31/ Environment

This section describes how to localize an SO CF RU:31/ Environment fault. This fault is only generated by external factors, for example climate or incoming power.

Related RU

The RU listed below has higher priority than the RU described in this section. If it is present, go to the related section before handling this RU.

- If “SO CF RU:34/ IDB” appears in the OMT, then proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Checking IDB Configuration

1. In the **Maintenance** menu in OMT, select **Check IDB** to display possible inconsistencies between the HW and the IDB. Ensure that the IDB configuration is in accordance with the HW cabinet configuration regarding defined power system and climate system.

Checking Climate

2. Inspect the airflow path in the RBS, and ensure that the airflow is not obstructed.
3. If the temperature is between 45 and 55° C, install a fan unit. For more information, see *Chapter Installation of RBS* in this manual.
4. If the temperature is below -15°C, then the RBS must be powered with AC. AC power is needed for the RBS to start the heater.

Note: RBS units from certain R-states are less sensitive to low temperatures and have therefore no internal heater. For more information about unit R-states from which these improvements apply, see *chapter Product Description, section Operating Environment* in the following manual:

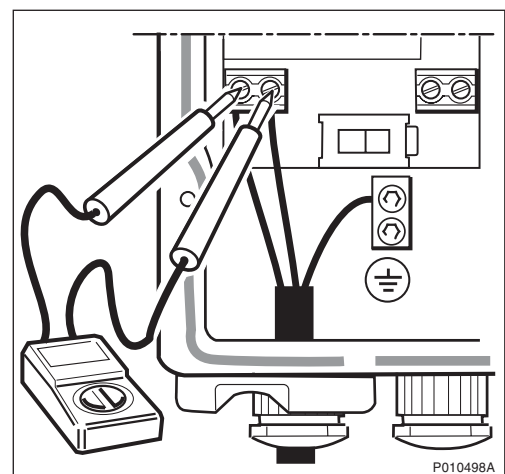


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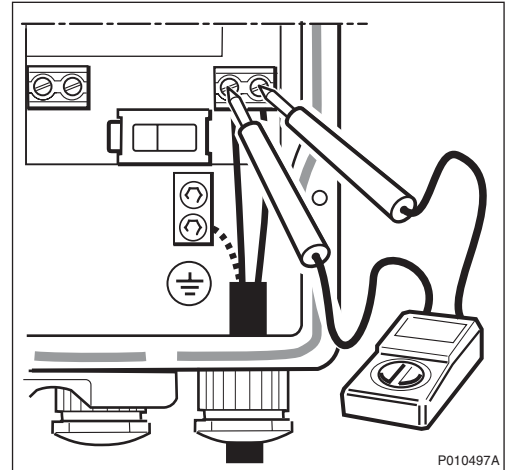
Checking Incoming AC Power (Optional)

5. Open the MBU cover and use a multimeter to check that the power input is either 100 V AC to 127 V AC, or 200 V AC to 250 V AC.



Checking Incoming DC Power (Optional)

6. Open the MBU cover and use a multimeter to check that the voltage supplying the RBS, is between -40.5 and -60.0 V DC. If a DC supply is not detected, then check the DC supply source.



10.3.8 SO CF RU:34/ IDB

This section describes how to localize an SO CF RU:34/ IDB.

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Resetting IXU

1. Press the **IXU Reset** button on the IXU Interface panel.

Reinstalling IDB

2. Reinstall the IDB. For more information, see *Chapter Site Installation Tests* in this manual.

Replacing Flash Card

3. Replace the flash card, see *Section 10.5.2 Replacing a Flash Card on page 210*.

10.3.9 SO CF RU:40/ Antenna

This section describes how to localize an SO CF RU:40/ Antenna fault.

Related RU

The RU listed below has higher priority than the RU described in this section. If it is present, then go to the related section before handling this RU.

- If "SO CF RU:34/ IDB" appears in the OMT, then proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Reading ARAE Alarm Status

Note: This step is only valid if "SO CF EC2:13/ Auxiliary equipment fault" appears in the OMT.

1. In the **Configuration** menu, select **Read IDB** and click **Yes**.
2. In the **Maintenance** menu, select **Monitor**.
3. Select **ARAE Alarm Status**.
4. In the Available monitors box, select "Alarm inlets" and click → to add it in the Monitors to start box.
5. Click **Start Monitor**.
6. Check the Display Status window to see which ARAE alarm are active.
7. Check that the ARAE fault is correctly defined in the IDB.
8. Check the cable to the equipment supervised by the ARAE alarm.
9. Replace the faulty equipment supervised by that alarm.

Checking RX Diversity

10. Ensure that the cell is configured, in the BSC, with the correct diversity (RXD).
11. Confirm that radio cables are connected to the correct RRUs and antennas.

Performing DTF Test

12. Disconnect the faulty feeder and locate the fault, by performing a Distance To Fault (DTF) test. For more information, see chapter *Antenna System Tests* in this manual.

13. Replace the faulty equipment identified in the DTF test.

Note: The RXBP and MCB are not included in the DTF test.

14. If no faulty equipment was identified, replace the antenna.

10.3.10 SO CF RU:48/ GPS Receiver

This section describes how to localize an SO CF RU:48/ GPS Receiver. To avoid complete loss of traffic, have the BSC operator configuring PCM as backup synchronization source (SYNCSRC=DEFAULT).

Related RUs

The RUs listed below have higher priority than the RU described in this section. If they are present, go to the related section before handling this RU.

- If "SO CF RU:34/ IDB" appears in the OMT, then proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*
- If "SO CF RU:0/ IXU" appears in the OMT, then proceed with *Section 10.3.2 SO CF RU:0/ IXU on page 179*

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Replacing GPS Receiver

1. Disconnect the power to the GPS, for example by disconnecting the connector in the OVP. Wait a few minutes and then reconnect the power.
2. Replace the GPS receiver.

10.3.11 SO CF RU:49/ GPS Receiver DXU Cable

This section describes how to localize an SO CF RU:49/ GPS Receiver DXU cable. To avoid complete loss of traffic, ensure that the BSC operator configures PCM as backup synchronization source (SYNCSRC=DEFAULT).

Related RUs

The RUs listed below have higher priority than the RU described in this section. If they are present, go to the related section before handling this RU.

- If "SO CF RU:34/ IDB" appears in the OMT, then proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*

- If "SO CF RU:0/ IXU" appears in the OMT, then proceed with *Section 10.3.2 SO CF RU:0/ IXU on page 179*

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Precondition

Before starting this procedure, ensure that the GPS system has no fault and is properly installed.

Check IXU GPS Cable

1. Check that the IXU GPS cable is free from damage. Replace if needed.
2. Check that the IXU GPS cable is correctly connected to the GPS/AUX port on the IXU.
3. If an EBB-01 is used, then check that the GPS and GPS/AUX cables on the EBB-01 are correctly connected.

Localizing Fault on GPS Receiver

4. Check all cables and equipment (including the GPS receiver) connected to the signal chain between the IXU GPS cable and the GPS receiver.
5. Check the power supply to the GPS by checking the DC indicator in the OVP.

Refer to manufacturer's documentation to perform fault localization on the GPS receiver.

Checking DC Supply

6. Check that both the -48 V LINK cable and the termination block are correctly connected, as shown in the figures below.

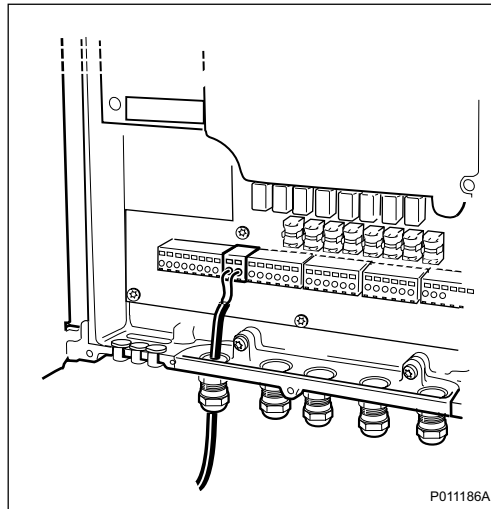


Figure 76 Cable Connection Check

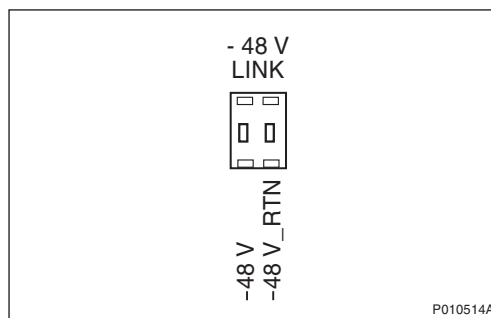
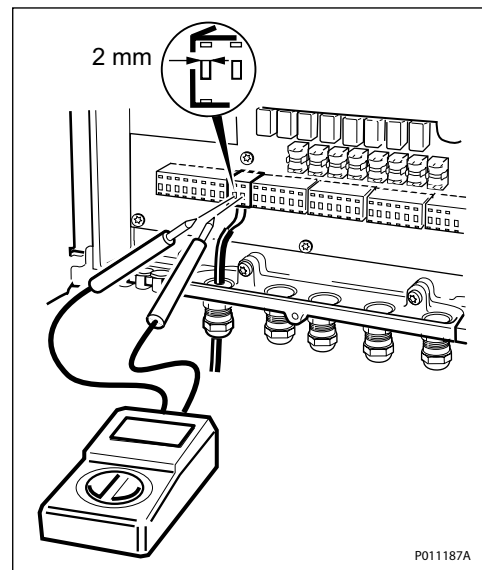


Figure 77 Connector Connection Check

7. Perform a cold reset on the GPS by disconnecting the termination block for a few seconds.
8. Check that both the -48 V LINK cable and the conductor are free from damage. Replace if needed.

9. Check that the voltage is -48 V DC , using a multimeter.



10.3.12 SO TRXC RU:0/ RRU

This section describes how to localize an SO TRXC RU:0/ RRU fault.

Related RUs

The RUs listed below have higher priority than the RU described in this section. If they are present, go to the related section before handling this RU.

- If “SO CF RU:3/ Y link” appears in the OMT, then proceed with *Section 10.3.3 SO CF RU:3/ Y Link on page 179*
- If “SO CF RU:31/ Environment” appears in the OMT, then proceed with *Section 10.3.7 SO CF RU:31/ Environment on page 185*
- If “SO CF RU:34/ IDB” appears in the OMT, then proceed with *Section 10.3.8 SO CF RU:34/ IDB on page 187*

Two TXs are used when TX diversity is activated, but only the first TX sends the alarm. The fault is therefore located in a different RRU.

Displaying Fault Information

Display fault information according to *Section 10.3.1 Reading Fault Status on page 177*.

Perform the following actions step-by-step until the fault ceases:

Resetting RRU

1. Press the **RRU reset** button on the RRU interface panel.

Restarting RRU

2. Switch off the RRU, wait for one minute and switch it on again.

Replacing RRU

3. Replace the RRU, see *Section 10.5.8 Replacing an RRU on page 235*.

10.4

Troubleshooting Using the RBS Indicators

This section describes troubleshooting procedures using the RBS indicators.

If no faults are detected in the RBS, then the indicators should be in accordance with the tables below.

Table 65 RRU Indicator Status When the RBS is in Operation

RRU Indicator	State
Fault	Off
Operational	On
Local	Off
RF off	Off
AC power on	On ⁽¹⁾
DC power on	On ⁽¹⁾
RRU temp.	Off

(1) Depending on power system configuration.

Table 66 IXU Indicator Status When the RBS is in Operation

IXU Indicator	State
Fault	Off
Operational	On
Local	Off
RBS fault	Off
External alarm	Off
AC power on	On ⁽¹⁾
DC power on	On ⁽¹⁾
IXU temp.	Off
Transmission OK	On ⁽²⁾

(1) Depending on power system configuration.

(2) A, B, C, or D, depending on transmission configuration.

Table 67 PSTU Indicator Status When the RBS is in Operation

PSTU Indicator	State
Fault	Off
Operational	On
Synchronized	On
10/100Base-T	On ⁽¹⁾
100Base-LX10	On ⁽²⁾
Transmission OK	Off ⁽³⁾

(1) When traffic is active on the electrical Ethernet link.

(2) When traffic is active on the optical Ethernet link.

(3) For ports A–D

If the indicators indicate a fault, see the applicable Section below.

10.4.1 Double-Flash Indication of Function Changes

When upgrading from an earlier to a later software version, the behaviour of the Operational indicator is always controlled by the earlier software version. After the upgrade is finished, the installed software version controls the Operational indicator.

When the Operational indicator is double-flashing on an RU, it means that the RU is performing a function change and saving software in internal flash memory.

This indication has been introduced because any disturbance of an RBS performing a function change can corrupt the RU software. It is also very important that all RUs in an RBS use the same software. Do not disturb any RU or change any RU to Local mode while an RU is indicating a function change. RUs continue to indicate function changes until a function change restart takes place, unless:

- The software downloaded to the RU is identical to the software in RAM, in which case the RU will stop indicating a function change after the download is completed
- IXU is downloading software to the flash memory that is not intended to execute on the IXU, in which case the IXU will only indicate a function change while the file transfer is in progress

An RU without internal flash memory double-flashes while receiving software even though it cannot store the software in flash memory.

Indication of a Function Change when Operational Indicator Is On

When a function change is initiated and the Operational indicator is on, it starts to double-flash and shows a constant light during the so-called indicator old

state. See figure below. This sequence is repeated throughout the function change process.

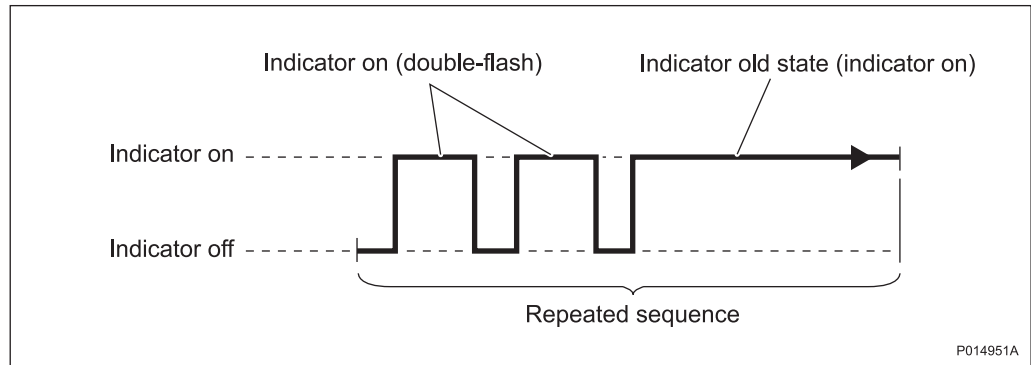


Figure 78 Function Change Indication When Operational Indicator Is On

Indication of a Function Change When Operational Indicator Is Off

When a function change is initiated and the Operational indicator is off, it starts to double-flash and is off during indicator old state. See figure below. This sequence is repeated throughout the function change process.

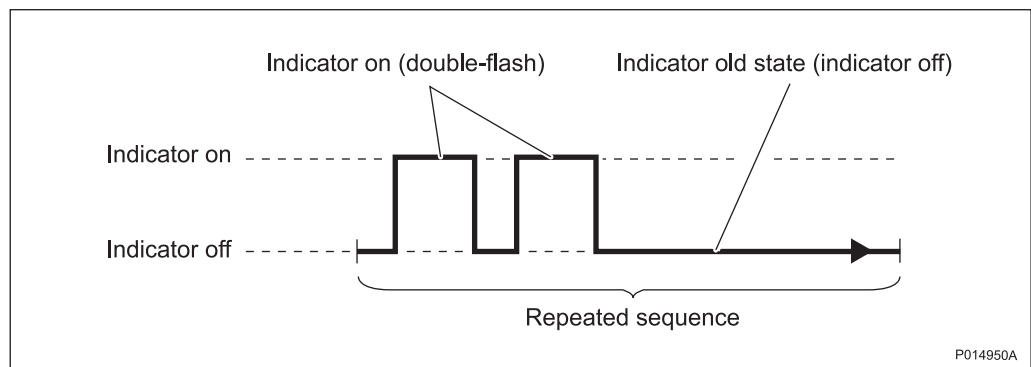


Figure 79 Function Change Indication When Operational Indicator Is Off

Before Maintaining an RBS Indicating a Function Change

Before performing any further operations on an RBS that is indicating function change, do one of the following:

- If the Operational indicator is double-flashing on the IXU, indicating that a file transfer is in progress (normally followed by RUs indicating function change), wait for a few minutes; if the Operational indicator on the IXU continues to double-flash, contact the OMC operator for further instructions or to request a start command on SO CF
- If the Operational indicator is double-flashing on an RU, which indicates that a function change is in progress, wait 1 or 2 minutes until a function change restart has been made

Note: Do not under any circumstances touch the RBS while a function change is in progress, which is indicated by a double-flashing Operational indicator.

10.4.2 Corrective Actions for the IXU

Fault

If the red Fault indicator is on, IXU HW fault(s) are detected. Perform the following actions step-by-step until the fault ceases:

- If a PSTU is used and the red Fault indicator on the PSTU is on, see *the PSTU Alarm OPI* corresponding to the alarm that was issued from the PSTU.
- Use the OMT to display fault information, see *Section 10.3 Fault Localization Using OMT on page 176*. If the OMT cannot be connected, then proceed with the steps below
- Ensure that the flash card has been properly inserted in the IXU
- Replace the IDB and software on the flash card, see *Section 10.5.2 Replacing a Flash Card on page 210*
- Replace the flash card, see *Section 10.5.2 Replacing a Flash Card on page 210*
- Replace the IXU, see *Section 10.5.4 Replacing an IXU on page 219*

Operational

If the green Operational indicator is double-flashing, software is being downloaded. If the indicator is flashing, configuration is in progress, for example, synchronization. A software download from the BSC can take 30 – 60 minutes and synchronization 5 – 10 minutes. Wait until all activity is finished, that is, until the flashing stops.

Local

If the yellow Local indicator is on and it is not possible to bring the IXU into remote mode, either by using the OMT or by pressing the IXU Local/Remote button, then perform the following actions step-by-step until the fault ceases:

- Reset the IXU
- Install a new IDB using the OMT, see chapter Site Installation Tests
- Replace the IXU. See *Section 10.5.4 Replacing an IXU on page 219*

If the yellow Local indicator is flashing and the anticipated BSC communication cannot be established, then perform the following actions step-by-step (in close cooperation with the BSC operator) until the fault ceases:

- Reset the IXU
- Ensure that the expected Transmission OK indicators are on

Note: Transmission OK indicators only indicate that the incoming transmission signal is present electrically. The physical transmission connection should still be checked.
- Ensure that the TEI value in the RBS IDB corresponds with the CF TEI value set in the BSC for this RBS. Request that the BSC operator checks that no other RBSs are using the same CF TEI value on the transmission line
- If a PSTU is used, ensure that the PSTU is in operation (otherwise, follow the instructions in the PSTU Alarm OPI, Ethernet Interface Down) and that the transmission interface parameter in the RBS IDB is set to IP
- If a PSTU is not used, ensure that the following transmission parameters in the RBS IDB are correct:
 - Transmission interface
 - CRC-4
 - Spare bits
 - Synchronization source
 - Receiver sensitivity
 - LBO
- Ensure that all RBSs, connected on the same transmission line between the BSC and this RBS, have Cascade defined as Network Topology in the IDB
- Ensure that the BSC has a correctly configured A-bis path to the RBS
- Ensure that the corresponding TRH and RBLT devices in the BSC are working

RBS Fault

If the yellow RBS Fault indicator is on, an RBS fault is detected. Perform the following actions step-by-step until the fault ceases:

- Use the OMT to display fault information, see *Section 10.3 Fault Localization Using OMT on page 176*

External Alarm

If the yellow External alarm indicator is on, external alarm(s) is active in the RBS. Perform the following actions step-by-step until the fault ceases:

- Use the OMT to display fault information. *See the following instructions:*
 1. Start the OMT.
 2. In the **Maintenance** menu, select **Monitor**.
 3. Select **External Alarms Status**.
 4. In the Available monitors box, select **Alarm inlets** and click → to add it to the Monitors to start box.
 5. Click **Start Monitor**.
 6. Check the Display Status window to see which external alarms are active.
 7. Check that the external alarms are correctly defined in the IDB.
 8. When the faults are corrected, close the Display Status window.

AC Power On

If the green AC power on indicator is off, and if AC power is supposed to be available, then perform the following actions step-by-step until the fault ceases or until the IXU power is confirmed:

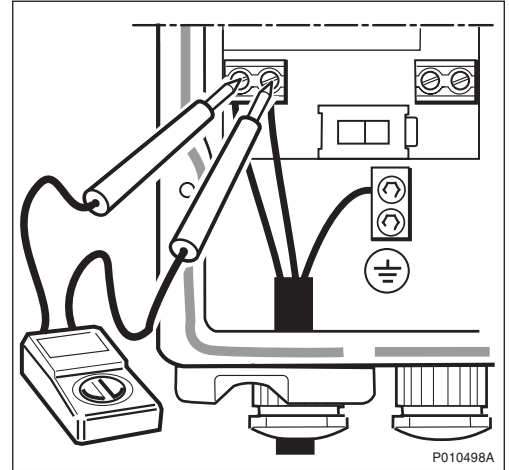
For more information about RBS AC power, *see:*



*RBS 2308, RBS 2309, and RBS 2109
Hardware Reference Manual*

EN/LZT 720 0058

1. Ensure that the RBS AC power switch on the MBU is on.
2. Open the MBU cover and use a multimeter to check that the power input is either 100 V AC to 127 V AC, or 200 V AC to 250 V AC.



3. Disconnect the power cable from the IXU and use a multimeter to check that the power supply to the IXU is either 100 V AC to 127 V AC, or 200 V AC to 250 V AC. The power is measured between pin 5 and pin 6, see figure below.

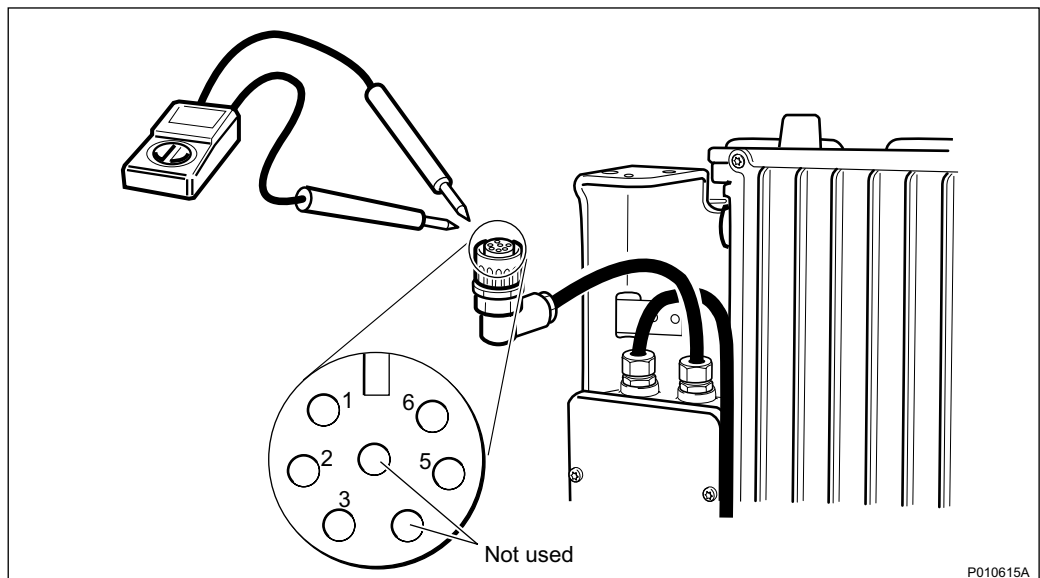


Figure 80 Measuring AC Voltage on IXU Power Cable

4. Replace the PIB in the MBU, see *Section 10.5.6 Replacing a PIB on page 227*.
5. Replace the IXU, see *Section 10.5.4 Replacing an IXU on page 219*.

DC Power On

If the green DC power on indicator is off, and if DC supply should be available, then perform the following actions step-by-step until the fault ceases, or until the IXU power is confirmed:

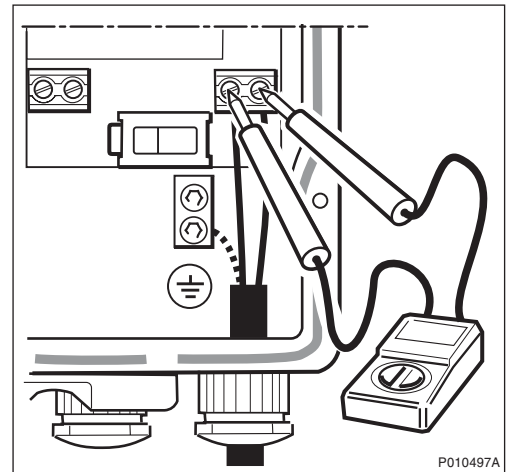
For more information about RBS DC supply voltage, see:



*RBS 2308, RBS 2309, and RBS 2109
Hardware Reference Manual*

EN/LZT 720 0058

1. Ensure that the RBS DC supply switch on the MBU is on.
2. Open the MBU cover and use a multimeter to check that the incoming voltage is between -40.5 V DC and -60.0 V DC.



3. Disconnect the power cable from the IXU and use a multimeter to check that the voltage supplying the IXU is between -40.5 V DC and -60.0 V DC. The power is measured between pin 1 and pin 2, see *figure below*.

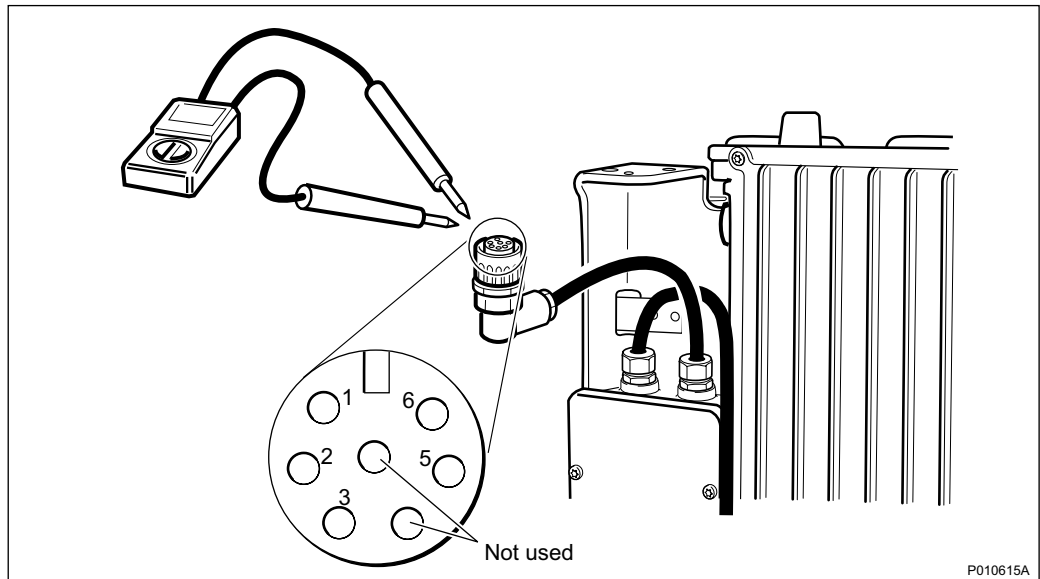


Figure 81 Measuring Voltage on IXU Power Cable

4. Replace the PIB in the MBU, see *Section 10.5.6 Replacing a PIB on page 227*
5. Replace the IXU, see *Section 10.5.4 Replacing an IXU on page 219*

IXU Temp

If the yellow IXU temp indicator is on and the conditions are hot, perform the following:

- Ensure that airflow is not obstructed above or below the RRU, or through its cooling flanges

If the yellow IXU temp indicator is on and the conditions are cold, perform the following:

- Ensure that the IXU is provided with AC power for the internal heater

Note: Under certain circumstances it can take up to 75 minutes for the IXU to start up.

Note: RBS units from certain R-states are less sensitive to low temperatures and have therefore no internal heater. For more information about unit R-states from which these improvements apply, see *chapter Product Description, section Operating Environment* in the following manual:



*RBS 2308, RBS 2309, and RBS 2109
Hardware Reference Manual*

EN/LZT 720 0058

Transmission OK

If a TIM is used and a green Transmission OK port indicator is off, even though transmission is expected, then perform the following actions step-by-step until the fault ceases:

- Ensure that the TIM is properly mounted, and the selector switch for transmission impedance selection is set correctly for each port
- Ensure that the transmission cables have been properly connected to the right port in the IXU, and each cable thread connected to the correct inlet

Note: The order of the ports in the IXU is: A C B D.

- Ensure that the external transmission equipment is working properly and that cables are connected correctly
- Swap the cable thread pairs
- Perform a transmission test, *see chapter RBS Site Integration*
- Check the transmission cable. If it is faulty, replace it
- Replace the IFB, *see Section 10.5.3 Replacing an IFB on page 215*.

If a PSTU is used, then follow the instructions in the following OPI:



E1 Interface Down

9/1543-LZA 701 0001

10.4.3

Corrective Actions on the RRU

Fault

If the red Fault indicator is on, an RRU HW fault(s) is detected. Perform the following actions step-by-step until the fault ceases:

- Use the OMT to display fault information, *see Section 10.3.1 Reading Fault Status on page 177*

Operational

If the green Operational indicator is double-flashing, software is being downloaded. If the indicator is flashing, configuration is in progress. A software download from the BSC can take 30 – 60 minutes, a software download from the IXU flash card 5 – 10 minutes, and a configuration less than 5 minutes. Wait until all activity is finished, that is, until the flashing stops.

Local

If the yellow Local indicator is on and if it is not possible to bring the RRU into remote mode, either by using the OMT or by pressing the RRU Local/Remote, then perform the following actions step-by-step until the fault ceases:

- Reset the RRU
- Replace the RRU, see *Section 10.5.8 Replacing an RRU on page 235*

If the yellow Local indicator is flashing and BSC communication (though expected) is not established, check the Local indicator on the IXU.

If the Local indicator on the IXU is flashing, see *Page 196*.

If the IXU has established a BSC connection, perform the following actions step-by-step until the fault ceases:

- Ensure that the BSC has deblocked the TRXCs for the RBS
- Ensure that the BSC has a correct configured A-bis path to the RBS [Digital Connection Point (DCP)].
- Reset the RRU
- Ensure that the Y-link cable is undamaged and properly connected to the correct ports, both on the RRU and the IXU
- Check that each transmission line is connected to the correct ports in both the RRU and the IXU

Note: The IXU can establish a BSC connection even if the transmission lines have been incorrectly connected to the ports. The order of the ports in the IXU is: A C B D.

- Ensure that the RRU is defined in the installed IDB. To create a new IDB, see *Chapter Site Installation Tests* in this manual.
- Reset the IXU
- Replace the Y-link cable, see *Section 10.5.12 Replacing a Y-Link Cable on page 250*
- Replace the RRU, see *Section 10.5.8 Replacing an RRU on page 235*
- Replace the IXU, see *Section 10.5.4 Replacing an IXU on page 219*

RF Off

RRU is not transmitting on any of its radio ports. No TX in the RRU is enabled in the BSC.

AC Power On

If the green AC power on indicator is off, and if AC power should be available, perform the following actions step-by-step until the fault ceases:

For more information about RBS AC power, see:



*RBS 2308, RBS 2309, and RBS 2109
Hardware Reference Manual*

EN/LZT 720 0058

- Ensure that the RBS AC supply and RRU power switches on the MBU are on
- Open the MBU cover and use a multimeter to check that the power input is either 100 V AC to 127 V AC, or 200 V AC to 250 V AC

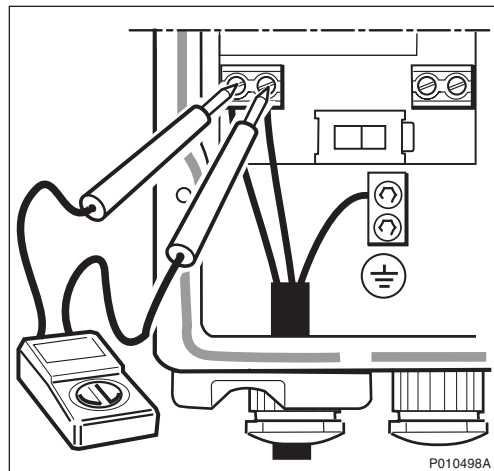


Figure 82 Measuring Incoming AC Voltage

- Disconnect the power cable from the RRU and use a multimeter to check that the power supply to the RRU, is either 100 V AC to 127 V AC, or 200 V AC to 250 V AC. The power is measured between pin 5 and pin 6, see *figure below*.

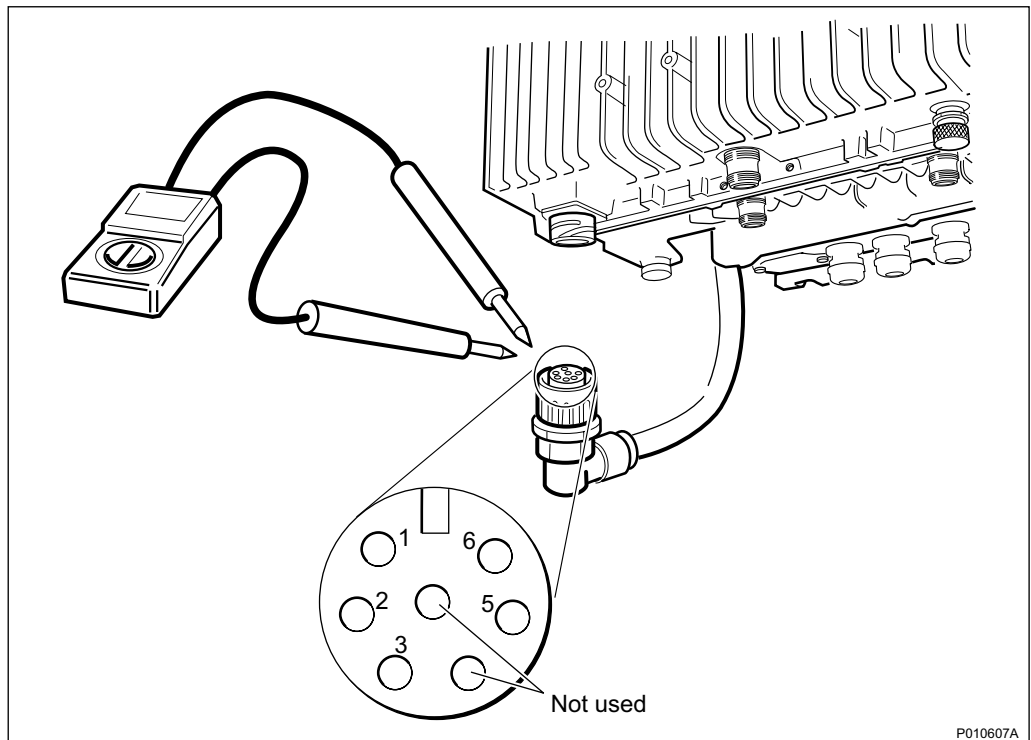


Figure 83 Measuring Voltage on the RRU Power Cable

- Replace the PIB in the MBU, see *Section 10.5.6 Replacing a PIB on page 227*
- Replace the RRU, see *Section 10.5.8 Replacing an RRU on page 235*

DC Power On

If the green DC power on indicator is off and if DC supply should be available, perform the following actions step-by-step until the fault ceases:

For more information about RBS DC supply voltage, see:



*RBS 2308, RBS 2309, and RBS 2109
Hardware Reference Manual*

EN/LZT 720 0058

- Ensure that the RBS DC supply and RRU switches on the MBU are on
- Open the MBU cover and use a multimeter to check that the incoming voltage is between -40.5 V DC and -60.0 V DC

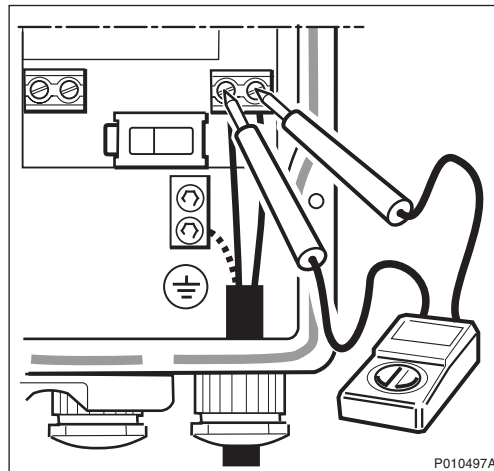


Figure 84 Measuring the Incoming DC Voltage

- Disconnect the power cable from the RRU and use a multimeter to check that the voltage, supplying the RRU, is between -40.5 and -60.0 V DC. The power is measured between pin 1 and pin 2, see figure below.

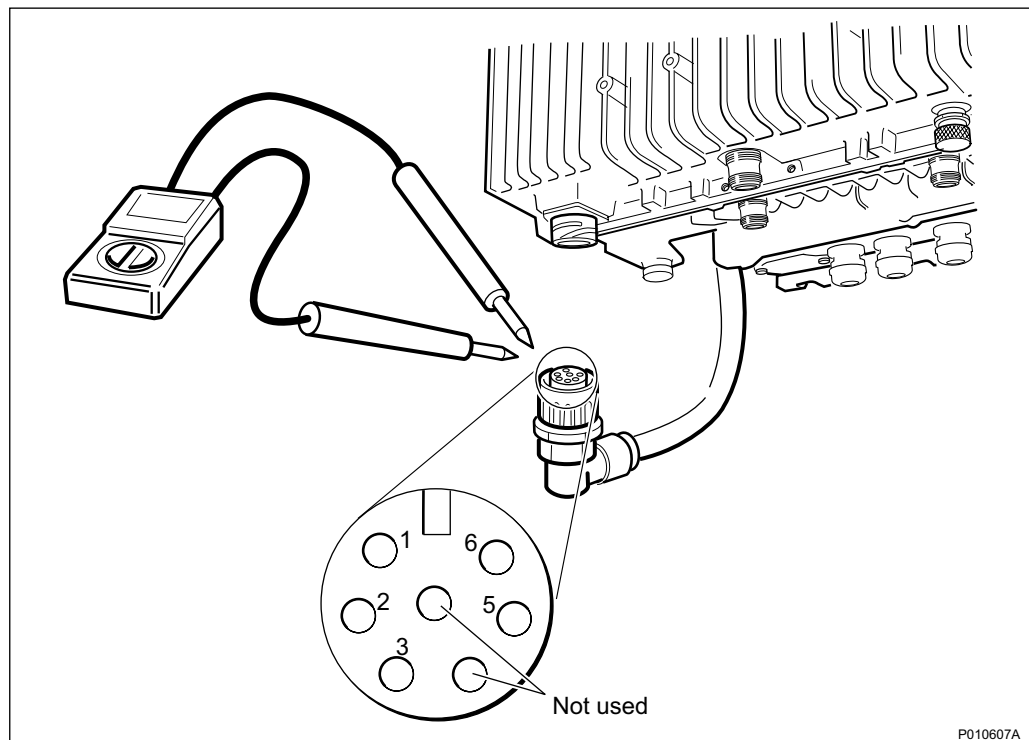


Figure 85 Measuring the Voltage on RRU Power Cable

- Replace the PIB in the MBU, see Section 10.5.6 Replacing a PIB on page 227
- Replace the RRU, see Section 10.5.8 Replacing an RRU on page 235

RRU Temp

If the yellow RRU temp indicator is on and the conditions are hot, perform the following actions step-by-step until the fault ceases:

- Ensure that airflow is not obstructed above or below the RRU, or through its cooling flanges
- Install a fan unit on the RRU

If the yellow RRU temp indicator is on and the conditions are cold, perform the following:

- Ensure that the RRU is provided with AC power for the internal heater

Note: Under certain circumstances it can take up to 75 minutes for the RRU to start up.

Note: RBS units from certain R-states are less sensitive to low temperatures and have therefore no internal heater. For more information about unit R-states from which these improvements apply, see *chapter Product Description, section Operating Environment* in the following manual:



*RBS 2308, RBS 2309, and RBS 2109
Hardware Reference Manual*

EN/LZT 720 0058

10.5 HW Replacement

This section describes how to replace faulty units identified in *Section 10.3 Fault Localization Using OMT on page 176*.

10.5.1 Replacing a Fan Unit

This section describes how to replace a faulty fan unit and how to test the new unit.

Note: If the fan unit is permanently removed, then the power connector protection cap on the RRU must be put back.

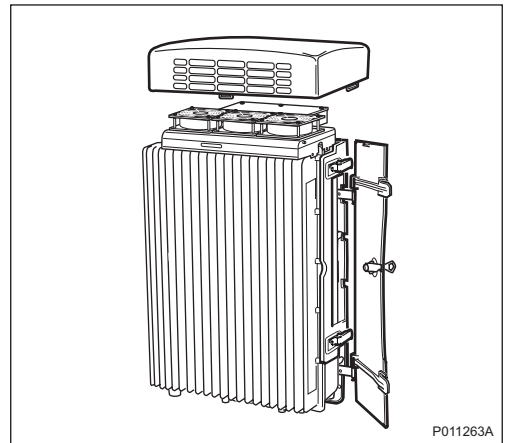


Caution!

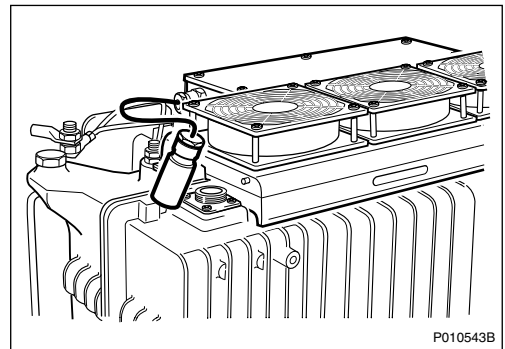
Rotating fan blades can cause injury to body parts that come into contact with the blades. Blades in fan units continue to rotate for a period of time, even after the fan has been switched off. Wait until fans have stopped rotating completely before starting work on or near fans.

Replacing the Fan Unit

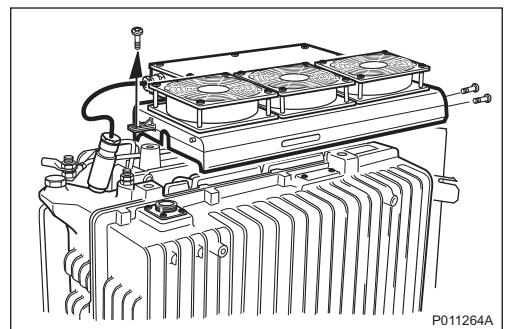
1. Remove the fan unit cover



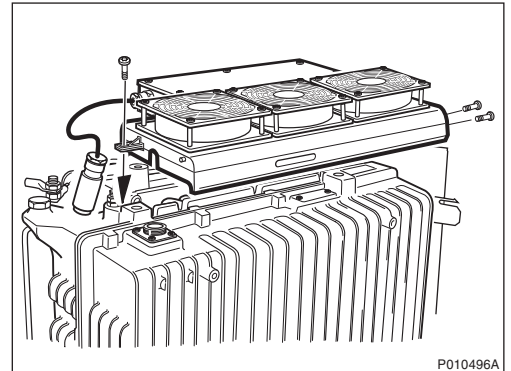
2. Disconnect the fan power cable from the RRU.



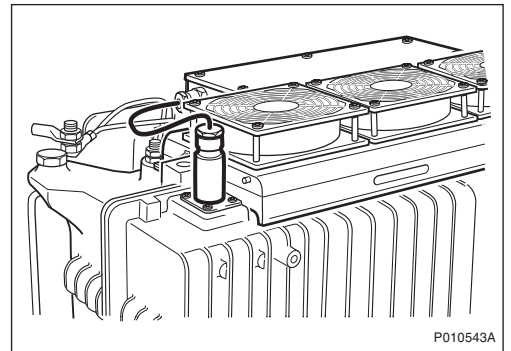
3. Loosen the three screws and remove the fan unit.



4. Install the new fan unit and fasten the three screws.

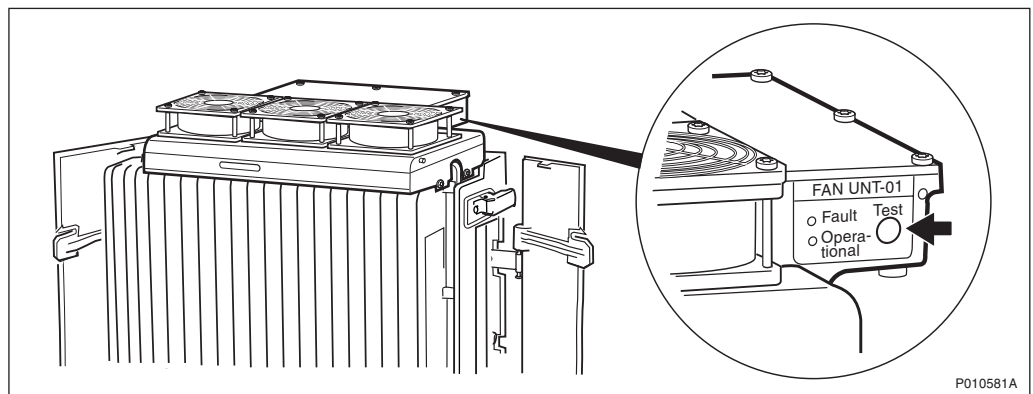


5. Connect the fan power cable to the RRU.



Testing the Fan Unit

6. Press the **Test** button on the fan unit.



The fan unit performs a self test

7. Check that the test sequence below is carried out:
 - The fans run at maximum speed for approximately 5 seconds
 - The fans run at nominal speed for approximately 5 seconds
 - The fans stop within approximately 5 seconds
8. Ensure that the indicator status of the fan unit is in accordance with the table below:

Table 68 Fan Unit Indicators After Test

Fan Unit Indicator	Status
Fault	Off
Operational	On

9. Reinstall the fan unit cover.

Handling Replaced Units

The fan should be returned to Ericsson for repair with a repair delivery note, LZF 084 84 (Blue Tag) attached. Include a clear description of the fault found. See *Section 10.6 Returning Hardware on page 255* for instructions on completing a repair delivery note.

10.5.2 Replacing a Flash Card

This section describes how to replace a faulty flash card.

Loading IDB and Software (Optional)

This section describes how to load the IDB and software onto the new flash card.

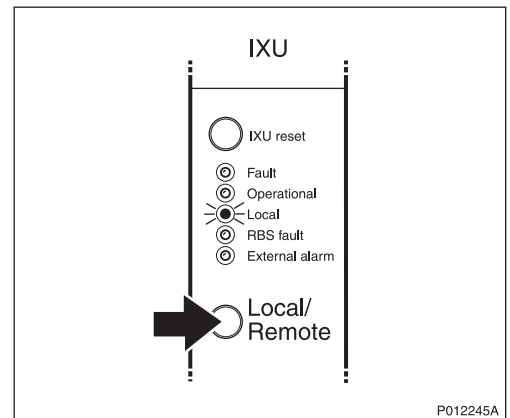
Note: Using the OMT, always reload the software and install the appropriate IDB after moving a used flash card to another cabinet. This ensures consistent software and correct configuration.

1. Create and save an IDB. For more information, see chapter *Site Installation Tests* in this manual.
2. From the **Configuration** menu in the OMT, select **Load flash card**.
3. In **Flash card location**, click **Browse** and select the location of the flash card driver.
4. In **Select IDB to use on flash card**, click **Browse** and select the IDB to use.
5. In **Select RBS SW to use on flash card**, click **Browse** and select the software to use.

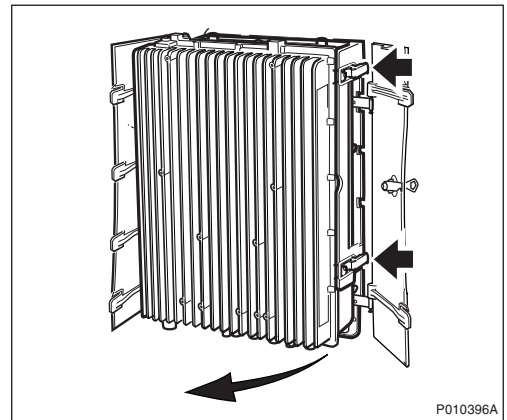
6. Click **Load**.

Taking the RBS Out of Operation

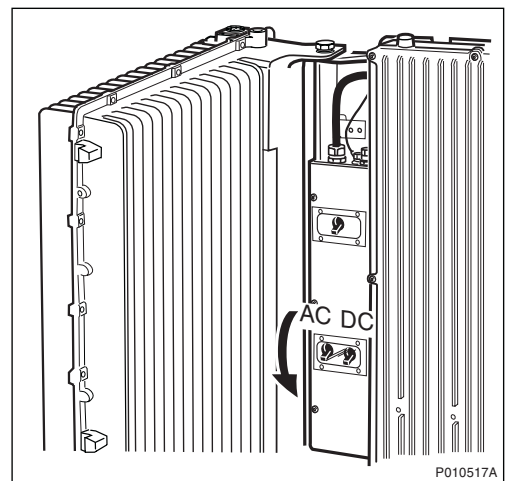
1. Open the sunshields.
2. Contact the OMC operator to obtain permission to temporarily take cells out of service. Wait until the RF off indicator (on all RRU interface panels) shows a constant light.
3. Press the Local/Remote button on the IXU to set the RBS to local mode. Wait until the local indicator on the IXU shows a constant light.



4. Open the two clasps and pull the RRU to the left to gain access to the power switches.

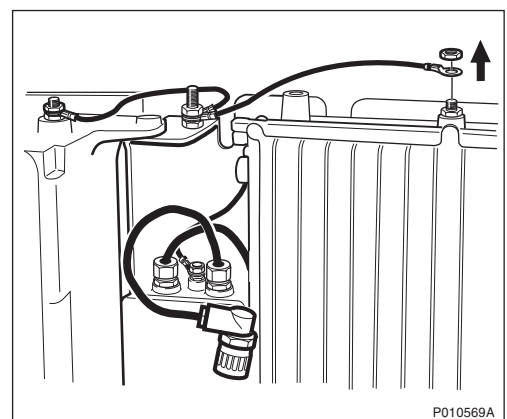


5. Switch off the AC power and DC power.



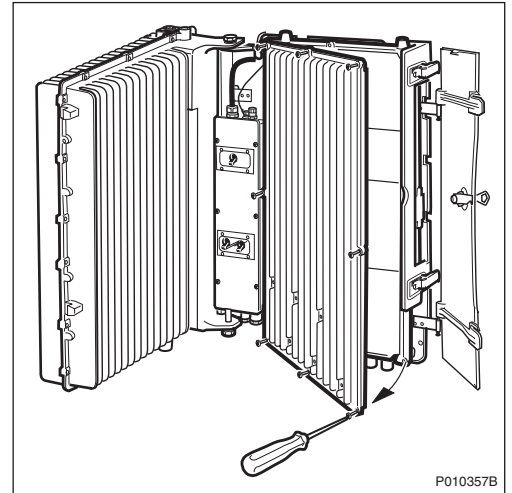
Replacing the Flash Card

6. Disconnect the AC/DC cable and the earth cable from the IXU.

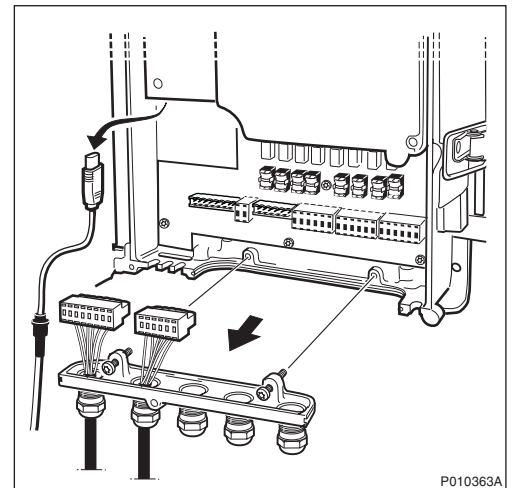


7. Disconnect the OMT cable.

8. Open the IXU cover.

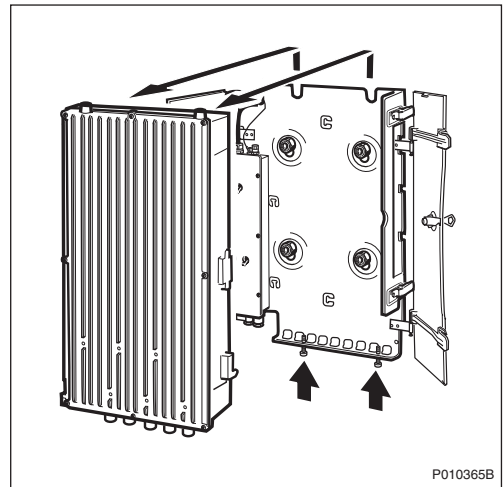


9. Remove the connection frame and loosen the cables from the IFB. Remove the Y-link cables.

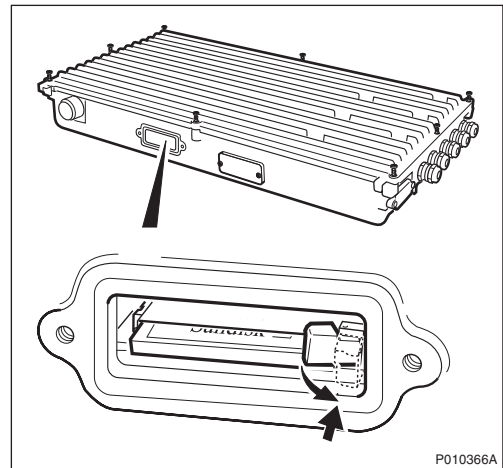


Note: Make a note of which connectors the Y-link cables were connected to.

10. Loosen the two securing screws under the IXU and remove the unit.



11. Remove the cover for the flash card. To remove the flash card, lift up the release lever and then push it in.



12. Insert the new flash card, reset the lever, then refit the cover.

Note: The flash card should be preloaded with the correct software and IDB. For instructions, see *Chapter Site Installation Tests*.

13. Mount the IXU and secure it with the two screws under the IXU.
14. Connect the Y-link cables. Ensure that the Y-link cables are connected to the correct connectors.
15. Mount the connection frame and connect all cables. Close the IXU cover.
16. Connect the earth cable and the AC/DC cable.

Putting the RBS into Operation

17. Switch on the AC power and DC power.
18. If new software has earlier been prepared for loading, it now starts. This may take up to 10 minutes.
19. Close the RRU.
20. Inform the OMC operator that the applicable cells are to be put into service.
21. Press the Local/Remote button on the IXU, and the RRU's to set the RBS to remote mode. Wait until the RF off indicator on the RRU interface panel goes off and the Operational indicator lights up.
22. Close the sunshields.

Handling Replaced Units

The flash card should be returned to Ericsson for repair with a repair delivery note, LZF 084 84 (Blue Tag) attached. Include a clear description of the fault found. See *Section 10.6 Returning Hardware on page 255* for instructions on completing a repair delivery note.

10.5.3 Replacing an IFB

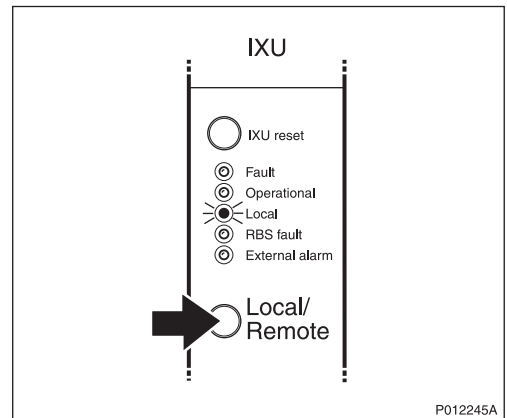
This section describes how to replace a faulty IFB.

Note: Replacing an IFB is only possible for an RBS equipped with an IXU with a revision state lower than R5A. For an RBS equipped with an IXU with revision state R5A or higher, the IXU must be replaced. See *Section 10.5.4 Replacing an IXU on page 219*.

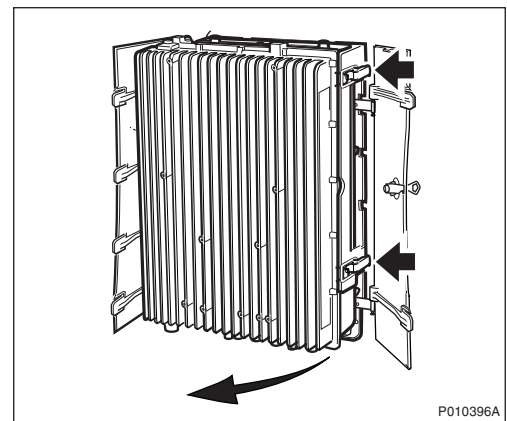
Taking the RBS Out of Operation

1. Open the sunshields.
2. Contact the OMC operator to obtain permission to temporarily take cells out of service. Wait until the RF off indicator (on all RRU interface panels) shows a constant light.

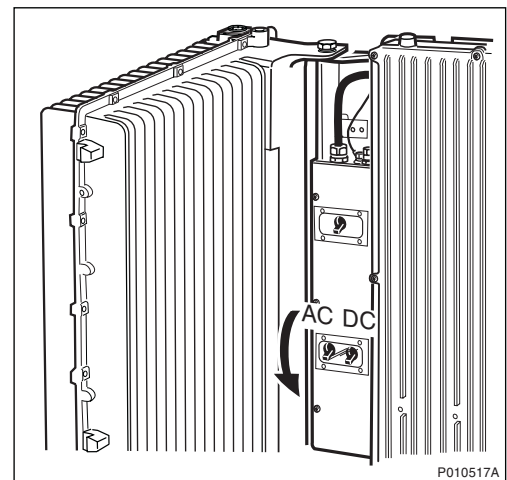
3. Press the Local/Remote button on the IXU to set the RBS to local mode. Wait until the Local indicator on the IXU shows a constant light.



4. Open the two clasps and pull the RRU to the left to gain access to the power switches.

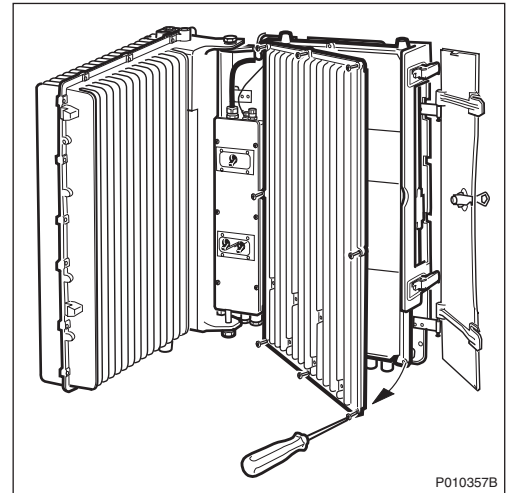


5. Switch off the AC power and DC power.

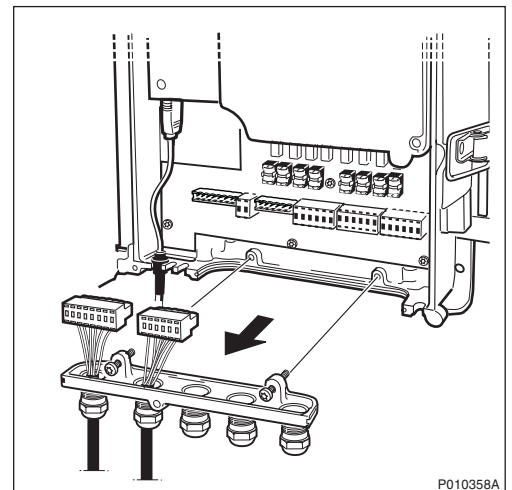


Replacing the IFB

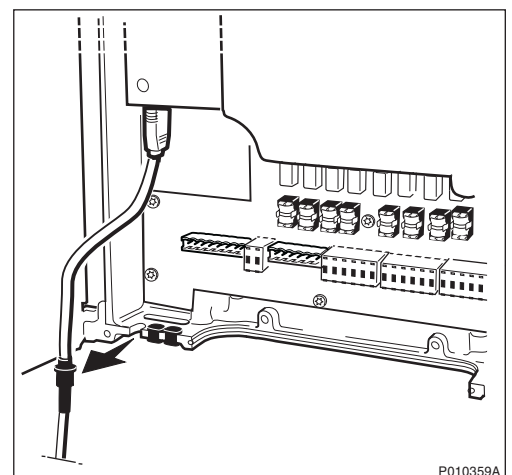
6. Open the IXU cover.



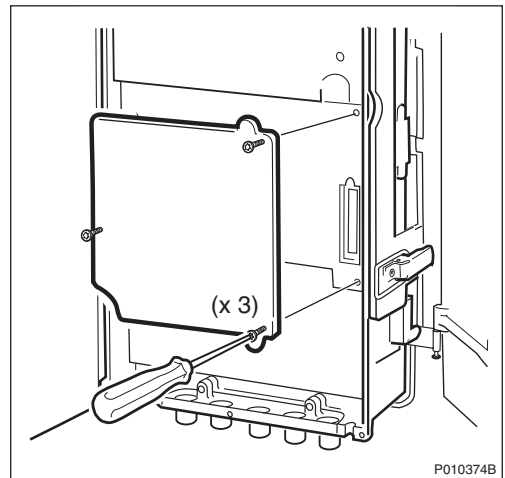
7. Remove the connection frame and all cables from the IFB.



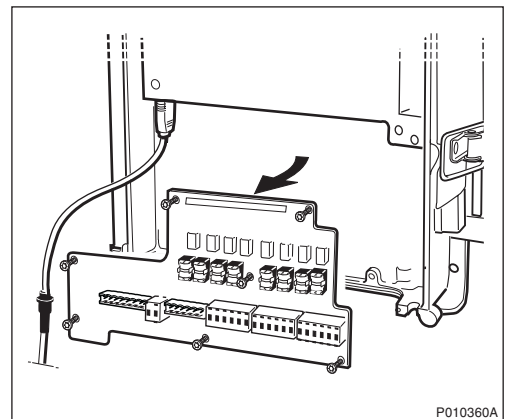
8. Loosen, but do not remove, the Y-link cables from the cable inlet.



9. Remove the TIM after loosening the three screws.



10. Remove the IFB after loosening the seven screws.



11. Put back the new IFB, the connection frame, and all cables.
12. Put back the TIM. Tighten the screws to 1.7 Nm.
13. Secure the Y-link cables.
14. Reconnect the IXU cover.

Putting the RBS into Operation

15. Switch on the AC power and DC power.
16. Close the RRU.
17. Inform the OMC operator that the applicable cells are to be put into service.
18. Press the Local/Remote button on the IXU to set the RBS to remote mode. Wait until the RF off indicator on the RRU interface panel goes off and the Operational indicator lights up.
19. Close the sunshields.

Handling Replaced Units

The IFB should be returned to Ericsson for repair with a repair delivery note, LZF 084 84 (Blue Tag) attached. Include a clear description of the fault found. See *Section 10.6 Returning Hardware on page 255* for instructions on completing a repair delivery note.

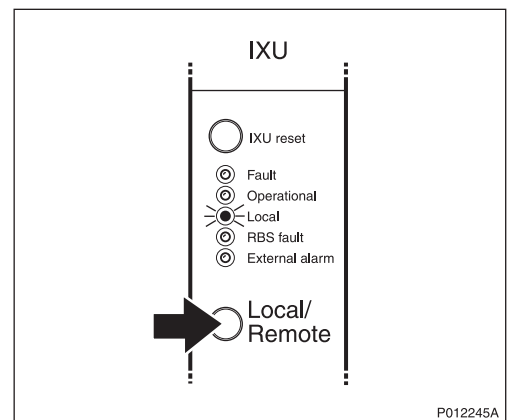
10.5.4 Replacing an IXU

This section describes how to replace a faulty IXU.

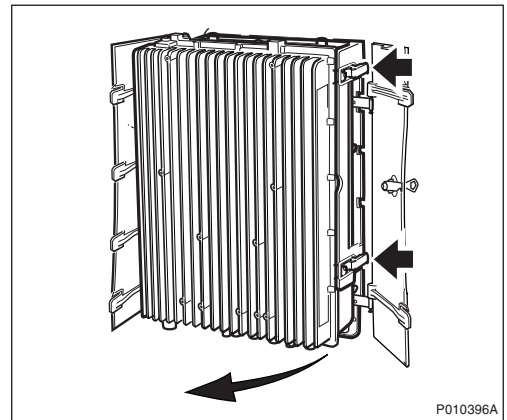
Note: Do not touch the RBS when any indicators are double-flashing. See *Section 10.4.1 Double-Flash Indication of Function Changes on page 194*.

Taking the RBS Out of Operation

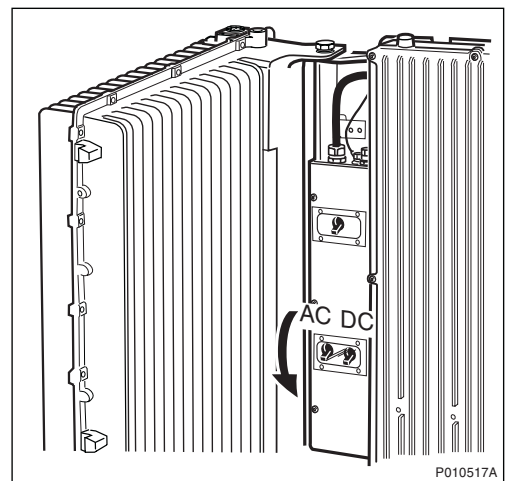
1. Open the sunshields.
2. Contact the OMC operator to obtain permission to temporarily take cells out of service. Wait until the RF off indicator (on all RRU interface panels) shows a constant light.
3. Press the Local/Remote button on the IXU to set the RBS to local mode. Wait until the local indicator on the IXU shows a constant light.



4. Open the two clasps and pull the RRU to the left to gain access to the power switches.

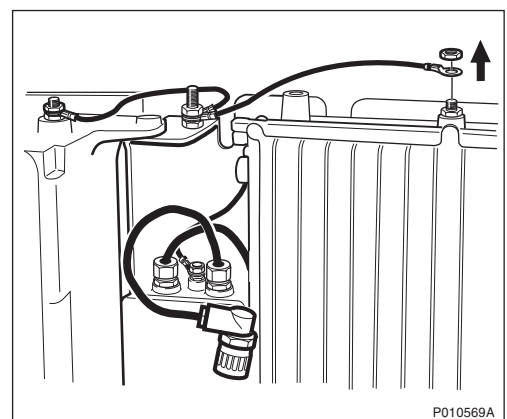


5. Switch off the AC power and DC power.



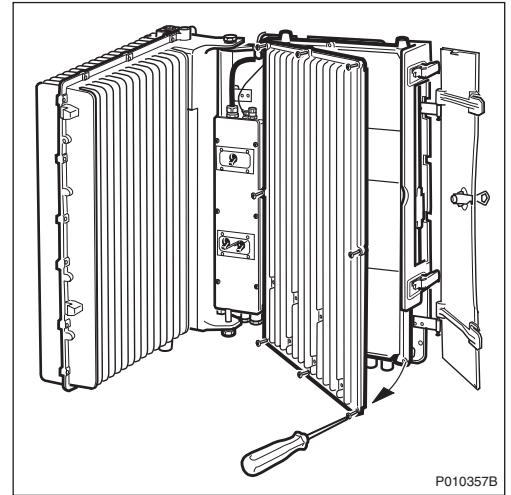
Replacing the IXU

6. Disconnect the AC/DC cable and the earth cable.



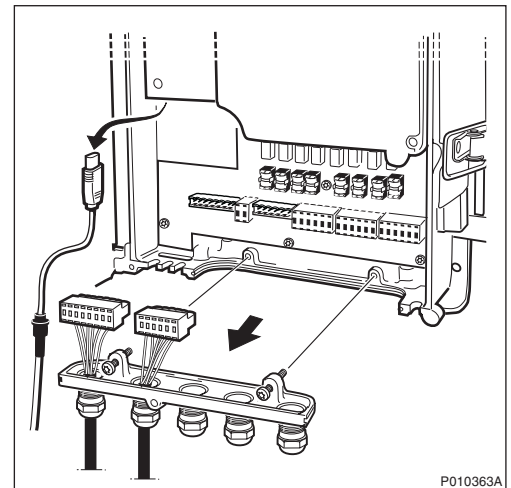
7. Remove the OMT cable.

8. Open the IXU cover.



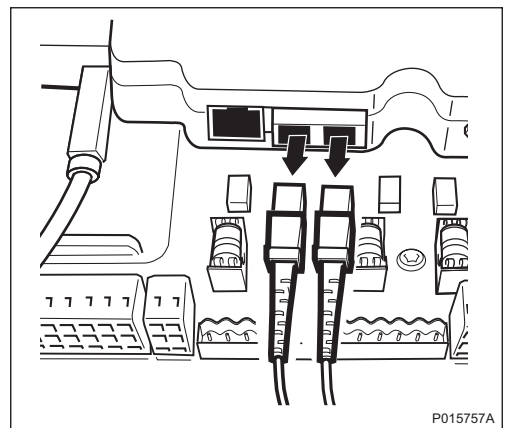
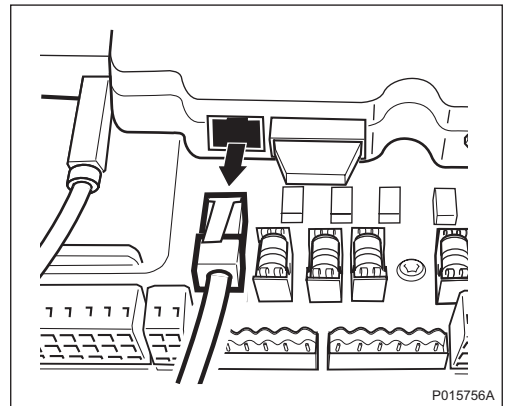
9. If PCM transmission is used:
Remove the connection frame and loosen the cables from the IFB. Remove the Y-link cables.

Note: Make a note of which connectors the Y-link cables were connected to.

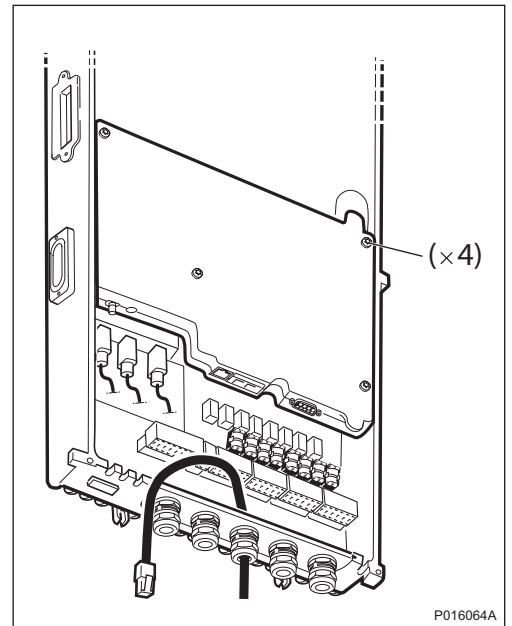


10. If IP-based transmission is used:
Remove the Ethernet cable connectors from the PSTU.

The optical connectors must be protected with connection covers.



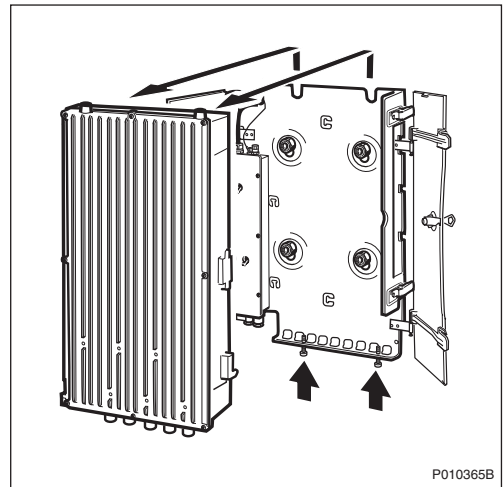
11. If IP-based transmission is used:
Loosen the four screws and
remove the PSTU.



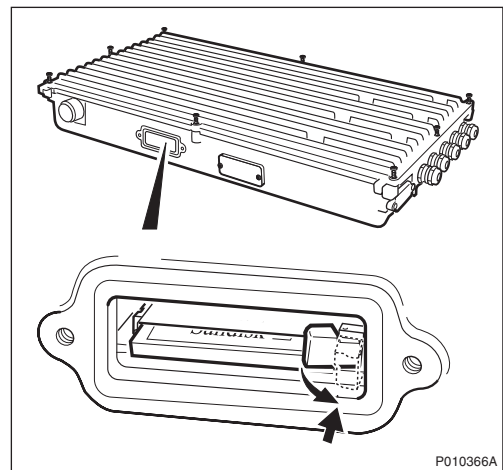
12. If IP-based transmission is used:
Remove the connection frame and the Y-link cables.

Note: Make a note of which connectors the Y-link cables were connected to.

13. Loosen the two securing screws under the IXU, and remove the unit.



14. Remove the cover for the flash card. To remove the flash card, lift up the release lever and then push it in.



15. Remove the cover for the flash card. Insert the old flash card in the new unit and push it down and reset the release lever, ensuring that the flash card is in position.
16. If PCM transmission is used:
Open the cover of the new IXU and set the switch positions on the TIM in accordance with installed transmission cables.
17. Mount the connection frame delivered with the new IXU into the old IXU, and close the cover.
18. Mount the IXU and secure it with the two screws under the IXU.
19. If IP-based transmission is used:
Put back the PSTU. Tighten the screws to 1.7 Nm.
20. Connect the Y-link cables. Ensure that the Y-link cables are connected to the correct connectors.
21. Mount the connection frame and connect all cables. Close the IXU cover.
22. Connect the earth cable and the AC/DC cable.

Putting the RBS into Operation

23. Switch on the AC power and DC power.
24. Close the RRU.
25. Inform the OMC operator that the applicable cells are to be put into service.
26. Press the Local/Remote button on the IXU to set the RBS to remote mode. Wait until the RF off indicator on the RRU interface panel goes off and the Operational indicator comes on.
27. Close the sunshields.

Handling Replaced Units

The IXU should be returned to Ericsson for repair with a repair delivery note, LZF 084 84 (Blue Tag) attached. Include a clear description of the fault found. See *Section 10.6 Returning Hardware on page 255* for instructions on completing a repair delivery note.

10.5.5

Replacing an MCB

This section describes how to replace a faulty MCB.



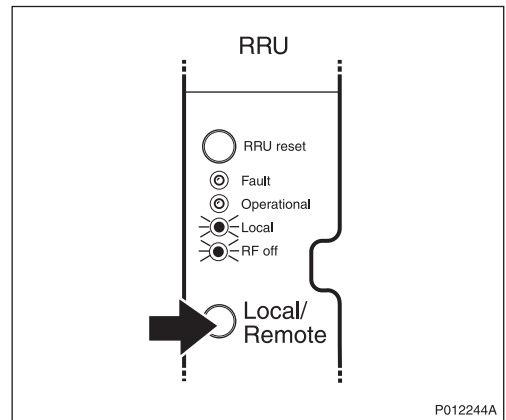
Caution!

Sharp metal edges may exist that can cause cuts to the skin or clothing. Wear protective gloves when handling this equipment.

Taking the RRU out of Service

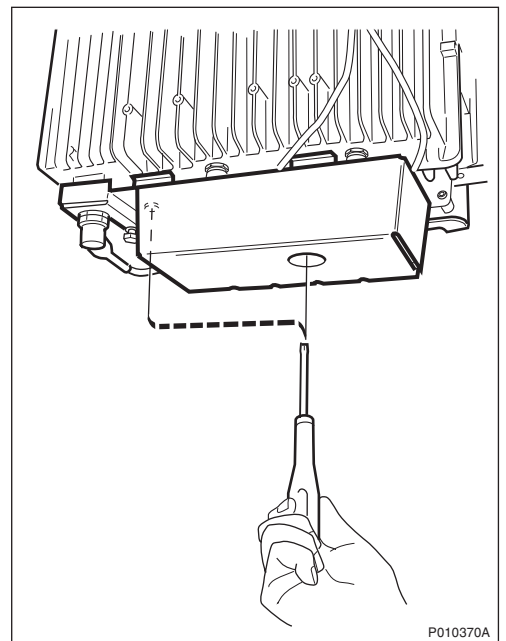
1. Open the sunshields.
2. Contact the OMC operator to obtain permission to temporarily take the TRXs connected to the RRU out of service. Wait until the RF off indicator shows a constant light.

3. Press the Local/Remote button on the RRU to set the unit to local mode. Wait until the local indicator on the RRU shows a constant light.



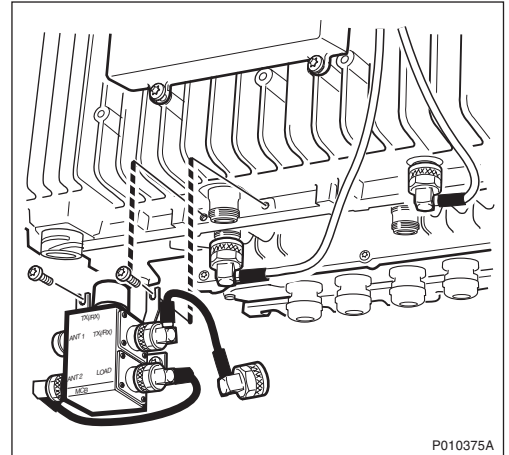
Replacing the MCB

4. Remove the MCB protection cover under the RRU.



5. Make a note of the cable positions.

6. Remove the MCB cable connected to the RRU and the cables connected to the antenna(s). Remove the MCB after loosening the two screws, then disconnect it.



Note: The figure shows an example of an MCB configuration.

7. Mount the new MCB and connect all cables.
8. Put back the MCB protection cover.

Note: Ensure that cables are not trapped or damaged by the cover.

Putting the RRU into Service

9. Inform the OMC operator that the TRXs connected to the RRU are to be put into service.
10. Press the Local/Remote button on the RRU to set the unit to remote mode. Wait until the RF off indicator on the RRU interface panel goes off and the Operational indicator lights up.
11. Close the sunshields.

Handling Replaced Units

The MCB should be returned to Ericsson for repair with a repair delivery note, LZF 084 84 (Blue Tag) attached. Include a clear description of the fault found. See *Section 10.6 Returning Hardware on page 255* for instructions on completing a repair delivery note.

Note: Since the MCB contains Beryllium oxide, BeO, the unit must be handled according to applicable regulations for handling of such products.

10.5.6 Replacing a PIB

This section describes how to replace a faulty Power Interface Board (PIB). The PIB is located in the MBU.