NOKIA

Nokia MetroSite EDGE Base Station

Solution Accessories

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Summary of changes

Version 1-0, 5th March, 1999. Norman M. Thomas.

Version 2-0, 30th August 2001. Tyrone Williams.

Version 3-0, August 2002. Kudos (Celia Pires, Mark Seymour). Added chaining extension cables into “Miscellaneous”, made corrections to specifications following comments from Jan Ekman, Tomi Karvonen and Peter Berghall.

Version 3-0, October 2002. Kudos (Mark Seymour). Product codes updated. 800/1900 MHz antennas added.

1 About this document

This document lists the Nokia accessories which are available to support the Nokia MetroSite™ Base Station. Descriptions and specifications of the accessories are also included.

For more information and ordering of the accessories, contact your local Nokia customer services representative.

2 Accessories and specifications

2.1 Flexbus accessories

Table 1. Flexbus accessories for the MetroSite EDGE Base Station

Item	Product code
Jumper cable, 2.5 m, TNC (m) - TNC (f)	CS72450.10
RG223, 4 m, TNC-TNC straight	T36625.02
RG223, 8 m, TNC-TNC straight	T36625.03
RG223, 15 m, TNC-TNC straight	T36625.04
TNC male for flexbus cable straight (RG214)	T36630.01
TNC male for flexbus cable 90 degree (RG214)	T36631.01
TNC male for flexbus cable straight (RG223)	T36627.01
TNC male for flexbus cable 90 degree (RG223)	T36627.02
Flexbus cable, RG223, 500 m reel	T36626.01
Flexbus cable, RG214, 500 m reel	T36629.01

2.1.1 Flexbus cable specifications

Product codes: T36626.01 (RG223); T36629.01 (RG214)

This coaxial cable is suitable for both straight and right-angled BNC/TNC plug connector types. Flexbus uses 50 Ω cable with TNC male connectors of both types, as applicable.

The cable is capable of handling frequencies up to 2.8 GHz and is, for example, used to connect the radio outdoor unit to the transmission unit.

Table 2 and Figure 1 identify the diameter of the cable attributes. The 'D' and 'E' min-max ranges allow for the different connectors used.

Cables, type RG223, of 4 m, 8 m and 15 m lengths terminated with TNC male straight connectors are available. The product code for each of these is identified in Table 1.

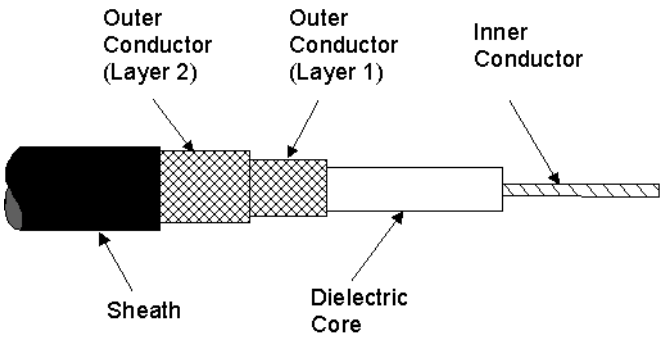


Figure 1. Flexbus cable

Table 2. Flexbus cable specifications

Parameter	RG214 cable	G223 cable
	Detail	
Inner Conductor	2.28 mm diameter Silver plated copper wires (7) 5.6 Ω/km at 20°C 50+/- 2 Ω impedance 101 nf/km capacitance at 800 Hz 201 g/m weight Attenuation: 23 dB/100 m at 800 MHz. Specification: DIN 40500/T4	0.9 mm diameter Silver plated copper wire (single) 29.4 Ω/km at 20°C 50+/- 2 Ω impedance 106 nf/km capacitance at 800 Hz 59 g/m weight Attenuation: 69 dB/100 m at 1000 MHz Specification: DIN 40500/T4
Dielectric Core	7.4 mm diameter PE Colour: neutral	3.05 mm diameter PE Colour: neutral
Outer conductor (layer 1)	Braided shield, silver plated copper wires Specification: DIN 40500/T4	Braided shield, silver plated copper wires Specification: DIN 40500/T4
Outer conductor (layer 2)	9.1 mm diameter maximum Braided shield, silver plated copper wires Specification: DIN 40500/T4	4.39 mm diameter maximum Braided shield, copper plated wires Specification: DIN 40500/T4
Sheath	10.9 mm diameter PVC Black Specification: DIN 53505	5.55 -0.2 mm diameter PVC Black Specification: DIN 53505

2.1.2 TNC male connector specifications (straight and right-angled)

Product code: T36630.01 and T36631.01 (RG214); T36627.01 and T36627.02 (RG223)

RF one step TNC connectors are single piece assemblies for the centre conductor and the braid of a broad range of coaxial cables. The connectors are fully compliant with MIL-C-39012 connectors. In this case, 50 Ω versions are used.

The features of these connectors include:

- exceptional cable retention force to withstand vibration and frequent connections and disconnections
- long term reliability
- usable with RG/U and Raychem Cheminax cables
- meets performance requirements of MIL-C-39012 up to 2.8 GHz

Only the right-angled connectors are used with type RG214 cable because of the cable's rigidity.

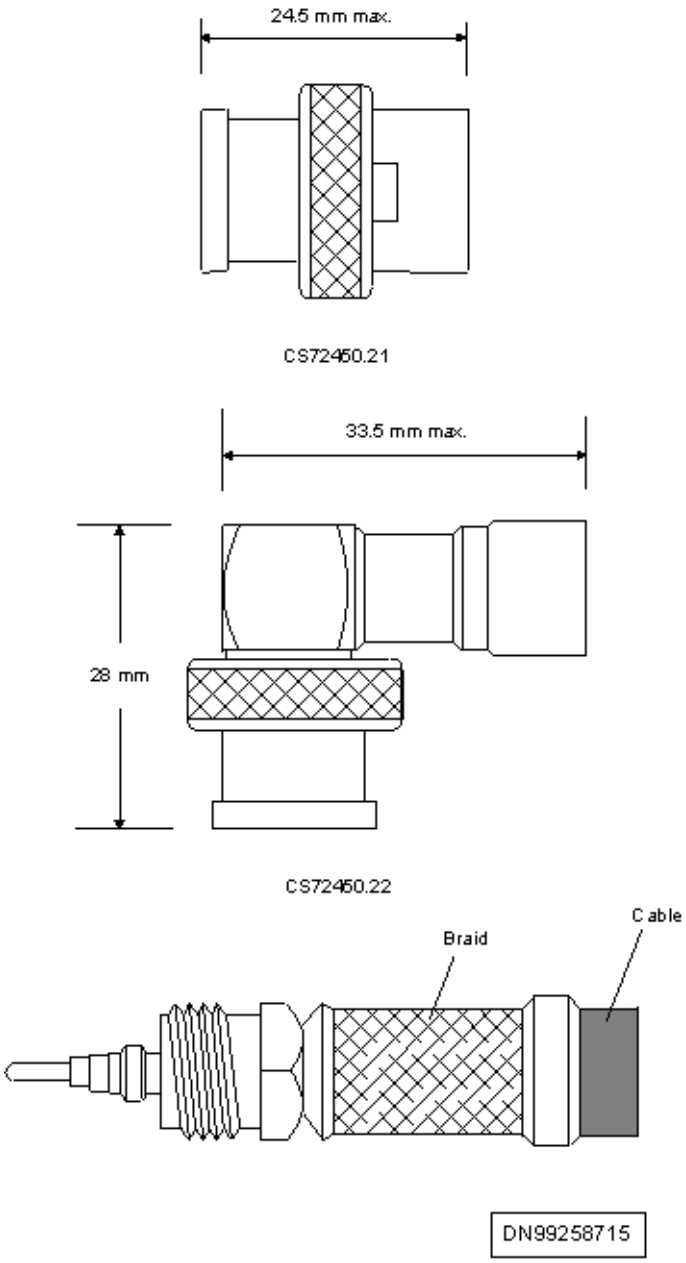


Figure 2. TNC connectors

2.2 Local Management Port accessories

Table 3. LMP accessories for the MetroSite EDGE Base Station

Item	Product code
Nokia Q1 LMP cable	T55270.01

2.2.1 Q1 LMP cable specifications

Product code: T55270.01

This is an RS232 cable terminated with a BQ bayonet type connector at one end and a 9-pin `D' type (D9F) connector at the other end. The length of the cable is 2,5 m and is provided already assembled.

Table 4. LMP cable connector specifications

BQ Connector		‘D’ type Connector	
Pin No.	**Function**	**Pin No.**	**Function**
1	LMP in	3	TD
2	n/c	1, 4, 6-9	n/c
3	LMP out	2	RD
4	GND	5	GND

RD = Received Data

TD = Transmitted Data

GND = Ground

n/c = not connected

Note

The pins of each connector correlate as shown in Table 4. For example, pin 1 of connector BQ connects to pin 3 of the ‘D’ type connector.

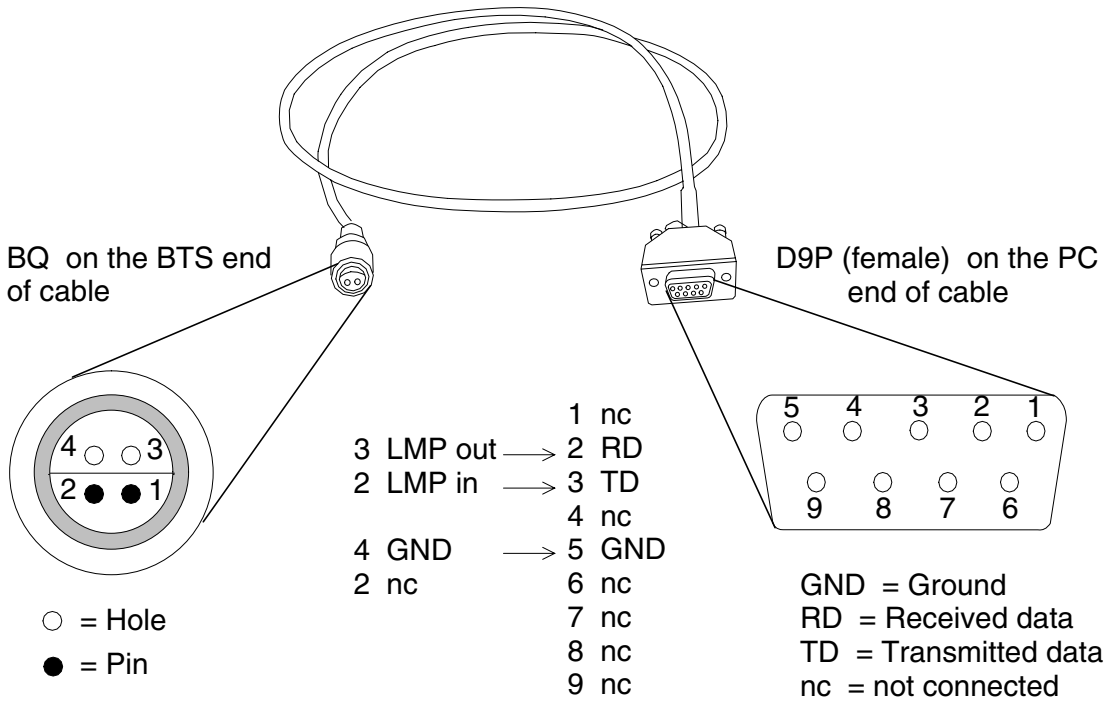


Figure 3. LMP cable and connectors

2.3 Abis PCM cable

Table 5. Abis PCM cable and accessories

Item	Product code
Abis PCM cable for MetroSite, 3 m, 120 Ω	T36612.01
Abis PCM cable for MetroSite, 15 m, 120 Ω	T36612.05
Abis PCM cable for MetroSite, 50 m, 120 Ω	T36612.04
Abis PCM cable, 75 Ω/m	T36602.01
Abis PCM cable, 120 Ω/m	T36614.01
BT43 plug, 75 Ω, 6 pieces for ABC cable	T36601.01
TQ plug, 120 Ω, 1 piece	CS73214.02

2.3.1 PCM cable 75 ohm

Product Code: T36602.01

The 75 Ω PCM cable is used for 2 Mbit transmission between the Nokia MetroSite EDGE Base Station and a BSC. This high quality coaxial cable consists of a plain copper inner conductor, polyethylene dielectric material, two copper braids, and a PVC outer jacket.

Table 6. PCM cable 75 Ω specifications

Characteristic impedance	75+ / - 4 Ω
Mutual capacitance	67 pF/m
Wave attenuation 1 MHz	2.3 dB/100 m
Wave attenuation 4 MHz	4.5 dB/100 m
Wave attenuation 20 MHz	9.2 dB/100 m
Operating voltage	300 V rms
Minimum bending radius	18 mm
Diameter	3.55 mm
Colour	Black

2.3.2 PCM cable 120 ohm

Product Code: T36614.01

The 120 Ω PCM cable is used for 2 Mbit transmission between the Nokia MetroSite EDGE Base Station and a BSC. This high quality cable consists of four bare copper wires, polyethylene wire insulation, intermediate plastic tape insulation, tinned copper wire gauze, and a halogen-free outer sheath.

The cables available are 3 m, 15 m, and 50 m, terminated with a TQ plug at each end.

Table 7. PCM cable 120 Ω specifications

Characteristic impedance	120+ / - 10 Ω
Mutual capacitance	40 nF/km
Wave attenuation 1 MHz	1.7 dB/100 m
Wave attenuation 4 MHz	3.5 dB/100 m

Table 7. PCM cable 120 Ω specifications (Continued)

Wave attenuation 20 MHz	7.8 dB/100 m
Operating voltage	300 V rms
Minimum bending radius	30 mm
Diameter	4.1 mm
Colour	Grey

2.3.3 BT43 plug

Product code: T36601.01

This connector is used with the TZC5024 cable. For connection of this plug to the Abis 75 Ω coaxial cable, refer to Attachment 1.

2.3.4 TQ plug

Product code: CS73214.02

This Abis 120 Ω interface connector supports the use of cables with outer diameter of 4-13 mm and wires of dimension AWG 26-30.

For connection of this plug to the Abis 120 Ω cable refer to Attachment 2. The cable is provided already assembled and is 2 m in length.

2.4 MetroSite antennas

Table 8. Antennas for the Nokia MetroSite EDGE Base Station

Item	Product code
MetroSite 130° panel antenna, dual band 870-960 / 1710-1880 MHz, 5 dBi, 2 x N female connectors	CS72454.01
MetroSite XX-pol panel antenna, dual band 870-960 / 1710-1880 MHz, 65°, 12.5/13.5 dBi, 4 port	CS72180
MetroSite XX-pol panel antenna, dual band 824-960 / 1710-2170 MHz, 65°, 14.5/17.5 dBi	CS72763.01

Table 8. Antennas for the Nokia MetroSite EDGE Base Station (Continued)

Item	Product code
MetroSite omni antenna, dual band 870-960 / 1710-1880 MHz, 2 dBi, 2 x N female connectors	CS72187
MetroSite omni antenna, dual band 824-960 / 1805-2170 MHz, 2 dBi, N female	CS72187.02
Indoor omni antenna, multi-band 824-960 / 1425-2170 MHz, 2 dBi, 360°, N female	CS72166
Indoor panel antenna, multi-band 824-960 / 1425-2170 MHz, 7 dBi, 90°, N female	CS72168
Single pole mounting clamp for 50-115 mm poles	CS72196

2.4.1 MetroSite 130° panel antenna

Product code: CS72454.01

This antenna is a vertically polarised, dual band, two-port antenna providing 130° coverage with a gain of 6 dBi.

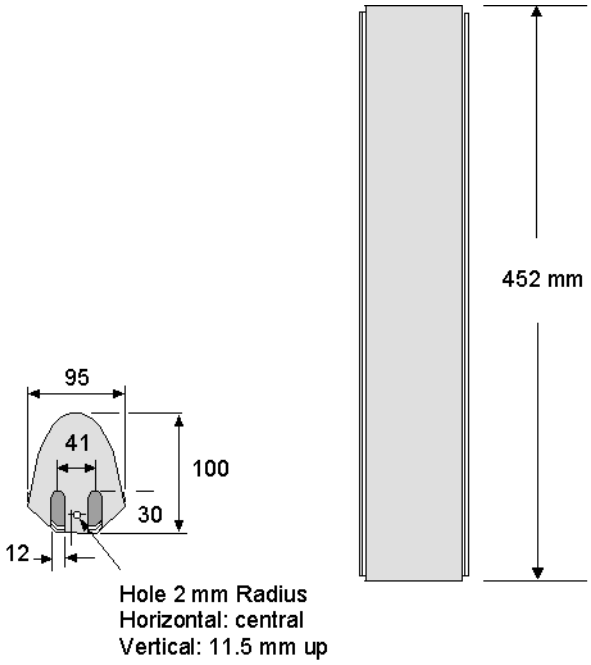


Figure 4. MetroSite 130^{o} panel antenna

Table 9. Specifications for the 130^{o} antenna

Item	**GSM 900**	**GSM 1800**
Frequency range	870-960 MHz	1710-1880 MHz
VSWR	< 1:1.7	< 1:1.7
Gain	6 dBi	6 dBi
Impedance	50 Ω	50 Ω
Polarization	Vertical	Vertical
Front-to-back ratio (co-polar)	> 10 dB	> 10 dB
Half power beam width	Horizontal: 130^{o} Vertical: 55^{o}	Horizontal: 130^{o} Vertical: 55^{o}
Maximum power/input (at 25^{o} C)	50 W	50 W

Table 9. Specifications for the 130° antenna (Continued)

Item	GSM 900	GSM 1800
Isolation	> 25 dB (GSM 900 - GSM 900) on Tx band > 30 dB (GSM 1800 - GSM 1800) > 30 dB (GSM 900 - GSM 1800)	
Input	2 x N female	
Connector position	Bottom	
Weight	2.0 kg (without packaging)	
Wind load	Frontal: 27 N (at 150 km/h) Lateral: 16 N (at 150 km/h) Rear side: 63 N (at 150 km/h)	
Maximum wind velocity	150 km/h	
Packing size	480 x 125 x 110 mm	
Height x width x depth	452 x 95 x 100 mm	
Material	Reflector screen: painted aluminium Radome: ABS; grey NCS S 2500-N screws and nuts: stainless steel	
Mounting	TBA	
Ice protection	The antenna remains operational during icy conditions	
Grounding	The metal parts of the antenna, including the mounting kit are DC grounded.	

2.4.2 MetroSite XX-pol panel antenna

Product codes: CS72180, CS72763.01

This is a four port, dual band antenna. Its output is cross polarised + / - 45 ° and provides 65 ° coverage with a gain of 12.5 to 13.5 dBi for the 900/1800 MHz antenna and 14.5 to 17.5 dBi for the 850/1900 MHz antenna (see also the note below).

Note

Further variations of the Nokia MetroSite XX-pol panel 850/1900 MHz antennas are available. Please contact your Nokia representative.

900/1800 MHz XX-pol panel antenna (CS72180)

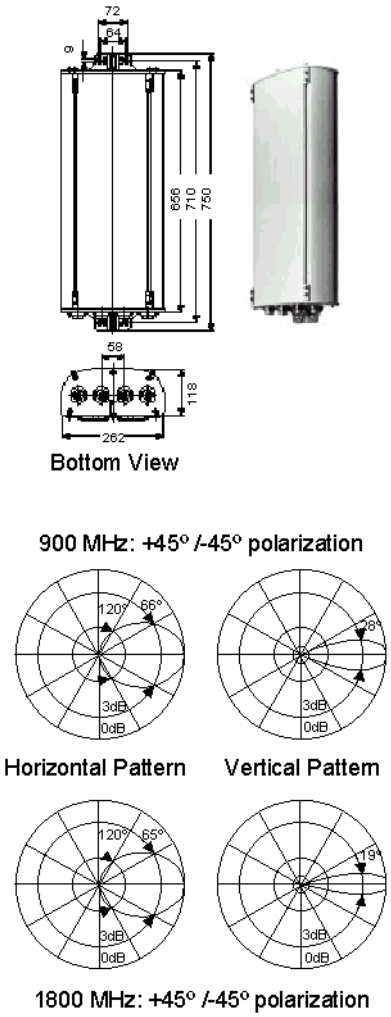


Figure 5. MetroSite XX-pol 900/1800 MHz panel antenna

Table 10. Specifications for the MetroSite XX-pol 900/1800 MHz panel antenna

Item	GSM 900	GSM 1800
Frequency range	870-960 MHz	1710-1880 MHz
VSWR	< 1.5	< 1.5
Impedance	50 Ω	50 Ω

Table 10. Specifications for the MetroSite XX-pol 900/1800 MHz panel antenna (Continued)

Item	GSM 900	GSM 1800
Polarization	+45° ; -45°	+45° ; -45°
Front-to-back ratio (co-polar)	> 30 dB	> 30 dB
Half power beam width	+45° / -45° Horizontal: 65° Vertical: 28°	+45° / -45° Horizontal: 65° Vertical: 28°
Maximum power/input (at 50° C)	250 W	150 W
Isolation	> 30 dB (GSM 900 - GSM 900) > 30 dB (GSM 1800 - GSM 1800) > 30 dB (GSM 900 - GSM 1800)	
Input	4 x 7-16 female	
Connector position	Top or bottom	
Weight	7 kg	
Wind load (at 150 km/h)	Frontal: 110 N. Lateral: 60 N. Rearside: 240 N.	
Maximum wind velocity	200 km/h	
Packing size	782 x 287 x 165 mm	
Height / width / depth	656 mm / 262 mm / 116 mm	
Material	Reflector screen: weather proof aluminium Radome: fibreglass (white) Screws and nuts: stainless steel	
Mounting	Walls: using two mounting plates already attached to the antenna Masts: using two clamps suitable for the mast diameter	
Ice protection	The antenna remains operational under icy conditions	
Grounding	The metal parts of the antenna, including the mounting kit and the inner conductors are DC grounded.	

850/1900 MHz XX-pol panel antenna (CS72763.01)

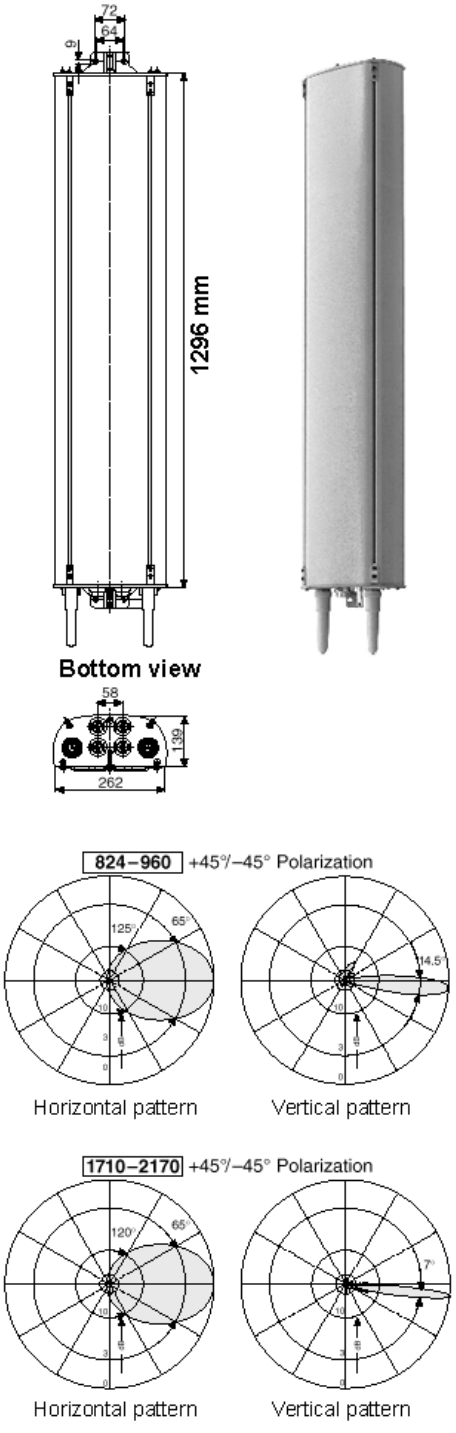


Figure 6. MetroSite XX-pol 850/1900 MHz panel antenna

Table 11. Specifications for the MetroSite XX-pol 850/1900 MHz panel antenna

Item	GSM 850	GSM 1900
Frequency range	824-960 MHz	1710-2170 MHz
VSWR	< 1.5	< 1.5
Impedance	50 Ω	50 Ω
Polarization	+45° ; -45°	+45° ; -45°
Front-to-back ratio (co-polar)	> 28 dB	> 25 dB
Half power beam width	+45° / -45° Horizontal: 68 - 65° Vertical: 16 - 14.5°	+45° / -45° Horizontal: 65 - 63° Vertical: 7.5 - 6.5°
Maximum power/input (at 50° C)	250 W	200 W
Isolation: intrasystem	> 30 dB	
Isolation: intersystem	> 45 dB	
Input	4 x 7-16 female	
Connector position	Top or bottom	
Weight	16.5 kg	
Wind load (at 150 km/h)	Frontal: 230 N. Lateral: 180 N. Rearside: 430 N.	
Maximum wind velocity	200 km/h	
Packing size	1590 x 287 x 177 mm	
Height / width / depth	1296 mm / 262 mm / 139 mm	
Material	Reflector screen: weather proof aluminium Radome: fibreglass (white) Screws and nuts: stainless steel	
Mounting	Walls: using two mounting plates already attached to the antenna Masts: using two clamps suitable for the mast diameter	
Ice protection	The antenna remains operational under icy conditions	
Grounding	The metal parts of the antenna, including the mounting kit and the inner conductors are DC grounded. The inputs 824-960 MHz are also DC grounded. The inputs 1710-2170 MHz are coupled capacitively.	

2.4.3 Omni dual band antenna

Product codes: CS72187, CS72187.02

This is a dual port, dual band 900/1800 or 850/1900 MHz antenna. The output is omni-directional (360^{o}) with a gain of 2 dBi and has two units (upper and lower).

900/1800 MHz omni-directional, dual band antenna (CS72187)

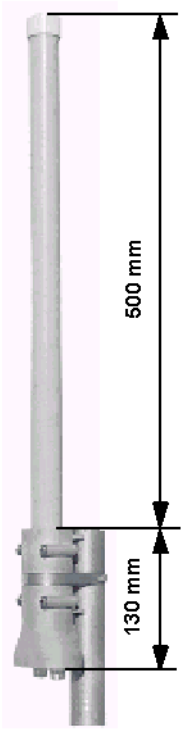


Figure 7. Omni-directional dual band 900/1800 MHz antenna

Table 12. Specifications for the omni-directional 900/1800 MHz dual band antenna

Input	2 x N female
Frequency range	870-960 MHz and 1710-1880 MHz for the upper and lower units
VSWR	< 1.8
Gain	2 dBi
Impedance	50 Ω

Table 12. Specifications for the omni-directional 900/1800 MHz dual band antenna (Continued)

Polarization	Vertical
Isolation	> 25 dB
Maximum power/input	50 W at 50°C ambient temperature
Weight	1.2 kg
Radome diameter	30 mm
Wind load	30 N at 150 km/h
Maximum wind load	200 km/h
Packing size	700 x 80 x 80 mm (approximately)
Height	500 mm
Material	Radiator: copper, brass Radome: fibreglass (grey) Base: weatherproof aluminium Mounting clamp and screws: stainless steel
Mounting	Attached laterally at the tip of a tubular mast of 40-70 mm diameter. The connecting cable (not supplied) runs outside the mast.
Range of application	Urban areas, preferably in places around buildings at low or medium heights above ground level or light poles or short masts on rooftops. The antenna shape reduces the optical impact.
Grounding	All metal parts of the antenna and the mounting kit (excluding the inner conductor of the upper unit) are DC grounded.

850/1900 MHz omni-directional, dual band antenna (CS72187.02)

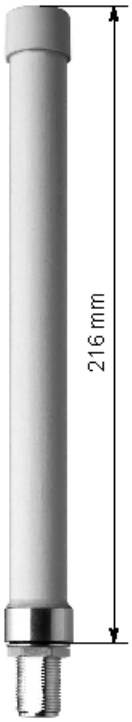


Figure 8. Omni-directional dual band 850/1900 MHz antenna

Table 13. Specifications for the omni-directional 850/1900 MHz dual band antenna

Input	2 x N female
Frequency range	824-960 MHz and 1805-2170 MHz for the upper and lower units
VSWR	< 2.0
Gain	2 dBi
Impedance	50 Ω
Polarization	Vertical
Maximum power/input	50 W at 50°C ambient temperature
Weight	250 g
Radome diameter	20 mm

Table 13. Specifications for the omni-directional 850/1900 MHz dual band antenna (Continued)

Height	216 mm
Material	Radiator: brass Radome: fibreglass (white) Base: weatherproof aluminium Mounting clamp and screws: stainless steel
Mounting	One hole mounting (16 mm) to surfaces of maximum 10 mm thickness or attached laterally at the tip of a tubular mast of 40-70 mm diameter.
Range of application	Urban areas, preferably in places around buildings at low or medium heights above ground level or light poles or short masts on rooftops. The antenna shape reduces the optical impact.
Grounding	All metal parts of the antenna and the mounting kit (excluding the inner conductor of the upper unit) are DC grounded.

2.4.4 Indoor omni multi-band antenna

Product code: CS72166

This is a single port, multi-band 850/900/1800/1900 MHz antenna. This antenna is vertically polarised and the horizontal radiation pattern is omni-directional (360^{o}) with a gain of 2 dBi. The antenna can be operated in all frequency ranges simultaneously, and needs no additional groundplane.

Figure 9. Indoor omni multi-band antenna

Table 14. Specifications for the indoor omni multi-band antenna

Input	N female
Frequency range	824-960 MHz and 1425-2170 MHz
VSWR	< 2.0: 824-960MHz < 2.0: 1425-1710MHz < 1.6: 1710-1990MHz < 2.0: 1990-2170MHz
Gain	2 dBi
Input	1 x N female
Impedance	50 Ω
Polarization	Vertical
Maximum power (at 50° C)	50 W /band
Weight	400 g
Diameter	260 mm
Height	78 mm (without connector)
Material	Base: aluminium Protective housing: high impact polystyrol Colour: white Additional painting is possible
Mounting	Three holes in the base to enable mounting on a ceiling. Two types of screws are supplied. N connector: a hole of 35 mm diameter needed in the ceiling.
Grounding	All metal parts including the inner conductor are DC grounded.

2.4.5 Indoor multi-band panel antenna

Product code: CS72168

This is a single port, multi-band indoor panel antenna. The antenna has a half power beam width of 90 ° with a gain of 7 dBi.

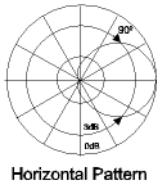


Figure 10. Indoor multi-band panel antenna

Table 15. Specifications for the indoor multi-band panel antenna

Input	Cable RG 223/CU of 1 m length; white; N female connector.
Frequency range	824-960 MHz and 1710-2170 MHz
VSWR	870-960 MHz and 1710-1900 MHz: < 1.6 824-960 MHz and 1710-2170 MHz: < 2.0
Gain	7 dBi approximately
Impedance	50 Ω
Polarization	Vertical
Half power beam width	Horizontal; 90^{o}
Maximum power (at 50^{o} C)	25 W
Weight	500 g
Packing size	321 x 165 x 50 mm
Height x width x depth	205 x 155 x 42 mm
Material	Radiator: brass Reflector: Aluminium Radome: ABS (white) Mounting plates: stainless steel
Mounting	Two holes of 6 mm diameter in the mounting plate.
Grounding	All metal parts and inner conductor DC grounded.

Installing the multi-band indoor panel antenna

1. Fix the attachment plate to the wall using two 4 mm diameter screws. See [1] in Figure 11.
2. Align the antenna over the attachment plate, keeping the cable in the middle of the plate. See [2] in Figure 11.
3. Pull the antenna downwards until it clicks into place. See [3] in Figure 11. Do not pull the antenna downwards with the antenna cable.

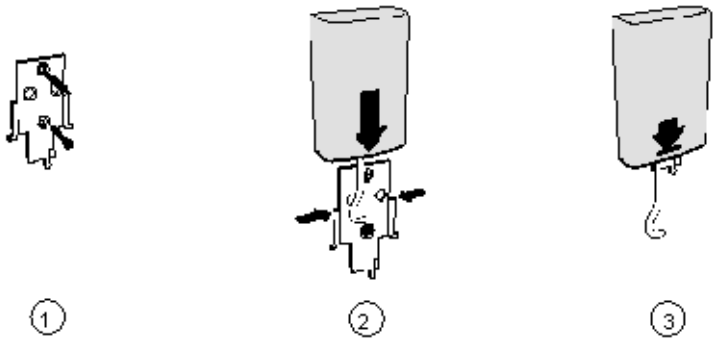


Figure 11. Installing the indoor multi-band panel antenna

2.4.6 Pole mounting clamps (50-115 mm pole diameter)

Product code: CS72196

This standard single unit clamp is suitable for standard Nokia antennas.

The number of clamps required depends upon the antenna.

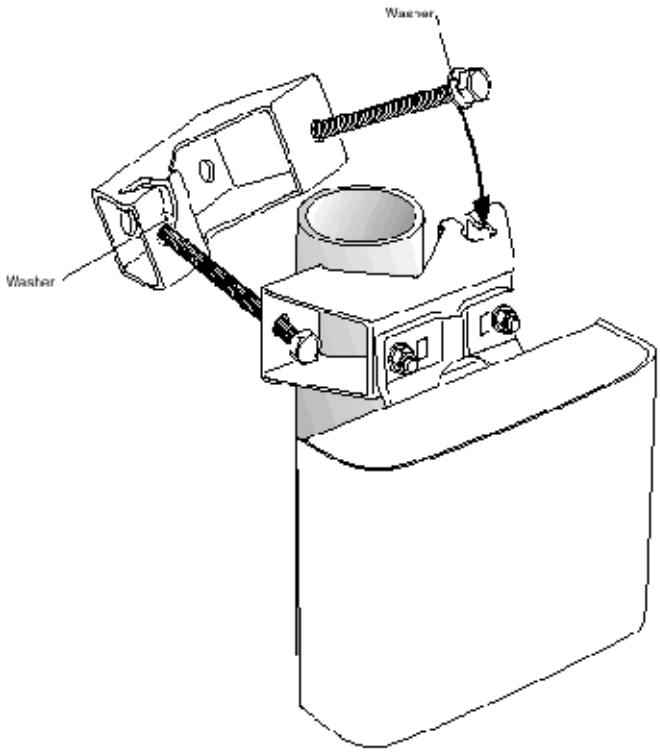


Figure 12. Antenna pole mounting clamp

2.5 GSM/EDGE 900, 1800 and 1900 combiners

Table 16. Combiners for the Nokia MetroSite EDGE Base Station

Item	Product code
GSM/EDGE 900 BTS 2-to-1 combiner	CS72216.01
GSM/EDGE 1800 BTS 2-to-1 combiner	CS72216.02
GSM/EDGE 1900 BTS 2-to-1 combiner	CS72216.03

Product code: CS72216.01; CS72216.02; CS72216.03

The GSM/EDGE combiner is a cost-effective solution for combining two MetroSite TRXs into a single antenna and feeder system.

The GSM/EDGE combiner allows you to combine the transmit signals from the transceivers and also divide receive signals from the antenna to those transceivers.

The GSM/EDGE 900, 1800 and 1900 combiners function in an identical manner and are designed for mounting outdoors. The combiners are compact, lightweight, easy to install, and require no maintenance.

Figure 13. GSM/EDGE combiner

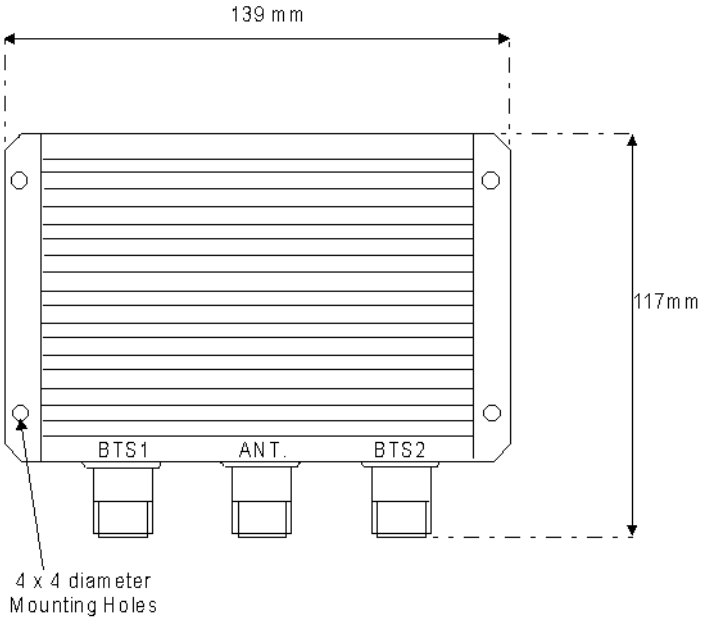


Figure 14. Dimensions of the GSM/EDGE combiner

Table 17. Specifications for the GSM/EDGE combiners

	GSM 900 Combiner	**GSM 1800 Combiner**	**GSM 1900 Combiner**
Transmit Path:			
Frequency range	925-960 MHz	1805-1880 MHz	1930-1990 MHz
Impedance	50 Ω	50 Ω	50 Ω
Insertion loss	3.5 dB maximum	3.5 dB maximum	3.5 dB maximum
Antenna port return loss	18 dB minimum	18 dB minimum	18 dB minimum
BTS port return loss	18 dB minimum	18 dB minimum	18 dB minimum
Isolation BTS port to BTS port (antenna port loaded to 50 Ω	25 dB minimum	25 dB minimum	25 dB minimum
Power handling	2 x 10 W	2 x 10 W	2 x 10 W
Receive Path:			

Table 17. Specifications for the GSM/EDGE combiners (Continued)

	GSM 900 Combiner	**GSM 1800 Combiner**	**GSM 1900 Combiner**
Frequency range	880-915 MHz	1710-1785	1850-1910
Impedance	50 Ω	50 Ω	50 Ω
Insertion loss	3.5 dB maximum	3.5 dB maximum	3.5 dB maximum
Antenna port return loss	18 dB minimum	18 dB minimum	18 dB minimum
BTS port return loss	18 dB maximum	18 dB maximum	18 dB maximum
Power division imbalance	0.5 dB maximum	0.5 dB maximum	0.5 dB maximum
Intermodulation: 2 x 10 W unmodulated carriers:			
Antenna port	880-915 MHz: -100 dBm maximum	1710-1785 MHz: -100 dBm maximum	1850-1910 MHz: -100 dBm maximum
BTS port	880-915 MHz: -116 dBm maximum	1710-1785 MHz: -116 dBm maximum	1850-1910 MHz: -116 dBm maximum
Outside the bands indicated	-38 dBm maximum	-38 dBm maximum	-38 dBm maximum
Mechanical:			
W x H x D mm	139 x 117 (including connectors) x 27 mm	139 x 117 (including connectors) x 27 mm	139 x 117 (including connectors) x 27 mm
Weight	680 g	680 g	680 g
Connectors	N type female (silver plated)	N type female (silver plated)	N type female (silver plated)
Enclosure	Aluminium; RAL 7047	Aluminium; RAL 7047	Aluminium; RAL 7047
Environmental:			
Protection	IP65	IP65	IP65
Operating temperature	-40°C to +60°C	-40°C to +60°C	-40°C to +60°C
Lightning specification	IEC 1312-1	IEC 1312-1	IEC 1312-1

Table 17. Specifications for the GSM/EDGE combiners (Continued)

	GSM 900 Combiner	GSM 1800 Combiner	GSM 1900 Combiner
Storage	Class 1.3E ETSI 300 010-1-1	Class 1.3E ETSI 300 010-1-1	Class 1.3E ETSI 300 010-1-1
Transportation	Class 2.3 ETSI 300 019-1-2	Class 2.3 ETSI 300 019-1-2	Class 2.3 ETSI 300 019-1-2
MTBF	> 500,000 hours	> 500,000 hours	> 500,000 hours

2.6 Antenna lines

Table 18. Antenna line accessories for the Nokia MetroSite EDGE Base Station

Item	Product code
N-male 3/8" straight connector	CS72683.20
N-male 3/8" angle connector	CS72683.21
7-16 male, 3/8” connector for superflex cable	CS72697
3/8" cable, RFF-50, telegrey, 250 m reel, superflex, UV	CS72259.10
3/8" cable, RFF-50, black, 250 m reel, superflex, UV	CS72258.10

2.6.1 Antenna line cables

Product code: CS72259.10 and CS72258.10

The inner conductor is copper clad aluminium wire contained in a cellular polyethylene dielectric. The outer conductor constitutes a corrugated copper tube.

The markings on the sheath consist of the manufacturer's name, cable type, week of manufacture, year of manufacture, and cable length in metres.

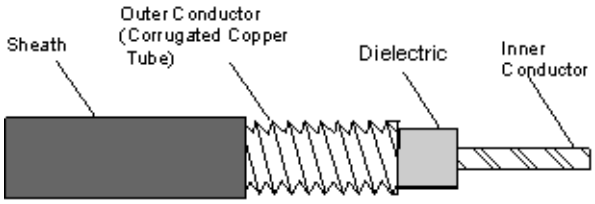


Figure 15. Antenna line cable

Table 19. Sheath characteristics for the antenna line cable

Sheath Characteristics		
Item	**3/8"-50 LD GY7047 (CS72259.10)**	**3/8"-50 (CS72258.10)**
Jacket	Telegrey, LD polyethylene	Black, LD polyethylene
IEC754-1/-2 (halogen free, non-corrosive	Yes	Yes
IEC1034 (low smoke emission)	No	No
IEC332-3C (fire retardant)	No	No
UV retardant	Yes	Yes
Minimum installation temperature	-20^{o} C	-20^{o} C

Table 20. Cable characteristics for the antenna line cable

Cable Characteristics	
Item	**CS72258.10 and CS72259.10 (3/8")**
Mechanical:	
Weight	130 kg/km
Maximum pulling force	400 N
Minimum bending radius: - single bending - repeated bending	13 mm; 25 mm
Operating temperature range	-40^{o} C to +70^{o} C

Table 20. Cable characteristics for the antenna line cable (Continued)

Cable Characteristics	
Item	**CS72258.10 and CS72259.10 (3/8")**
Electrical at +20^{o} C	
Characteristic impedance	50 + 1 Ω
Attenuation	See table
Velocity factor	0.81
Capacitance	82 pF/m
Cut-off frequency	15200 MHz
Maximum operating frequency	3000 MHz
Maximum power rating	See table
Peak RF voltage rating	1.04 kV
Peak power rating	11 kW
DC resistance: inner conductor	5.1 Ω/km
DC resistance: outer conductor	6.1 Ω/m

Table 21. Attenuation and power characteristics for the antenna line cable

Attenuation (maximum) and power rating			
	CS72258.10 and CS72259.10 (3/8")		
Frequency (MHz)	**Attenuation at ambient temp. 20^{o} C dB/100 m**	**Power rating at ambient temp.40^{o} C inner conductor +70^{o} C (kW)**	**Power rating at ambient temp.40^{o} C inner conductor +100^{o} C (kW)**
700	12.1	0.32	0.69
800	13.0	0.30	0.64
850	13.4	0.29	0.62
900	13.9	0.29	0.60
950	14.3	0.28	0.58

Table 21. Attenuation and power characteristics for the antenna line cable

Attenuation (maximum) and power rating			
	CS72258.10 and CS72259.10 (3/8")		
Frequency (MHz)	**Attenuation at ambient temp. 20° C dB/100 m**	**Power rating at ambient temp.40° C inner conductor +70° C (kW)**	**Power rating at ambient temp.40° C inner conductor +100° C (kW)**
1000	14.7	0.26	0.57
1200	16.3	0.24	0.51
1400	17.8	0.22	0.47
1600	19.1	0.20	0.44
1800	20.5	0.19	0.41
1900	21.1	0.18	0.40
2000	21.8	0.18	0.39
2200	23.0	0.17	0.37

2.6.2 N male connector: straight

Product code: CS72683.20 (3/8")

This connector type is suitable for 3/8 inch helical cable and facilitates solderless attachment of the inner wire of the connected cable.

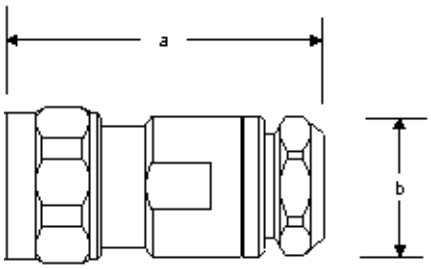


Figure 16. N male connector

Table 22. Specifications for the N male connector

Item	CS72683.20 (3/8")
Frequency f/GHz	0 < f ≤ 1 1 < f ≤ 2.7
VSWR	≤ 1.02 ≤ 1.03
Intermodulation (2x20W; 936/958MHz; 1770/1810 MHz)	≤ -155 dBc
Assembly time	< 2 minutes
Weight	70 g
a (mm)	47
b (mm)	21

2.6.3 N male connector: right angled

Product code: CS72683.21 (3/8")

This connector type is suitable for 3/8" helical cable and facilitates solderless attachment of the inner wire of the connected cable.

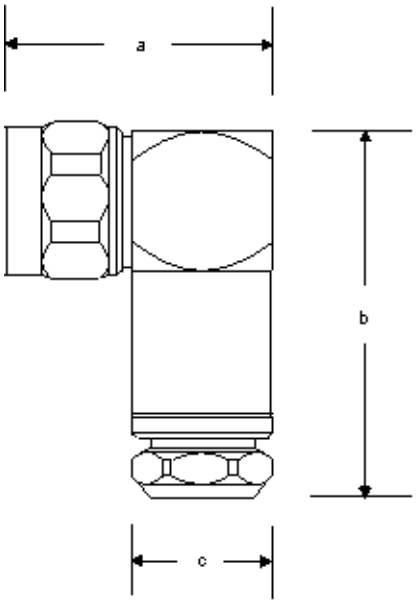


Figure 17. N male connector, right angled

Table 23. Specifications for the N male connector, right angled

Item	**CS72683.21 (3/8")**
Frequency f/GHz	0< f ≤1 1 < f ≤2 2 < f ≤ 2.7 2.7 < f ≤ 3.7
VSWR	≤ 1.02 ≤ 1.04 ≤ 1.06 ≤ 1.13
Intermodulation (2x20W; 936/958MHz; 1770/1810 MHz)	≤ -155 dBc
Assembly time	< 2 minutes
Weight	145 g

Table 23. Specifications for the N male connector, right angled (Continued)

Item	CS72683.21 (3/8")
a (mm)	36
b (mm)	38.3
c (mm)	23

2.6.4 7-16 Straight Male connector

Product code: CS72697 (3/8")

This connector type is suitable for 3/8" helical cable and facilitates solderless attachment of the inner wire of the connected cable.

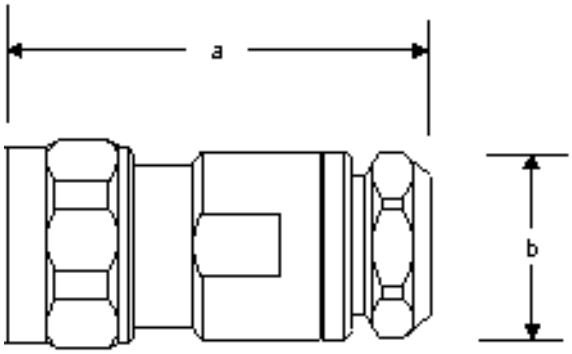


Figure 18. 7-16 Straight male connector

Table 24. Specifications for the N male connector, right angled

Item	CS72697 (3/8")
Frequency f/GHz	0 < f ≤ 1 1 < f ≤ 2.7 2.7 < f ≤ 3.7
VSWR	≤ 1.02 ≤ 1.03 ≤ 1.06
Intermodulation (2x20W; 936/958MHz; 1770/1810 MHz)	≤ -155 dBc

Table 24. Specifications for the N male connector, right angled (Continued)

Item	CS72697 (3/8")
Assembly time	< 2 minutes
Weight	105 g
a (mm)	39
b (mm)	21

2.7 MetroSite Battery Backup Unit

Product code: CS70401.01 for BBU (without batteries) and .02 for batteries

2.7.1 Battery Backup Unit

The MetroSite BBU is designed to provide 110 VAC or 230 VAC backup support for connected elements.

The MetroSite BBU is able to support a single MetroSite BTS or a single MetroHub and can be pole or wall mounted in almost any location, indoors or outdoors. Its appearance is identical to the MetroSite BTS and the MetroHub, consequently it can be readily integrated into a site location unobtrusively.

2.7.2 Mains power cable (230 VAC)

Note

This item is included in CS70401.01.

The 230 VAC power cables for AC connectivity are light and flexible. They can be installed in dry, damp and wet environments, both indoor and outdoor, in addition to fire-sensitive locations.

The cable has three conductors made of high quality copper insulated with EPDM-rubber.

One end of the cable is fitted with an IEC320 female connector and the other end with an appropriate three-pin male connector for connection to the mains power source (user defined).

Note

The MetroSite BTS or MetroHub mains power cable can be utilised for connecting the MetroSite BBU to the mains power source.

Table 25. Specifications for the 230 VAC mains power cable

Code	Detail
Cross section	1.5 mm^2
Nominal diameter	9.0 mm
Nominal voltage U_o /U	300 V/500 V
Maximum continuous operating temperature	+60° C
Minimum recommended handling temperature	-50° C
Minimum bending radius	54 mm
Live wire colour	Brown
Neutral wire colour	Blue
Earthing cable colour	Green/yellow
Sheath colour	Black

2.7.3 230/110 VAC output cable

Note

This item is included in CS70401.01.

The 230/110 VAC power cables for AC connectivity are light and flexible. They can be installed in dry, damp and wet environments, both indoor and outdoor, in addition to fire-sensitive locations.

The cable has three conductors made of high quality tinned copper insulated with EPDM-rubber and is 2 metres in length.

One end of the cable is fitted with an IEC320 female connector and the other end with an IEC320 male connector. The former connects to the MetroSite BBU and the latter to a MetroSite BTS or MetroHub.

Table 26. Specifications for the 230/110 VAC mains power cable

Code	Detail
Cross section	1.5 mm^2
Nominal diameter	9.0 mm
Nominal voltage U_o /U	300 V/500 V
Maximum continuous operating temperature	+60° C
Minimum recommended handling temperature	-50° C
Minimum bending radius	54 mm
Live wire colour	Brown
Neutral wire colour	Blue
Earthing cable colour	Green-yellow
Sheath colour	Black

2.7.4 Alarm cable

Note

This item is included in CS70401.01.

This cable facilitates the monitoring of the status of the various MetroSite BBU alarm outputs at a remote control centre via the MetroSite BTS.

The cable is fitted with an X3, mini D26 (EAC) connector at each end.

Table 27. Specifications for the alarm cable

Pin	Signal	Pin	Signal
1	EAC1	14	GND
2	EAC2	15	GND
3	EAC3	16	GND
4	EAC4	17	GND
5	EAC5	18	GND
6	EAC6	19	GND
7	EAC7	20	GND
8	EAC8	21	GND
9	EAC9	22	GND
10	EAC10	23	GND
11	CO1	24	CO3
12	+3 V	25	CO4
13	CO2	26	+5 V

2.7.5 Battery connection kit

Note

This item is included in CS70401.01.

The kit provides the connection busbars and the connector cable for the battery backup to the MetroSite BBU. The cable which connects the batteries to the MetroSite BBU is fitted with terminals for connection to the batteries and a common connector for connection to the MetroSite BBU -48 VDC connector.

Table 28. Contents of the battery connection kit

Item	Quantity
10-pin genderless connection cable	1
Short battery inter-connecting busbar	2
Long battery inter-connecting busbar	1

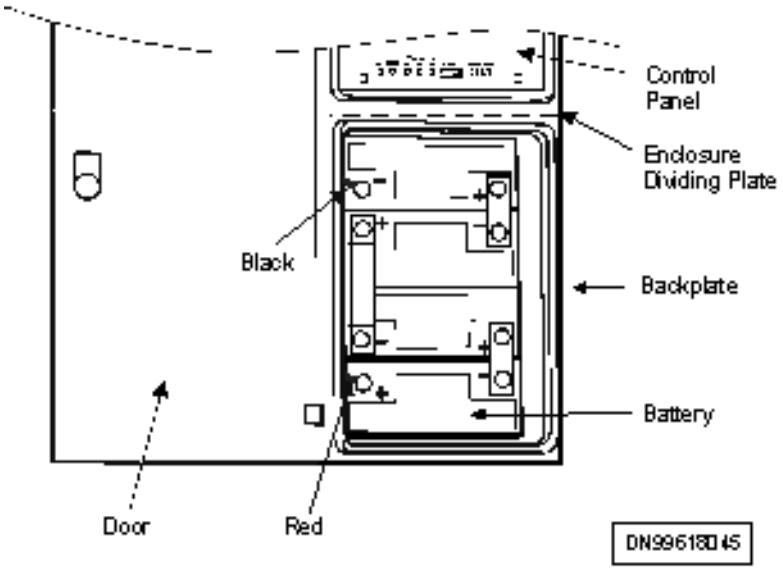


Figure 19. Battery connection kit

2.8 Miscellaneous

Table 29. Miscellaneous accessories for the Nokia MetroSite EDGE Base Station

Item	Product code
Earthing cable, 16 mm^2	CS73174
Metro Hopper optical alignment tool	T55875.01
Alarm cable (between BTS and Hub)	CS72451.20
Pole mounting kit for MetroSite cabinet	CS72451.10
Power cable for BTS/Hub (230 VAC)	CS72452.50
Power cable for BTS/Hub (110 VAC)	CS72452.51
Power cable for BTS (DC)	CS72452.52
Power cable for Hub (DC)	CS72452.53
Clamp for 2 x 3/8” cable	CS72747.04
Two-pair, 120 Ω cable, 305 m	CS72452

Table 29. Miscellaneous accessories for the Nokia MetroSite EDGE Base Station (Continued)

Item	Product code
Extension cable kit, 1 metre	469584A
Extension cable kit, 3 metres	467614A
Extension cable kit, 5 metres	469585A
Extension adapter for PCM/clock cable	CS74814

2.8.1 Jumper cables

Table 30. Jumper cable accessories

Code	Description
CS72672	Jumper cable 2,5 m, 3/8” N-m angle/N-m telegrey
CS72680.06	Jumper cable 1,25 m, 3/8” N-m angle/N-m, telegrey
CS72680.07	Jumper cable 2 m, 3/8” N-m right-angle/7-16f, telegrey

2.8.2 Grounding cable

Product Code: CS73174

The grounding cable is plastic insulated copper wires with a yellow-green colour insulation cover identification.

Table 31. Grounding cable specifications

Code	Details
Cross-section	16 mm^2
Nominal diameter	7.2 mm
Nominal voltage U_o /U	450 V/750 V
Maximum continuous operating temperature	+60^o C

Table 31. Grounding cable specifications (Continued)

Code	Details
Minimum recommended handling temperature	-50° C
Minimum recommended bending radius (single bend)	22 mm
Colour	Yellow-green

2.8.3 AC power cables for MetroSite BTS or MetroHub

The power cables for AC connectivity are light and flexible. They can be installed in dry, damp and wet environments, both indoor and outdoor, in addition to fire-sensitive locations.

The cables have three conductors made of high quality tinned copper insulated with EPDM-rubber and are 10 m in length.

One end of the cable is fitted with an IEC320 three-pin male connector and the other end with an appropriate three-pin male connector for connection to the mains power source (user defined).

230 VAC power cable: CS72452.50

Table 32. Specifications for the 230 VAC power cable

Code	Detail
Cross section	1.5 mm^2
Nominal diameter	9.0 mm
Nominal voltage U_o /U	300 V/500 V
Maximum continuous operating temperature	+60° C
Minimum recommended handling temperature	-50° C
Minimum bending radius	54 mm
Live wire colour	Brown
Neutral wire colour	Blue
Earthing cable colour	Green-yellow
Sheath colour	Black

110 VAC power cable: CS72452.51

Table 33. Specifications for the 110 VAC power cable

Code	Detail
Cross section	1.5 mm^2
Nominal diameter	9.0 mm
Nominal voltage U_o /U	300 V/500 V
Maximum continuous operating temperature	+60° C
Minimum recommended handling temperature	-50° C
Minimum bending radius	54 mm
Live wire colour	Brown
Neutral wire colour	Blue
Earthing cable colour	Green-yellow
Sheath colour	Black

2.8.4 DC power cable for MetroSite BTS or MetroHub

Product code: CS72452.52 (MetroSite); CS72452.53 (MetroHub)

The -48 VDC power cables for DC connectivity are light and flexible. They can be installed in dry, damp and wet environments, both indoor and outdoor, in addition to fire-sensitive locations.

Each cable type has three conductors made of high quality tinned copper insulated with EPDM-rubber and is 10 m in length.

Table 34. Specifications for the DC power cable

Code	Detail
Cross section	TBA
Nominal diameter	TBA
Nominal voltage U_o /U	300 V/500 V
Maximum continuous operating temperature	+60° C
Minimum recommended handling temperature	-50° C
Minimum bending radius	TBA

Table 34. Specifications for the DC power cable (Continued)

Code	Detail
Live wire colour	Brown
Neutral wire colour	Blue
Earthing cable colour	Green-yellow
Sheath colour	Black

2.8.5 Optical Alignment Tool

Product code: T55875.01

The optical alignment tool is used to align the MetroHopper for optimum efficiency.

The optical alignment tool is fitted on the MetroHopper mounting assembly before the MetroHopper is fitted. Upon switching on, a red dot is visible through the eyepiece and this can be adjusted for brightness. A coarse then a fine alignment is carried using the red dot.

The red dot is aimed towards the centre of the far-end radio and the mounting assembly is aligned accordingly. During the course of alignment, appropriate screws are tightened to lock the mounting assembly in the aligned position.

When satisfied that alignment is complete, the optical alignment tool is switched off and removed from the MetroHopper mounting assembly. The MetroHopper can then be fitted to the mounting assembly.

Figure 20. Optical alignment tool

Table 35. Specifications for the optical alignment tool

Item	Details
Type	Optical red dot alignment sight. ‘Aimpoint Comp’ sight with a 90^{o}viewing angle and a mounting base perpendicular to the optical axis of sight.
Manufacturer	Aimpoint AB, Sweden
Application	Used with MetroSite Alignment Unit, type T55850.01
Alignment ranges	Alignment range with 2x magnification lens, 0.5 to 1 km. 4x magnification lens version: 1 km
Optical characteristics	Red dot size 3 MOA
Calibration	Factory calibrated with the optical axis set perpendicular to the base within 10 MOA. The unit can be re-calibrated as necessary.
Power source	Battery operated. One lithium DL1/3N battery or similar. Battery life: 150-250 h (average)
Mechanical characteristics	Base has mechanical interface to alignment unit (T55850.01)
Materials and surface treatment	Anodised/painted aluminium; stainless steel
Required tools	One 6 mm Allen key.

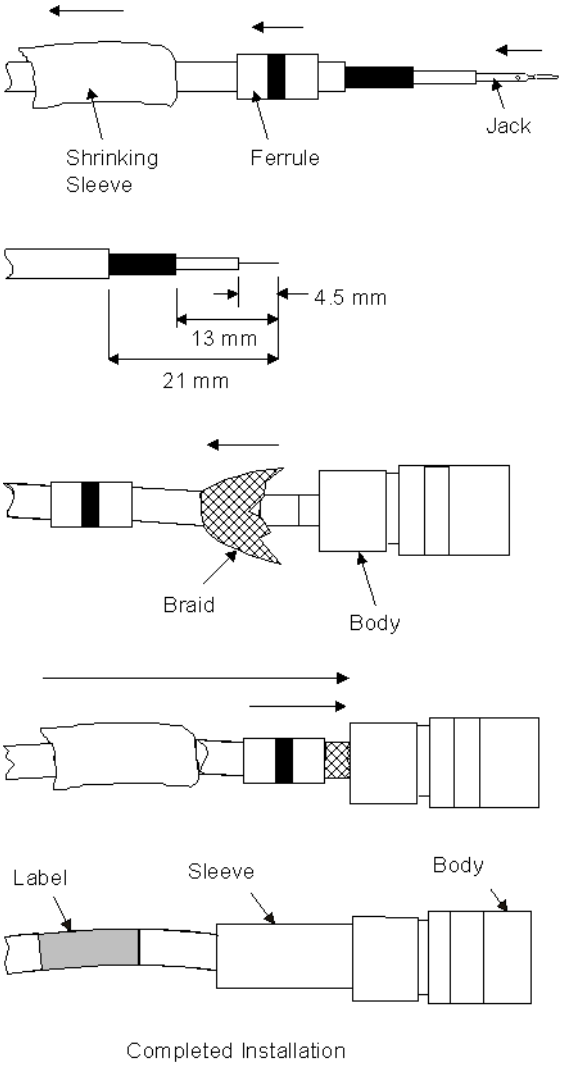
3 Attachments

Attachment 1: Installation instructions for the Abis 75-ohm interface of Nokia MetroSite with TZC75024 cable

For installation the following listed tools are needed:

- CS74863 Peeling Tool
- CS74862 Centre Contact Crimp Tool
- CS77550.01 Crimp Tool

The connector consists of three parts: a ferrule, a jack and a body.



Instructions:

1. Slide the shrinking sleeve and the ferrule onto the un-peeled part of the cable.

2. Peel the cable as shown in the picture. The lengths of the peeled parts are: 21 mm (0.827"), 13 mm (0.512") and 4.5 mm (0.177").

3. Position the jack on the end of the cable. Push the cable into the crimping tool so that the jack is inside the crimping hole, and crimp the jack onto the conductor.

4. Push the body onto the cable so that the braid is outside the thinnest part of the body.

5. Pull the ferrule over the braid onto the body so that the ferrule touches the thick part of the body.

6. Crimp the ferrule onto the body with the crimping tool CS77550.01. Use the gap '4.52' on the tool.

7. Draw the shrinking sleeve over the ferrule and warm it to cause it to shrink onto the ferrule.

Attachment 2: Installation configuration for the Abis 120-ohm interface of Nokia MetroSite.

Note

This cable is provided already assembled but is shown here to identify all the parts constituting an Abis 120-ohm interface.

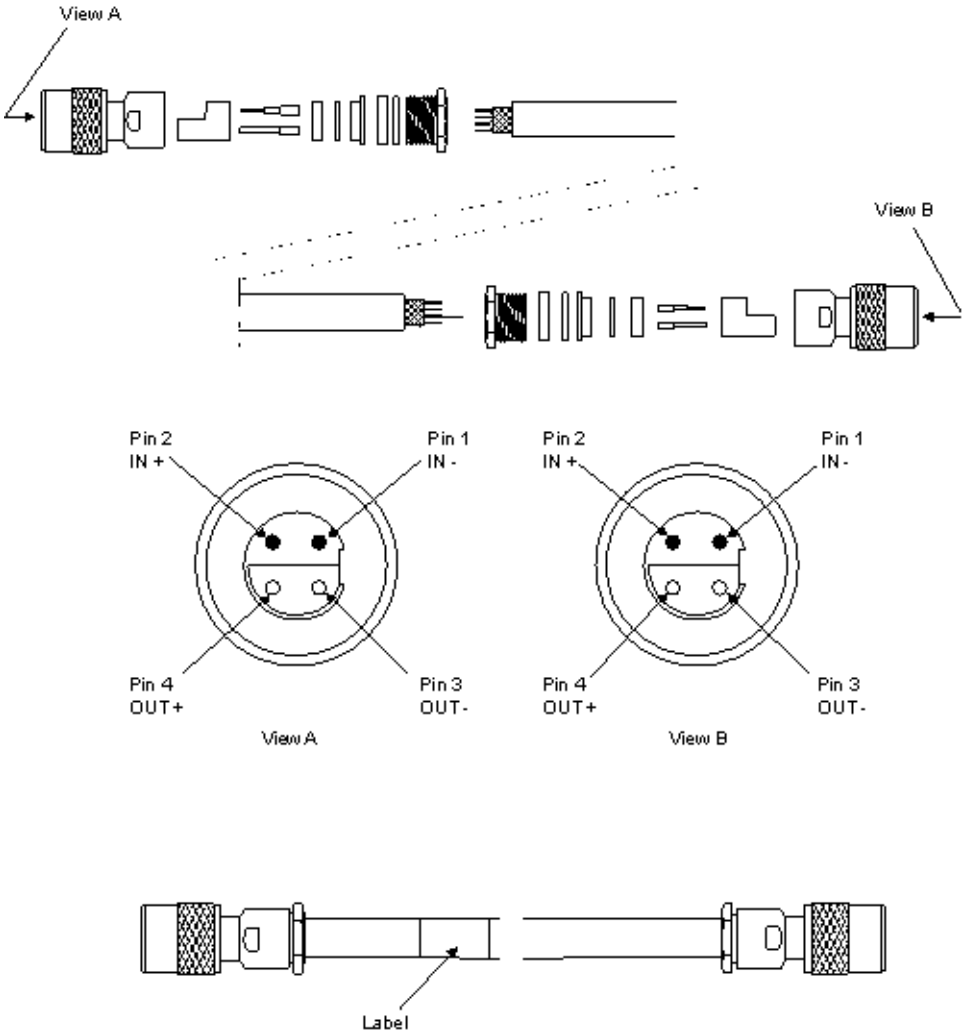
A TQ connector is fitted to both ends of the cable. The wires connecting the TQ connectors are coloured as follows (see figure):

OUT+ (pin 4): White stripe

OUT- (pin 3): White

IN+ (pin 2): Blue stripe

IN- (pin 1): Blue

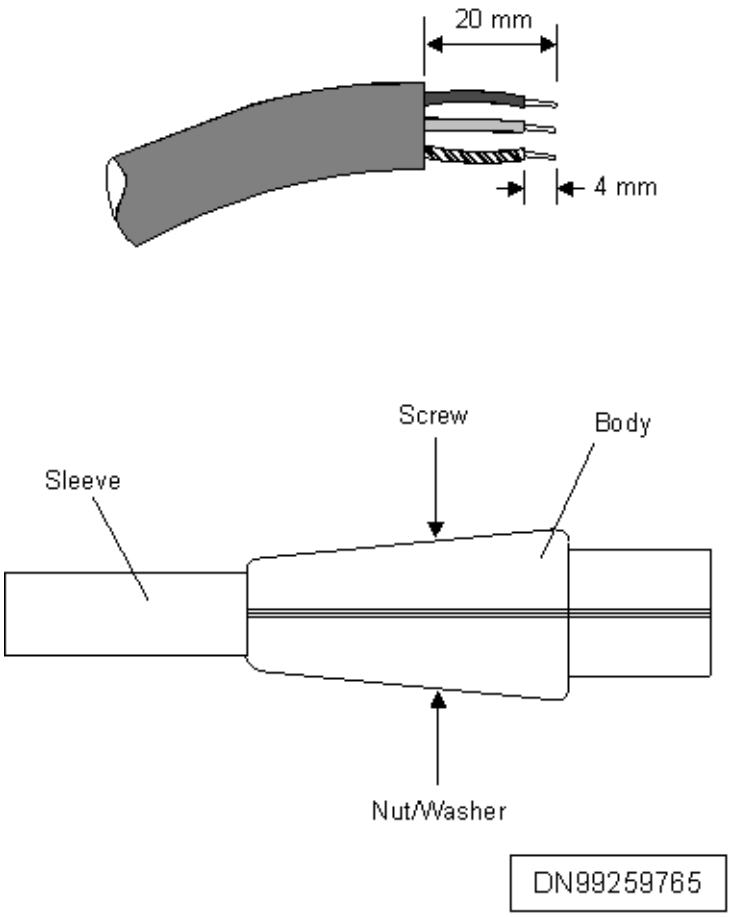


Attachment 3: Installation instructions for the AC power plug for Nokia MetroSite.

The power feeder is a flexible rubber insulated cable with three multi-wire conductors having dimensions of: 1.5 mm^2 or 2.5 mm^2 (AWG 15.5-13.5).

For installation the following listed tools are needed:

- Screwdriver (flat)
- Screwdriver (Philips)



Instructions:

1. Strip the power feeder cable from its main insulation 20 mm (0.787").
2. Strip the inner conductors and cut them so that the blue and brown wires are 20 mm (0.787") long and the yellow/green wire is slightly longer, at 25 mm (1"). The stripped area is 4 mm (0.157") long.
3. Undo the screw holding the body parts together and store the screw, nut and washer in a safe place. Separate the two parts of the body.
4. Remove the sleeve then feed the cable (exposed end) through the sleeve from the rear.
5. Pull the cable through sufficiently to enable the wires to be attached to the plug connectors.

6. Undo each plug connector screw sufficiently to enable the cable wire to be inserted and insert the wires in each connector.

Note

The brown (live) wire to be inserted in the right-hand connector as viewed from the front. The blue (neutral) wire is inserted into the left-hand connector, and the yellow/green (earth) wire to the centre connector.

7. Tighten each screw in turn to fix the wires in the connectors.

8. Align the sleeve on the cable so that the raised end can be inserted into the slot.

9. Place the two body parts together, making sure they are aligned, the wires are clear of the body fixing hole and the sleeve is properly located in the slot.

10. Fix the body parts together with the screw, nut and washer.

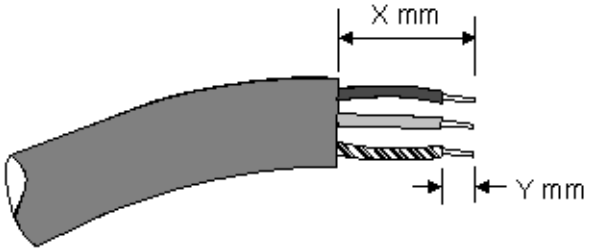
11. This procedure is to be repeated for the other end of the cable if the power cable is to connect the MetroSite BBU to a MetroSite BTS.

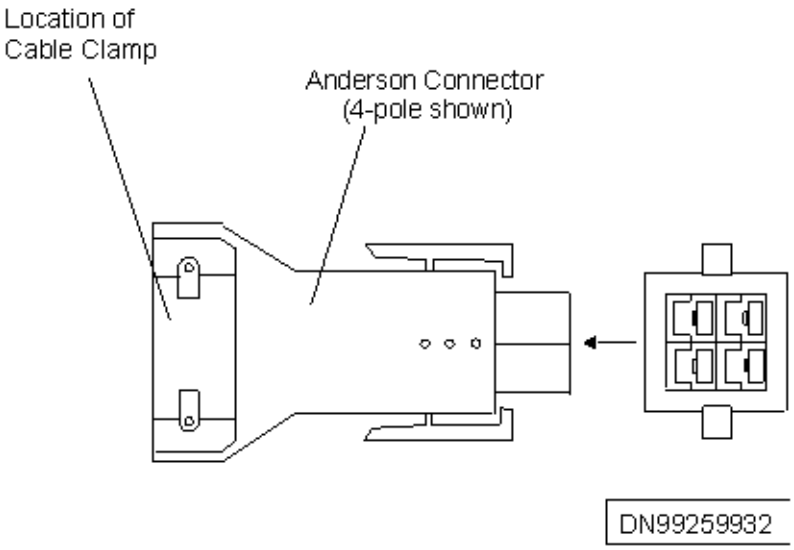
    If the cable is to be connected to a MetroHub, repeat steps 1 and 2 for the other end of the cable. Connect that end to the MetroHub as described in the *MetroHub User Manual (Installation)*.

    If the cable is to be connected to the mains power source then this is user defined.

Attachment 4: Installation instructions for the DC power plug for Nokia MetroSite

The power feeder is a flexible rubber insulated cable with three multi-wire conductors having dimensions of: 1.5 mm^2 or 2.5 mm^2 (AWG 15.5-13.5).





Instructions:

1. Strip the power feeder cable from its main insulation 'X' mm (TBA).
2. Strip the inner conductors and cut them so that they are of equal length.
3. Strip each wire insulation to 'Y' mm (TBA) length using a sharp blade, taking care not to cut any strands of wire.
4. Insert each wire, in turn, into a contact and using the crimping tool, crimp the contact around the wire.
5. Undo the cable clamp to enable the cable to be inserted.
6. Push the contacts into the connector in their correct positions.*It is very important that the contacts are in the correct order in the connector.*
7. If the cable is to connect the DC supply to a MetroSite BTS, the procedure is to be repeated for the other end of the cable. If the cable is to connect the DC supply to a MetroHub, refer to the *MetroHub User Manual (Installation)*for the connection of the other end of the cable.