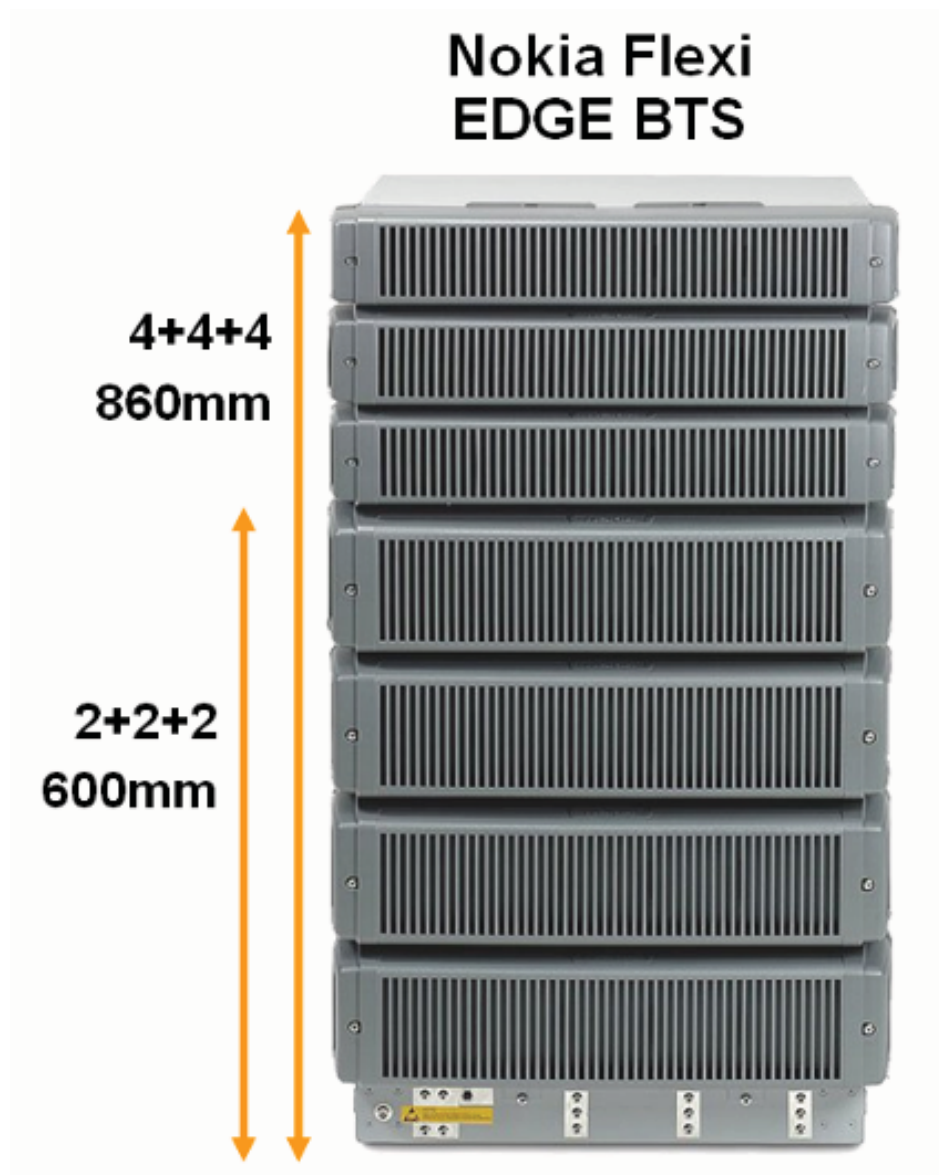




**Nokia Siemens  
Networks**

The logo graphic consists of two wavy, horizontal lines. The left line is purple and tapers to a point on the left. The right line is yellow and tapers to a point on the right. They meet in the middle, creating a narrow gap. The lines are composed of many thin, parallel strokes.

# The new BTS site.



# Abbreviations

General policy for abbreviations:

1 <sup>st</sup> letter	F for Flexi EDGE/WCDMA
	E for Flexi EDGE
	D for Diplexer
2 <sup>nd</sup> letter	M for mounting kits/units
	S for System Modules
	R for Radio Modules
	C for cabinets
	I for Transmission Modules
	P for Power Modules

DU2A	Diplexer Unit
ECxA	Flexi EDGE Remote Tune Combiner module
EMHA	3HU module casing
EMIA	Citytalk conversion kit
EMTA	2HU module casing
EMxA	Flexi EDGE module casing
ERxA	Dual Diplexer module
ESEA	Flexi EDGE System extention module
ESMA	Flexi EDGE System module
EUCA	Upgrade cable kit
EWxx	Flexi EDGE Wideband Combiner sub module
EXxA	Dual TRX module
FCDA	Flexi cabinet heat detector
FCFA	Flexi cabinet air filter
FCIA	Flexi cabinet for indoor
FCOA	Flexi cabinet for outdoor
FIEA	Assymetric E1/T1 Transmission sub module
FIFA	Flexbus Transmission sub module
FIPA	Symmetric E1/T1 Transmission sub module
FMAA	Flexi mounting auxiliary brackets
FMBB	Flexi mounting kit for batteries
FMCB	Flexi mounting covers for back and front
FMFA	Flexi mounting kit for wall and floor
FMPA	Flexi mounting unit for pole
FPAA	AC/DC submodule
FPBA	AC/DC battery submodule
FPDA	Flexi Power DC/DC module
FPMA	Flexi Power module
FSEB	Flexi system external alarm box
MIBBU	Integrated long term battery back up solution
WMPB	Pole mounting kit

# Flexi EDGE System Module (ESMA) Mechanics

## Weight

- 8.6 kg without transmission sub module
- 9.3 Kg with transmission sub module



Height 133 mm  
(3 U)

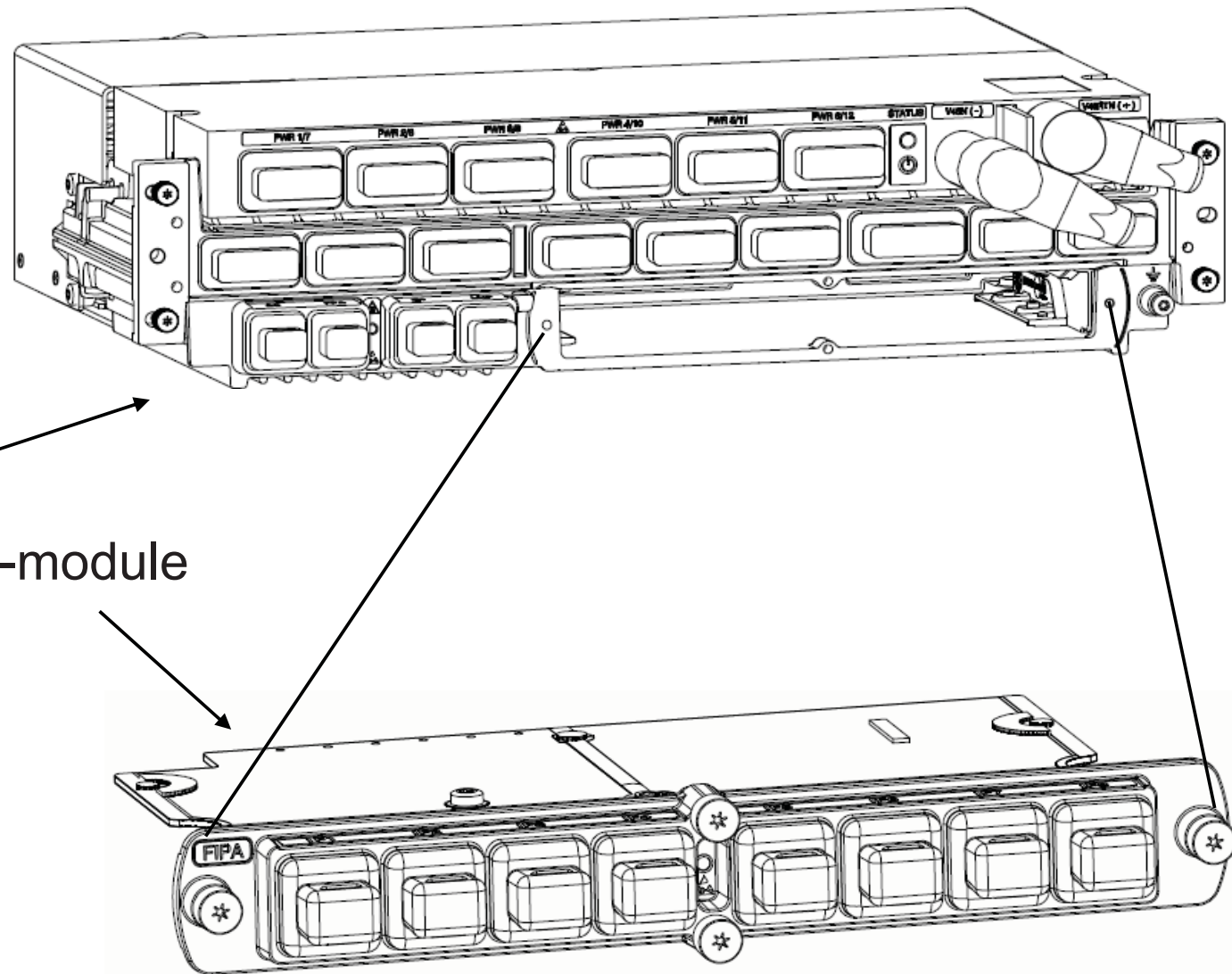
## Depth

- 422 mm without covers
- 560 mm with front and back covers

## Width

- 447 mm without covers
- 492 mm with covers

# Flexi EDGE System module (ESMA)



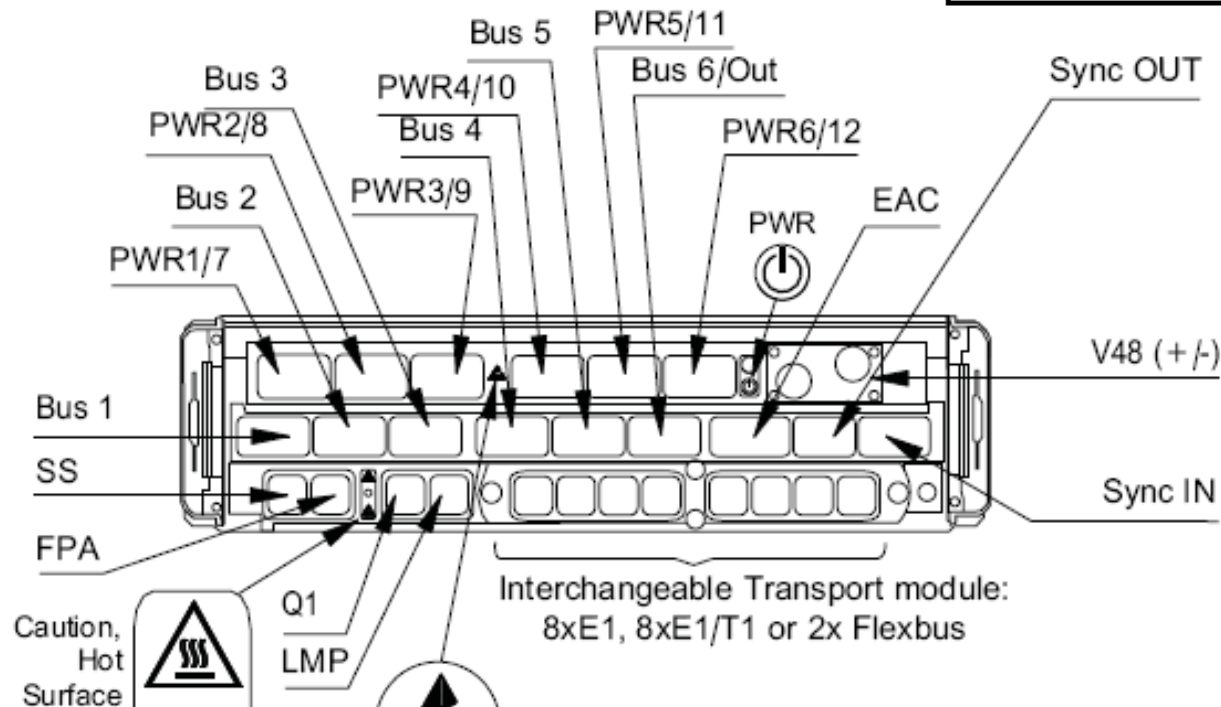
It is consisted of:

Core module

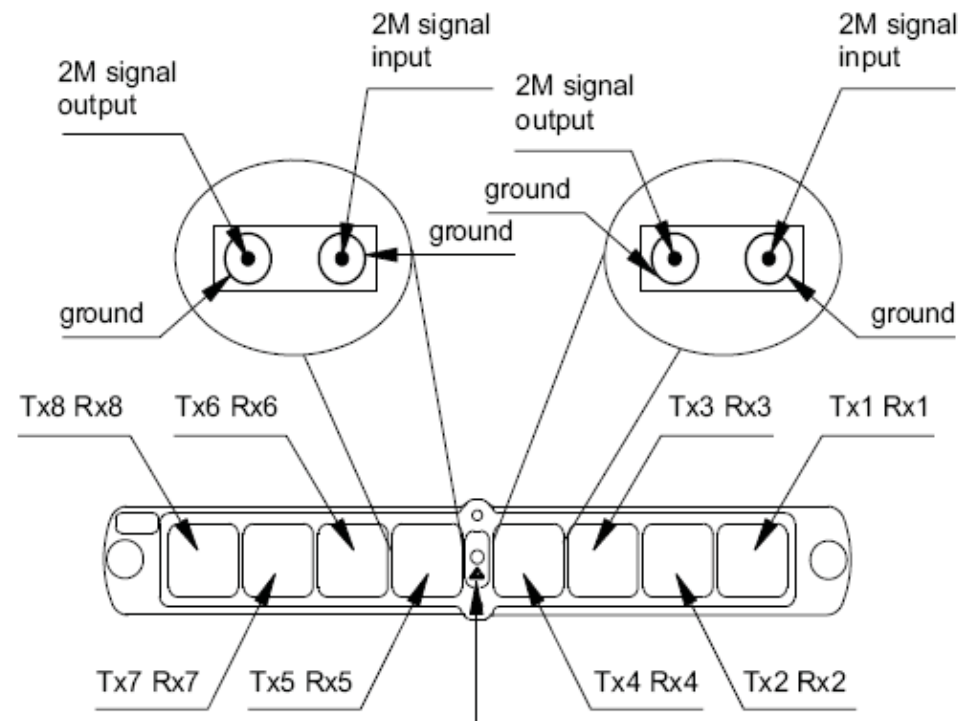
Transmission sub-module

ESMA can power up to six modules, 12 TRXs

Label name on module	Function	Connector type	Interface(s)
V48N (+/-)	-48 V DC input power for the base station.	M10 terminal bolts	FPMA, FPDA, site support, or other external power supply
PWR 1/7...PWR 6/12	-48 V DC output power with fuse protection to six other modules.	Multi-Beam XL	EXxA, ECxA, FCFA
BUS 1...BUS 6/OUT	6 x Ethernet (1000 Base-T)	MDR 26 F RA	EXxA, ECxA, ESEA
EAC	External alarm and control interface	MDR 36 F RA	FSEB, FSAA, customer alarm inputs or control outputs
Sync OUT	Base station synchronisation chaining out	MDR 26 F RA	External BTS
Sync IN	Base station synchronisation chaining in	MDR 14 F RA	External BTS, LMUB
SS	Site Support alarm	RJ45	-
FPA	Flexi power alarm	RJ45 shielded	FPAA, FPBA, FPDA
Q1	Q1 management interface	RJ45 shielded	Nokia Q1 managed network elements
LMP	Local management port	RJ45 shielded	Laptop or other computer

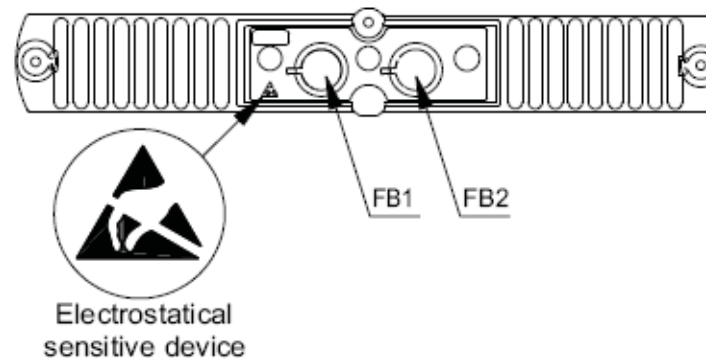


# FIEA Transmission sub module



Label name on module	Description	Connector type	Interface(s)
Tx1 Rx1...Tx8 Rx8	Eight Transmission (Abis) interfaces - unbalanced (coaxial) E1	SMB	External transmission equipment

# FIFA Transmission sub module



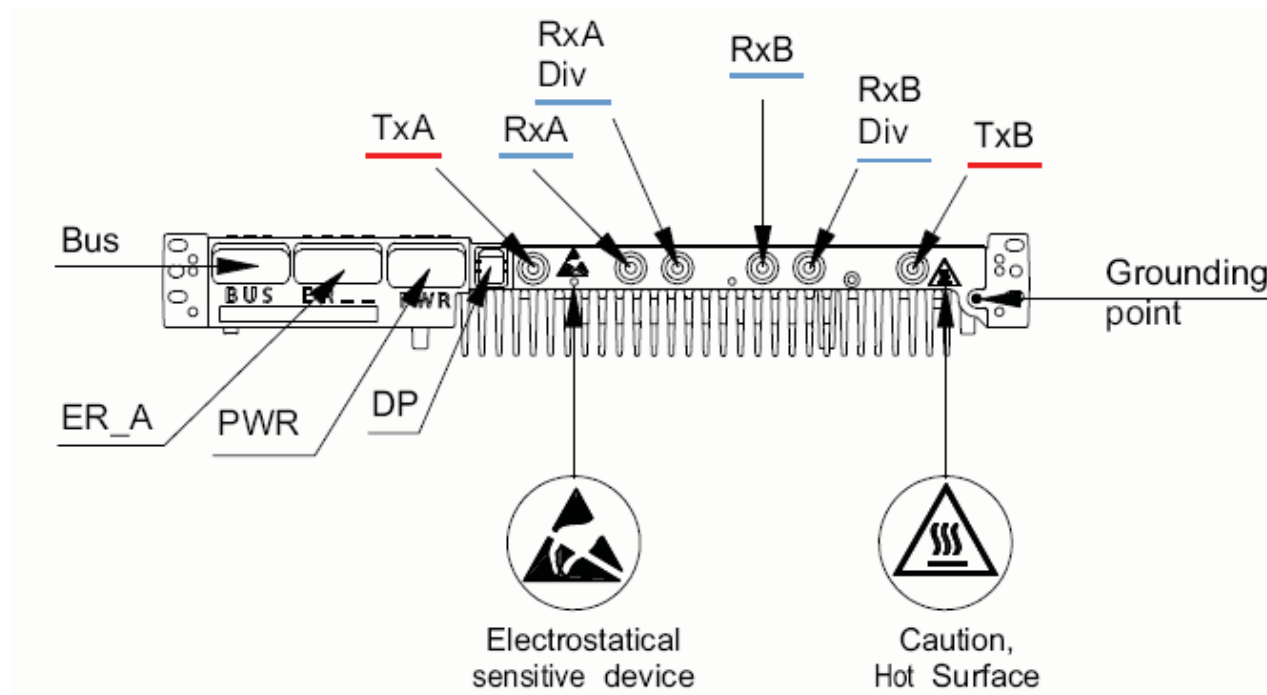
Label name on module	Description	Connector type	Interface(s)
FB1, FB2	Transmission (Abis) interface - Flexbus (Nokia proprietary PDH radio)	TNC	Nokia FlexiHopper microwave radios

# EAC connector PIN assignments

Signal	Pin	Pin	Signal
EXT_CO0	1	19	+5V/150mA
EXT_CO1	2	20	+5V/150mA
EXT_CO2	3	21	+5V/150mA
EXT_CO3	4	22	+5V/150mA
EXT_CO4	5	23	+5V/CAN_L
EXT_CO5	6	24	+5V/CAN_H
EXT_AL0	7	25	GND
EXT_AL1	8	26	GND
EXT_AL2	9	27	GND
EXT_AL3	10	28	GND
EXT_AL4	11	29	GND
EXT_AL5	12	30	GND
EXT_AL6	13	31	GND
EXT_AL7	14	32	GND
EXT_AL8	15	33	GND
EXT_AL9	16	34	GND
EXT_AL10	17	35	GND
EXT_AL11	18	36	GND

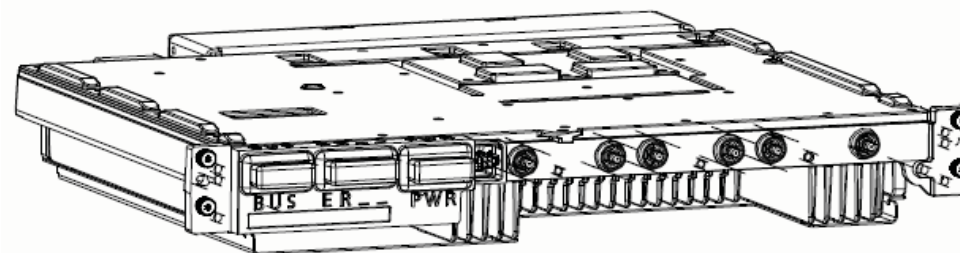
The EAC alarm polarity can be set to two states, Normally Open or Normally Closed

# Dual TRX module EXxA Mechanics



Weight

- 10.2 kg



Depth

- 422 mm without covers
- 560 mm with front and back covers

Width

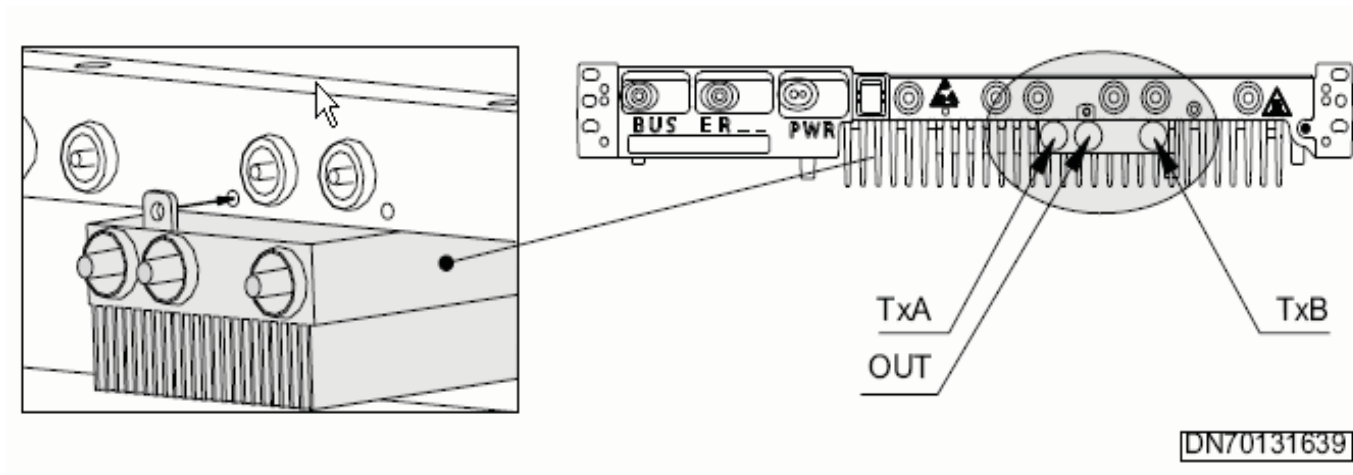
- 447mm without covers
- 492 mm with covers

Height

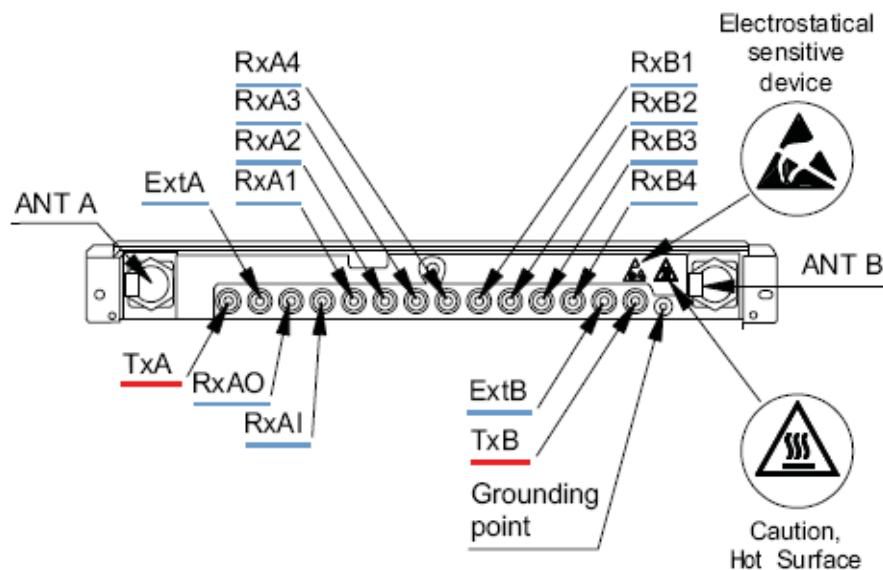
- 90mm (2U)

# Wideband combiner sub module (EWxx)

Optionally up to two wideband combiners can be attached on the dual TRX module



# Dual duplexer module ERxA Mechanics

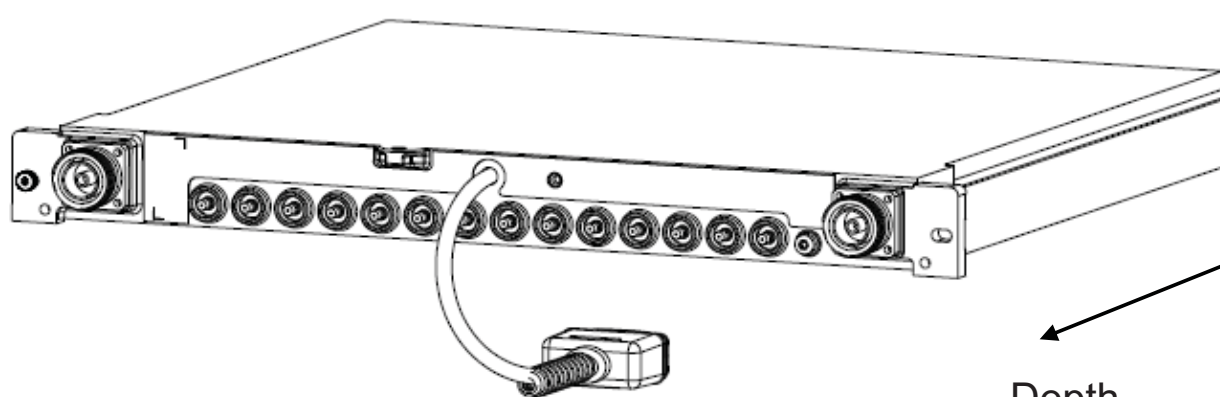


Weight

- 10.8 kg

Height

- 44mm (1U)



Depth

- 422 mm without covers
- 560 mm with front and back covers

Width

- 447mm without covers
- 492 mm with covers

# Flexi EDGE typical Power consumptions

BTS configuration. Cost optimized configuration and 24 TRXs / BCF in BSS13 assumed	Power Consumption 800/900 MHz (all Time Slots constant full power)	Power Consumption 1800/1900 MHz (all Time Slots constant full power)
	Watts	Watts
1+1+1	710	752
2+2+2	1063	1138
3+3+3	1536	1970
4+4+4	1948	2098
6+6+6	2873	3090
8+8+8	3758	4050
4+4+4 RTC	1988	2123
6+6+6 RTC	2873	3083

# Flexi EDGE Power requirements

The cross-sectional area of the Main Earthing Conductor shall not be less than live and neutral conductors nor less than 6 mm<sup>2</sup>, recommended size is 25 mm<sup>2</sup>.

When 220-240 VAC is used, power cables must be 1.5 - 2.5 mm<sup>2</sup> (15...13 AWG)

When 48 VDC is used, power cables must be 25...35 mm<sup>2</sup> (4...2 AWG), recommended size is 25mm<sup>2</sup>

The permitted operating voltage is 40.5 to 57 VDC

Recommended fuse for DC: 60A per system module

# Flexi BTS installation options

Stack  
installation



Wall  
installation



Pole  
installation



Cabinet  
installation



In addition, Nokia Flexi EDGE BTS can be installed:  
in 19" racks, Talk and other legacy cabinets (where space and thermal requirements are fulfilled) inside shelters, on top of masts etc.

# Requirements for cabinet use

## Modules must be installed in an indoor or outdoor cabinet, when:

- You want to install more than nine modules in a stack (total height over 22 U),
- You want to install more than five modules in a stack (total height over 15 U) and still meet the Telcordia GR-63-CORE Zone 4 requirement
- You want to install the BTS in a separate locked space
- You want to install Remote Tune Combiner
- Installation space for site support or integrated battery backup unit (MIBBU) is needed.

BTS outdoor cabinet installation with an air filter must be used when standard based operational environmental conditions presented in *environmental specifications* shown in next page are exceeded.

Typically, a cabinet with an optional air filter is needed:

- In places where dust is a concern,
- Next to a dusty road with heavy traffic,
- In sandy terrain with the possibility of wind-blown sand in the air,
- Next to an industrial plant with significant emissions of dust or other particles, such as cement factory, sawmill etc.
- Nearby a cornfield with heavy straw dust during harvesting,
- In places where salt fog or acid rain caused by air pollution is a concern,
- Near sea shore
  - with dense salt fog and line of sight <500m from sea with breaking waves
  - where wind-driven salt fog from sea can be identified.
  - In site locations where surrounding metal structures show signs of corrosion due to extreme conditions (salt in air),
- In locations with especially heavy rainfall and high humidity combined with air pollution

# Environmental specifications

Flexi EDGE stand-alone BTS (modules installed w/o a cabinet) can operate under the environmental specification defined in the right table.

When choosing the installation location for the stand-alone BTS, note that heat and moisture may damage equipment. Install the base station preferably away from direct sunlight, and protect the BTS from direct rain, splash water and salt fog.

Property	Value
Transportation requirements	ETSI 300 019-1-2, class 2.3, climate conditions according to class 2.3 (for a single module, in package)
Storage requirements	ETSI 300 019-1-1, Class 1.2 (for a single module, in package)
Operational requirements	ETSI 300 019-1-3, class 3.2 (indoor site) ETSI 300 019-1-4, class 4.1 (outdoor site)
Wind driven rain	GR-487-CORE MIL-STD 810E method 506.3 for rainfall rate 15 cm (15.9 in.)/hr and wind velocity 33 m (108.3 in.)/s
Salt fog and dust	IEC 721-2-5 IEC 68-2-52/Kb, stress level 1 with 0.44% salt solution by weight. This corresponds to IEC 721-2-5 humid costal and inland (moderate) environment with < 8mg/(m <sup>2</sup> day) salt deposition for outdoor BTS without optional cabinet with air filter. A typical installation location example: 500 m (1640 ft) from the seashore.
Acoustic noise at +15 °C (59 °F)	Sound power level 54 dB(A), for 2+2+2 bypass configuration Sound power level 56 dB(A), for 4+4+4 2:1 configuration
Acoustic noise at +23 °C (73 °F)	Sound power level 58 dB(A), for 2+2+2 bypass configuration Sound power level 60 dB(A), for 4+4+4 2:1 configuration
Acoustic noise at +50 °C (122 °F)	Sound power level 66 dB(A), for 2+2+2 bypass configuration Sound power level 68 dB(A), for 4+4+4 2:1 configuration
Ingress Protection	IP55
Safety	IEC-60950-1
Earthquake Requirements	Bellcore GR-63-CORE, vibrational requirements for earthquake Zone 4: a maximum of five casings (2U <sup>1</sup> ) or 3U) in a stack. Bellcore GR-63-CORE, Vibrational requirements for earthquake Zone 2: a maximum of 22 U in a stack.
Installation base flatness requirement	2 mm (0.08 in.)

# Outdoor cabinet (FCOA)



Property	Value
Height	1550 mm (61 in.)
Width	770 mm (30.3 in.)
Depth	770 mm (30.3 in.)
Depth with air filter	930 mm (36.6 in.)
Depth with air filter and wind breaker	1020 mm (40.2 in.)
Weight (empty cabinet)	Max. 80 kg (177 lbs)
Weight (with air filter)	104 kg (230 lbs)
Weight (with air filter and wind breaker)	110 kg (243 lbs)
Total weight (Fully equipped with batteries)	365 kg (807 lbs)
Free space for modules	40 U (30 U horizontally + 5 U + 5 U vertically)
Free space for modules (site support and batteries installed)	21 U (16 U horizontally + 5 U vertically)

# Environmental requirements for Flexi EDGE BTS installation

Operating temperature: -33°C to +50°C, temporarily +55°C

- Same for all installations types (indoor and outdoor, with and without cabinet)

It is recommended to install modules into shade, avoiding direct sunlight

- In maximum usage temperature sun load of 1120W/m<sup>2</sup> is taken in account
- Front and rear module covers are not used in cabinets that have a door, in all other cases they are mandatory

For securing air flow, 40 mm open space behind modules is required

- In cabinet and rack installations the open space can be behind cabinet if sufficient air-flow to modules is secured (through grid back wall, for example)

# Flexi EDGE BTS, cooling requirements

A Nokia Flexi EDGE BTS module is installed in the cabinet without the rear side and front side plastic covers. All modules must receive cool ambient air, and circulation from the front to the rear side of the module must be prevented. The following table shows the air volume flow for each Flexi EDGE BTS module.

<i>Module</i>	<i>Air volume flow (m<sup>3</sup>/h)</i>
System Module (ESMA)	50 (m <sup>3</sup> /h) (1766 cu.ft)
Remote Tune Combiner Module (ECxA)	50 (m <sup>3</sup> /h) (1766 cu.ft)
Dual TRX Module (EXxA)	100 (m <sup>3</sup> /h) (3531 cu.ft)
Dual Duplexer Module, ERxA (no fans)	0

The entire cabinet volume flow is dependent on the number of modules and configuration. The following table shows cabinet flow volume for common configurations.

A minimum of 100 mm (3.9 in.) is recommended from the rear side of the cabinet to the wall (or any obstacle) to allow the required airflow rate to be reached for each module. It is recommended that cables be routed on the module sides to prevent the obstruction of airflow from the BTS.

<i>Configuration</i>	<i>ESMA (m<sup>3</sup>/h)</i>	<i>EXxA (m<sup>3</sup>/h)</i>	<i>Total (m<sup>3</sup>/h)</i>
2+2+2 bypass	1 x 50	3 x 100	350
4+4+4 2-way WBC	1 x 50	6 x 100	650
2+2+2 and 2+2+2 dual band	1 x 50	6 x 100	650