

NOKIA

Expanding UltraSite EDGE BTS

The information in this document is subject to change without notice and describes only the product defined in the introduction of this documentation. This document is not an official customer document and Nokia Networks does not take responsibility for any errors or omissions in this document. No part of it may be reproduced or transmitted in any form or means without the prior written permission of Nokia Networks. The document has been prepared to be used by professional and properly trained personnel, and the customer assumes full responsibility when using it. Nokia Networks welcomes customer comments as part of the process of continuous development and improvement of the documentation.

The information or statements given in this document concerning the suitability, capacity, or performance of the mentioned hardware or software products cannot be considered binding but shall be defined in the agreement made between Nokia Networks and the customer.

Nokia Networks WILL NOT BE RESPONSIBLE IN ANY EVENT FOR ERRORS IN THIS DOCUMENT OR FOR ANY DAMAGES, INCIDENTAL OR CONSEQUENTIAL (INCLUDING MONETARY LOSSES), that might arise from the use of this document or the information in it. UNDER NO CIRCUMSTANCES SHALL NOKIA BE RESPONSIBLE FOR ANY LOSS OF USE, DATA, OR INCOME, COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, PROPERTY DAMAGE, PERSONAL INJURY OR ANY SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES HOWSOEVER CAUSED.

THE CONTENTS OF THIS DOCUMENT ARE PROVIDED "AS IS". EXCEPT AS REQUIRED BY APPLICABLE MANDATORY LAW, NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT, ARE MADE IN RELATION TO THE ACCURACY, RELIABILITY OR CONTENTS OF THIS DOCUMENT. NOKIA RESERVES THE RIGHT TO REVISE THIS DOCUMENT OR WITHDRAW IT AT ANY TIME WITHOUT PRIOR NOTICE.

This document and the product it describes are considered protected by copyright according to the applicable laws.

NOKIA and Nokia Connecting People are registered trademarks of Nokia Corporation. Other product names mentioned in this document may be trademarks of their respective companies, and they are mentioned for identification purposes only.

Copyright © Nokia Corporation 2004. All rights reserved. Reproduction, transfer, distribution or storage of part or all of the contents in this document in any form without the prior written permission of Nokia is prohibited.

Contents

	Contents	3
1	Statutory information	5
1.1	CE Marking	5
1.2	FCC Statement	6
2	UltraSite BTS expansion to include EDGE capability	7
2.1	Overview of UltraSite EDGE BTS optimisation and expansion	7
2.2	Preparing UltraSite BTS for expansion to include EDGE capability	8
2.3	Removing GSM units for UltraSite BTS expansion to include EDGE capability	9
2.4	Installing GSM EDGE units for UltraSite BTS expansion to include EDGE capability	11
3	Glossary	13
3.1	Glossary for UltraSite EDGE BTS	13
3.1.1	Abbreviations and acronyms	13
3.1.2	Terms	29

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	<p>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.</p> <p>The product is marked with the CE marking and Notified Body number according to the Directive 1999/5/EC.</p> <p>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.</p>

2 UltraSite BTS expansion to include EDGE capability

2.1 Overview of UltraSite EDGE BTS optimisation and expansion



Steps

1. Expand UltraSite BTS to include EDGE capability.

Preparing UltraSite BTS for expansion to include EDGE capability

Removing GSM units for UltraSite BTS for expansion to include EDGE capability

Installing GSM EDGE units for UltraSite BTS expansion to include EDGE capability

2. Inspect and modify ATM settings.

Inspecting and modifying BTS AAL2 Multiplexing settings

Inspecting and modifying Access Profile

Inspecting and modifying Traffic Descriptor

Modifying ATM cross-connection

Modifying Virtual Channel

Modifying Virtual Path

3. Inspect interface settings.

Inspecting and modifying CES settings

Inspecting and modifying fractional interfaces

Inspecting and modifying IMA settings

Inspecting and modifying PDH settings

Inspecting and modifying Q1 EOCs

Inspecting and modifying SDH/Sonet settings

4. Inspect and modify IP settings.

Modifying DCN settings

Modifying NTP settings

Modifying NTP settings

Modifying public IP address

Inspecting and modifying Management Protocol settings

Modifying AXC configuration with XML configuration file

Modifying Synchronisation settings

Modifying AXC Q1 Support Function

5. Inspect and modify Management Protocol settings.

6. Modify AXC configuration with XML configuration file.

7. Modify Synchronisation settings.

8. Modify AXC Q1 Support Function.

2.2 Preparing UltraSite BTS for expansion to include EDGE capability



Steps

1. Establish the final configuration for the BTS being upgraded.

2. **Ensure all required units are available for the upgrade and unpacked from shipping containers**

See Unpacking and inspecting the UltraSite EDGE BTS delivery.

3. **Contact the Operational Maintenance staff to reroute the traffic from the BTS being upgraded.**
 4. **After confirmation of traffic reroute, block the BTS from the BSC.**
 5. **Power down the BTS.**
 6. **Switch Mains Breakers to OFF.**
-



Warning

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

7. **Identify the existing units that require replacement for the new configuration.**

2.3 Removing GSM units for UltraSite BTS expansion to include EDGE capability

Summary

This section describes how to remove existing GSM units from the BTS. Depending on the desired configuration, you may need to remove additional units to allow the desired configuration.



Warning

Always use the antistatic wrist strap when handling units marked with the Electrostatic Sensitive Device (ESD) sign. Units carrying the ESD sign are sensitive to electrostatic discharge!



Caution

Take care when handling units due to their significant weight. For unit dimensions and weights, see *Overview of UltraSite EDGE BTS technical descriptions*.



Caution

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



Steps

- 1. Remove BB2A units being replaced.**
See Removing a BB2x unit.
- 2. Disconnect RF cables from TSxA units to be removed noting their existing connections for reconnection.**
- 3. Remove TSxA units being replaced.**
See Removing a TSxx unit.
- 4. Remove any additional units, as required for the desired configuration.**
See Overview of removing units from UltraSite EDGE BTS.
- 5. Package removed units to prevent damage and allow for future use.**

2.4 Installing GSM EDGE units for UltraSite BTS expansion to include EDGE capability

Summary

GSM/EDGE-capable TSxB, BB2E and BB2F units for UltraSite EDGE BTS are compatible with GSM TSxxs and BB2xs and fit into the same slots in the BTS cabinet. In addition to providing EDGE services, GSM/EDGE TSxB, BB2E and BB2F units are backward compatible with legacy GSM hardware.



Caution

Keep units in their packages before installation to protect the units from humidity.



Caution

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

Note

Overtightening causes stress on the connectors. For the TSxB units, ensure a gap of 1.0 to 3.0 mm exists between the front flange of the unit and the cabinet when tightened. See *Torque settings of UltraSite EDGE BTS*.



Steps

1. Install the BB2E or BB2F unit.

See *Installing a Transceiver Baseband (BB2x) unit in UltraSite EDGE BTS*.

2. Install TSxB units.

See *Installing a Transceiver (TSxx) unit in UltraSite EDGE BTS*.

3. Install any additional units required for the desired configuration.

See *Overview of installing GSM/EDGE units of UltraSite EDGE BTS*.

4. Replace any units necessary for the desired configuration.

See *Preparing to replace UltraSite EDGE BTS units*.

5. Install, route and connect RF cabling for the new configurations.

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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none">• 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
	<ul style="list-style-type: none">• 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 Control

EC	European Community
EDGE	Enhanced Data rates for Global Evolution
EEC	European Economic Community
EEPROM	Electrically 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 <ul style="list-style-type: none">• 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
	Specifically, 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none">• 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 <p>A text-based command language with a standardised structure, designed to facilitate direct user control of a system.</p>
MNxx	Masthead Amplifier specific to Nokia UltraSite EDGE Base Station <ul style="list-style-type: none">• MNGA for GSM/EDGE 800/900• MNDA for GSM/EDGE 1800 A band• MNDB for GSM/EDGE 1800 B band

	<ul style="list-style-type: none"> • MNPA for GSM/EDGE 1900 A band • MNPB for GSM/EDGE 1900 B band • MNPC for GSM/EDGE 1900 C band
MPT	<p>Ministry of Posts and Telecommunications</p> <p>Telecommunications regulatory agency of Great Britain.</p>
MS	<p>Mobile Station</p> <p>User equipment which uses a radio connection, and which can be used in motion or at unspecified points. This is usually a mobile phone.</p>
MSC	<p>Mobile Switching Centre</p> <p>The mobile network element which performs the switching functions in its area of operation, and controls cooperation with other networks.</p>
MTBF	<p>Mean Time Between Failure</p>
NCRP	<p>National Council on Radiation Protection and Measurements</p>
NCU	<p>Node Control Unit</p>
NEBS	<p>Network Equipment Building Systems</p>
NED	<p>Nokia Electronic Documentation</p>
NMS	<p>Network Management System</p>
O&M	<p>Operation and Maintenance</p>
OAKB	<p>Cable entry kit for BTS co-siting</p>
OAKx	<p>Outdoor Application Kit for Nokia UltraSite EDGE Base Station</p> <ul style="list-style-type: none"> • OAKA for UltraSite Outdoor cabinet • OAKC for UltraSite Midi Outdoor cabinet • OAKD for UltraSite Midi Outdoor to Talk-family Co-siting
OBKA	<p>Outdoor Bridge Kit</p>

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 <ul style="list-style-type: none">• 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
	<ul style="list-style-type: none">• 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
	<ul style="list-style-type: none">• 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)	<p>The direction of transmission in which the mobile station is the transmitting facility and the BTS is the receiving facility.</p> <ul style="list-style-type: none">• 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	<p>Terrestrial Radio Access Network</p> <p>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.</p>
UPS	Uninterruptible Power Supply
VC	Virtual Channel
VCO	<p>Voltage Controlled Oscillator</p> <p>An oscillator for which a change in tuning voltage results in a predetermined change in output frequency.</p>
VLL	Line-to-Line Voltage
VP	<p>Virtual Path</p> <p>The unidirectional transport of ATM cells belonging to virtual channels that are associated by a common identifier value.</p>
VPCI	<p>Virtual Path Connection Identifier</p> <p>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.</p>

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
	<ul style="list-style-type: none">• VXE A for FC E1/T1• VXR A for FC RRI• VXR B for FXC RRI• VXT A for FXC E1• VXT B 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
	<ul style="list-style-type: none">• WCG A 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 ² C-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.

Sectorized 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.