Nokia Flexi EDGE Dual TRX Module (EXxA) Description

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1 Dual TRX Module (EXxA)

The Dual TRX Module (EXxA) is a two-carrier TRX unit. The module contains the common (2 carrier) baseband part and two separate RF parts for two transceivers (transmitter and receiver chains) and space for two optional Wideband Combiner Modules.

The Dual TRX Module is used as:

- a combined module with the Dual Duplexer Module (ERxA), making a logical Sector Module
- or a stand-alone TRX module with the Remote Tune Combiner (ECxA) Module
- or a stand-alone extension TRX module.

The Dual TRX Module and System Module (ESMA) communication is managed through a single Ethernet interface. Each transceiver within the Dual TRX Module can be separately activated with a licence key at the BSC.

The Dual TRX Module contains two transceivers that can be used:

- as a separate TRX in the same sector
- as a separate TRX in different sectors
- or as a Double Power TRX.

There are separate Dual TRX Modules for each frequency band that Nokia Flexi EDGE BTS supports:

- EXTA – GSM800
- EXGA – GSM900
- EXDA – GSM1800
- EXPA – GSM1900

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

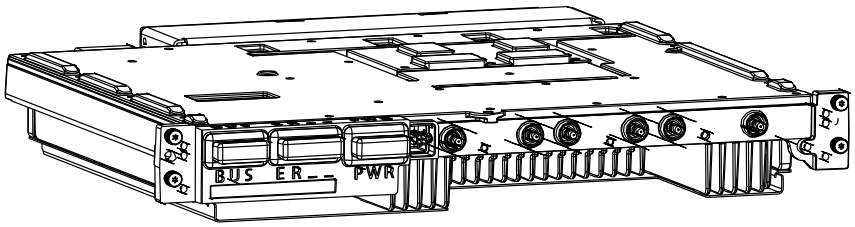
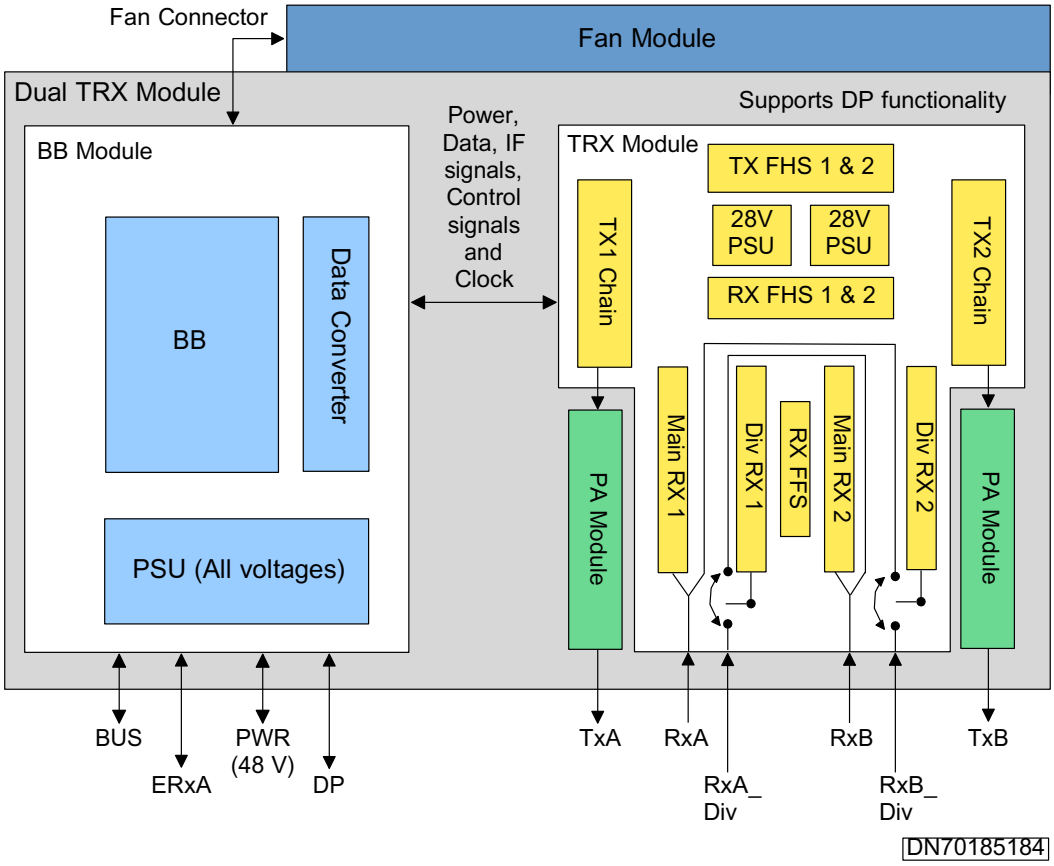


Figure 1. Dual TRX Module

2 Dual TRX Module (EXxA) main blocks

The Dual TRX Module (EXxA) includes the following functional blocks:

- Baseband
  - TRX, O&M, telecom and digital signal processing (DSP)
  - Ethernet interface for control, user and baseband hopping data
  - Synchronisation
  - Digital up/down conversion and filtering
  - TX and RX data conversion
  - TX Double Power support
  - Intelligent Downlink Diversity (IDD)
  - 4-way Uplink Diversity support
  - RX 4-Way Interference Reject Combining (IRC) support
  - Temperature management
- Power supply
  - Power distribution of TRX internal supply voltages
- Transmitter
  - Direct conversion from TX interface to TX RF
  - Digital power control
  - TX Double Power and IDD support
- Receiver
  - Dual down-conversion from RX RF to RX interface
  - Diversity reception
  - Digital Automatic Gain Control (AGC)
- Synthesisers
  - Local oscillator signals for TX and RX up/down conversions
  - Frequency hopping capability on timeslot basis



In 2-way diversity case the signal comes from DTRX's other Rx main connector and with 4-way diversity the signal comes from the diversity Rx connector.

PSU - power supply unit, BB - baseband, IF - interface, DP - double power, FHS - frequency hopping system, PA - power amplifier

Figure 2. Dual TRX Module main blocks

3 Dual TRX Module (EXxA) power requirements

Table 1. Dual TRX Module (EXxA) power requirements

Property	Value
Nominal system voltage	48 V DC
Input voltage range	40.5 - 57 V DC

Table 2. Dual TRX Module power consumption

	EXTA/EXGA (800/900)	EXDA/EXPA (1800/1900)
Maximum	325 W	350 W
Nominal	295 W	320 W
Idle	39 W	37 W

4 Dual TRX Module (EXxA) interfaces

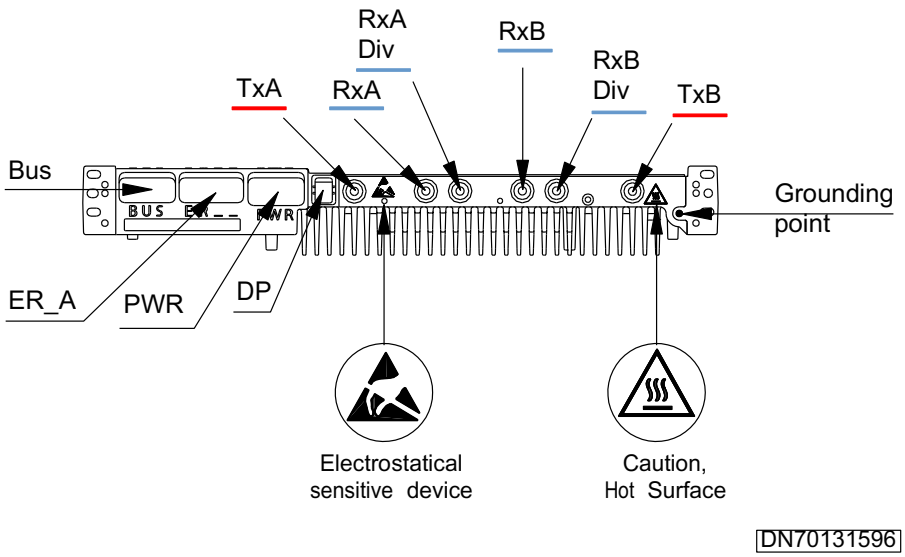


Figure 3. Nokia Flexi EDGE Dual TRX Module (EXxA) front panel connectors and labels

Table 3. Nokia Flexi EDGE Dual TRX Module (EXxA) front panel connectors, cable types and interfaces

Label name on module	Description	Connector type	Cable type	Interface(s)	Signal direction (to/from the module)
BUS	Ethernet (1000 Base-T/100 Base-TX) baseband processing of end user, hopping, synchronisation, and O&M data	MDR 26 (female)	• Bus cable, AWG30 Twinax, MDR 26 (male) • length: 1054/1554 mm (41.5/61.2 in.)	ESMA, ESEA	To and from the module
ER_A	Power and control interface for the ERxA	MDR 36 (female)	• ERxA cable, MDR 36 (male) hard-wired with other end fixed to ER_A • length: 200 mm (7.9 in.)	ERxA	To and from the module
PWR	-48 VDC input power with fuse protection	Multi-Beam XL (female)	• Power cable, 2 x AWG12, Multi-Beam XL (male) • length: 1188/2000 mm (46.8/78.7 in.)	ESMA, ESEA	To and from the module
DP	Synchronous combining of both transmitters in the module to generate one GSM/EDGE carrier capacity with increased output power	Molex Microfit (male)	• DP cable, 4 x AWG24, Molex Microfit (female) • length: 203 mm (8.0 in.)	EWxA	To and from the module
RxA, RxB (blue)	Receives a digitally modulated GSM/ EDGE RF carrier in accordance with the appropriate telecommunications standard (Rx input)	QMA (female)	• RF cable, SemiFlex 50, QMA (male) • length: 172/275/1300 mm (6.8/10.8/51.2 in.)	ERxA, ECxA	To the module
RxA Div , RxB Div (blue)	Four-way uplink receive diversity (4UD)	QMA (female)	• RF cable, SemiFlex 50, QMA (male) • length: 172/275/1300 mm (6.8/10.8/51.2 in.)	ERxA, ECxA	To the module

Table 3. Nokia Flexi EDGE Dual TRX Module (EXxA) front panel connectors, cable types and interfaces (cont.)

Label name on module	Description	Connector type	Cable type	Interface(s)	Signal direction (to/from the module)
TxA, TxB (red)	Transmits a digitally modulated GSM/ EDGE RF carrier in accordance with the appropriate telecommunications standard (Tx output).	QMA (female)	• RF cable, SemiFlex 50, QMA (male) • length: 172/275/1300 mm (6.8/10.8/51.2 in.)	ERxA, EWxA, ECxA	From the module

5 Dual TRX Module (EXxA) dimensions and weight

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

Table 4. EXxA dimensions and weight

Property	Value
Width [1)]	447/492 mm (17.6/19.4 in.)
Height	90 mm (3.5 in.)
Depth [2)]	422/560 mm (16.6/22.1 in.)
Weight	10.2 kg (22.5 lbs)

[1)] Width of the casing without front covers/with front covers

[2)] Depth of the casing without front covers/with front covers

6 Dual TRX Module (EXxA) LED indications

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

Table 5. Dual TRX Module LED indications

Colour	Explanation
Cycling colours	Nokia Flexi EDGE BTS Manager has requested information and the timer is still running.
Red	The O&M software of the module is not running, or 7606 alarm (TRX faulty) is active on both carriers.
Red, blinking	7606 alarm (TRX faulty) is active on one carrier, or 7607 alarm (TRX operation degraded) is active on one or both carriers.
Yellow	Both carriers in the TRX module are blocked/locked from EM/BSC, or Both carriers in the TRX module are shutdown from BSC, but TRX module is still providing power and control for an ERxA, or Both carriers in the TRX module are shutdown from BSC, but TRX module is powered following a reset of ESMA or ESEA module, or Both carriers in the TRX module have LAPD on TRXSIG channel disconnected when the carriers state is supervisory, or One carrier is not in supervisory state but other carrier is in supervisory state with LAPD on TRXSIG channel disconnected.

Table 5. Dual TRX Module LED indications (cont.)

Colour	Explanation
Yellow, blinking	TRX_OM SW state is in TRX_Started State, or TRX_OM SW state is Clock sync, or One or both carriers are configuring: • Wait for LAPD establishment or • Wait for system information One or both carriers have LAPD on TRXSIG channel disconnected when none of the carriers are in state supervisory.
Green	Both carriers are in state supervisory and no 7606 or 7607 alarms are active and LAPD on TRXSIG is connected to both carriers.
Green, blinking	Only one carrier is in state supervisory and no 7606 or 7607 alarm is active and LAPD on TRXSIG is connected for this carrier, or Both carriers are in state supervisory but one carrier has LAPD on TRXSIG channel disconnected.

7 Contents of the Dual TRX Module (EXxA) delivery

Table 6. Nokia Flexi EDGE Dual TRX Module (EXxA) delivery contents

Description	Product code	Quantity
EDGE Dual TRX Module (EXxA):		1
• EDGE Dual TRX Module 800 MHz (EXTA)	470214A	
• EDGE Dual TRX Module 900 MHz (EXGA)	470215A	
• EDGE Dual TRX Module 1800 MHz (EXDA)	470216A	
• EDGE Dual TRX Module 1900 MHz (EXPA)	470217A	
Dual TRX Module Cable Set:	083309A	1
• Power cable 1188 mm (46.8 in.)	• 994940	1
• Bus cable 1054 mm (41.5 in.)	• 994938	1
• RF cable 172 mm (6.8 in.)	• 994931	4
M5 screws		4
Cage nuts		4