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UltraSite EDGE BTS Warnings and Cautions

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1 Statutory information

1.1 CE Marking

Standard	Description
CE 0168 !	Hereby, Nokia Corporation, declares that this Nokia UltraSite EDGE Base Station is in compliance with the essential requirements and other relevant provisions of Directive: 1999/5/EC.

1.2 FCC Statement

Standard	Description
FCC Statement	Hereby, Nokia Corporation declares that this Nokia UltraSite EDGE Base Station is in compliance with the essential requirements and other relevant provisions of Directive: 1999/5/EC. The product is marked with the CE marking and Notified Body number according to the Directive 1999/5/EC. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

2 Warnings and Cautions

2.1 Warnings and Cautions for UltraSite EDGE BTS

2.1.1 Transporting BTS

Caution

To prevent damage to the equipment, transport Nokia UltraSite EDGE BTS to the installation site in the original transportation package.

Caution

The typical transportation time to the installation site is 30 days or less. If the total transportation time exceeds 30 days, consider additional storage or packaging precautions.

2.1.2 Installing BTS cabinet

Warning

Empty CRMA and CRMC cabinet cores weigh 79 kg (155 lb) and 52 kg (115 lb) respectivly. Nokia recommends that a lifting device be used when moving a cabinet core.

Warning

An empty cabinet core weighs a maximum of 70 kg (155 lb). Nokia recommends that a lifting device be used when moving the cabinet core.

Warning

The OAKx door is heavy. You will need a minimum of two installation personnel to remove the OAKx door.

Warning

When lifting or positioning the cabinet, avoid tilting the cabinet forward. Internal components, such as cables, may fall out.

Warning

Nokia UltraSite EDGE BTS has many sharp edges. Exercise caution during installation.

Warning

Keep your fingers clear of the metal edges on the top of the cabinet and rear wall when installing the back wall.

Warning

When drilling, wear the necessary protective gear, such as gloves and safety glasses.

Caution

Before you begin installation, ensure that the site is prepared and identify any special requirements for installation (for example: two people needed for lifting equipment).

Caution

Nokia requires that only properly trained and authorised personnel perform installation operations on any Nokia BTS.

Caution

If the installation site is in an area affected by seismic activity, follow the earthquake mounting instructions.

Caution

The plinth weighs approximately 10 kg (22.05 lb). Handle the plinth with care.

Caution

Do not block air intake to the back of the Indoor cabinet. The recommended back clearance of 52 mm (2.0 in.) ensures proper air intake for the Unit Cooling fans of the cabinet core.

Caution

Uneven bolt installation can damage the cabinet floor.

2.1.3 Safety distance

Warning

The equipment generates electromagnetic radiation that can exceed safety levels when an installer is working near the antennas. Observe the minimum distance precautions. To calculate minimum safe distance refer to the formula.

Warning

Do not install Nokia UltraSite EDGE BTS or its antennas in areas where there is a potential risk for interference with inadequately shielded medical equipment, such as life support devices, hearing aids, or other electrically or magnetically sensitive devices.

Warning

Before installing Nokia UltraSite EDGE BTS or its antennas, identify the emission of nearby antennas to properly manage ambient emissions.

Warning

Observe the six-hour maximum time limit for safety when working with antennas.

Warning

Do not go any closer to a live antenna than the compliance boundary. The radio frequency energy generated by the antenna poses a serious health risk.

Warning

If performing installation or maintenance procedures on the BTS, make sure that all transmitters in the area are switched off.

Warning

The safety distance calculation in our example is for reference only. Ensure the measurements for the actual site are used during installation or maintenance.

2.1.4 Power

Warning

Follow national regulations when working with power supply and power cables.

Warning

Potentially lethal voltages!

Switch the BTS power OFF from a disconnecting device or circuit breaker before starting the maintenance work, whenever the nature of maintenance work causes a risk of electric shocks!

Warning

Permanently wire Nokia UltraSite EDGE BTS to a disconnect device, such as a circuit breaker.

Warning

Disconnect Nokia UltraSite EDGE BTS from the mains power network with a dedicated switch. Turning OFF Nokia UltraSite EDGE BTS using the BTS power supply switch leaves it in STAND BY mode.

Warning

Risk of lethal voltages and electric shock exist when routing power cables. Verify that mains power breaker is OFF and that the cabinet is properly grounded before attempting any connections to the cabinet.

Warning

Be aware of the risk of lethal voltages and electric shock. Before you route AC Filter module cables, make sure the mains power breaker is in the OFF position.

Warning

Mains power must be removed from the BTS prior to servicing PWSC units.

Warning

Failure to switch off all AC and DC breakers prior to ADUx removal can result in hazardous voltage discharges.

Warning

Permanently wire Nokia UltraSite EDGE BTS to a disconnect device, such as a circuit breaker.

Warning

Before repositioning PWSx backplane connectors, ensure that mains power breaker is OFF. There is risk of lethal voltages and electric shock.

Warning

Be careful when handling the Power Supply Unit (PWSx) or WCDMA Power Supply Unit (WPS) and power cables. Electrical hazards exist. The power is ON in the GSM/EDGE part of the BTS.

Warning

Do not disconnect the antenna cables from the antenna box. Electrical hazards exist. The BTS power is on.

Warning

Disconnect Nokia UltraSite EDGE BTS from the mains power network with a dedicated switch. Turning OFF Nokia UltraSite EDGE BTS using the BTS power supply (PWSx) switch leaves it in STANDBY mode.

Warning

Do not switch on the power supply from Nokia UltraSite Support to the BTS. Electrical hazards exist. Removing the IBBU requires the BTS power is off.

Warning

Be careful of the edges of the cabinet when performing any maintenance work. The edges of the cabinet are sharp and may cause personal injury.

Caution

Switch off the power for all BTSs that you are going to modify during co-siting installation.

Caution

A power plug with a PE connection is not sufficient for Nokia UltraSite EDGE BTS. Grounding must have a fixed, non-removable connection.

Caution

Avoid unnecessary loops and sharp bending of the grounding cable. Do not run the grounding cables parallel with power cables.

Caution

To prevent damage to units, grounding must be connected to the cabinet before installing any of the units.

2.1.5 Cabling

Warning

Risk of lethal voltages and electric shock exist when routing power cables. Verify that mains power breaker is OFF and that the cabinet is properly grounded before attempting any connections to the cabinet.

Warning

Damage to cabinet components or personnel can occur if the power cable is not secure. Ensure the power cable is secure within the strain relief.

Warning

Electrical hazards exist while installing RTxx cables to the RFU backplane of a powered Nokia BTS. Ensure the cable being connected is held clear of all conductive surfaces during installation.

Warning

Electrical hazards exist if removing or installing DVxx cables to the RFU backplane of a powered Nokia BTS. Hold cable being connected clear of all conductive surfaces during installation.

Warning

Be aware of the risk of lethal voltages and electric shock. Before you route AC Filter module cables, make sure the mains power breaker is in the OFF position.

Warning

The HETA power cable is 230 VAC. Route cables between the OAKx door and the cabinet in a manner that will prevent damage to the cables during door opening and closing.

Warning

Comply with all illustrations of power cable routing.

Caution

Minimise the number of times you bend the cable back and forth. The cables age through bending and may be damaged.

Caution

Do not bend the antenna cables more than is permitted. The smallest permissible bending radius for the antenna cables is 25 mm (1 inch).

Caution

Nokia requires that only properly trained and authorised personnel perform cabling operations on any Nokia BTS.

Caution

The cable cross section dimension must meet national, state, and local regulations.

Caution

If disconnecting the Flexbus cable, power off Flexbus interface with transmission unit Manager Software.

Caution

The power/alarm cable will be damaged if not properly cable tied.

Caution

Do not damage the EMC shielding that is under the feeder plastic shield, when connecting antenna jumper cables.

Caution

To prevent damage to the cables in windy conditions, use the door stay to hold the door open. When you close the door, make sure the cables are not between the door and door frame.

Caution

All cables connected between the interface module (Q1, Q1_SSS, etc.) and BTS units must be grounded and shielded on both ends.

Caution

Data cables over four feet in length that are installed between Outdoor cabinets must be routed through solid metal conduit (USA only).

Caution

When removing bushing material from the cable entry block bushings, ensure the remaining bushing material forms a tight seal around the entire circumference of the cable.

Caution

If you reverse the DC power cables when you install them, it can cause a fuse to blow (open) in the TSxA Transceiver unit when you insert the unit into the cabinet. Before you connect the power cables, check their polarity with a multimeter.

Caution

If the DC power cables are reversed during installation, it will blow (open) a fuse in the PWSC Power supply unit. Before you connect the power cables, check their polarity with a multimeter.

Caution

Be careful not to bend the RF and antenna cables more than is allowed. The smallest allowed bending radius is 25 mm (1 inch).

Caution

If you remove the grounding bridge, the grounding of the RX connector's outer conductor changes from direct grounding to capacitive.

Caution

Use either separate 75 ohm RX and TX connectors (BT-43) or one 120/100 ohm TX/ RX connector (TQ) when routing cables for FC E1/T1.

Caution

The 75 ohm TX is grounded only when the grounding bridge between the TX and RX connectors is in place, when routing cables for FXC E1.

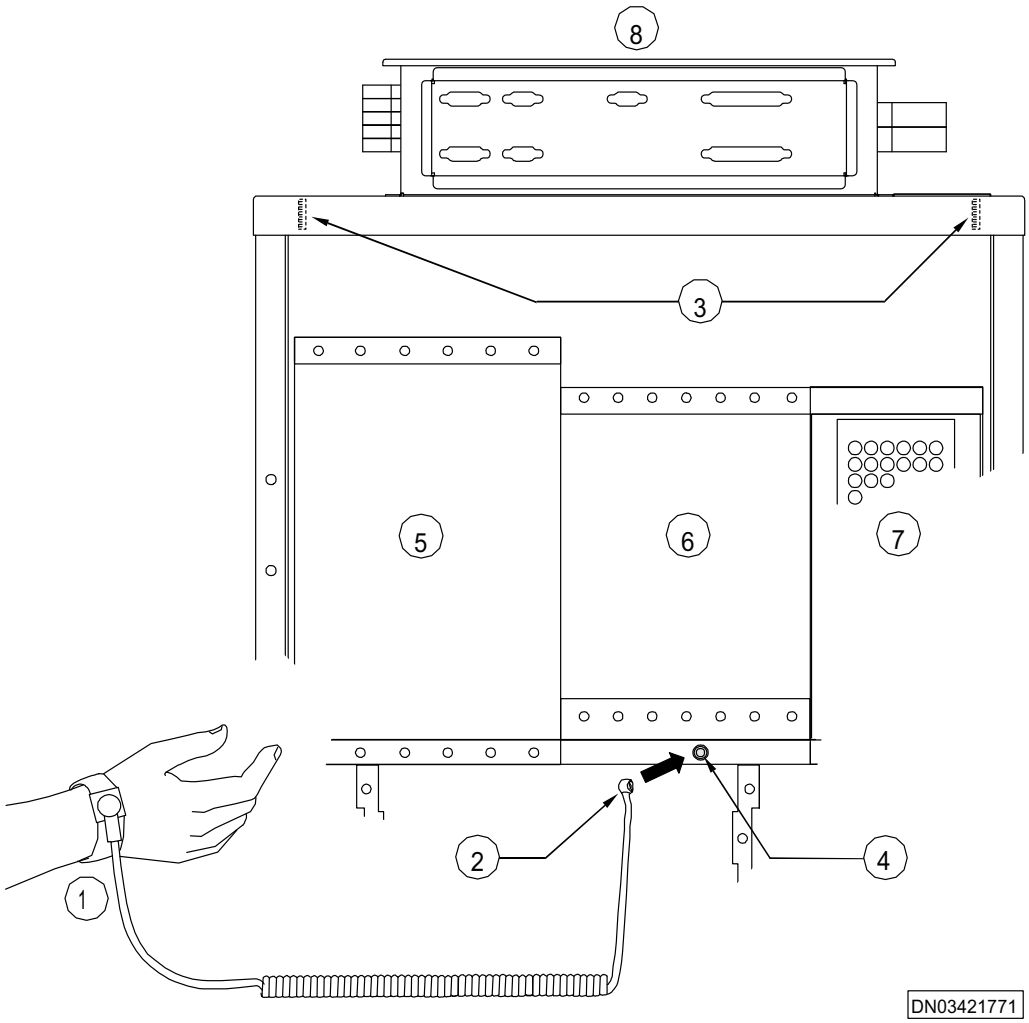
2.1.6 Handling units

Warning

Unit mounting fasteners may be nickel plated. Nokia recommends that personnel allergic to nickel wear protective gloves when handling units.

Caution

Always use the antistatic hand strap when handling units that are marked with the ESD sign. Units carrying the ESD sign are sensitive against electrostatic discharging.



1	Wrist strap
2	To ESD snap
3	Grounding stud behind front flange
4	ESC snap

Figure 1. Antistatic wrist strap connection

Caution

Keep the units in their protective packages until installation to protect them against humidity.

Caution

Handle the heavy units with care. The following WCDMA units are considered heavy: WAF, WMP, WTR, WPS and WTCA Fan Module.

Caution

Handle the BCFB unit with care. Inappropriate handling can damage the LCD display on the front panel. Use the front-panel handles for lifting and pushing the unit into the cabinet.

2.1.7 Installing units

Warning

Be careful when handling the Power Supply Unit (PWSx) or WCDMA Power Supply Unit (WPS) and power cables. Electrical hazards exist. The power is ON in the GSM/EDGE part of the BTS.

Warning

Before repositioning PWSx backplane connectors, ensure that mains power breaker is OFF. There is risk of lethal voltages and electric shock.

Warning

To prevent electrical shock, verify that power has been removed from the BTS input cables with a voltage measurement device before performing any upgrade procedures.

Caution

Notify BSC personnel before you replace or add units to Nokia UltraSite BTS.

Caution

Ensure the new PWSx unit is in STAND BY mode before installing it.

Caution

Notify RNC personnel when you replace or add WCDMA units to Nokia UltraSite EDGE BTS.

Caution

When installing the WAF, WMP, WTR or WIC, be careful not to damage the backplanes and connectors.

Caution

Handle the heavy units with care. The following WCDMA units are considered heavy: WAF, WMP, WTR, WPS and WTCA Fan Module.

Caution

Install the units into the slots with great care to avoid damage to the backplanes and connectors.

Caution

Do not use force to insert the TSxx unit. The connector pins are fragile and may be damaged.

Caution

To prevent damage to the backplane connector when removing Transceiver units, ensure the unit is pulled straight out from the backplane with no upward force.

Caution

Ensure no BB2x unit is installed in the far right slot of the common subrack area. This position is only for installation of a BOIx unit.

Caution

To prevent damage to the backplane, do not force the VXxx unit into position during installation. Gently tilt the rear of the VXxx unit up to engage the backplane connector.

Caution

Do not insert PWSx units with the power supply switch in the ON position.

Caution

Install the units into the slots with great care to avoid damage to the backplanes and connectors.

Caution

Nokia requires that only properly trained and authorised personnel perform installation operations on any Nokia BTS.

Caution

Do not use excessive force when installing units to the RFU backplane connectors.

2.1.8 Replacing units

Warning

Mains power must be removed from the BTS prior to servicing PWSC units.

Warning

Failure to switch off all AC and DC breakers prior to ADUx removal can result in hazardous voltage discharges.

Warning

Ensure the battery circuit breaker is in the OFF position before replacing the BBAx.

Warning

When replacing fans within the BTS, the new fans may start operation when the power/signal cable is connected.

Warning

Ensure the fan has stopped rotating before removing the cabinet fan cover.

Warning

Do not open a faulty HETA unit. Return HETA unit to Nokia Service.

Caution

Notify BSC personnel before you replace or add units to Nokia UltraSite BTS.

Caution

If replacing the FXC RRI, power off Flexbus interface with transmission unit Manager Software.

Caution

Notify RNC personnel when you replace or add WCDMA units to Nokia UltraSite EDGE BTS.

2.1.9 Installing batteries

Warning

Ensure the battery circuit breaker is in the OFF position before replacing the BBAx.

Warning

Never connect or disconnect the battery cable from the ADUx when the other end of the lead is connected to the batteries.

Warning

Always disconnect the positive battery lead before the negative lead.

Warning

As the cabinets are positive earthed, to minimise the risk of short circuits while the battery leads are loose, always connect the negative battery lead before the positive lead.

Warning

Before you start the installation, verify that the battery circuit breaker is in the OFF position. Use only insulated tools to work on the batteries.

Warning

To minimise the risk of short circuits if the battery leads are loose, connect the negative battery lead to the batteries before the positive cable. Always disconnect the positive battery cable from the batteries before the negative cable.

Warning

Ensure battery cable lugs do not touch each other during installation.

Warning

Take great care when installing the battery boxes to the cabinet. The installation is difficult and the battery boxes are heavy.

Caution

Do not use force when installing the BATx unit into the backplane connectors; backplane connector pins can be damaged.

2.1.10 Commissioning

Warning

Nokia recommends only properly trained and authorised personnel perform commissioning operations on any Nokia BTS.

Caution

The Power On setting should not be used when two RRI units are connected together with a Flexbus cable. If power is on in such a case, the units could be damaged.

Caution

In order not to interfere with the operation of other sites, make sure that an RF attenuator is connected to every TRX in the BTS before you start local TRX tests.

Caution

Changing the parameters may cause the site not to work according to the network plan.

2.1.11 Preventing failures

Caution

Nokia requires that only properly trained and authorised personnel perform installation, cabling, commissioning, and maintenance operations on any Nokia BTS.

3 Glossary

3.1 Glossary for UltraSite EDGE BTS

3.1.1 Abbreviations and acronyms

This section lists abbreviations and acronyms used throughout Nokia UltraSite EDGE Solution documentation.

AC	Alternating Current
ACFU	AC Filter Unit
A/D	Analog/Digital
ADC	Analog to Digital Converter
ADUA	AC/DC control and distribution unit for Integrated Battery Backup (IBBU)
AGC	Automatic Gain Control
ALS	Automatic Laser Shutdown
AMR	Adaptive Multi-Rate coding
ANSI	American National Standards Institute
ANT	Antenna connector
ARFN	Absolute Radio Frequency Channel Number
ASIC	Application Specific Integrated Circuit
ATM	Asynchronous Transfer Mode

AWG	American Wire Gauge
AXC	ATM cross-connect
AXU	ATM cross-connect unit
BAPT	Bundesamt für Post und Telekommunikation Telecommunications advisory agency of Federal Republic of Germany
BATx	Rectifier for battery backup
BBAG	12 V battery for Integrated Battery Backup (IBBU)
BB2x	Transceiver Baseband unit • BB2A for GSM • BB2E for GSM/EDGE
BCCH	Broadcast Control Channel
BCF	Base Control Function
BER	Bit Error Ratio The ratio of the number of bit errors to the total number of bits transmitted in a given time interval.
BIST	Built-In Self Test A technique that provides a circuit the capability to carry out an implicit test of itself.
BOIx	Base Operations and Interfaces unit
BPxN	Bias Tee without VSWR monitoring • BPDN for GSM 900/1800/1900 • BPxV Bias Tee with VSWR monitoring • BPGV for GSM 900 • BPDV for GSM 1800/1900
BS	British Standards
BSC	Base Station Controller

BSS	Base Station Subsystem
BTS	Base Transceiver Station (Base Station)
CC	Cross-Connection
CCCH	Common Control Channel
CCITT	Comité Consultatif International Télégraphique et Téléphonique International Telegraph and Telephone Consultative Committee (Telecommunications advisory agency of France)
CCUA	Cabinet Control Unit
CDMA	Code Division Multiple Access A technique in which the radio transmissions using the same frequency band are coded in a way that a signal from a certain transmitter can be received only by certain receivers
CE	Cable Entry; Consumer Electronics; Conformit Européen (European Conformity) CH Channel
CHDSP	Channel Digital Signal Processor
CN	Change Note A short trouble management document in a specified form sent to a customer about a modification in a product
CRC	Cyclic Redundancy Check A method for detecting errors in data transmission.
CRMx	Core Mechanics for Nokia UltraSite EDGE Base Station Indoor and Outdoor cabinet • CRMA for Indoor and Outdoor cabinets • CRMB for Site Support cabinets • CRMC for Midi Indoor and Outdoor cabinets
CSC	Customer Services Centre
D/A	Digital/Analog

DC	Direct Current
DCS	Digital Cellular System
DDS	Direct Digital Synthesis The frequency synthesis in which logic and memory are used to digitally construct the desired output signal, and a digital-to-analogue converter is used.
DL	(Downlink) The direction of transmission in which the BTS is the transmitting facility and the mobile station is the receiving facility.
DIP	Dual In-line Package
DRAM	Dynamic Random Access Memory
DRX	Discontinuous Reception
DSP	Digital Signal Processor
DTX	Discontinuous Transmission
DU2A	Dual Band Diplex Filter unit for GSM 900/1800
DVxx	Dual Variable Gain Duplex Filter unit • DVTB for GSM/EDGE 800 • DVTC for GSM/EDGE 800 co-siting • DVGA for GSM/EDGE 900 • DVHA for GSM/EDGE 900 customer-specific H band • DVJA for GSM/EDGE 900 customer-specific J band • DVDC for GSM/EDGE 1800 • DVDA for GSM/EDGE 1800 A band • DVDB for GSM/EDGE 1800 B band • DVPA for GSM/EDGE 1900
E1	European Digital Transmission Format Standard (2.048 Mbit/s)
EAC	External Alarms and Controsl

EC	European Community
EDGE	Enhanced Data rates for Global Evolution
EEC	European Economic Community
EEPROM	Electronically Erasable Programmable Read Only Memory
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
EN	European Norm
EQDSP	Equaliser Digital Signal Processor
ESD	Electrostatic Discharge
ET	Exchange Terminal
ETSI	European Telecommunications Standards Institute
Ext.	External
FACCH	Fast Associated Control Channel
FACH	Forward Access Channel
FCC	Federal Communications Commission The United States federal agency responsible for the regulation of interstate and international communications by radio, television, wire, satellite, and cable.
FC E1/T1	Wireline transmission unit (75 [ohm] E1, 120 [ohm] E1, or 100 [ohm] T1) of Nokia UltraSite EDGE Base Station without cross-connection capability.
FCLK	Frame Clock
FET	Field Effect Transistor
FHS	Frequency Hopping Synthesiser

FIFP	Forwarded Intermediate Frequency Power
FIKA	+24 VDC Installation Kit
FPGA	Field Programmable Gate Array
FXC E1	Wireline transmission unit (75 [ohm] E1) with four line interfaces to the 2 Mbit/s (E1) transmission line; cross-connection capability at 8 kbit/s level.
FXC E1/T1	Wireline transmission unit (120 [ohm] E1 or 100 [ohm] T1) with four line interfaces to the 2 Mbit/s (E1) or 1.5 Mbit/s (T1) transmission line; cross-connection capability at 8 kbit/s level.
FXC RRI	Radio link transmission unit (radio indoor unit) with cross-connection capability at 8 kbit/s level. Used with MetroHopper Radio and FlexiHopper Microwave Radio.
Gb	Interface between RNC and SGSN
GMSK	Gaussian Minimum Shift Keying
GND	Ground; Grounding (protective earthing). See Grounding and PE.
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications • GSM 800 GSM 800 MHz frequency band • GSM 900 GSM 900 MHz frequency band • GSM 1800 GSM 1800 MHz frequency band • GSM 1900 GSM 1900 MHz frequency band
GUI	Graphical User Interface
HDLC	High-level Data Link Control
HETA	Base station cabinet heater
HO	Handover

	The action of switching a call in progress from one radio channel to another, to secure the continuity of the established call
HSCSD	High-Speed Circuit Switched Data
HV	High Voltage
HW	Hardware Specfically, electronic equipment supporting data transmission and processing tasks, and the electrical and mechanical devices related to their operation
IAKx	Indoor Application Kit for Nokia UltraSite EDGE Base Station • IAKA for UltraSite Indoor cabinet • IAKC for UltraSite Midi Indoor cabinet
IBBU	Integrated Battery Backup
IC	Integrated Cell
ICE	Intelligent Coverage Enhancement
ID	Identification; Identifier IE Information Element The basic unit of a transaction capabilities application part (TCAP) message.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IF	Intermediate Frequency
IFM	Interface Module
IFU	Interface unit
ILKA	Indoor Lock Kit
ILMT	Integrated Local Management Tool

IMA	Inverse Multiplexed ATM
IP	Ingress Protection
IRPA	International Radiation Protection Association
ISDN	Integrated Services Digital Network
ISHO	Inter-system handover The handover from one system to another.
ISO	International Organization for Standardization
ITU	International Telecommunication Union
L2	AC Phase 2
L3	AC Phase 3
Iu	The interconnection point between the RNC and the Core Network
Iub	Interface between the RNC and node B
Iubis	Interface between the RNC and the BTS
Iur	The logical interface for the interconnection of two radio network controller (RNC) components of the UMTS terrestrial radio access network (UTRAN) system
JIS	Japanese Industrial Standard
LAN	Local Area Network A data transmission network covering a small area.
LAPD	Link Access Protocol on D-channel between the BSC and BTS
LED	Light Emitting Diode
LMB	Local Management Bus
LMP	Local Management Port

LNA	Low-Noise Amplifier
LO	Local Oscillator
LTE	Line Terminal Equipment
LV	Low Voltage
LVD	Low Voltage Disconnect
LVDS	Low Voltage Differential Signalling
LVTTL	Low Voltage Transistor Transistor Logic
M2xA	2-way Receiver Multicoupler unit • M2LA for GSM/EDGE 800/900 • M2HA for GSM/EDGE 1800/1900 • M6xA 6-way Receiver Multicoupler unit • M6LA for GSM/EDGE 800/900 • M6HA for GSM/EDGE 1800/1900
MAC	Medium Access Control function, handles the channel allocation and multiplexing, that is, the use of physical layer functions.
MCLG	Master Clock Generator
MDF	Main Distribution Frame
MHA	Masthead Amplifier
MMI	Man-Machine Interface
MML	Man-Machine Language A text-based command language with a standardised structure, designed to facilitate direct user control of a system.
MNxx	Masthead Amplifier specific to Nokia UltraSite EDGE Base Station • MNGA for GSM/EDGE 800/900 • MNDA for GSM/EDGE 1800 A band • MNDB for GSM/EDGE 1800 B band

- MNPA for GSM/EDGE 1900 A band
- MNPB for GSM/EDGE 1900 B band
- MNPC for GSM/EDGE 1900 C band

MPT — Ministry of Posts and Telecommunications

Telecommunications regulatory agency of Great Britain.

MS — Mobile Station

User equipment which uses a radio connection, and which can be used in motion or at unspecified points. This is usually a mobile phone.

MSC — Mobile Switching Centre

The mobile network element which performs the switching functions in its area of operation, and controls cooperation with other networks.

MTBF — Mean Time Between Failure

NCRP — National Council on Radiation Protection and Measurements

NCU — Node Control Unit

NEBS — Network Equipment Building Systems

NED — Nokia Electronic Documentation

NMS — Network Management System

O&M — Operation and Maintenance

OAKB — Cable entry kit for BTS co-siting

OAKx — Outdoor Application Kit for Nokia UltraSite EDGE Base Station

- OAKA for UltraSite Outdoor cabinet
- OAKC for UltraSite Midi Outdoor cabinet
- OAKD for UltraSite Midi Outdoor to Talk-family Co-siting

OBKA — Outdoor Bridge Kit

OCXO	Oven Controlled Crystal Oscillator An oscillator in which the crystal and critical circuits are temperature-controlled by an oven.
OEKA	Outdoor (cable) Entry Kit
OFKA	Outdoor Air Filter Kit
OFKC	MIDI Outdoor Air Filter Kit
OMU	Operation and Maintenance Unit
OMUSIG	OMU Signalling
OVP	Over-Voltage Protection
PC	Personal Computer
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PE	Protective earthing (grounding) See GND and Grounding.
PFC	Power Factor Correction
PLL	Phase-Locked Loop
Point-to-point	Transmission between two fixed points
PSM	Power System Management
PWM	Pulse Width Modulation
PWSx	AC/DC Power Supply unit • PWSA for 230 VAC input • PWSB for -48 VDC input • PWSC for +24 VDC input
Q1	Nokia proprietary transmission management protocol

RACH	Random Access Channel
RAKE	A receiver capable of receiving and combining multipath signals
RAM	Random Access Memory
RAN	Radio Access Network A third generation network that provides mobile access to a number of core networks of both mobile and fixed origin.
RCD	Residual Current Device
RF	Radio Frequency
RFF	Radio Frequency Fingerprinting
RIFP	Reflected Intermediate Frequency Power
RLE	Radio Link Equipment
RNC	Radio Network Controller The network element in a radio access network which is in charge of the use and the integrity of radio resources.
ROM	Read Only Memory
RRI	Radio Relay Interface
RSSI	Received Signal Strength Indicator
RTC	Remote Tune Combining
RTxx	Remote Tune Combiner • RTGA for GSM/EDGE 900 • RTHA for GSM/EDGE 900 H band • RTJA for GSM/EDGE 900 J band • RTDC for GSM/EDGE 1800 • RTDA for GSM/EDGE 1800 A band • RTDB for GSM/EDGE 1800 B band • RTPA for GSM/EDGE 1900

RTN	Return
RX	Receiver; Receive
SCF	Site Configuration File
SCT	Site Configuration Tool
SDCCH	Stand-alone Dedicated Control Channel
SDH	Synchronous Digital Hierarchy
SMB	Sub-Miniature B Connector
SMS	Short Message Service
SSS	Site Support System
STM	Synchronous Transport Module
STM-1	Synchronous Transport Module (155 Mbit/s)
SW	Software
Sync	Synchronization The process of adjusting corresponding significant instances of signals, in order to obtain the desired phase relationship between these instances.
T1	North American Digital Transmission Format Standard (1.544 Mbit/s)
TC	Transcoder
TCH	Traffic Channel The logical radio channel that is assigned to a base transceiver station and is primarily intended for conversation.
TCP/IP	Transport Control Protocol/Internet Protocol
TCS	Temperature Control System
TDMA	Time Division Multiple Access

TE	Terminal Equipment Equipment that provides the functions necessary for user operation of the access protocols.
TMS	Transmission Management System The network system for managing equipment settings, and for centralised retrieval of statistics and alarm information from transmission equipment connected to the system.
TS	Time Slot A cyclic time interval that can be recognised and given a unique definition.
TRE	Transmission Equipment
TRX	Transceiver
TRXSIG	TRX Signalling
TS	Time Slot
TSxx	Transceiver (RF unit), specific to Nokia UltraSite EDGE Base Station • TSTB for GSM/EDGE 800 • TSGA for GSM 900 • TSGB for GSM/EDGE 900 • TSDA for GSM 1800 • TSDB for GSM/EDGE 1800 • TSPA for GSM 1900 • TSPB for GSM/EDGE 1900
TTL	Transistor Transistor Logic
TX	Transmitter; Transmit
UC	Unit Controller
UI	User Interface
UL	Underwriters Laboratories

UL (Uplink) The direction of transmission in which the mobile station is the transmitting facility and the BTS is the receiving facility.

- 2-way uplink diversity - The function by which a BTS uses two antennas and two receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.
- 4-way uplink diversity - The function by which a BTS uses four antennas and four receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

UMTS Universal Mobile Telecommunications System

UTRAN / UMTS
Terrestrial Radio Access Network

A radio access network (RAN) consisting of radio network controllers (RNCs) and base transceiver stations (BTSs). It is located between the Iu interface and the wideband code division multiple access (WCDMA) radio interface.

UPS Uninterruptible Power Supply

VC Virtual Channel

VCO Voltage Controlled Oscillator

An oscillator for which a change in tuning voltage results in a predetermined change in output frequency.

VLL Line-to-Line Voltage

VP Virtual Path

The unidirectional transport of ATM cells belonging to virtual channels that are associated by a common identifier value.

VPCI Virtual Path Connection Identifier

An identifier which identifies the virtual path connection between two B-ISDN ATM exchanges, or between a B-ISDN ATM exchange and a B-ISDN user.

VPI — Virtual Path Identifier

An identifier which identifies a group of virtual channel links at a given reference point that share the same virtual path connection.

VSWR — Voltage Standing Wave Ratio

The ratio of maximum to minimum voltage in the standing wave pattern that appears along a transmission line. It is used as a measure of impedance mismatch between the transmission line and its load.

VXxx — Transmission unit, specific to Nokia UltraSite EDGE Base Station

- VXEA for FC E1/T1
- VXRA for FC RRI
- VXRB for FXC RRI
- VXTA for FXC E1
- VXTB for FXC E1/T1

WAF — Wideband Antenna Filter unit

WAM

Wideband Application Manager unit

WBC — Wideband Combining unit

WCC — Wideband Cabinet Core

WCDMA — Wide band Code Division Multiple Access

A spread spectrum CDMA technique used to increase the capacity and coverage of wireless communication networks.

WCH — Wideband Cabinet Heater

WCxA — Wideband Combiner, specific to Nokia UltraSite EDGE Base Station

- WCGA for GSM/EDGE 800/900
- WCDA for GSM/EDGE 1800
- WCPA for GSM/EDGE 1900

WEK	Wideband Extension Kit
WFA	Wideband Fan
WHX	Wideband Heat Exchanger
WIC	Wideband Input Combiner
WIK	Wideband Indoor Kit
WOC	Wideband Output Combiner
WOK	Wideband Outdoor Kit
WPA	Wideband Power Amplifier unit
WPS	Wideband Power Supply unit
WSC	Wideband System Clock
WSM	Wideband Summing and Multiplexing unit
WSP	Wideband Signal Processor unit
WTR	Wideband Transmitter and Receiver

3.1.2 Terms

This section provides definitions for terms used throughout Nokia UltraSite Solution documentation.

Abis Interface
: Interface between a Base Transceiver Station (BTS) and the Base Station Controller (BSC) and between two BTSs.

Absolute radio frequency channel number
: See absolute radio frequency number.

Absolute radio frequency number; absolute radio frequency channel number; ARFN; ARFCN
: Radio frequency used in connection with, for example, mobile originating and terminating test calls.

Adaptive multi-rate speech codec; AMR speech codec; AMR codec; AMR
: Speech codec which adapts its operation optimally according to the prevailing channel conditions.

Air Interface — Interface between MS and BTS.

Alarm — Announcement given to the operating personnel about abnormal functioning of the system or about a failure, or an indication of the degradation of the service level or reliability.

Alarm Status — Classification of the severity of an alarm, such as Critical, Major, Minor, and Information.

Alternating current; AC
A periodic current having a mean value zero.

Analogue-to-digital converter; Analog-to-digital converter /US/; A/D converter; ADC
A device which converts an analogue input signal to a digital output signal carrying equivalent information.

Application-specific integrated circuit; custom circuit; custom IC; ASIC
Integrated circuit which is designed for a specific application and a specific customer and which is not available to other customers.

ATM connection control; connection control; CC
Function that keeps track of connection resources and based on those handles the operations related to different kind of cross-connections.

ATM inverse multiplexing
See inverse multiplexing for ATM.

Backplane — Connector board at the back of Nokia UltraSite cabinets to which plug-in units are directly connected. See also BATA backplane and RFU backplane.

Base station — See base transceiver station.

Base station controller; BSC
Network element in the public land mobile network (PLMN) for controlling one or more base transceiver stations (BTS) in the call set-up functions, in signalling, in the use of radio channels and in various maintenance tasks.

Base station system; BSS
System of base stations (BSs) and base station controllers which is viewed by the mobile services switching centre (MSC) through a single interface.

Base transceiver station; base station; BTS; BS
: Network element in a mobile network responsible for radio transmission and reception to or from the mobile station.

BATA backplane
: Additional backplane required in a Site Support cabinet when using 12 rectifiers.

Bias Tee
: Unit that provides DC power for an associated MHA unit.

Cabinet Control Unit
: Module of the ADUA or ADUB that manages battery control, climatic control, alarm reporting, and serial and version number reporting for the IBBU or Nokia UltraSite Support cabinet. The CCU connects to the BOIx with Q1-bus.

Cell
: Coverage area of a given BTS where transmission is acceptably received.

Cell breathing
: Variation of the cell coverage area; depends on the interference and power requirements.

Cellular Network
: Two or more base stations connected together to provide an area of coverage for Mobile Stations (MS).

CENELEC
: Comité European de Normalisation ELECtrotechnique. European Committee for Electrotechnical Standardization.

Chain Connection
: Transmission solution in which the BTSs are interconnected through a chain, and the first BTS in the chain is connected to the BSC. See Loop Connection, Multidrop Connection, and Star Connection.

Chip
: Signal element.

Chip rate
: Number of chips transmitted in one second.

Commissioning
: Tasks performed to enable the BTS to be connected to the network. Includes operational tests and configuring of the transmission equipment.

Coverage Area
: See Cell.

Cross-connection
: Connection between input and output ports of a network element.

Cross-connection bank
: Information base that defines the cross-connections of a network element. The network element contains two or more banks, one of which is always active.

Custom circuit
: See application-specific integrated circuit.

Custom IC
: See application-specific integrated circuit.

D-bus
: Bus used for traffic communication between the transmission units and BB2x units (D1-bus) and for internal O&M communication with the BOIx, BB2x, and RTxx units (D2-bus).

Despreading
: The received wideband signal is modulated with the spreading code to get a narrowband signal after the multipath propagation in spread spectrum systems.

Digital signal processor; DSP
: A processor designed for signal handling, resembling an ordinary microprocessor.

Discontinuous reception; DRX
: Means of saving battery power (for example in hand-portable units) by periodically and automatically switching the mobile station receiver on and off.

Discontinuous transmission; DTX
: Feature which enables saving battery power (for example in hand-portable units) and reducing interference by automatically switching the transmitter off when no speech or data are to be sent.

Downlink Diversity
: See Frequency Hopping.

Earthing
: See Grounding.

F-bus
: Frequency Hopping bus. See Frequency Hopping.

Finger; rake finger; RAKE finger
: Receiver unit that despreads one multipath signal.

Four-way uplink diversity; 4-way uplink diversity
: Function by which a base transceiver station (BTS) uses four antennas and four receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

Forward link
: See downlink.

Flash memory
: Nonvolatile, electronically writable memory, similar to EEPROM in function, but which must be erased in blocks.

Flexbus
: Bidirectional coaxial cable that carries up to 16 x 2 Mbit/s signals and power between transmission equipment, such as a radio outdoor and indoor unit.

Frequency-change oscillator
: See local oscillator.

Frequency Hopping
: Function in which a BTS swaps two transmitters on a single channel to obtain improved overall MS receiver sensitivity in a system that is subject to random fading.

Gain
: Signal amplification, expressed in dBi—decibels over a theoretic, isotropic, and uniformly radiating antenna.

Grounding
: Protecting the equipment and the users against lightning and surges through the external connections.

I^2C-bus
: Integrated Inter Cell communication bus used for polling, autodetection, version and serial number management, temperature polling, and alarm collection in units without a microprocessor.

Handover
: The handover occurs between two cells; the signal goes through one base station or base station sector at a time.

Human-machine interface; man-machine interface; HMI; MMI
: A subsystem or function which provides user interface functions in a man-machine language.

Installation
: Tasks performed to enable the BTS to be mounted at the site.

Integration
: Tasks performed to make the BTS functional in the cellular network. Includes making test calls.

Inter-frequency handover
: Handover where the new carrier frequency is different from the current one.

Inter-system handover
: Handover from one system to another, e.g. between a 3rd generation system and GSM.

Inverse multiplexing for ATM; ATM inverse multiplexing; inverse multiplexing; IMA
: The transmission method in which ATM cells in a cell stream are divided across several physical E1 links on a cell-by-cell basis, and then reassembled at the receiving end without affecting the original cell order.

Loop connection
: Transmission solution in which BTSs are interconnected in a loop. For example, the first and last BTSs are connected to the BSC. See Chain Connection, Multidrop Connection, and Star Connection.

Macrocellular
: Application that covers large areas with a cell radius of 1 to 10 km (0.6 to 6 miles). The coverage area is achieved when the antenna is installed high and off the ground.

Maximum ratio combining
: A signal combining technique in which each signal is multiplied by a weight factor that is proportional to the signal amplitude: the strong signals are further amplified, while the weak signals are attenuated.

Microcellular
: Application that typically covers areas with a cell radius of 100 m to 1 km (327 feet to 0.6 miles). The antennas are installed below rooftop level.

Microwave radio
: Radio equipment for establishing an aligned and fixed radio connection between two points.

Midi
: Indoor or Outdoor cabinet with up to six TRXs.

Multidrop Connection
: Transmission solution in which one or more BTS chains are connected to one BTS that is connected to the BSC. See Chain Connection, Loop Connection, and Star Connection.

Network Element

Any equipment that can be managed, monitored, or controlled in a telecommunications network.

Network Topology

Method of transmission between the cells of a network. Examples of transmission solutions are chain, loop, multidrop, and star connections.

Node Manager

A feature of Power System Management (PSM), the Node Manager software called PSMMan is used to control network elements, or nodes, of the Site Support System.

Nokia FlexiHopper

Nokia family of Flexbus-compatible microwave radios for the 13, 15, 18, 23, 26, and 38 GHz frequency bands, in which the radio transmission capacity can be selected using software. The radio transmission capacity of Nokia FlexiHopper can be 2 x 2, 4 x 2, 8 x 2, or 16 x 2 Mbit/s.

Nokia FlexiHopper outdoor unit can be used with different indoor units: FIU 19, RRIC, FC RRI, and FXC RRI.

Nokia Hopper Manager

PC software application used for controlling and monitoring Nokia FlexiHopper and Nokia MetroHopper radios connected to FIU19 or RRIC indoor units.

Nokia MetroHopper

Nokia Flexbus-compatible radio for the 58 GHz frequency band that does not require coordinated frequency planning. The main use of Nokia MetroHopper is to provide 4 x 2 Mbit/s, point-to-point wireless access for Nokia MetroSite BTS and Nokia MetroHub.

Nokia MetroHopper outdoor unit can be used with different indoor units: FIU 19, RRIC, FC RRI, and FXC RRI.

Nokia MetroHub

Nokia’s compact transmission node with cross-connection and grooming functions, such as FXC RRI. Nokia MetroHub contains up to five transmission units.

Nokia MetroSite GSM BTS

Nokia’s compact four-TRX GSM base station for Nokia MetroSite capacity solution. Nokia MetroSite GSM BTS can contain one transmission unit.

Nokia Q1 Connection Tool
: Program that makes connection and node definitions for identifying objects on a Nokia Q1 managed network. See Q1.

Nokia UltraSite
: Multimedia coverage and capacity macrocellular base station.

Omnidirectional Cell
: Cell with a 360× sector; also known as standard cell.

Operator
: Telecommunications company running telecommunications services in a specific geographical area.

PCM time slot
: 1.5 Mbit/s PCM circuit is divided into twenty-four 64 kbit/s time slots.

  2 Mbit/s PCM circuit is divided into thirty-two 64 kbit/s time slots.

Peltier elements
: Elements that absorb or emit heat when an electric current passes across a junction between two materials. Used for heating and cooling IP20 protection class equipment.

Point-to-point
: Transmission between two fixed points.

Q1-bus
: Bus in Nokia UltraSite EDGE BTS, used for local transmission management (Q1int) and for extending the management to external equipment.

Radio interface; air interface; AI
: The interface between the mobile station (MS) and the radio equipment in the network. This is defined by functional characteristics, common radio (physical) interconnection characteristics, and other characteristics as appropriate.

Radio Relay
: Microwave radio unit that replaces a fixed cable with a microwave radio link in the Abis Interface.

Rectifier
: Device for converting alternating current to direct current. See BATx.

RFU backplane
: Backplane in Nokia UltraSite EDGE BTS cabinet to which RF units are attached.

Sectored BTS Site
: A site with multiple cells positioned to supply the desired radiation.

Sectored Cell — A cell with a conical coverage area achieved by means of a directional aerial.

Single Sector — A part of the BTS's physical equipment that serves a single cell in the network radio topology.

Site — Location where telecommunication equipment has been installed. For example, a site can contain a base station and transmission equipment with an equipment shelter and antenna tower.

Several network elements can be located at a site.

Soft handover — Handover where the signal goes through two base stations or base station sectors at a time.

Softer handover — Handover where the signal goes through two sectors in one base station area at a time.

Software Package — Software collection consisting of the components of the BTS operating system.

Spreading — A process in which the signal is modulated with the pseudo noise code to get a wideband signal for multipath propagation in spread spectrum systems.

Spreading code — A code that is used to despread a signal in spread spectrum communications.

Star Connection — Transmission solution in which three branches with one BTS in each are connected to a common node. See Chain Connection, Loop Connection, and Multidrop Connection.

Synchronisation (Sync) — Process of adjusting the corresponding significant instances of signals (between adjacent and serving cells) to obtain the desired phase relationship between these instances.

Uplink — Direction of transmission in which the mobile station is the transmitting facility and the BTS is the receiving facility.

Uplink Diversity

2-way uplink diversity – Function in which a BTS uses two antennas and two receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

4-way uplink diversity – Function in which a BTS uses four antennas and four receivers simultaneously on a single channel to obtain improved overall BTS receiver sensitivity in an environment that is subject to random multipath fading.

See Frequency Hopping.