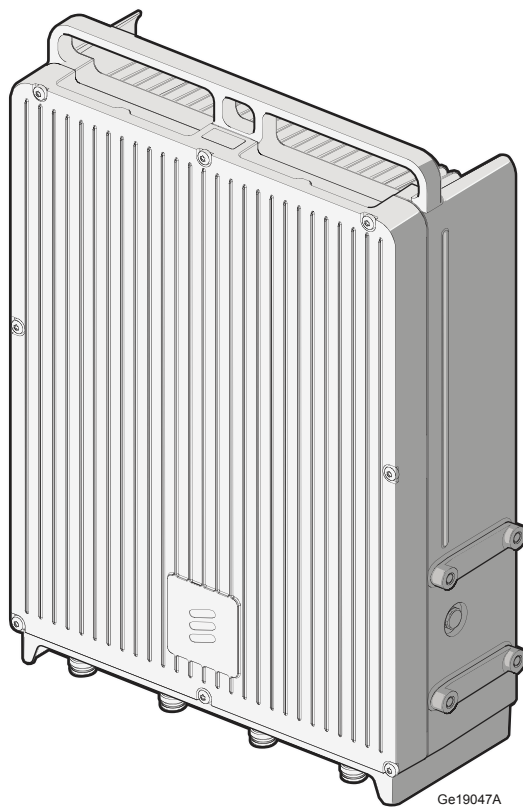


Radio Description

Radio 4480

Description



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1 Introduction

1.1 Naming Convention

Radio <Radio TX/RX> <Unique ID> <<Band TX/RX><1st 3GPP Band>> <<Band TX/RX><2nd 3GPP Band>> <Port Configuration>

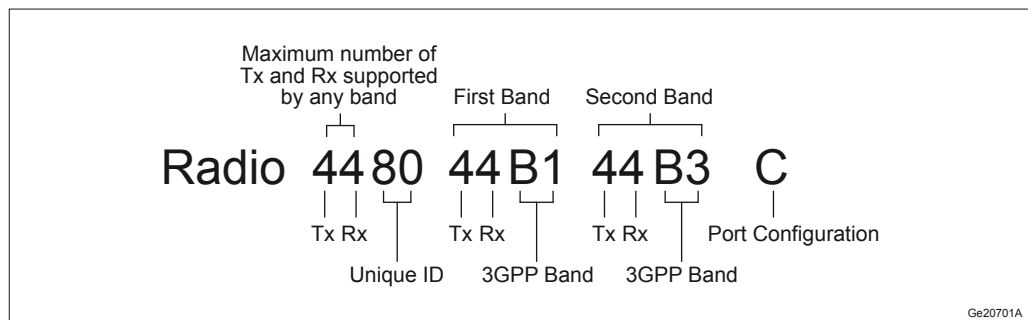


Figure 1 Naming Convention Example

Port Configuration

C - Combined RF ports for the bands, total four ports. See [Table 1](#).

Table 1 Variant Naming for Multiband Radios

Variant	1st 3GPP Band	2nd 3GPP Band
C	RF A: TX/RX RF B: TX/RX RF C: TX/RX RF D: TX/RX	RF A: TX/RX RF B: TX/RX RF C: TX/RX RF D: TX/RX

Example 1

Radio 4480 44B1 44B3 C has 4 TX and 4 RX on band 1, and 4 TX and 4 RX on band 3. RF ports are combined and therefore in total radio has four-RF ports.

1.2 Warranty Seal

The product is equipped with a warranty seal sticker.

Note: Seals that have been implemented by Ericsson must not be broken or removed, as it otherwise voids warranty.



2 Product Overview

The radio remotely extends the reach of the Radio System, and is designed to be located near the antenna. The radio is part of a modular radio building concept that enables a variety of installation alternatives that are also easy to expand. Flexible mounting solutions are provided using rails, pole clamps, and brackets.

An overview of different radio installations is shown in [Figure 2](#).

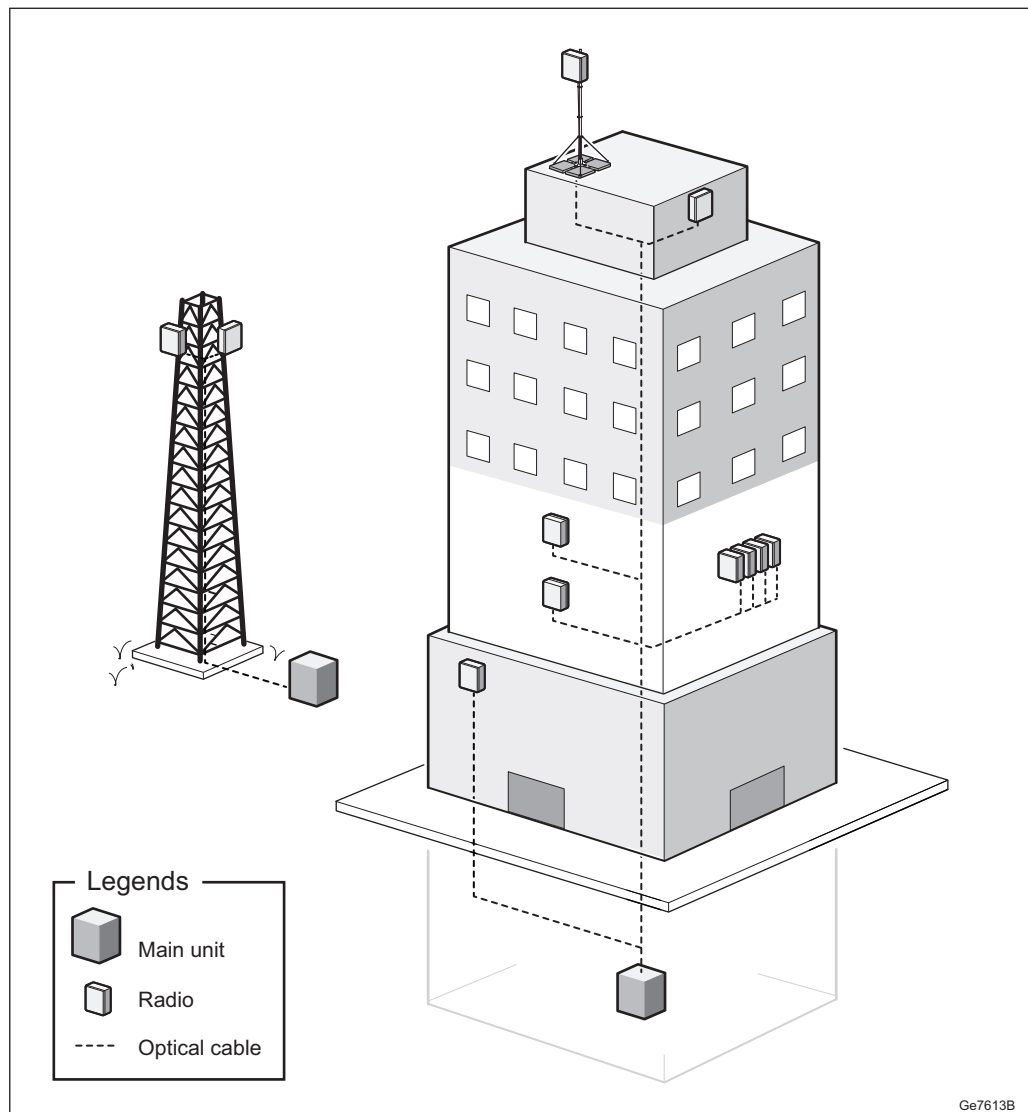


Figure 2 Radio Installations



2.1 Main Features

The following are the main features of the radio:

- The power connection supports 2-wire (DC-C) and 3-wire (DC-I) power cable connectors.
- NR FDD, ESS FDD, LTE FDD, WCDMA, GSM, and NB-IoT
- Dual band: B0A B28, B1 B3, and B8 B28
- Duplex transmitter and receiver (4TX/4RX) branches
- Up to 10.1 Gbps CPRI (optical)
- Supports Basic Stand-alone Radio Installation Check
- Complies with 3GPP base station class Wide Area. For a list of relevant standards, see [Standards and Regulations](#) on page 32.

2.2 Optional Equipment

Optional equipment is the following:

- Fan unit



3 Technical Data

Table 2 Radio 4480 Technical Data

Description	Value
Maximum nominal output power ^{(1) (2) (3)} (Hardware Activation Codes (HWAC) are required for total output power over 20 W.)	Radio 4480 44B0A 44B28 C B0A: 60 W per port B28: 40 W per port Total: 80 W per port without fan Total: 100 W per port with fan
	Radio 4480 44B1 44B3 C 60 W per port and band Total: 80 W per port without fan Total: 100 W per port with fan
	Radio 4480 44B8 44B28 C B8: 60 W per port B28: 40 W per port Total: 80 W per port without fan Total: 100 W per port with fan
Minimum configurable output power on an RF port	Radio 4480 44B0A 44B28 C, Radio 4480 44B1 44B3 C, and Radio 4480 44B8 44B28 C 10 W (5 W per band)
Number of carriers	Radio 4480 44B0A 44B28 C Maximum 6 carriers per band and port Total 12 carriers over both bands and port B0A: LTE: 6 downlink per port, 6 uplink per port NR: 4 downlink per port, 4 uplink per port ESS: 4 downlink per port, 4 uplink per port WCDMA: 5 downlink per port, 5 uplink per port GSM: 2 downlink per port, 5 uplink per port (Mixed mode GSM: 4 downlink per port, 5 uplink per port) NB-IoT in-band mode: 1 NB-IoT carrier per configured LTE host carrier NB-IoT standalone mode: 2 downlink per port, 4 uplink per port NB-IoT guard band mode: 1 NB-IoT carrier per configured LTE host carrier B28: LTE: 6 downlink per port, 6 uplink per port NR: 4 downlink per port, 4 uplink per port ESS: 4 downlink per port, 4 uplink per port NB-IoT in-band mode: 1 NB-IoT carrier per configured LTE host carrier NB-IoT standalone mode: 2 downlink per port, 4 uplink per port NB-IoT guard band mode: 1 NB-IoT carrier per configured LTE host carrier
	Radio 4480 44B1 44B3 C Maximum 6 carriers per band and port Total 12 carriers over both bands and port B1: LTE: 6 downlink per port, 6 uplink per port NR: 4 downlink per port, 4 uplink per port ESS: 4 downlink per port, 4 uplink per port WCDMA: 6 downlink per port, 6 uplink per port NB-IoT standalone mode: 2 downlink per port, 4 uplink per port NB-IoT in-band mode: 1 NB-IoT carrier per configured LTE host carrier NB-IoT guard band mode: 1 NB-IoT carrier per configured LTE host carrier B3: LTE: 6 downlink per port, 6 uplink per port



Description	Value
	GSM: 4 downlink per port, 5 uplink per port NR: 4 downlink per port, 4 uplink per port ESS: 4 downlink per port, 4 uplink per port NB-IoT in-band mode: 1 NB-IoT carrier per configured LTE host carrier NB-IoT standalone mode: 2 downlink per port, 4 uplink per port NB-IoT guard band mode: 1 NB-IoT carrier per configured LTE host carrier
	Radio 4480 44B8 44B28 C Maximum 6 carriers per band and port. Total 12 carriers over both bands and port B8: LTE: 6 downlink per port, 6 uplink per port NR: 4 downlink per port, 4 uplink per port ESS: 4 downlink per port, 4 uplink per port WCDMA: 6 downlink per port, 6 uplink per port GSM: 2 downlink per port, 5 uplink per port (Mixed mode GSM: 4 downlink per port, 5 uplink per port) NB-IoT in-band mode: 1 NB-IoT carrier per configured LTE host carrier NB-IoT standalone mode: 2 downlink per port, 4 uplink per port NB-IoT guard band mode: 1 NB-IoT carrier per configured LTE host carrier B28: LTE: 6 downlink per port, 6 uplink per port NR: 4 downlink per port, 4 uplink per port ESS: 4 downlink per port, 4 uplink per port NB-IoT in-band mode: 1 NB-IoT carrier per configured LTE host carrier NB-IoT standalone mode: 2 downlink per port, 4 uplink per port NB-IoT guard band mode: 1 NB-IoT carrier per configured LTE host carrier
Frequency ⁽⁴⁾	B0A for NR, LTE, ESS, WCDMA, GSM ⁽⁵⁾ , NB-IoT in-band mode, NB-IoT standalone mode, and NB-IoT guard band mode 890–915 MHz uplink 935–960 MHz downlink
	B1 for NR, ESS, LTE, WCDMA, NB-IoT in-band mode, NB-IoT guard band mode: 1 NB-IoT carrier per configured LTE hoststandalone mode, and NB-IoT guard band mode 1920–1980 MHz uplink 2110–2170 MHz downlink
	B3 for NR, ESS, GSM ⁽⁵⁾ , LTE, NB-IoT in-band mode, NB-IoT standalone mode and NB-IoT guard band mode 1710–1785 MHz uplink 1805–1880 MHz downlink
	B8 for NR, LTE, ESS, WCDMA, GSM ⁽⁵⁾ , NB-IoT in-band mode, NB-IoT standalone mode, and NB-IoT guard band mode 880–915 MHz uplink 925–960 MHz downlink
	B28 for NR, LTE, ESS, NB-IoT in-band mode, NB-IoT standalone mode, and NB-IoT guard band mode 703–748 MHz uplink 758–803 MHz downlink
TMA Gain	
Radio 4480 44B0A 44B28 C Radio 4480 44B1 44B3 C Radio 4480 44B8 44B28 C	12 dB gain
Dimensions	
Radio 4480 44B0A 44B28 C Radio 4480 44B8 44B28 C	H×W×D: 553 × 398 × 190 mm
Radio 4480 44B1 44B3 C	H×W×D: 553 × 398 × 151 mm
Weight	



Description	Value
Radio 4480 44B0A 44B28 C Radio 4480 44B8 44B28 C	37.6 kg
Radio 4480 44B1 44B3 C	32 kg
Color	
Body	NCS S 1002-B
Front	NCS S 6502-B

(1) For detailed information about LTE licenses and HWAC, see:

NR: Manage Licenses and Hardware Activation Codes in the NR RAN library.

LTE: Manage Licenses and Hardware Activation Codes in the LTE RAN library.

WCDMA: Manage Licenses and Hardware Activation Codes in the WCDMA Radio Node libraries.

GSM: User Description, GSM RAN Handling of Software Licenses and Hardware Activation Codes and MCPA Guideline in the GSM RAN library.

(2) For detailed information about output power, see:

NR: Hardware-Related Capabilities in the NR RAN library.

LTE: Hardware-Related Capabilities in the LTE RAN library.

(3) It is dimensioned with a configuration targeting for maximum output power level. The COVERAGE mode prioritizes output power but causes small penalty in EVM depending on carrier configurations such as wider carrier separation, number of deployed carriers, carrier positions, and RATs combination. The configuration alternatives in LTE attribute `SectorCarrier.radioTransmitPerfMode` can be used to prioritize EVM performance.

(4) For information about IBW, see Radio Node Configurations.

(5) GSM in mixed mode only.

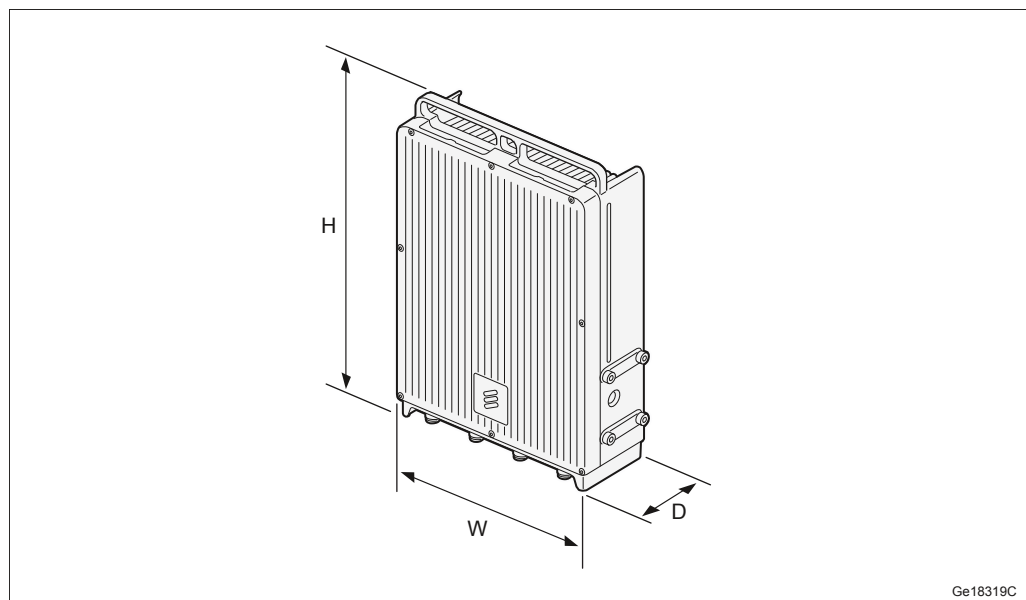


Figure 3 Radio 4480 Height, Width, and Depth



Table 3 Fan Unit Technical Data

Description	Value
Dimensions	
Height	95 mm
Width	355 mm
Depth	35 mm
Weight	
	0.5 kg
Color	
Fan unit	NCS S 6502-B

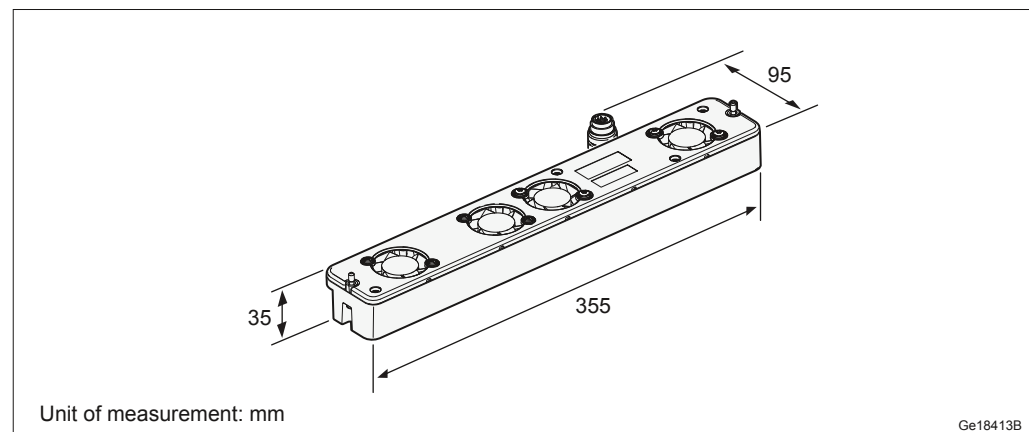


Figure 4 Fan Unit Height, Width, and Depth

3.1 Installation Recommendations

To achieve reliable operation, and maximum performance, an appropriate installation location must be chosen.

3.1.1 Indoor Locations to Avoid

Although the unit is designed for outdoor use, it can also operate in an indoor environment according to ETSI EN 300 019-1-3 class 3.1, 3.2, 3.3, and 3.6. This does not cover installation with heat traps or installation in lofts, where air ventilation does not exist. To ensure smooth performance of the product, it is recommended to ensure that the planned installation site for the unit is not a potential microclimate location. This typically occurs in places such as unventilated lofts, sites with heat traps, or sites where the product is exposed to direct sunlight through windows. Ensure proper ventilation and avoid installing the equipment under glass covers or skylight windows.



3.1.2 Outdoor Locations to Avoid

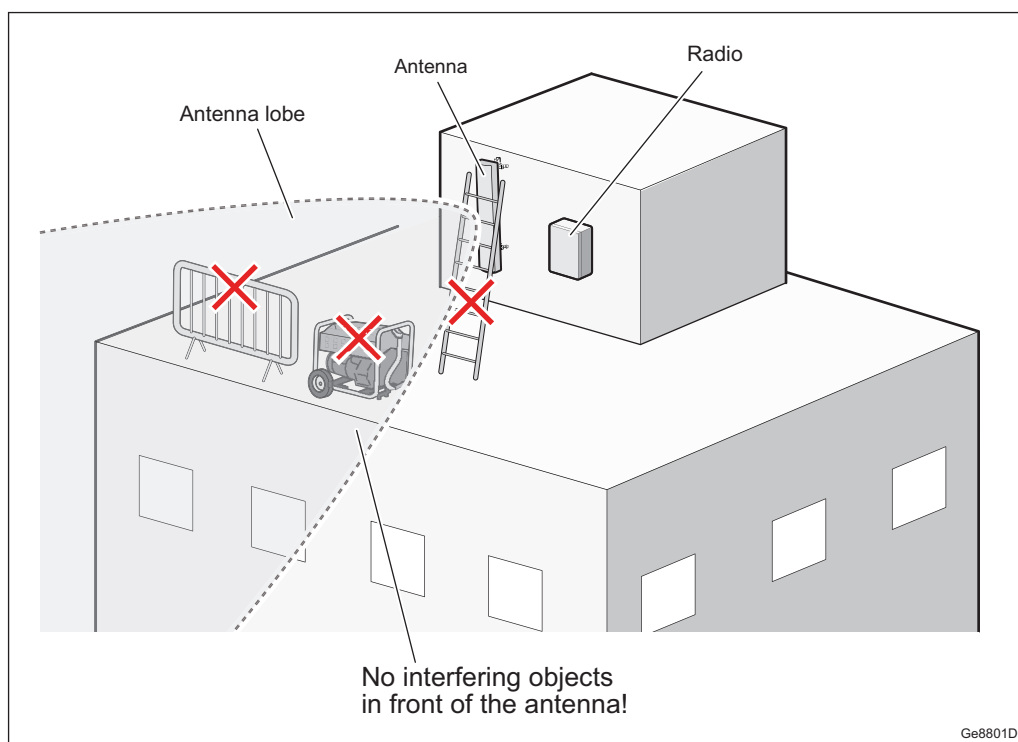
Although Ericsson declares this product suitable for most outdoor environments, this does not cover installations where the planned installation site for the unit is a potential microclimate location. Typical examples of these microclimate locations are sites where the products are not only exposed to the actual temperature, but also additional temperature as heat coming from dark-colored planes, for example, reflections from the floor or walls. The additional temperature can generate heat traps with temperatures up to 10°C higher than expected.

Avoid installing equipment in the following locations:

- Near the exhaust of the building ventilation system.
- Near the exhaust of the chimney.
- Opposite large surfaces made of glass or new concrete.
- Near overhanging structures such as roof overhangs.

Avoid radio interference by keeping the area directly in front of the antenna clear of the following:

- Metal surfaces or objects such as railings, ladders or chains
- Equipment generating electromagnetic fields, such as electric motors in air conditioners or diesel generators
- RBS equipment



3.1.3 Installations that Require Fan Unit

The fan unit must be used in all installation scenarios where the cables from the radio are not pointing directly downwards. Bookshelf installation requires a fan unit. The fan unit must also be used in extreme conditions, such as installations with poor ventilation or installations with heat traps.

3.1.4 Painting Disclaimer

Ericsson recommends to not paint the product as it can affect performance of the product.

Ericsson applies limitations to the warranty and service contract if the product is painted.

If the product is painted, the following commercial limitations apply:

- Failure modes directly related to overheating because of painting are not valid for repair within the scope of the warranty or standard service contract.
- Product failures related to paint contamination of components of the unit are not valid for repair within the scope of warranty or standard service contract.
- When a painted unit is repaired, it might be restored to the standard color before being returned to the market. It is not possible to guarantee that the



same unit is sent back to the same place. This is also valid for units repaired under a service contract.

- For repairs within the warranty period or a standard service contract, the customer is charged the additional costs for replacing all painted parts of the unit or the complete unit.

If adaptations are required, contact Ericsson for information.



3.2 Installation Alternatives

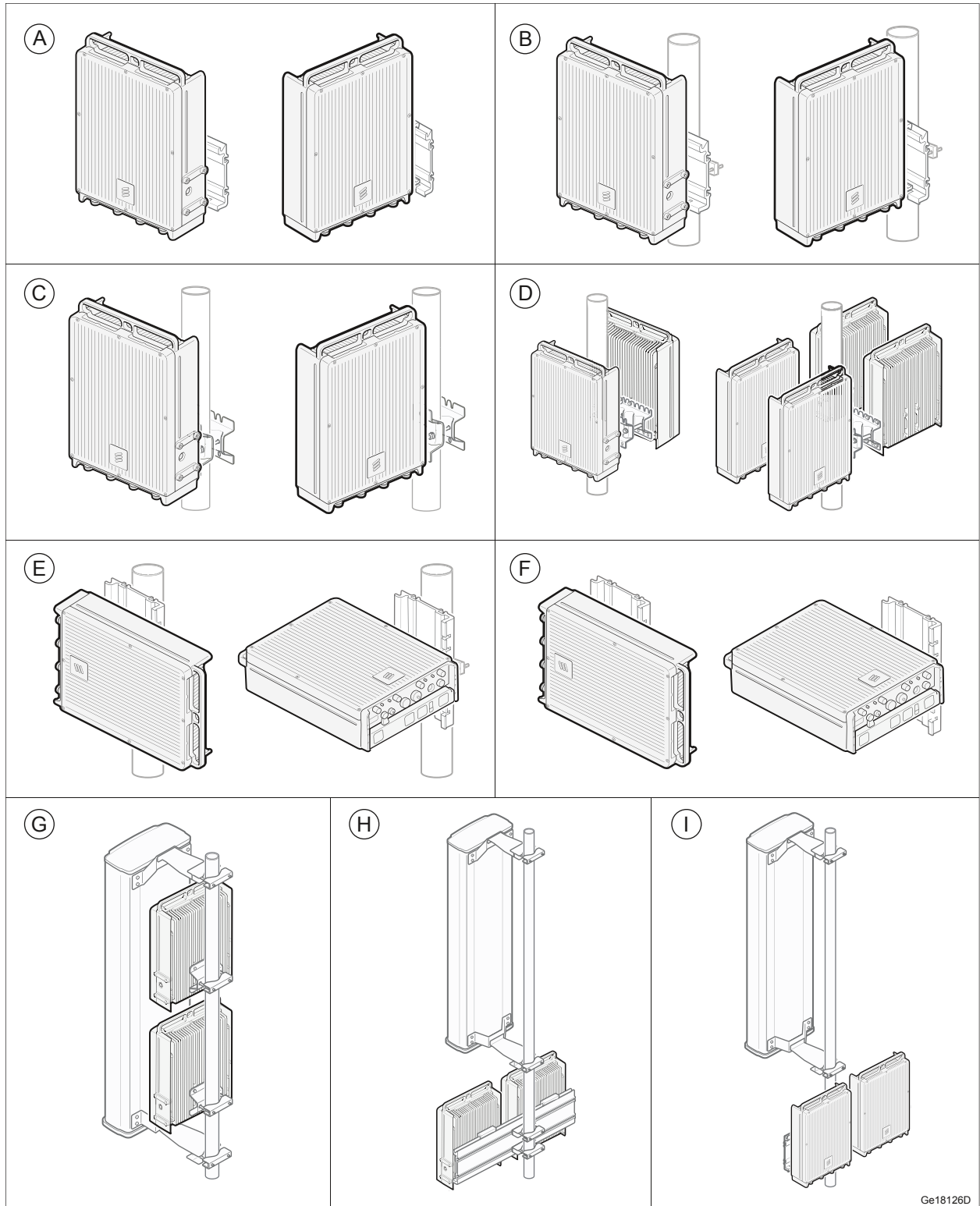


Figure 5 Installation Alternatives



Table 4 Key to Installation Alternatives

Installation Method	Description
A	Wall installation with rail
B	Pole installation with rail
C	Pole installation with Single or Dual ERS Bracket
D ⁽¹⁾	Pole installation with Multi ERS Bracket XL
E	Pole installation (Requires a fan unit is installed)
F	Wall installation (Requires a fan unit is installed)
G	Radio mounted behind the antenna
H	Radio mounted below the antenna
I	Radio mounted below the antenna

(1) For maximum numbers of bookshelf mounted radios, see [Table 5](#).

Table 5 Number of Bookshelf Mounted Radios on Multi ERS Bracket XL

Radio	Number of Bookshelf Mounted Radios per Side of the Multi ERS Bracket XL	
	Without Fan	With Fan
Radio 4480 44B0A 44B28 C	1 ⁽¹⁾	2
Radio 4480 44B1 44B3 C	2	2
Radio 4480 44B8 44B28 C	1 ⁽¹⁾	2

(1) Limited by necessary unit separation distance.

3.3 Space Requirements

3.3.1 Generic Requirements

Parts of the radio can attain high temperatures during normal operation. Therefore the radio must be installed in a classified service access area. Exception applies when the radio is installed at a height that is not reachable from ground level.



Allow a sufficient working space in front of the radio.

It is recommended that the radio is installed below, or behind the antenna. Do not install the radio closer than 25 m from the main lobe of its own antenna, or antennas belonging to other services or operators using the same site.

3.3.2

Pole or Mast Installation

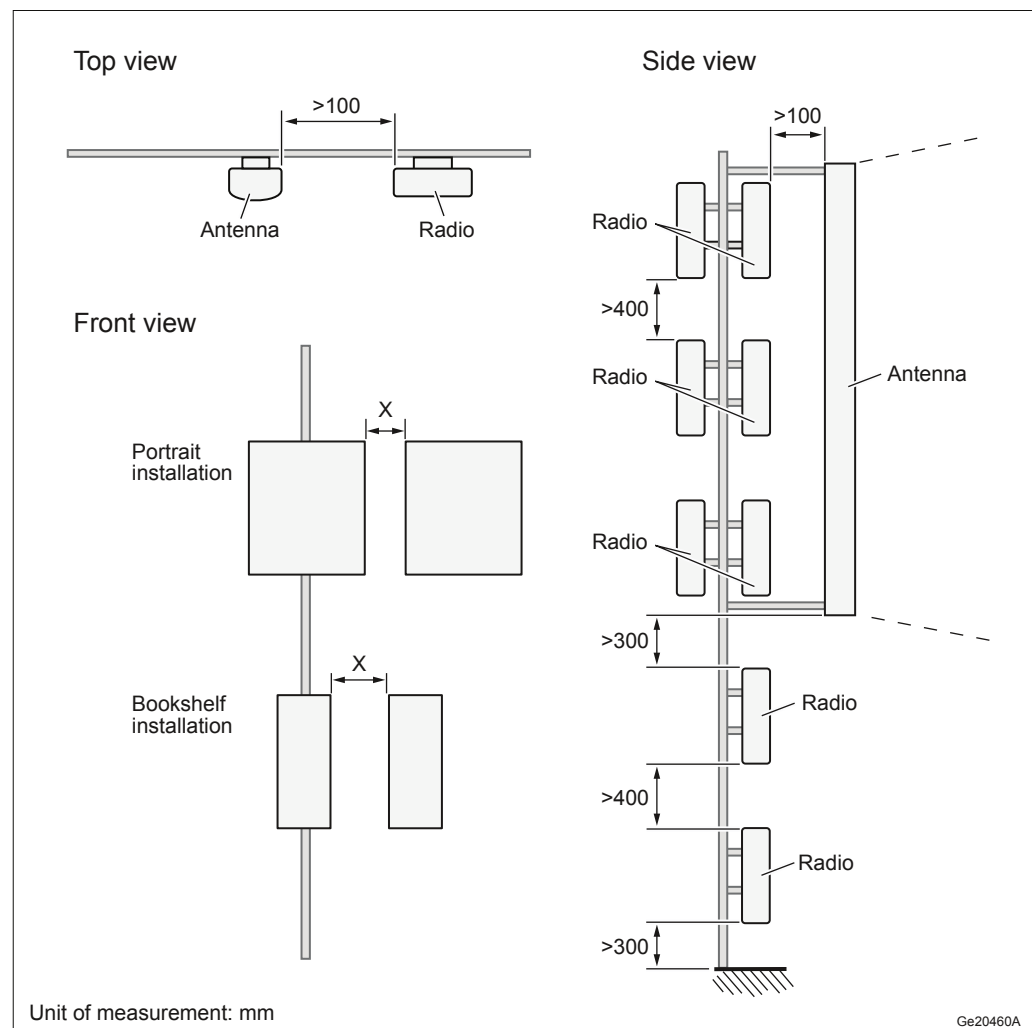


Figure 6 Radio Pole Installation Requirements

The minimum distance X depends on the mounting direction of radio unit and if the radio unit is installed with or without fan unit. For minimum space between radio units installed side by side, see [Table 6](#).

To ensure adequate airflow between the units, allow a minimum of 400-mm free space between radios vertically installed on a horizontal rail on a single pole, or a dual pole installation. Allow a minimum vertical distance of 300 mm between



radio and antenna, if installed above or below an antenna. The minimum horizontal distance between a radio mounted behind an antenna and the antenna is 100 mm. The minimum horizontal distance from the bottom of the radio to the floor is 300 mm.

Table 6 Space Requirements between Radio Units Installed Side by Side

Mounting Direction	Minimum Free Horizontal Space between Radio Units (X)	
	With Fan Unit	Without Fan Unit
Portrait	20 mm	20 mm
Bookshelf	40 mm	200 mm ⁽¹⁾

(1) An adjacent heat source with 500 W maximum heat dissipation requires minimum 100 mm free space between the radio unit and the heat source.

Note: A radio cannot be installed in the uppermost position of a pole or mast.

3.3.3 Rail Installation on Wall

This section describes the installation requirements when installing the radio on a wall.



3.3.3.1

Radio Installation on Outdoor Wall

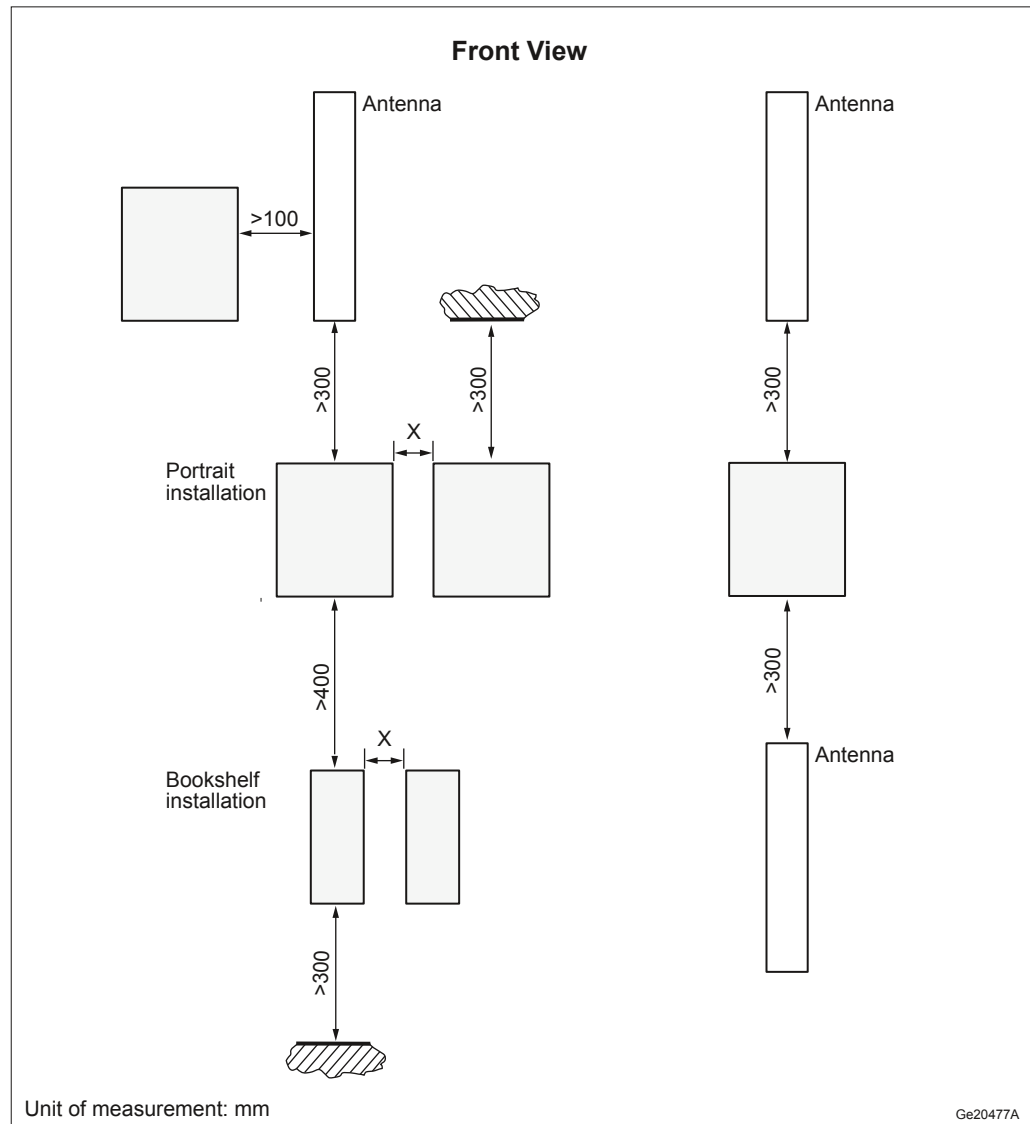


Figure 7 Radio Outdoor Wall Installation Requirements

The minimum distance X depends on the mounting direction of radio unit and if the radio unit is installed with or without fan unit. For minimum space between radio units installed side by side, see [Table 7](#).

To ensure adequate airflow between the units, allow a minimum of 400-mm free space between radios vertically installed on a horizontal rail on a wall. Allow a minimum vertical distance of 300 mm between radio and antenna, if installed above or below an antenna. The minimum distance from the bottom of the radio to the floor is 300 mm.



Allow a minimum of 300-mm free space to any overhanging roof or other structure that can obstruct airflow and create a heat trap.

Table 7 Space Requirements between Radio Units Installed Side by Side

Mounting Direction	Minimum Free Horizontal Space between Radio Units (X)	
	With Fan Unit	Without Fan Unit
Portrait	20 mm	20 mm
Bookshelf	40 mm	200 mm ⁽¹⁾

(1) An adjacent heat source with 500 W maximum heat dissipation requires minimum 100 mm free space between the radio unit and the heat source.

3.3.3.2

Radio Installation on Indoor Wall

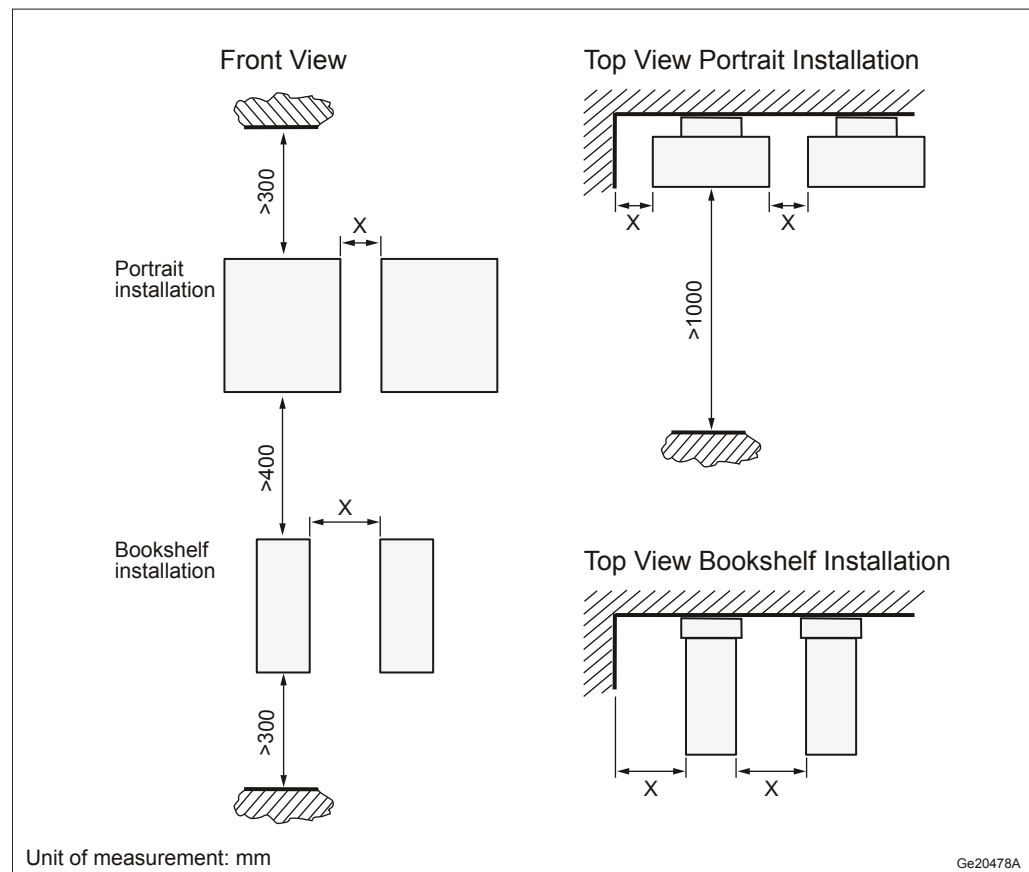


Figure 8 Radio Indoor Wall Installation Requirements

The minimum distance X depends on the mounting direction of radio unit and if the radio unit is installed with or without fan unit. For minimum space between radio units installed side by side, see [Table 8](#).



To ensure adequate airflow between the units, allow a minimum of 400-mm free space between radios vertically installed on a horizontal rail on a wall. The minimum distance from the bottom of the radio to the floor is 300 mm.

Allow a minimum of 300-mm free space to the ceiling or any overhanging structure that can obstruct airflow and create a heat trap.

Table 8 Space Requirements between Radio Units Installed Side by Side

Mounting Direction	Minimum Free Horizontal Space between Radio Units (X)	
	With Fan Unit	Without Fan Unit
Portrait	40 mm	40 mm
Bookshelf	40 mm	200 mm ⁽¹⁾

(1) An adjacent heat source with 500 W maximum heat dissipation requires minimum 100 mm free space between the radio unit and the heat source.

3.4 Acoustic Noise

The radio sound pressure level is lower than 28 dBA at 1-meter distance for hemispherical distribution without fan.

With the fan, the acoustic noise is ambient temperature dependent, as listed below.

Table 9 Maximum Sound Pressure Level (dBA) for Radio 4480 with Fan

Temperature (°C)	Radio 4480 Sound Pressure Level (dBA) at 1-meter distance ⁽¹⁾
+10	52
+15	52
+20	52
+25	55.5
+30	57.5
+40	63
+45	64.5
+55	73.5

(1) The sound pressure level is measured at hemispherical distribution.

3.5 Environmental Characteristics

This section contains operating environment data for the radio.



3.5.1 Operating Environment

The following are the values for the normal operating environment of the radio:

Table 10 Operating Environment

Description	Value
Temperature ⁽¹⁾	-40 to +55 °C
Solar radiation	≤ 1,120 W/m ²
Relative humidity	5–100%
Absolute humidity	0.26–40 g/m ³
Maximum temperature change	6.0 °C/min
Maximum wind load at 42 m/s (pole installed single case)	B0A B28 and B8 B28: 822 N (front), 301 N (side) B1 B3 : 320 N (front), 90 N (side)

(1) Depending on installation scenario, traffic load, and configuration, the product can, in the highest 10 °C temperature range, temporarily reduce the output power. This depends on the durations of the high ambient temperature.

3.5.2 Heat Dissipation

The radio is convection cooled and designed for outdoor installation.

Avoid indoor installation in a room without adequate ventilation and cooling.

Table 11 Radio Heat Dissipation

Unit	Output Power (W)	Maximum Heat Dissipation (kW)
Radio 4480 44B0A	4 × 80	0.9
44B28 C	4 × 100	1.05
Radio 4480 44B1 44B3 C		
Radio 4480 44B8 44B28 C		

3.5.3 Vibration

This section describes the radio tolerance to vibrations. The radio operates reliably during seismic activity as specified by test method IEC 60068-2-57 Ff.

Maximum level of Required Response Spectrum (RRS)	50 m/s ² within 2–5 Hz for DR=2%
Frequency range	0.3–50 Hz



Time history signal

Verteq II

The radio operates reliably during random vibration as specified by test method IEC 60068-2-64 Fh

Random vibration, normal operation

 $0.3 \text{ m}^2/\text{s}^3$

3.5.4

Materials

All Ericsson products fulfill the legal and market requirements regarding the following:

- Material declaration
- Materials' fire resistance, components, wires, and cables
- Recycling
- Restricted and banned material use

3.6

Power Characteristics

This section describes the power supply requirements, power consumption, and fuse and circuit breaker recommendations for the radio.

3.6.1

DC Power Characteristics

The power supply voltage for the radio is –48 V DC.

Table 12 Radio DC Power Supply Requirements

Conditions	Values and Ranges
Rated voltage	–48 V DC
Normal voltage range ⁽¹⁾	–36.0 to –58.5 V DC
Abnormal voltage range	0 to –36.0 V DC and –58.5 to –60 V DC

(1) The radio prevents startup until a stable input level is reached, this threshold is defined as cold startup voltage at –46 V DC.

Fuse and Circuit Breaker Recommendations

The recommendations given in this section are based on peak power consumption and give no information on power consumption during normal operation.



The recommended melting fuse type is gG-gL-gD in accordance with IEC 60269-1. Circuit breakers must comply with at least Curve 3 tripping characteristics, in accordance with IEC 60934.

The radio has a built-in Class 1 (Type 1) SPD to protect the equipment if there is lightning and network transients. The recommended fuse or circuit breaker rating is therefore dimensioned not to trip the fuse or circuit breaker if there is most SPD operation. The minimum fuse rating can only be considered if it is accepted that fuses or circuit breakers trip in such situations.

Table 13 External Radio Fuse and Circuit Breaker Recommendations

Unit (DC Powered)	Output Power	Maximum Load Current at -36 V DC	Maximum Allowed Fuse Rating ⁽¹⁾
Radio 4480 44B0A 44B28 C	4 × 80 W	32 A	50 A
	4 × 100 W	38 A	50 A
Radio 4480 44B1 44B3 C	4 × 80 W	32 A	50 A
	4 × 100 W	38 A	50 A
Radio 4480 44B8 44B28 C	4 × 80 W	32 A	50 A
	4 × 100 W	38 A	50 A

(1) The maximum allowed fuse rating must (with a certain safety margin 10–20%) be larger than the maximum load current for reliable operation. However, it must not be larger than the next or nearest higher fuse or circuit breaker standard value to minimize the cable cross-section area and at the same time fully comply with relevant safety standards.

3.6.2 Power Consumption

For information on power consumption, see [Power Consumption Calculations](#).

3.7 System Characteristics

This section describes the system characteristics of the Radio System.

3.7.1 RF Electromagnetic Exposure

For general information on RF EMF exposure, see [Radio Frequency Electromagnetic Fields](#).

The tables list the compliance boundaries (exclusion zones), outside of which the RF EMF exposure from Radio 4480 is below the limits applicable in:

— EU (1999/519/EC, 2013/35/EU, EN 50385) [Table 14](#)



Table 14 Dimensions of the Box-Shaped Compliance Boundary for General Public (GP) and Occupational (O) Exposure Applicable in the EU and Markets Employing the ICNIRP RF Exposure Limits (Including 0.5 dB Transmission Loss and 0.6 dB Output Power Tolerance)

Mode and Output Power for Radio 4480				Dimensions of the Box-Shaped Compliance Boundary ⁽¹⁾⁽²⁾ (m)							
				Distance in Front of Antenna		Width		Height		Distance Behind Antenna	
Band	Standard ⁽³⁾	Maximum Nominal Output Power from the Radio	IEC 62232 Installation Class	GP	O	GP	O	GP	O	GP	O
B0A + B28	G/W/L/I/N (B0A) + L/I/N (B28)	4 × 60 W (B0A) + 4 × 40 W (B28)	E+	25.8	11.6	21.3	9.5	4.0	2.5	< 0.1	< 0.1
B1 + B3	W/L (B1) + G/L (B3)	4 × 50 W (B1) + 4 × 50 W (B3)	E+	19.6	8.6	15.5	7	4.5	2.1	< 0.1	< 0.1
B1 + B3	W/L (B1) + G/L (B3)	4 × 40 W (B1) + 4 × 60 W (B3)	E+	19.5	8.6	15.5	6.9	4.7	2.1	< 0.1	< 0.1
B1 + B3	W/L (B1) + G/L (B3)	4 × 60 W (B1) + 4 × 40 W (B3)	E+	19.6	8.6	15.7	7	4.8	2.2	< 0.1	< 0.1
B8 + B28	G/W/L/I/N (B8) + L/I/N (B28)		E+	25.8	11.6	21.3	9.5	4.0	2.5	< 0.1	< 0.1

(1) The compliance boundaries for B0A B28 and B8 B28 are determined for maximum output power with transmission loss and power tolerance included using the antenna KRE 101 2325/1 for an electrical tilt of 0°.

(2) The compliance boundaries for other dual bands are determined for maximum output power with transmission loss and power tolerance included using the antenna KRE 101 2294/1 and 2 degrees of electrical down tilt.

(3) G = GSM, W = WCDMA, L = LTE, N = NR, and I = NB-IoT.

3.7.2 Software

For information on software dependencies, see [Radio Software Support](#).

3.7.3 Radio Configurations

For information about available radio configurations, see [Radio Node Configurations](#).

3.7.4 VSWR Limitations

When a radio operates with WCDMA on two bands and is connected to a DUW, it is not possible to distinguish VSWR between the bands. Instead, the worst case (worst band) is reported.



4 Hardware Architecture

For a description of the supported radio configurations, refer to [Radio Node Configurations](#).

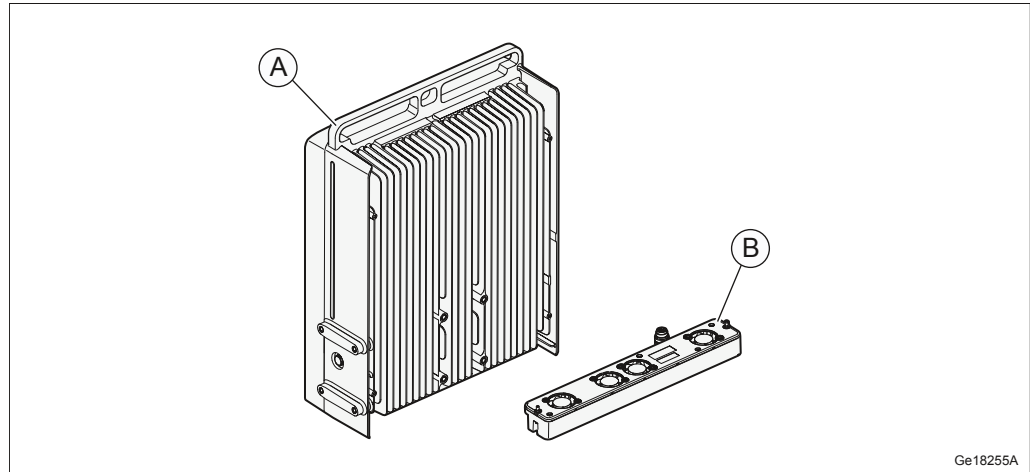


Figure 9 Radio Components

Table 15 Key to Radio Components

Position	Component
A	Radio
B	Fan unit

4.1 Radio Overview

The radio contains most of the radio processing hardware. The following sections describe the components inside the radio.

4.1.1 TRX

The Transmitter and Receiver (TRX) provides the following:

- Analog/Digital (A/D), Digital/Analog (D/A) conversion
- Channel filtering
- Delay and gain adjustment



- Digital predistortion
- RF modulation and demodulation
- Optical cable interface termination
- Two receivers for RX diversity
- RET modem (the antenna system communication link)

4.1.2 Power Amplifier

The MCPA is the linear power amplifier for the RF carriers. The radio has two MCPAs per RF port.

4.1.3 Filter Unit

The Filter Unit consists of band-pass filters.

In the radio, the Filter Unit also provides the following:

- Power and supervision for the TMA, or the RIU
- VSWR supervision
- TX and RX combining and power splitting

4.1.4 DC SPD

An SPD protects the DC power input from lightning currents.

4.1.5 ALD (RET) SPD

An SPD provides overvoltage or overcurrent protection for the ALD (RET) port.

4.1.6 External Alarm SPD

An SPD provides overvoltage or overcurrent protection for the external alarm ports.

4.1.7 RF SPD

An SPD provides overvoltage or overcurrent protection for the RF port.



4.2 Fan Unit (Optional)

The fan unit is DC-powered (24 V DC) and controlled through the radio external alarm port.

4.3 Optical Indicators and Buttons

The radio is equipped with optical indicators that show system status. The radio optical indicators are located under the maintenance cover.

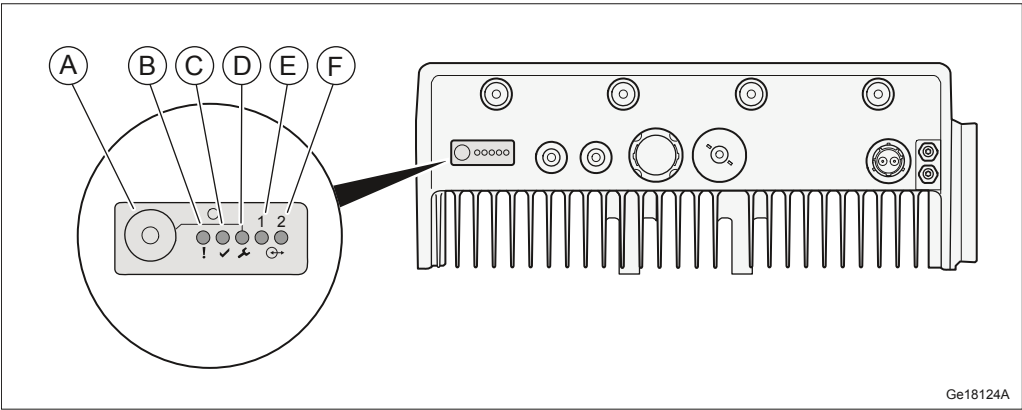


Figure 10 Radio Optical Indicators and Buttons

Table 16 Description of Radio Optical Indicators and Buttons

Position	Name	Marking
A	Maintenance button	—
B	Fault	!
C	Operational	✓
D	Maintenance	🔧
E	Interface 1	🔌
F	Interface 2	

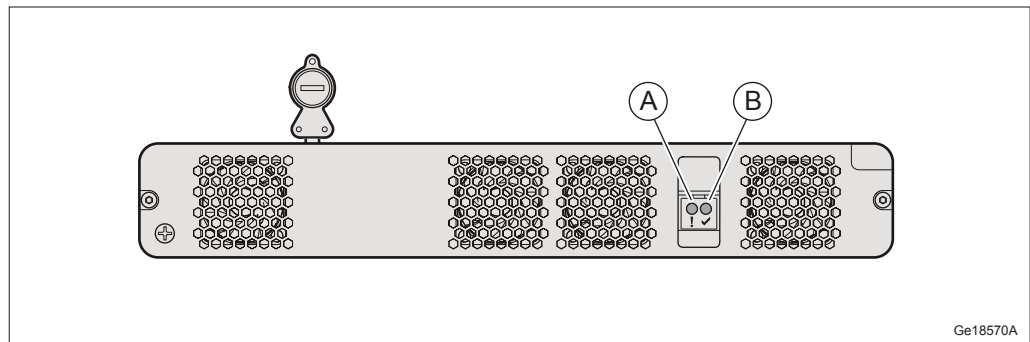


Figure 11 Fan Unit Optical Indicators

Table 17 Description of Fan Unit Optical Indicators

Position	Name	Marking
A	Fault	!
B	Operational	✓

For more information about the behavior of the optical indicators and the maintenance button, refer to [Indicators, Buttons, and Switches](#).



5 Connection Interfaces

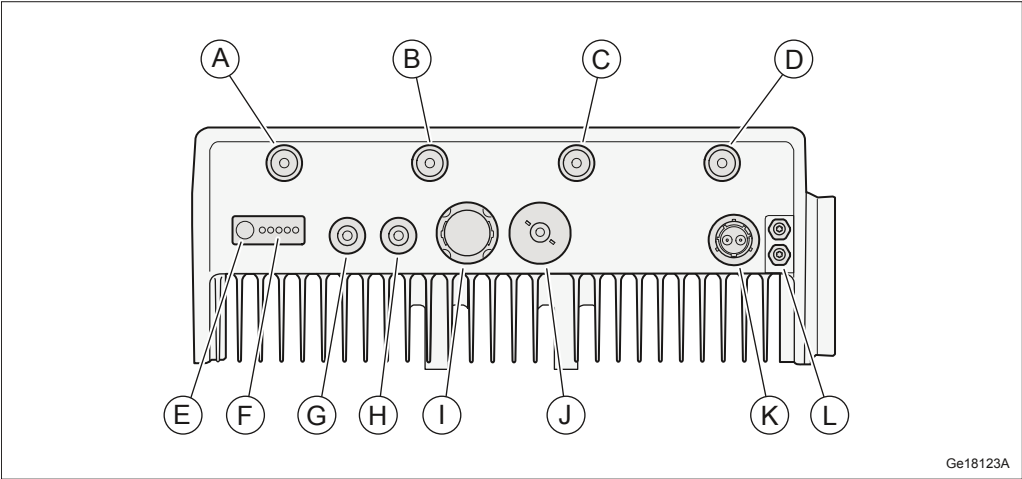
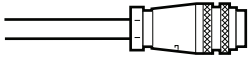
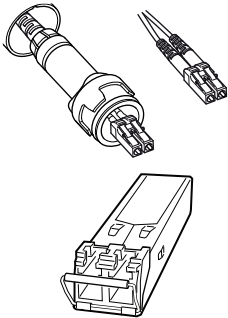

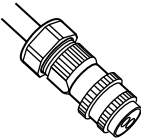




Figure 12 Radio 4480 Connection Interfaces

Table 18 Radio Connection Interfaces

Position	Description	Marking	Connector Types	Cable Illustration
A	Antenna A	A TxRx	4.3–10	
B	Antenna B	B TxRx		
C	Antenna C	C TxRx		
D	Antenna D	D TxRx		
E	Maintenance button	—	—	—
F	Optical indicators		—	—
G	Following functions supported: — Fan unit power supply and control — EC-light — External alarms Note: If using more than one function, a Y-cable must be connected to the DIN 14 connector for each added function.		DIN connector, 14 pin	



Position	Description	Marking	Connector Types	Cable Illustration
H	ALD (used for a RET unit for example)	ALD	DIN connector, 8 pin	
I	Optical cable 1	↻ 1	LC (On SFP+) with support for FullAXS	
J	Optical cable 2	↻ 2		
K	-48 V DC power supply	-48 V 	Power connector	
L	Grounding		2 × 6 mm dual lug	

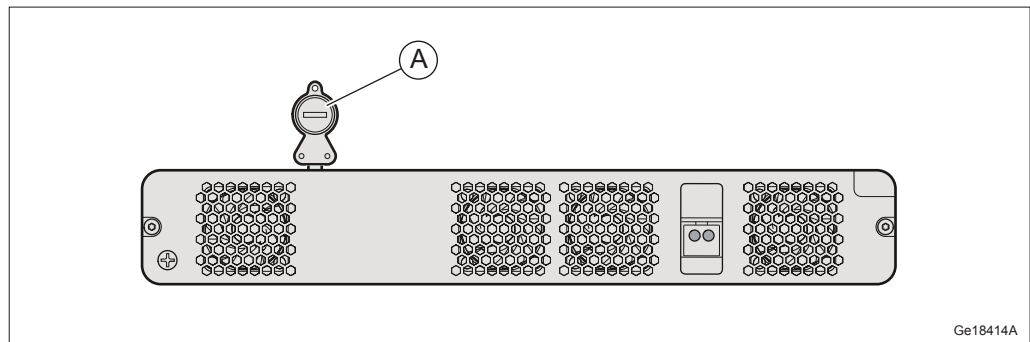


Figure 13 Fan Unit Connection Interface

Table 19 Fan Unit Connection Interface

Position	Description
A	External alarm



5.1 Antenna Interface

The antenna interfaces provide connections for the radio to antennas. RF cables connect the radio to the antenna. The antenna interfaces also provide support for control and power to ALD.

Table 20 Radio Antenna Connection Interface Characteristics

Connector Type	RF Cable Type	Cable Connector Type
4.3-10, insert-receiver type	50 Ω coaxial	4.3-10 type

Table 21 Radio Antenna Cable Connectors

Radio Connectors	Antenna Connectors
A TxRx	TX/RX
B TxRx	TX/RX
C TxRx	TX/RX
D TxRx	TX/RX

5.2 Maintenance Button

The maintenance button is at the left of the **!** symbol.

For more information about the maintenance button, see [Indicators, Buttons, and Switches](#).

5.3 Optical Indicators

Optical indicators show the system status.

For more information about the optical indicators, see [Indicators, Buttons, and Switches](#).

5.4 Ext Alarm Interface

Two external alarms can be connected to the radio external alarm port.

The fan unit is DC-powered (+24 V DC) and controlled through the radio external alarm port.



5.5 ALD Ctrl Interface

The ALD control (ALD Ctrl) connects an ALD (RET) cable to the radio for antenna system communication. The interface supports 2.5 A DC.

ALD control is also supported on Antenna Interface connectors.

5.6 Interface for Optical Cable to Main Unit

The ↻ 1 and ↻ 2 interfaces provide connections to optical cables for traffic and timing signals between the radio and the main unit. An SFP+ is used to connect the optical cable to the radio.

Note: The radio uses SFP+ modules for optical transmission and optical radio interfaces on Data 1 (optical cable 1) and Data 2 (optical cable 2).

Only use SFP+ modules approved and supplied by Ericsson. These modules fulfill the following:

- Compliance with Class 1 laser product safety requirements defined in standard IEC 60825-1.
- Certification according to general safety requirements defined in standard IEC/EN 62368-1.
- Functional and performance verified to comply with Radio System specifications.

Recommended SFP+ modules are obtained from the product packages for the Radio System and the Main Remote Installation products. For more information about SFP modules, see [SFP Module Selector Guide](#) and [Site Installation Products Overview](#).

5.7 –48 V DC Power Supply Interface

The –48 V DC power connection is done through a connector with a 3-wire (DC-I) connection or a connector with a 2-wire (DC-C) connection.

The power cable conductor has a wire for both the 0 V conductor and a wire for the –48 V DC conductor.

All cables must be shielded. The shielding must be properly connected both to the power connector and to the grounding interface in the power supply equipment, otherwise the radio unit over voltage and lightning protection does not work properly.



Power Cable Dimensions and Cable Length

For more information on –48 V DC power cable dimensions and cable length, see [Site Installation Products Overview](#), excluding radio units with R-state R1 listed below.

- Radio 4480 44B0A 44B28 C
- Radio 4480 44B1 44B3 C
- Radio 4480 44B8 44B28 C

To find which power cable length to use for the excluded radio units, see [Table 22](#).

Table 22 Power Cable Length

Cross-Sectional Area of Cable (mm ²)	Maximum Cable Length (m)	
	4 x 80 W	4 x 100 W
6	25	20
10	40	35
16	65	55
25	100	80

Power Cable Connector

To find which connector or junction box to use, see [Table 23](#).

Table 23 –48 V DC Power Supply Connector or Junction Box

Cross-Sectional Area of Each Conductor (mm ²)	Connector or Junction Box
6	Use one of the following power connector models: <ul style="list-style-type: none">— For 3-wire (DC-I)<ul style="list-style-type: none">• RNT 447 36/01• RNT 447 38/02— For 2-wire (DC-C)<ul style="list-style-type: none">• RNT 447 37/01
10	Use one of the following power connector models: <ul style="list-style-type: none">— For 3-wire (DC-I)<ul style="list-style-type: none">• RNT 447 36/01



Cross-Sectional Area of Each Conductor (mm ²)	Connector or Junction Box
	<ul style="list-style-type: none"> • RNT 447 38/02 • RNT 447 38/03 — For 2-wire (DC-C) <ul style="list-style-type: none"> • RNT 447 37/01 • RNT 447 39/01
16	Use one of the following power connector models: <ul style="list-style-type: none"> — For 3-wire (DC-I) <ul style="list-style-type: none"> • RNT 447 36/01 • RNT 447 38/03 — For 2-wire (DC-C) <ul style="list-style-type: none"> • RNT 447 37/01 • RNT 447 39/01
25	Used with junction box NTB 101 75/1

5.8 Grounding Interface

The radio must be grounded to protect it from overvoltage and lightning strikes. The grounding interface on the radio accepts a 2 × 6 mm dual lug on a coated cable.

For more information about grounding principles, see [Grounding Guidelines for RBS Sites](#).

5.9 Optional Equipment Interfaces

The equipment presented in this section is optional and can be ordered separately.

5.9.1 Fan Unit

The fan is a replaceable unit.



6 Standards and Regulations

This section presents a brief overview of standards, regulatory product approval, and declaration of conformity for the radio.

Declaration of Conformity

"Hereby, Ericsson AB, declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU and 2011/65/EU."

6.1 Regulatory Approval

The Radio System complies with the following market requirements:

- European Community (EC) market requirements, Radio Equipment Directive (RED) 2014/53/EU

CE (Class 2 equipment). Restrictions to use the apparatus may apply in some countries or geographic areas. Individual license to use the specific radio equipment may be required.

The apparatus may include radio Transceivers with support for frequency bands not allowed or not harmonized within the EC.

- Products containing radio equipment outside North America and in countries not recognizing the CE-mark may be labeled according to national requirements or standards.

6.1.1 Environmental Standards Compliance

The product complies with the following environmental standard:

Europe

- Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2011/65/EU)

6.1.2 Safety Standards Compliance

In accordance with market requirements, the Radio System complies with the following product safety standards and directives:

**Europe**

- EN 50385
- EN 62368-1

6.1.2.1 Outdoor specific requirements

The Radio complies with the following outdoor specific requirements:

Europe

- EN 60529 (IP65)
- EN 60950-22

6.1.3 EMC Standards Compliance

The Radio System complies with the following Electromagnetic Compatibility (EMC) standards:

Europe

- ETSI EN 301 489-1
- ETSI EN 301 489-50

6.1.4 Radio Standards Compliance

The Radio System complies with the following radio standards:

Europe

- ETSI EN 301 908-1
- ETSI EN 301 908-14
- ETSI EN 301 908-18
- ETSI EN 301 502

6.1.5 Marking

To show compliance with legal requirements, the product is marked with the following labels:



Europe

— CE mark

The labels are hidden when the fan unit is installed. To make the labels visible, remove the fan unit and reinstall the fan unit according to the instructions. [Figure 14](#) shows where the labels are placed on the radio.

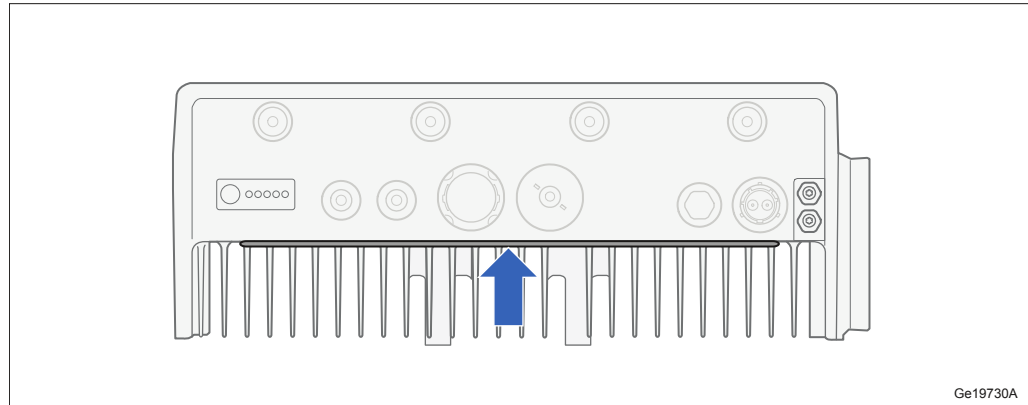


Figure 14 Legal requirement labels

6.2 Other Standards and Regulations

The standards and regulations in this section are not regulatory requirements.

6.2.1 Spare Parts

The product adheres to the Ericsson Serviceability and Spare Part Strategy.

6.2.2 Surface Quality

The surface quality of the radio is according to Ericsson standard class A5 for the top, front, side of the heat-sink, and side covers, and A6 for the fins on the heat-sink.

6.2.3 Vandal Resistance

Unauthorized access is not possible without damaging the tamper proof warranty seal.