

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

## **Nokia Flexi EDGE Dual Duplexer Module (ERxA) Description**

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# 1

## Dual Duplexer Module (ERxA)

The Dual Duplexer Module and the Dual TRX Module create one Sector Module. One Dual Duplexer Module is needed per sector. The Dual Duplexer Module is always attached to the Dual TRX Module, which provides the Dual Duplexer Module with power and O&M link. Extension Dual TRX Modules are installed without the Dual Duplexer Module.

The Dual Duplexer Module provides two antenna connections (configured from 1 or 2 sectors) of Nokia Flexi EDGE BTS for by-pass and wideband combined configurations. The Dual Duplexer Module supports antenna sharing (co-siting) with another BTS as long as the frequency range meets the given Nokia specifications.

The Dual Duplexer Module contains two duplex filters, two low-noise amplifiers (LNAs), two Bias-Ts, and a common TRX loop for TRXs in one sector. The TRX loop is controlled through the Sector Module.

The Bias-T is a circuit and function to supply power to a MHA. The Return Loss monitor is a separate circuit and function that is independent of the Bias-T. The functionality is now in the Dual Duplexer Module, and a separate unit on top of BTS cabinets common in traditional solutions is no longer needed.

The MHA current monitor allows the BTS to determine an alarm or fault condition of the MHA.

The TX forward power alarm allows the BTS to report an alarm if insufficient TX power is at the DDU's TX connector.

The LNAs have two gain states:

1. high-gain and
2. adjustable low-gain settings.

The high-gain state (HGS) is the default mode and when the BTS is not configured with an MHA. The low-gain state (LGS) is used when the BTS is configured with an MHA; the LGS settings, which are in 0.5dB steps, are used to overcome the cable loss for the cable connecting the MHA to the DDU's antenna connector.

There is a separate Dual Duplexer Module for each frequency band:

- ERTA – GSM800
- ERGA – GSM900 full band
- ERHA – GSM900 SB-H
- ERJA – GSM900 SB-J
- ERDA – GSM1800 full band
- ERPA – GSM1900 full band

See the following figure for an isometric view of the Dual Duplexer Module.

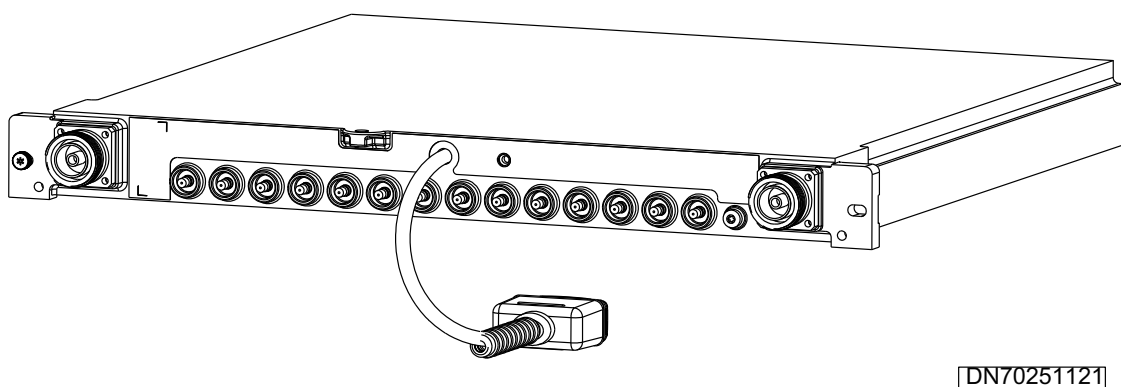


Figure 1. Isometric view of the Dual Duplexer Module

# 2

## Dual Duplexer Module (ERxA) main blocks

The Dual Duplexer Module (ERxA) includes the following functional blocks:

- Duplex Filter
  - RX and TX filtering
  - TX and RX coupling to one antenna interface
- RX Front End
  - RX low-noise amplifier (LNA)
  - RX Multicoupling
  - Support for co-siting (antenna sharing)
- TRX Loop
  - TRX loop path between Dual Duplexer Module's TX input and RX output
  - Signal mixing from TX to RX band
  - Timeslot-based capability to run loops
  - Loop connection capability from either TX input to any RX Output
- Bias-T alarm
  - Masthead amplifier (MHA) interface and power supply
  - Antenna supervisory
- Return Loss monitor values are reported to the TRX O&M.
- The MHA current monitor allows the BTS to determine an alarm or fault condition of the MHA.
- The TX forward power alarm allows the BTS to report an alarm if insufficient TX power is at the DDU's TX connector.

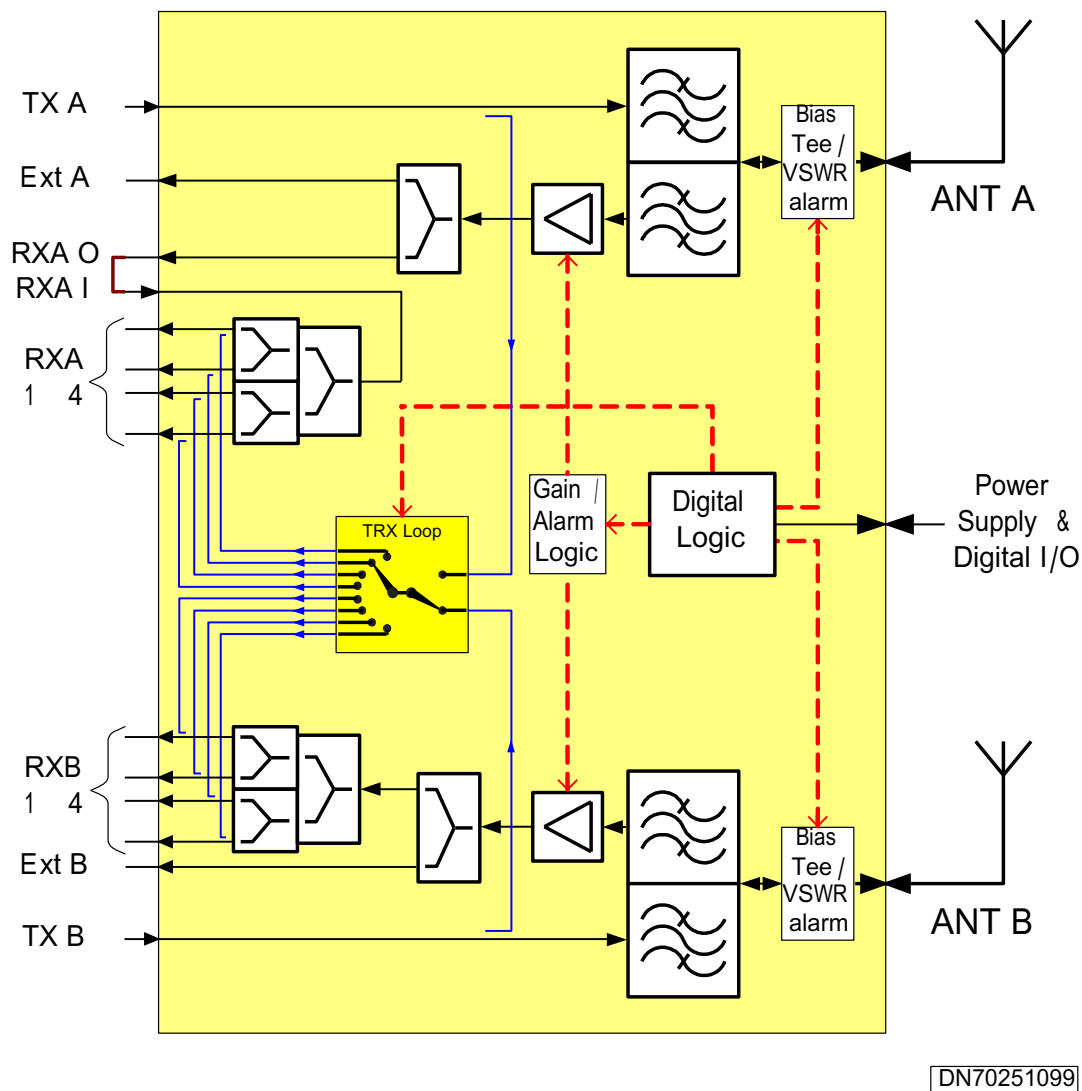


Figure 2. Dual Duplexer Module main blocks

# 3

## Dual Duplexer Module (ERxA) power requirements

### Dual Duplexer Module (ERxA) power requirements

The DDU's voltage is 13.7V +/- 3% and is supplied by the TRX.

### Dual Duplexer Module power consumption

Table 1. Dual Duplexer Module power consumption

| Property | ERTA/ERGA/ERHA/<br>ERJA (800/900)<br><br>ERDA/ERPA (1800/<br>1900) |
|----------|--------------------------------------------------------------------|
| Maximum  | at maximum 13.7V and 2.6A                                          |
| Nominal  | 32.6 W                                                             |



# 4 Dual Duplexer Module (ERxA) interfaces

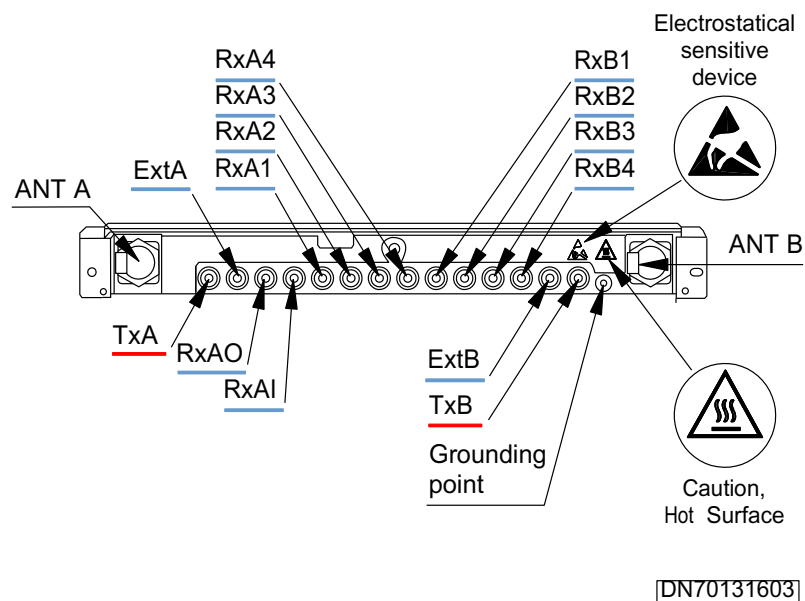


Figure 3. Nokia Flexi EDGE Dual Duplexer Module (ERxA) front panel connectors and labels

Table 2. Nokia Flexi EDGE Dual Duplexer Module (ERxA front panel connectors and interfaces

| Label name on module | Description           | Connector type | Interface(s)                    |
|----------------------|-----------------------|----------------|---------------------------------|
| Ant A, Ant B         | Antenna interface     | 7/16           | Antenna jumper or feeder cables |
| TxA, TxB (red)       | 2 Tx inputs           | QMA            | EXxA, EWxA, EWxB                |
| ExtA, ExtB (blue)    | 2 external Rx outputs | QMA            | External receiver               |
| RxAO (blue)          | Rx co-siting output   | QMA            | External BTS cabinet            |

Table 2. Nokia Flexi EDGE Dual Duplexer Module  
(ERxA front panel connectors and interfaces  
(cont.))

| Label name on module                     | Description        | Connector type | Interface(s)         |
|------------------------------------------|--------------------|----------------|----------------------|
| RxAI (blue)                              | Rx co-siting input | QMA            | External BTS cabinet |
| RxA1...RxA4 (blue)<br>RxB1...RxB4 (blue) | 8 Rx outputs       | QMA            | EXxA                 |

# 5

## Dual Duplexer Module (ERxA) dimensions and weight

The dimensions of the Flexi EDGE Dual Duplexer Module are presented in the table below.

Table 3. ERxA dimensions and weight

| Property            | Maximum value                 |
|---------------------|-------------------------------|
| Width <sup>1)</sup> | 447/492 mm<br>(17.6/19.4 in.) |
| Height              | 44 mm<br>(1.7 in.)            |
| Depth <sup>2)</sup> | 422/560 mm<br>(16.6/22.1 in.) |
| Weight              | 10.8 kg<br>(23.9 lbs)         |

<sup>1)</sup> Width of the casing without front covers/with front covers

<sup>2)</sup> Depth of the casing without front covers/with front covers



# 6 Dual Duplexer Module (ERxA) LED indications

The Dual Duplexer Module (ERxA) has two tri-colour LEDs on the front panel to indicate the operational status of the module and all fault conditions during operation.

Table 4. Dual Duplexer Module LED indications

| Colour           | Explanation                                                                                       |
|------------------|---------------------------------------------------------------------------------------------------|
| Red              | Module self-test or reset (LED red for < 5 seconds), or Major alarm                               |
| Red, blinking    | Minor alarm                                                                                       |
| Yellow           | Stand-by or blocked                                                                               |
| Yellow, blinking | SW download or configuration ongoing, module non-operational                                      |
| Green            | Module operational (cell can be locked in BSC)                                                    |
| Green, blinking  | Module is loading software or parameters or local maintenance access when modules are operational |



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## Contents of the Dual Duplexer Module (ERxA) delivery

Table 5. Nokia Flexi EDGE Dual Duplexer Module (ERxA) delivery contents

| Description                                     | Product code | Quantity |
|-------------------------------------------------|--------------|----------|
| EDGE Dual Duplexer Module (ERxA):               |              | 1        |
| • EDGE Dual Duplexer Module 800 MHz (ERTA)      | • 470249A    |          |
| • EDGE Dual Duplexer Module 900 MHz (ERGA)      | • 470250A    |          |
| • EDGE Dual Duplexer Module 900 MHz SB-J (ERJA) | • 470251A    |          |
| • EDGE Dual Duplexer Module 900 MHz SB-H (ERHA) | • 470252A    |          |
| • EDGE Dual Duplexer Module 1800 MHz (ERDA)     | • 470253A    |          |
| • EDGE Dual Duplexer Module 1900 MHz (ERPA)     | • 470254A    |          |
| M5 screws                                       |              | 2        |