Designation	Description	Standards	Observations
Physical interfaces: ATM network interface optical			
Connector type	SC/PC socket		1300 nm 1 for each direction
Media	Single-mode Fiber (SMF; 9/125 µm)		1300 nm 1 for each direction
Environment	Laser product Class 1		
Bit rate Nominal Timing	 155.520 Mbps ± 20 ppm		Free run mode, i.e. under synchronization source fault conditions
Line coding	NRZ		
Jitter	Refer to standard masks		
Signalling	UNI 4.0		
Physical interfaces: E3 G703 (34 Mbps) (75 Ω)			
Connector type 75Ω interface	 1,6/5,6		
Media 75Ω interface	 Coaxial cable		
Environment Safety EMC/EMI			
Bit rate Nominal Tolerance	 34.368 Mbps ± 20 ppm		
Line coding	HDB3		
Jitter Input tolerated jitter Output residual jitter	Refer to standard masks		

Designation	Description	Standards	Observations
Physical interfaces: E1, TDM circuit interface (75/120 Ω)			
Connector type			
DBS Standard	Sub-D/37 pins/fem.		8 connectors; 8 TDM interfaces per connector
75Ω interface	BNC or 1,6/5,6		1 for each direction
120Ω interface	STP specific connector		1 for each direction
Media			
75Ω interface	Coaxial cable		1 pair for each direction
120Ω interface	STP		1 pair for each direction
Environment			
Safety			
EMC/EMI			
Bit rate			
Nominal	2.048 Mbps		Synchronous stream
Tolerance	± 50 ppm		Under synchronization source fault conditions
Line coding	HDB3		
Jitter	Refer to standard masks		
Input tolerated jitter			
Output residual jitter			

Designation	Description	Standards	Observations
Physical interfaces: T1 , TDM circuit interface (100 Ω)			
Connector type 100Ω interface	Sub-D 37 points		
Media 100Ω interface	Shielded twisted Pair		
Bit rate Nominal Tolerance	1.544 Mbit/s ± 32 ppm		
Line coding	AMI or B8ZS		Software configurable
Jitter Input tolerated jitter Output residual jitter	Refer to standard masks		
Environmental specifications			
DBS Classification	-		-
Operating temperature	-5°C to +55°C		-
Relative humidity at 30°C	93%		

2.12.3– Common characteristics of the X-Pol RBS and DBS

Designation	Description	Standards	Observations
Logistics			
Transport	Public transport: class 2.3		-
Ambient temperature	-40°C to+ 70°C		-
Relative humidity at 55°C	95%		-
Storage	Class 1.2		storage premises sheltered from the weather, without air-conditioning
Ambient temperature	-40°C to + 70°C		-

Designation	Description	Standards	Observations
Relative humidity at 30°C Condensation	100% 90 to 100 %		-

2.13– Equipment power consumption

2.13.1– X-Pol RBS

The typical power consumption of the **X-Pol RBS** is **31 W** and **X-Pol RBS Tx** — **50W**, **X-Pol RBS Rx** — **24W**.

2.13.2– DBS

DBS configuration type	Typical power consumption
basic configuration (1 sector, 1+0)	130 W
per additional sector	100 W
1+1 redundancy (per sector)	100 W
ANT board (per board)	25 W
TNT board (per board)	30 W

3 – Installation of the Base Station

3.1 – Equipment delivery

When you receive the equipment in its packaging:

- check the condition of the packaging,
- if damaged, make your reservations known to the carrier without delay.

3.1.1 – Labels on the equipment and the packaging

Figures given on the examples below are not contractual.

The RBS labels are affixed to the packaging and to the equipment to indicate its contents.

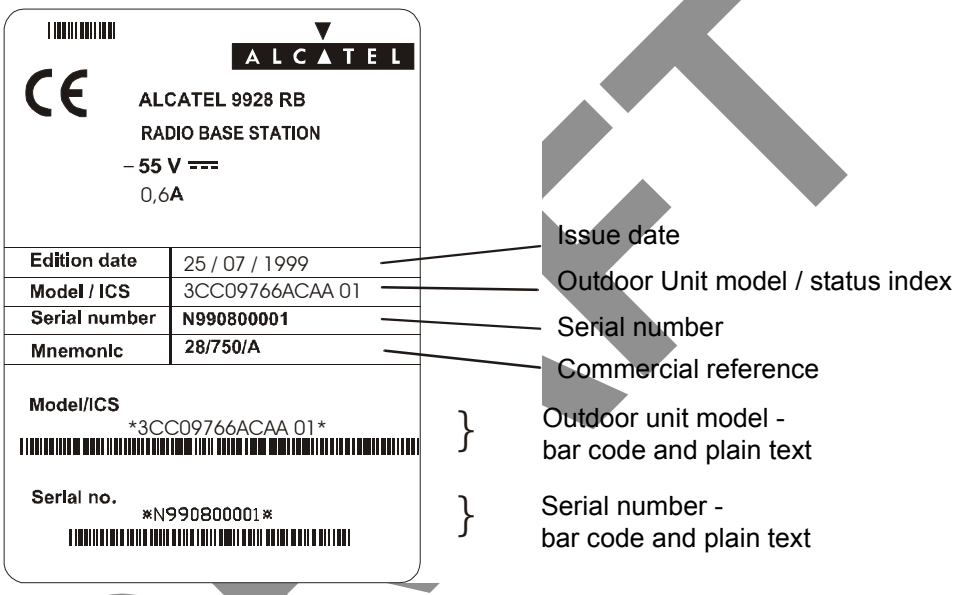
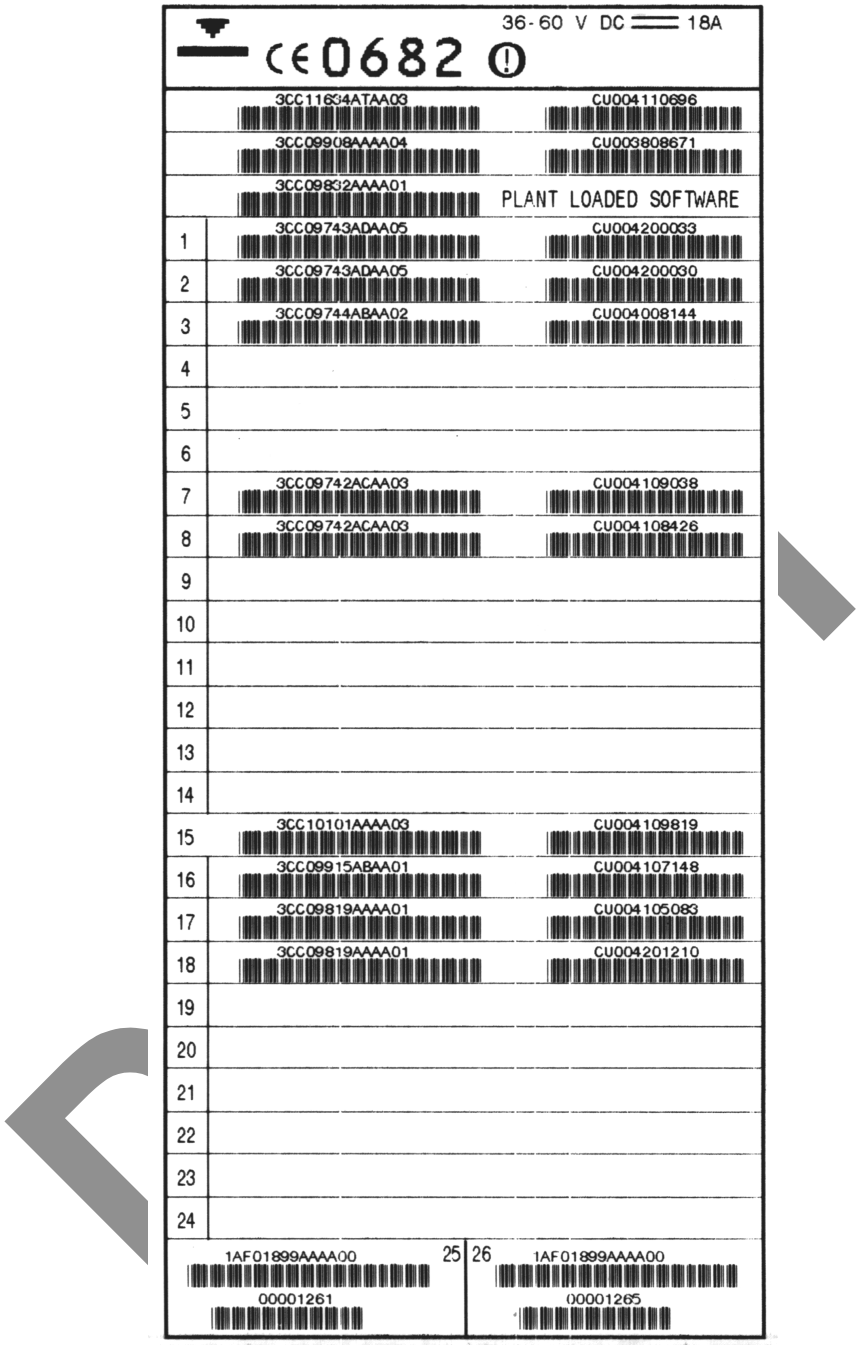


Figure 83 – Example of a label for the RBS unit

The DBS labels are fixed to the packaging to indicate its contents on leaving the factory.These labels are not affixed to the equipment because the DBS configuration changes in accordance with the site modifications.



Note: to know the place of the corresponding elements, refer to § 3.5.6 – Place of the board into the rack

Figure 84 – Example of a label for the DBS chassis

X-Pol RBS Tx **X-Pol RBS Rx**

Figure 85 – Unpacking X-Pol RBS

Unpacking the DBS chassis

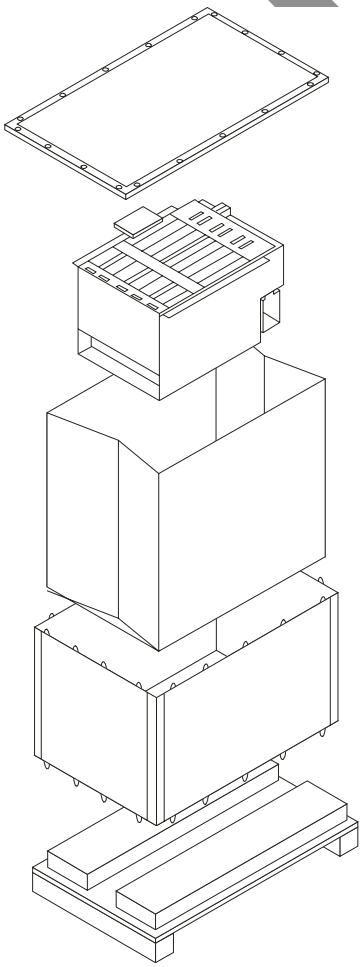


Figure 86 – Unpacking the DBS chassis

3.1.1.1 – Content of boxes

EQUIPMENT	CONTENTS
X-Pol RBS Tx/X-Pol RBS Rx	1 assembly

EQUIPMENT	CONTENTS
X-Pol RBS Tx/X-Pol RBS Rx antenna	1 antenna assembly

EQUIPMENT	CONTENTS
DBS chassis	1 chassis containing the electronic boards according to the client configuration
	cables (for IBS board interface, N panel), in accordance with the site configuration
	fiber optic jumpers, in accordance with the site configuration
	2 fiber optic cable winding cassettes
	1 set of screws to install the rack into the chassis

EQUIPMENT	CONTENTS
DC/DC power supply	2 DC/DC power supply units

EQUIPMENT	CONTENTS
Optiona Standard 19" rack	1 rack with removable top cover and adjustable feet

3.1.1.2 – Storage

If the installation is not to be carried out immediately, the type of packaging will determine the equipment storage conditions:

- the cardboard boxes should be warehoused indoors, in a well-ventilated and dry space,
- the wooden or laminated crates may be stored outdoors, provided that they are protected from the rain and direct sunlight.

3.2 – Installing the equipment

3.2.1 – Information required for installation

Appendix 1 – Installation sheet contains a sheet for you to complete, that compiles all the general information needed for the installation procedure.

3.2.2 – Precautions

Installation is designed to meet all requirements concerning electromagnetic compatibility and safety.

The performance of the equipment depends on installation practices (cable installation, ground connections, etc.) which should be based on best trade practices and which may be degraded if theses pratices are not respected.

3.2.3 – Tools required

The installation team must possess a standard installation toolkit (containing, in particular: drill, drill bits, soldering iron, cable tie pliers, terminal pliers).

The list of tools required for the mechanical installation of the equipment is given below:

Tool	Use
No. **6** Allen wrench (for 8 mm screw)	Antenna alignment
16/17 mm box wrench and flat wrench	Used for pole mounting and for fine adjustment of the antenna and various tightening operations
16/17 mm Torque wrench	Used for pole mounting and various tightening operations
20 mm flat wrench	For attaching the "N" coaxial connectors
Compax "Mars Actel OSA3" insertion and extraction tool	Wiring the COMPAX (mars actel cad) terminal strips
Essential compass and inclinometer (not supplied)	Pointing the antenna
5 mm Allen key (for M6 screw)	For mounting the antenna
10 mm flat wrench	For fixing the ground terminal
8 mm Allen key (for M10 screw)	For tightening the different parts of the pole mounting

Tool	Use	Industrial Code
Crimping tool	Sub-D connectors crimping	7390YTB001

To get the commercial codes of these items, please consult *Appendix 5 – Correspondence between commercial codes and industrial codes relating to the BS* which gives the connection between industrial and commercial codes.

3.3 – Installation of outdoor equipment

Considerations

- Outdoor equipment installation involves:
  - installation of the mechanical system (also called "pole mounting" system) which supports the X-Pol RBS and facilitates antenna alignment,
  - installation of the X-Pol RBS assembly and its antenna,
  - installation of the connection cable connecting the X-Pol RBS to the DBS rack.
- Outdoor equipment installation should guarantee a precise and fixed antenna pointing.
- The X-Pol RBS location and its antenna orientation should arise from a planning analysis in order to optimize the sector coverage. These elements must be imperatively known with precision by the installation staff.
- Antenna orientation is carried out according to geometric criterion (using compass and inclinometer).

– All the outdoor equipment assemblies are designed for installation without any particular protection. However, the following recommendations must be respected:
  - make sure that the reception metallic structure has a perfect stability,
  - do not install the equipment below bird nesting areas,
  - do not attach the equipment to chimneys which give off fat deposits, dust and other aerosols which are liable to be deposited on the equipment,
  - do not install the equipment in proximity to sources of heat,
  - do not place the equipment in proximity to corrosive gas outputs,
  - do not place the equipment below roof run-offs not equipped with guttering (high risk of microwave short-circuit),
  - do not attach the equipment to a structure prone to vibrations,
  - do not cross the antenna field.

– Two types of installation are possible:

1. installation on a tube or pole, using threaded U-bolts and nuts.

Note: *the tube selected should be sufficiently rigid to resist vibrations that may give rise to antenna misalignment.*

3.3.1 – Spatial separation for Base Station Antennas

In band-plans where the uplink and downlink frequency separation is large, then the distance required between the Tx antenna and the RX antenna might be negligible. Where the band-plan is contiguous and uplink and downlink frequency separation is small, or non-existent, the distance required between the Tx and Rx antennas must be greater. Use this document to plan required between the antennas in installations where the use of contiguous band-plans and small frequency separations require a substantial.

It is important to note that this document contains general recommendations. The unique characteristics of every rooftop may require a customized layout for each installation. For example, where a larger roof accomodates a larger distance between Tx and Rx antennas, it is possible to minimize frequency separation. If a small rooftop prohibits a large distance between Tx and Rx antennas, the frequency separation can be increased to compensate.

These table lists the minimum antenna separation requirements for various relative antenna configurations. With these separations, no guard band is required between the uplink and downlink frequencies.

Interference scenario	Minimum Antenna Separation (feet)	Meters
Vertical Mount, X-Pol, parallel antennas	4.3	
Vertical Mount, X-Pol, antennas offset by 90deg	9.8	
Vertical Mount, X-Pol, antennas offset by 180deg	3.3	
Horizontal Mount, X-Pol, parallel boresite	49.2	
Horizontal Mount, X-Pol, antennas offset by 90 deg at 135deg off base station to base station plane	13.1	
Horizontal Mount, X-Pol, antennas offset by 90deg at 90 & 180deg off base station to base station plane	3.3	