Alcatel 9900

Multiservice broadband wireless access solution Base Station – release 2.0

USER MANUAL

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Table of contents

1 – Foreword

1.1 – Structure of the manual

This manual is for users with a sound knowledge of how to operate and install **point–multipoint microwave systems** and how to use a **PC-based craft termina**l running the Windows™ operating system. With it, you should quickly be able to operate the equipment. It is not intended to replace the training services that we can provide for your particular needs.

The manual is divided into seven sections followed by appendixes:

- **Foreword**
- **Description of the equipment**
- **Installation of the equipment**
- **Servicing**
- **Maintenance**
- **Upgrading configurations**
- **Appendixes**

1.2 – Using the manual

With this manual, you should be able to commission and operate the described equipment to a basic level.

You should always read this manual in conjunction with the attached “Update” document (if provided) so that you are aware of the latest equipment upgrades.

Manual updates

This edition of the manual describes hardware and software releases of the following revision indexes and above:

Hardware revision: 01

In cases where an equipment upgrade affects the content of the manual, the relevant modification should be inserted in the “**Update**” document, with the same reference number, but with code type VE (instead of TQ).

When the number or extent of the changes justifies it, they should be incorporated in the body of the manual and the manual’s revision index should be incremented. Revision bars will show the differences from the previous version.

Note: MS-DOS, MICROSOFT and WINDOWS are registered trademarks of Microsoft Corporation.

1.3 – Safety instructions

1.3.1 – General rules

The following general safety precautions must be observed by the installer and the operator. ALCATEL assumes no liability for the customer's failure to comply with these requirements.

Ground the equipment:

For Safety Class 1 equipment, always connect the earth conductor of the power cable to an appropriate earthing device.

DO NOT operate the product in an explosive atmosphere or in presence of flammable gases or fumes.

For protection against fire:

replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type.

Dangerous voltages:

Users must not remove equipment covers or shields. The installation and maintenance procedures described in this manual are for use by service–trained personnel only.

DO NOT operate equipment which may be damaged:

Whenever it is possible that the safety protection features built into this equipment have been impaired, ISOLATE FROM THE POWER SUPPLY and do not use the equipment until safe operation can be verified by service–trained personnel. If necessary, return the equipment to Alcatel After Sales for service and repair.

DO NOT substitute parts or modify equipment:

Return the product to Alcatel Customer Service for servicing and repair.

1.3.2 – Symbols on products

1.3.2.1 – Danger symbols

When subsystems and modules have warning labels, it is extremely important to follow their instructions.

These labels are designed to indicate dangerous situations; they may contain any standard symbol or any text considered necessary to protect users and employees.

The most frequent danger situations and symbols are:

Danger or general warning

Prompts the user to refer to the manual.

Dangerous electrical voltages

Close to dangerous voltages (>42.4 V AC peak, 60 V DC; power level ≥240 VA) you will find this warning label

Presence of heat-radiating mechanical parts

1.3.2.2 – Earth symbols

Terminal for connecting the protective earth conductor in power supply wiring

Other earth terminal

1.3.2.3 – Other symbols

Indicates compliance with European standards

1.3.3 – Symbols used in the document

These symbols alert the reader the possible risks. They indicate:

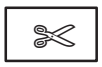
- the cause and type of danger,
- the possible consequences,
- the preventive action.

1.3.3.1 – Warning

- **protection of personnel,**
- warning of a **possible dangerous situation,**
- danger of fatal or serious injury.

1.3.3.2 – Precautions

- **protection of equipment,**
- warning of a procedure, practice or condition that **could be dangerous** to equipment or its environment,
- danger of damage to the equipment or its environment; permanent loss of data possible.



- This symbol, introducing the description of a procedure, indicates that it will cause the link to be temporarily disconnected.

- This symbol, introducing the description of a procedure, indicates that it cannot be continued without a full knowledge of the data contained in the procedure sheet concerning the stations concerned.

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2 – Equipment overview

2.1 – Overview of the A9900 system

The **Alcatel 9900** is a multi–service **broadband wireless local loop** system designed to provide telecom services to small and medium–sized enterprises.

Broad band WLL (Wireless Local Loop) system, Alcatel 9900 allows **operators** to offer rapid provision – to a large number of client sites – of a comprehensive range of telephone and data transmission **services**.

For **cellular phone network** operators, Alcatel 9900 offers the possibility of linking **base stations** to base station **controllers**. This makes Alcatel 9900 an economical transmission solution, for the implementation or extension of high traffic density areas coverage.

For **mixed network** operators (fixed and mobile), Alcatel 9900 enables to connect, with the same system, fixed professional end user as well as **base stations of cellular telephony.**

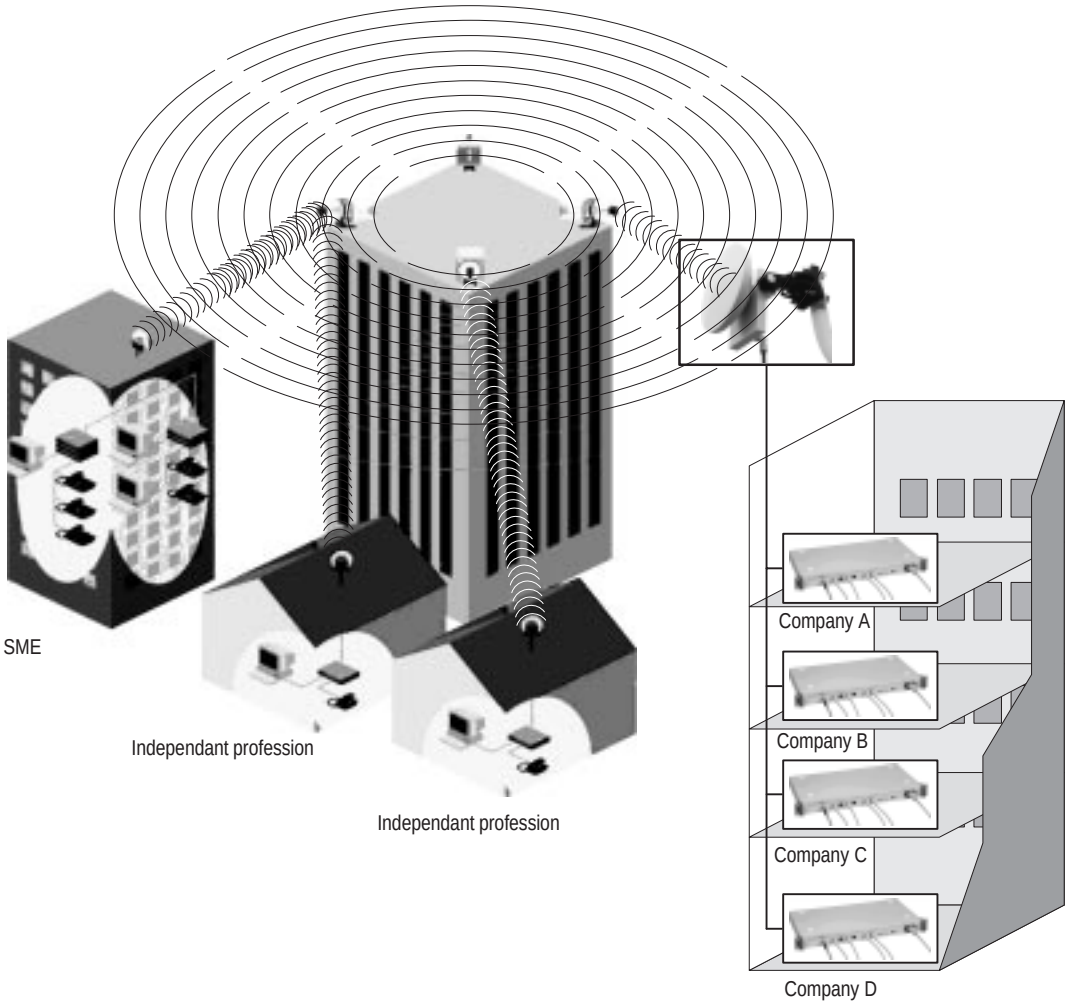

Figure 1 – A9900 System – Local point–multipoint service distribution –

2.2 – Composition of the A9900 system

An A9900 network cell mainly consists of the following:

- a common **Base Station** designated **9900BS**;
- and several **Terminal Stations** distributed across the user sites, and designated **9900TS**.

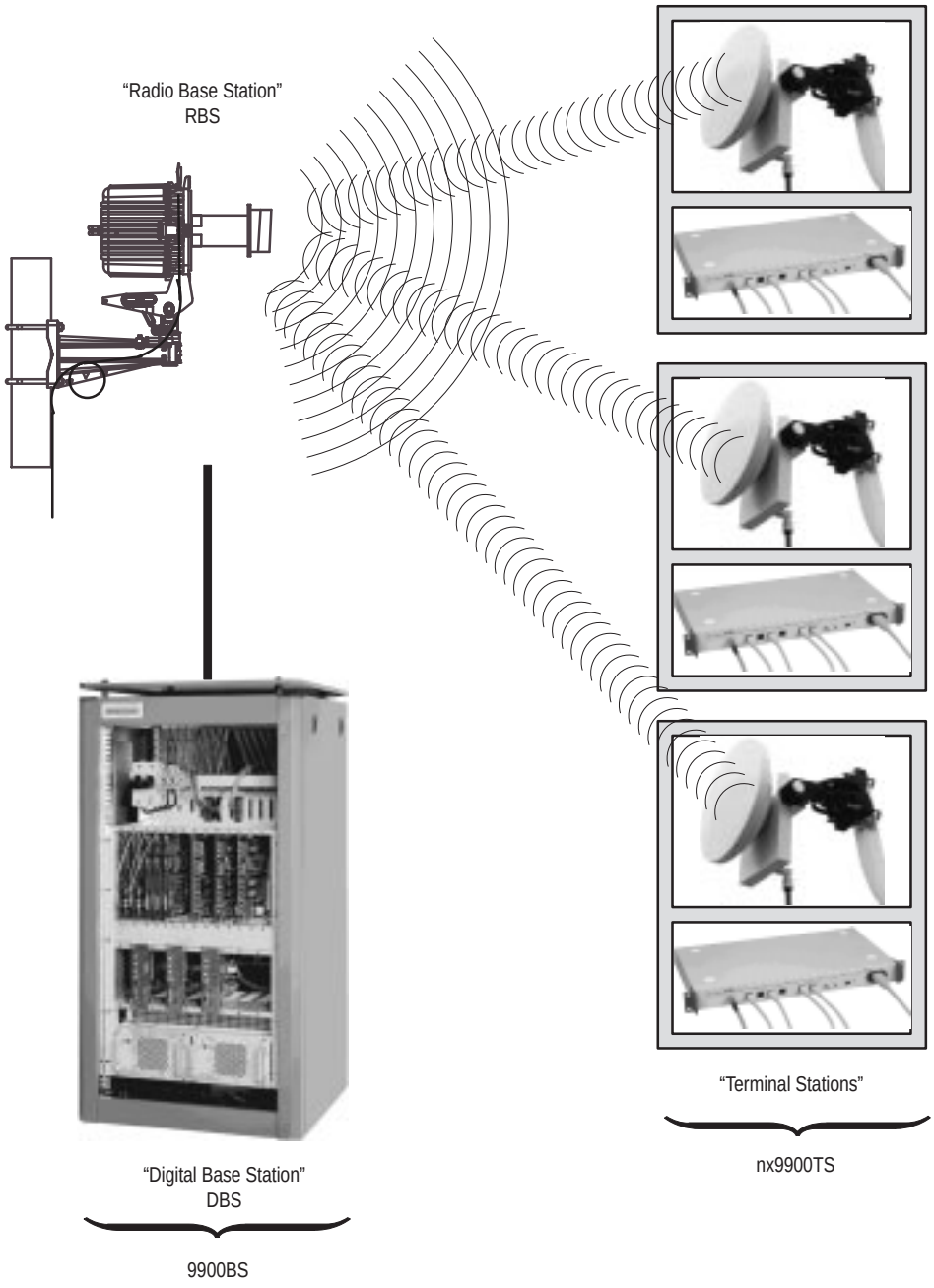

Figure 2 – Base Station and Terminal Stations

2.3 – A9900 system specifications

2.3.1 – Frequency bands used

25 GHz frequency band:

– CEPT T/R 13–02E European recommendation 24.5 – 26.5 GHz

26 GHz frequency band:

– MPT (Japan) 25.25 – 27 GHz

28 GHz frequency band:

– 27 GHz (LMCS – Canada) 27.35 – 28.35

– 28 GHz (CEPT) 27.5 – 28.6, 29.1 – 29.5

– 29 GHz (LMD – USA) 27.5 – 28.35, 29.10 – 29.25

2.3.2 – Radio transmission specifications

The following table gives the main radio characteristics of the A9900 wireless system.

A downstream (BS to TS)carrier is combined with up to four upstream (TS to BS) carriers.

	Downstream			
Channel bandwidth	**14 MHz**		**28 MHz**	
Occupied bandwidth	13.63 MHz		27.25 MHz	
Modulation	QPSK		QPSK	
Cross bit rate	20.19 Mbit/s		40.37 Mbit/s	
Code	Convol. 7/8 (k=7)		Convol. 7/8 (k=7)	
Interlace	depth 12		depth 12	
Code	Reed–Solomon (204,188,8)		Reed–Solomon (204,188,8)	
Bit rate before coding	16.19 Mbit/s		32.38 Mbit/s	
Link budget	**25 GHz**	**28 GHz**	**25 GHz**	**28 GHz**
RBS output power	17 dBm	17 dBm	17 dBm	17 dBm
Transmit antenna gain	15 dB	15 dB	15 dB	15 dB
Receive antenna gain	35 dB	34.5 dB	35 dB	34.5 dB
Rx RF level for error ratio = 10^{-10}	– 83.5 dBm	– 83,5 dBm	– 80,5 dBm	– 80,5 dBm
System gain	150.5 dB	150 dB	147.5 dB	147 dB

	Upstream			
Channel bandwidth	**3.5 MHz**		**7 MHz**	
Occupied bandwidth	3.36 MHz		6.72 MHz	
Modulation	D–QPSK		D–QPSK	
Cross bit rate	5.38 Mbit/s		10.75 Mbit/s	
Code	Convol. 7/8 (k=7)		Convol. 7/8 (k=7)	
Interface	Convol. 7/8 (k=7)		Convol. 7/8 (k=7)	
Code	Reed–Solomon (63,53,5)		Reed–Solomon (63,53,5)	
Bit rate before coding	4.19 Mbit/s		8.38 Mbit/s	
Link budget	**25 GHz**	**28 GHz**	**25 GHz**	**28 GHz**
RBS output power	12 dBm	12 dBm	12 dBm	12 dBm
Transmit antenna gain	35 dB	34.5 dB	35 dB	34.5 dB
Receive antenna gain	15 dB	15 dB	15 dB	15 dB
Rx RF level for error ratio = 10^{-10}	– 87 dBm	– 87 dBm	– 84 dBm	– 84 dBm
System gain	149 dB	148.5 dB	146 dB	145.5 dB

2.3.3 – Capacity

The network capacity depends on the **traffic distribution** betwen the data and circuit services (leased lines and telephony). It also depends on the **channeling** and the **number of upstream channels**.

The following tables give the characteristics of three combinations: **minimum**, **medium** and **maximum** circuit throughput; however, any intermediate combination is possible.

28 / 7 MHz channeling:

Downlink: 28 MHz	Trafic MIX: circuit capacity		
Uplink: 1 x 7 MHz	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	60	121
ATM uplink capacity (cells/s)	18.980	9.569	0
ATM downlink capacity (cells/s)*	76.141	67.084	57.877

Downlink : 28 MHz	Trafic MIX: circuit capacity		
Uplink : 2 x 7 MHz	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	120	242
ATM uplink capacity (cells/s)	37.961	19.137	0
ATM downlink capacity (cells/s)*	76.141	58.028	39.613

Downlink : 28 MHz **Uplink : 3 x 7 MHz**	Trafic MIX: circuit capacity		
	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	180	363
ATM uplink capacity (cells/s)	56.941	28.706	0
ATM downlink capacity (cells/s)*	76.141	48.971	21.349

Downlink : 28 MHz **Uplink : 4 x 7 MHz**	Trafic MIX: circuit capacity		
	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	240	484
ATM uplink capacity (cells/s)	75.922	38.275	0
ATM downlink capacity (cells/s)*	76.141	39.915	3.084

14/3.5 MHz channeling:

Downlink: 14 MHz **Uplink: 1 x 3.5 MHz**	Trafic MIX: circuit capacity		
	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	30	60
ATM uplink capacity (cells/s)	9.412	4.706	0
ATM downlink capacity (cells/s)*	38.047	33.519	28.990

Downlink : 14 MHz **Uplink : 2 x 3,5 MHz**	Trafic MIX: circuit capacity		
	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	60	120
ATM uplink capacity (cells/s)	18.824	9.412	0
ATM downlink capacity (cells/s)*	38.047	28.990	19.934

Downlink : 14 MHz **Uplink : 3 x 3,5 MHz**	Trafic MIX: circuit capacity		
	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	90	180
ATM uplink capacity (cells/s)	28.235	14.118	0
ATM downlink capacity (cells/s)*	38.047	24.462	10.877

Downlink : 14 MHz **Uplink : 4 x 3,5 MHz**	Trafic MIX: circuit capacity		
	Minimum	Medium	Maximum
nb of circuits: 64 kbit/s	0	120	240
ATM uplink capacity (cells/s)	37.647	18.824	0
ATM downlink capacity (cells/s)*	38.047	19.934	1.821

* : part of the ATM downlink bit rate can be used for dynamic bandwidth allocation. This proportion varies within the following limits:

- 2.5 % of the bit rate , if **one** upstream channel is used,
- 4 % of the bit rate , if **two** upstream channels are used,
- 5.5 % of the bit rate , if **three** upstream channels are used,
- 7 % of the bit rate , if **four** upstream channels are used.

2.4 – Simplified description of the Base Station (9900BS)

The A9900 system Base Station (**9900BS**) consists of the following main elements:

- one or more (up to 8) external transceivers, comprising the **radio and the antenna** part and designated "**RBS**" (Radio Base Station);
- one modem rack, including the power supply unit and interfaces, comprising the "**indoor**" part and designated **DBS** (Digital Base Station);
- a **cable** linking the RBS and the DBS and called the indoor–outdoor cable (or RBS/DBS link);
- a network management and configuration station (**9900LT**), based on the use of a PC with appropriate software.

2.5 – Examples of configuration of the Base Station (9900BS)

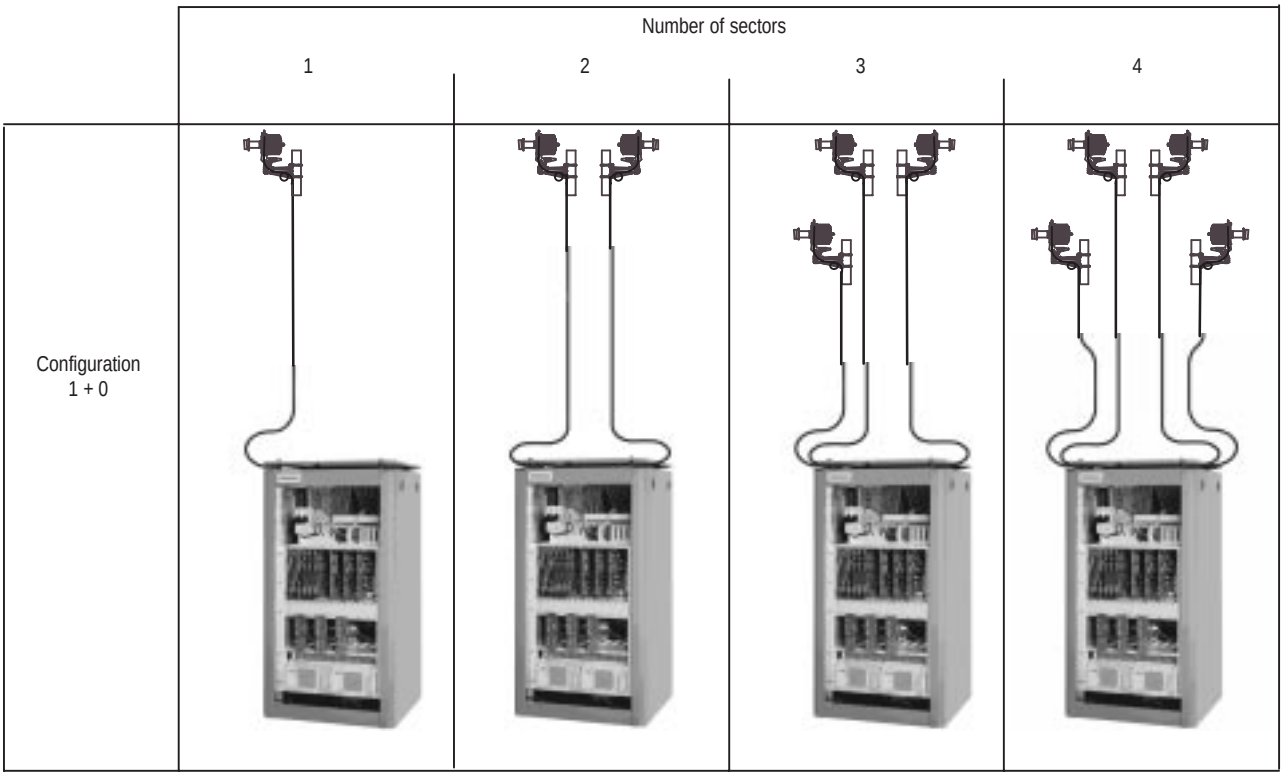

Figure 3 – Examples of configuration of the 9900BS Base Station

2.6 – Technical specifications of the Base Station (9900BS)

2.6.1 – RBS specifications

Designation	Description	Standards	Observations
Mechanical specifications of the RBS assembly (antenna + pole mounting)			
HxLxD	644(mm)x221(mm)x720(mm)	—	D taken from axial tube (diameter = 50 to114mm) cf. diagram in § 3 Installation
Weight	15 kg	—	—
Physical interfaces: RBS/DBS indoor–outdoor cable			
Connector type	N/female	—	weatherproof
Medium	50 Ω coaxial cable	—	—
Environmental specifications			
RBS Classification	—	ETS 300 019–2–4 IEC 721 3–4/ classes 4K2–4Z1–4Z5–4Z7–4B1–4C2–4S2–4M5	equipment for premises not sheltered from the weather.
Operating temperature	–33°C to + 55°C	—	—
Relative humidity at 30°C	100%	—	—

2.6.2 – DBS specifications

Designation	Description	Standards	Observations
Mechanical specifications: Rack–mounted DBS assembly			
HxLxD	1200(mm)x600(mm)x600(mm)	ETSI ETS 300–119	cf. diagram in § 3 Installation
Weight	135 kg (including 85 kg for empty rack)		—
Mechanical specifications: DBS shelf without rack			
HxLxD	880(mm)x482.6(mm)x440(mm)	ETSI ETS 300–119	19–inch cf. diagram in § 3 Installation
Weight	< 50 kg		—

Designation	Description	Standards	Observations
Power supply and consumption			
Primary voltage range	36 V to 60 V none–referenced	ETSI ETS 300–132	48 V rated voltage
Maximum consumption	< 1kW		including 8 RBS
Protection	overvoltage, short–circuit (40 A fuse), polarity inversion, thermal protection (ventilation failure)		—
Physical interfaces: ATM network interface (UNI)			
Connector type	SC/PC	ITU–T.432.2/§3.1	1300 nm 1 for each direction
Medium	single mode fiber (SMF; 9/125 µm)	ITU–T G.652	1300 nm 1 for each direction
Environment	class 1 LASER product	IEC 825	—
Bitrate nominal tolerance	 155.520 Mbps +/– 20 ppm	ITU–T.432.2/§3.1	—
Line coding	NRZ		—
Instability	cf. standard masks	ITU–T G.958	—
Physical interfaces: E1, TDM circuit interface (75/120 Ω)			
standard DBS	female sub–D pins	—	8 connectors, 8 TDM interfaces per connector
75 Ω interface	BNC or 1.6/5.6 connector	—	1 per direction
120 Ω interface	STP specific connector	—	1 per direction
Nominal bitrate	2.048 Mbps (+/– 50 ppm)	ITU–T G.703/§6.1	—
Line coding	HDB3	—	—
tolerated input jitter residual output jitter	cf. standard template	ITU–T G.823/§3 ITU–T G.823/§2	—
Environmental specifications			
DBS Classification	—	ETS 300 019–2–3 IEC 721 3–3/ classes 3K5–3Z2– 3Z4–3B1–3C2–3S2 –3M1	—
Operating temperature	–5°C to + 55°C	—	—
Relative humidity at 30°C	93%	—	—

2.6.3 – Common characteristics of the RBS and DBS

Designation	Description	Standards	Observations
Logistics			
Transport	Public transport: class 2.3	ETS 300 019–2–2 IEC 721–3–2 classes 2K4, 2B2, 2C2, 2S2, 2M3	—
Ambient temperature	–40°C to+ 70°C	—	—
Relative humidity at 45°C	95%	—	—
Storage	Class 1.2	ETS 300 019–2–1 IEC 721–3–1 classes 1K4, 1Z2, 1Z3, 1Z5, 1B2, 1C2, 1S3, 1M2	storage premises sheltered from the weather, without air–conditioning.
Ambient temperature	–40°C to + 70°C	IEC 721–3–1/class 1K5	—
Relative humidity at 30°C Condensation	100% 90 to 100 %	—	—

2.7 – Equipment power consumption

2.7.1 – RBS

The power consumption of the **RBS** is **31 W**.

2.7.2 – DBS

DBS configuration type	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

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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 – Unpacking

Considerations

You are recommended to:

- Unpack the equipment according to the instructions on the packaging.
- Take an inventory and identify any missing items. If the delivery does not match the delivery advice note, notify ALCATEL **within 48 hours of receipt of the equipment**.

Unpacking the RBS unit (also called RBS radio or RBS)

IMPORTANT NOTE: NEVER REMOVE THE ROUND YELLOW PADS USED TO SEAL THE OUTDOOR SYSTEM.

Unpacking the RBS radio antenna

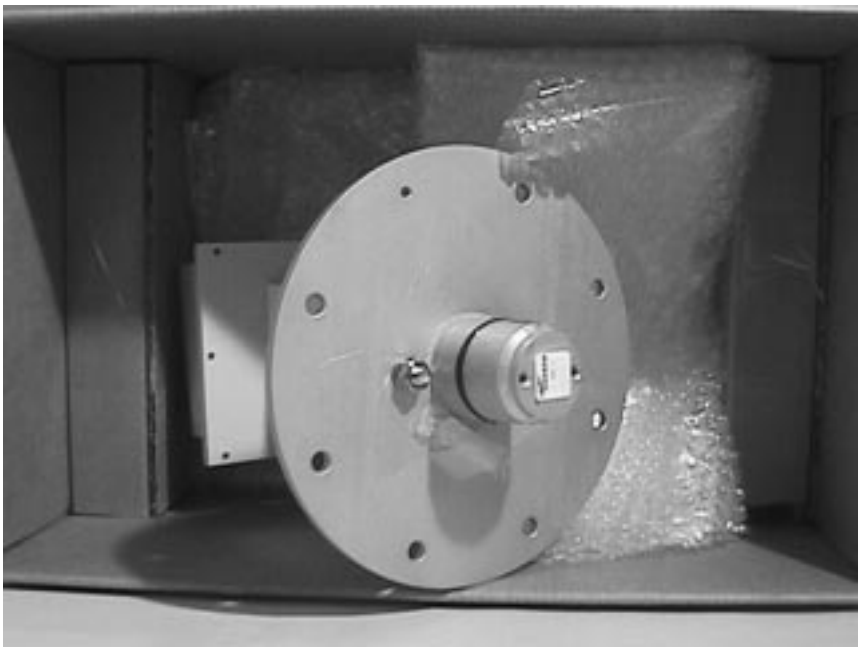


Figure 4 – Unpacking the RBS radio antenna

Unpacking the pole–mounting mechanical system

Figure 5 – Unpacking the pole–mounting mechanical system

Unpacking the DBS rack

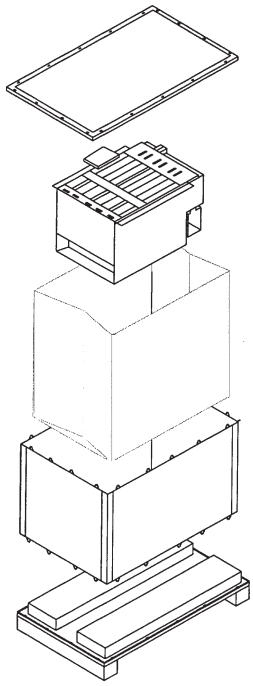


Figure 6 – Unpacking the DBS rack

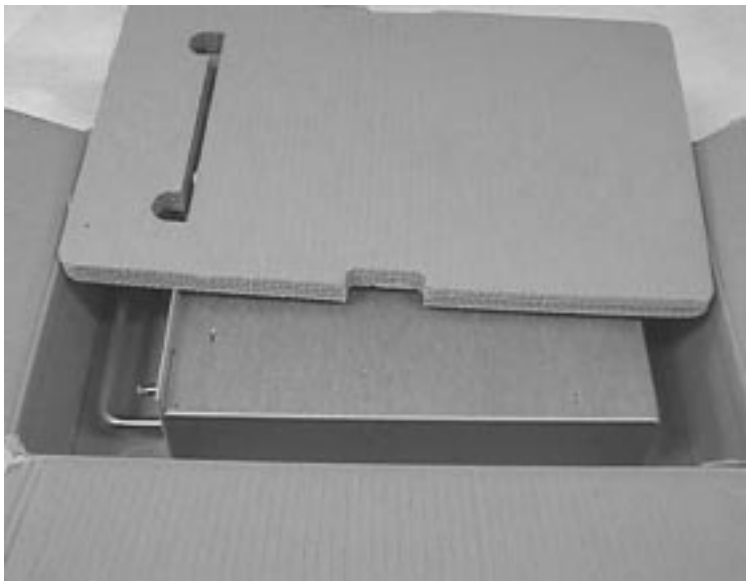


Figure 7 – Unpacking power supply units

3.1.2 – Checking the delivered configuration

The following **Base Station** (9900BS) components are delivered:

- the **RBS radio** and its installation hardware: in a cardboard box,
- the **RBS radio antenna**: in a cardboard box,
- the **pole mounting** mechanical system: in a cardboard box,
- the **DBS rack** and the **installation kit:** in a crate/pallet,
- the DC/DC **power supply units**: in a cardboard box,
- the **connection cable** between RBS radio and DBS rack: on a reel.

Depending on the delivery site configurations, the delivery may include separate crates containing **standard 22U 19" racks**.

3.1.2.1 – Content of boxes

EQUIPMENT	CONTENTS
RBS radio	1 RBS radio assembly

EQUIPMENT	CONTENTS
RBS radio antenna	1 RBS antenna assembly

EQUIPMENT	CONTENTS
Pole mounting	1 pole–mounting mechanical system assembly
	2 U–bolts and their hardware
	grounding lugs and its hardware; antenna attachment parts

EQUIPMENT	CONTENTS
DBS rack	1 rack containing the electronic boards specific to the client configuration
	cables (RBS/DBS connection inside rack), in accordance with the site configuration
	fiber optic jumpers, in accordance with the site configuration
	2 fiber optic cable winding cassettes
	1 installation manual

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

EQUIPMENT	CONTENTS
Standard 20U 19” rack	1 rack with lid and removable feet

3.1.2.2 – 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 – Labels on the equipment

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

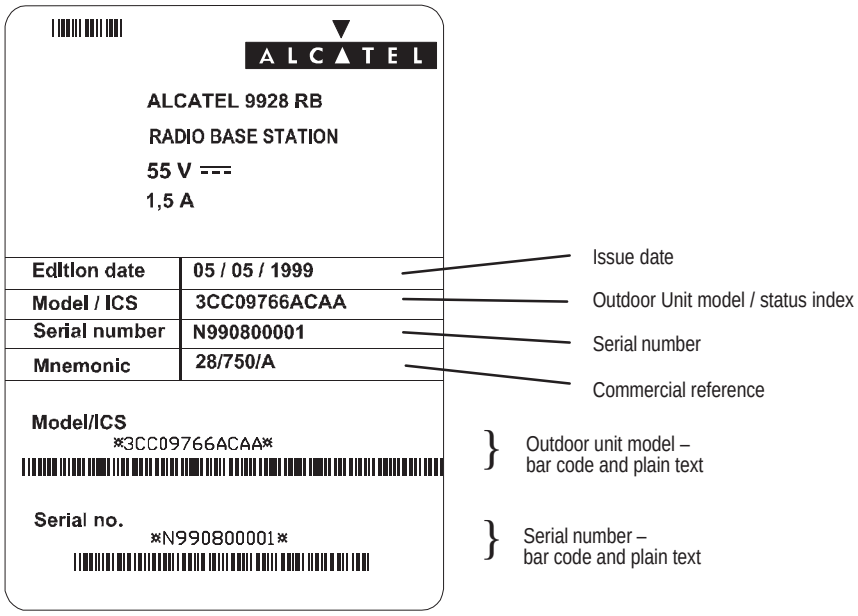


Figure 8 – Example of a label for the RBS unit

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

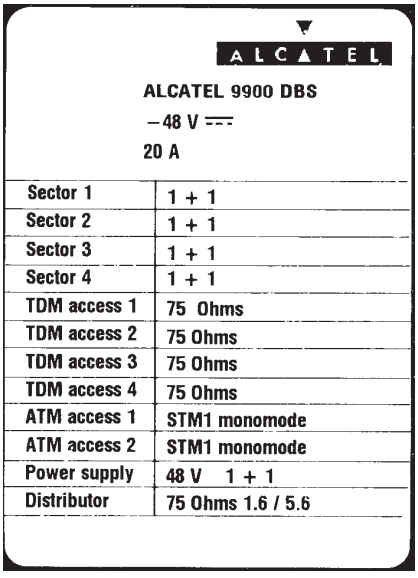


Figure 9 – Example of a label for the DBS rack

3.3 – Installing the equipment

3.3.1 – Information required for installation

Appendix 1 contains a sheet for you to complete to collate all the general information needed for the installation procedure.

3.3.2 – Precautions

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

The performance of the equipment decreases if the installation practices (cable installation, ground connections, etc.)are not respected: installation should be based on best trade practices.

3.3.3 – Tools required

The installation personnel 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 key (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
Torque wrench	Used for pole mounting and various tightening operations
20 mm flat wrench	For attaching the “N” coaxial connectors

A compass and an inclinometer (not supplied) are essential for pointing the antenna.

Depending on the installations, additional equipment may prove useful:

– Compax “ Mars Actel “OSA3 insertion and extraction tool, for terminal strip wiring

(mars actel cad) COMPAX;

– Crimping tool for the sub–D connectors, ref.:608868–1 (AMP) .

3.4 – Installation of outdoor equipment

Considerations

– Outdoor equipment installation involves:

- installation of the mechanical system (also called “pole–mounting” system) which supports the RBS radio and facilitates antenna alignment,
- installation of the RBS radio assembly and its antenna,
- installation of the connection cable connecting the RBS radio to the DBS rack.

– Outdoor equipment installation should garantee a precise and fixed antenna pointing.

– The RBS location and its antenna orientation should arise from a planning analysis in order to optimize the sector coverage. These elements are essential for the installation staff.

– Antenna orientation is only 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 should be respected:

- make sure that the reception metallic structure has a perfect stability,
- avoid installation below bird nesting areas,
- avoid attaching to chimneys which give off fat deposits, dust and other aerosols which are liable to be deposited on the equipment,
- avoid proximity to sources of heat,
- avoid placing the equipment in proximity to corrosive gas outputs,
- avoid placing the equipment below roof run–offs not equipped with guttering (high risk of microwave short–circuit),
- avoid attaching to a structure prone to vibrations,
- avoid to cross the antenna field of action.

– The type of installation used:

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

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

- Wall mounting possible.

3.4.1 – Definition of assemblies

The 9900BS outdoor equipment includes:

- the mechanical mounting and alignment (pole mounting) system,
- the transceiver (also known as RBS unit or “ODU”) ,
- the sectored antenna.

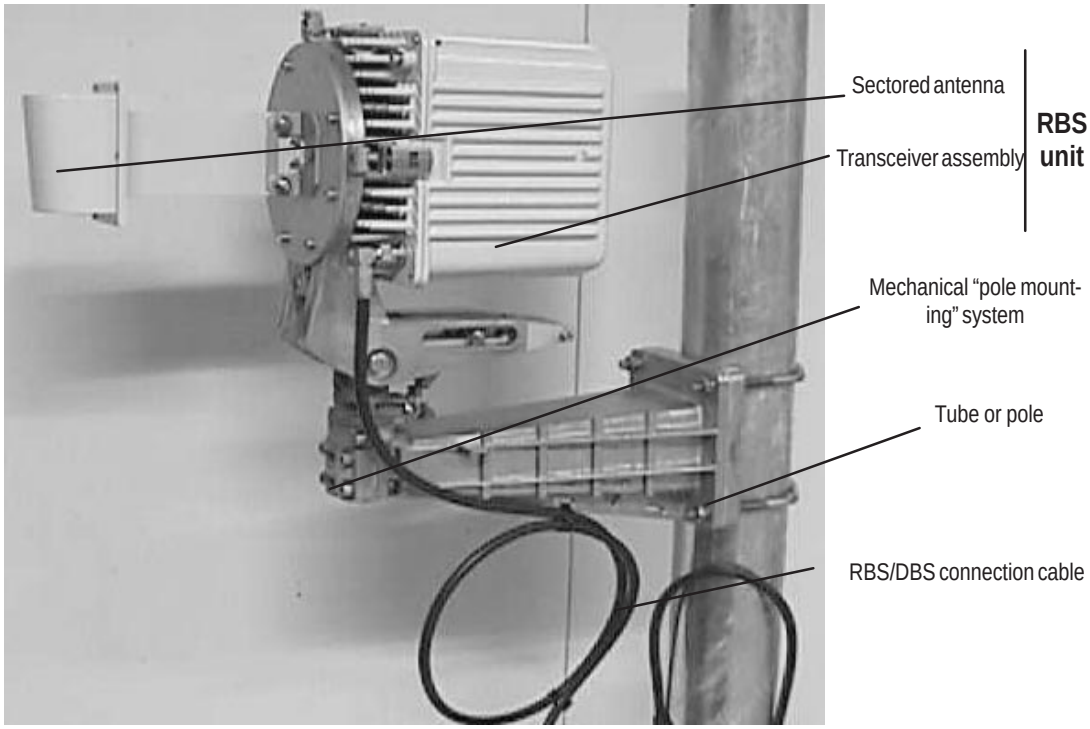


Figure 10 – Definition of 9900BS outdoor equipment

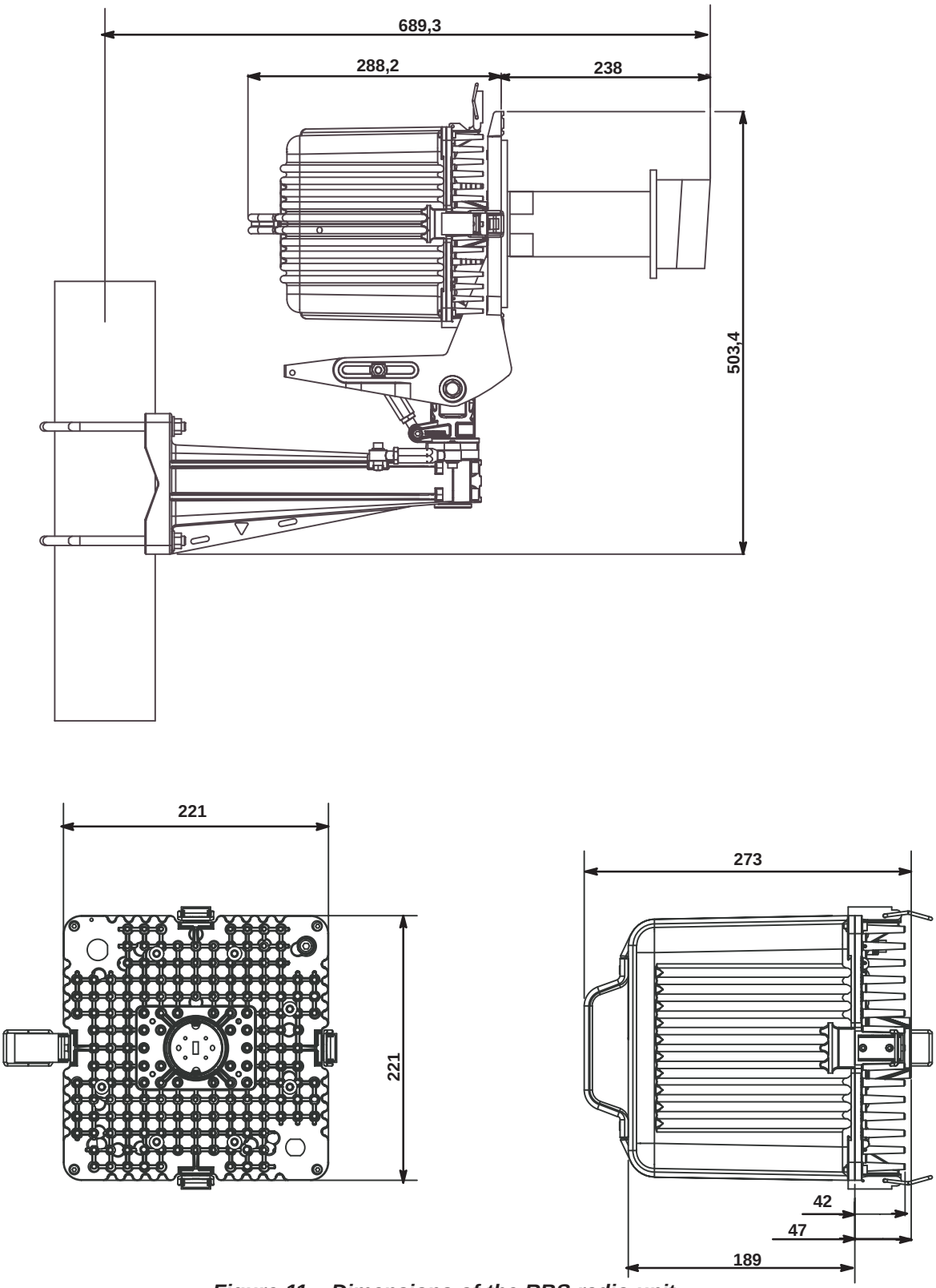


Figure 11 – Dimensions of the RBS radio unit.

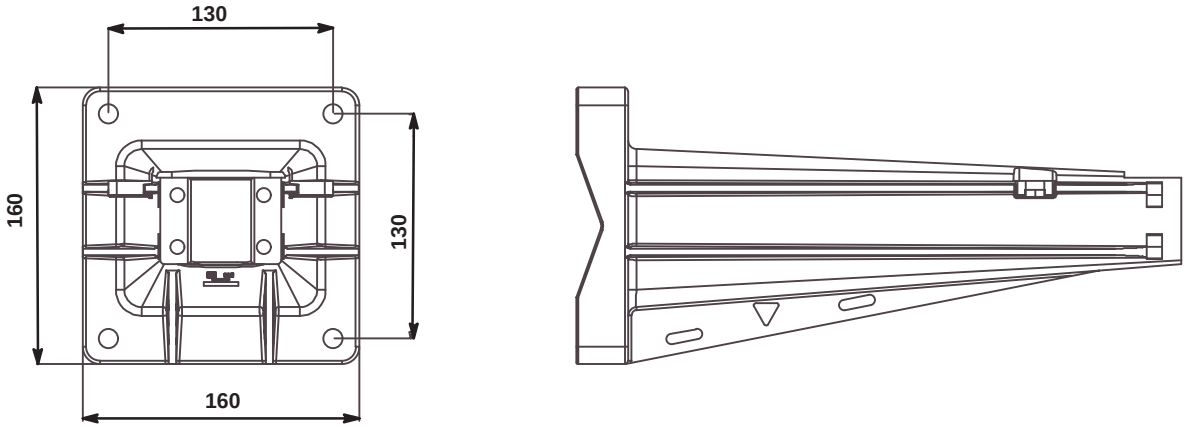


Figure 12 – Direct wall mounting.

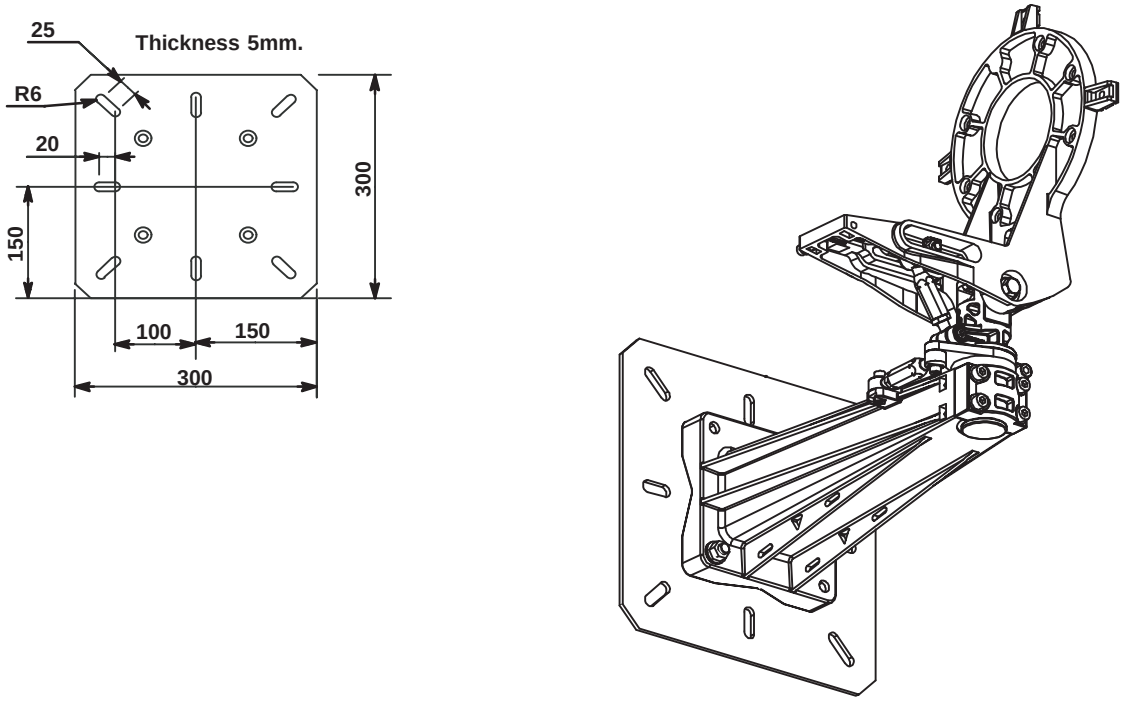


Figure 13 – Wall mounting option with mounting plate 3CC11109AAAA.

⚠	**Use bolt size M10 or more check relevant local regulations before installing (minimum 10 mm diameter).**

3.4.2 – Installation and orientation of the mechanical system

VERTICALITY OF THE BEARING: + – 0.5 º FOR STANDARD ANTENNAS.
+ – 0,25 º FOR LARGE GAIN ANTENNAS.

NEVER INSTALL THE BEARING AXIS HORIZONTALLY; THE ODU MUST BE ABOVE THE POLE MOUNTING AND NOT PROJECT LATERALLY.

Considerations

- Installation can be carried out on an existing or newly installed tube or pole.
- The external diameter of the tube or pole is **114 mm** in standard configuration.

Nota : *Other tube diameters may be used depending on the loads to be supported: minimum diameter 76 mm.*

- The tube or pole along with the U–bolts must be clean and (apart from threads) grease–free.
- Wall mounting possible with or without wall plate: see figures 12 and 13.

Stages (Figure 14)

1. On the pole mounting (ref. **1**), loosen the four “bearing” locking screws (ref. **6**) and the coarse “bearing” locking screw (ref. **7**) to facilitate the subsequent RBS unit mounting.
2. Fit the pole mounting (ref. **1**) on the tube or pole (ref. **2**) using the U–bolts (ref. **3**). Secure it using flat washers, “grower” washers, nuts and lock–nuts (ref. **4**).
3. **Roughly orientate the bearing** of the pole mounting in the desired topographical direction. The bearing turnbuckle (ref. **8**) should remain in mid–position. Use the “top” marking of the antenna and a compass, then tighten the U–bolts (ref. **3**). U–bolt tightening torque = 3daN.m.
4. **Roughly orientate the elevation** of the antenna support by loosening the “elevation” locking screw (ref. **9**). The elevation turnbuckle (ref. **5**) should remain in mid–position; pivot the antenna support through the vertical to adjust, then tighten the “elevation” locking screw (ref. **9**).

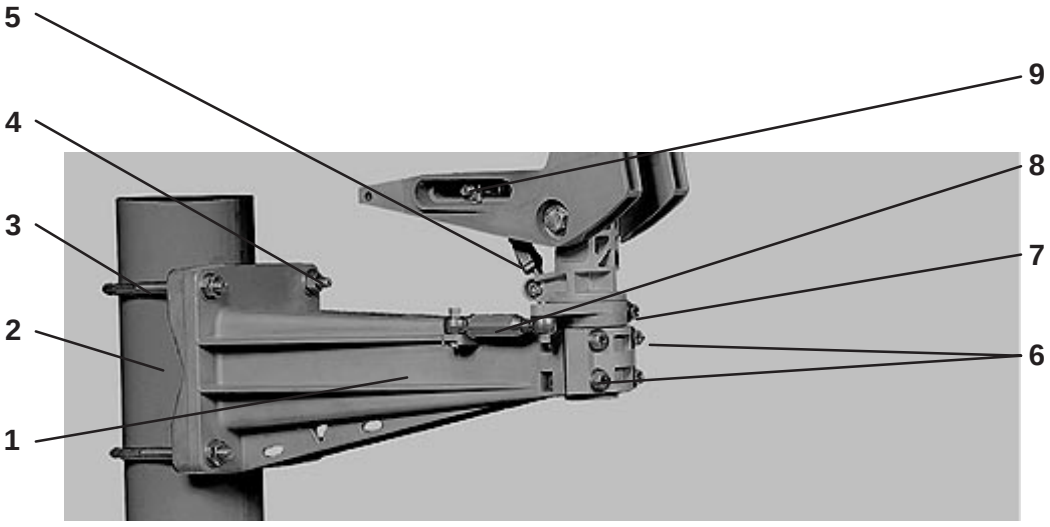


Figure 14 – Installation and orientation of the mechanical system

3.4.3 – Installation of the RBS radio antenna

Considerations

- The form of the sectored antennas may vary. Always refer to the “TOP” marking on the antenna when installing on the pole mounting.
- **The orientation of the waveguide is not linked to the polarization for this type of antenna.** It is always necessary to conform you to the “POLAR H” or “POLAR V” constructor’s marking on the antenna and not to the orientation of the waveguide.
- The antenna must be installed before the RBS radio unit.

Storage (Figure 15)

1. Position the RBS radio antenna against the pole mounting support (ref. **2**), and install it at the oposite side of the RBS radio unit.
2. Secure the RBS radio antenna using seven M6 x 25 screws (ref.**3**) and onduflex washers.

	**TAKE CARE NOT TO DAMAGE THE O–JOINT ON THE NOSE OF THE ANTENNA CONNECTION.** **IF THE RBS RADIO UNITS ARE NOT TO BE MOUNTED IMMEDIATELY AFTER THE MOUNTING OF THE ANTENNA, PROTECT THE CONNECTION NOSE (FROM WATER, DIRT AND IMPACT).**

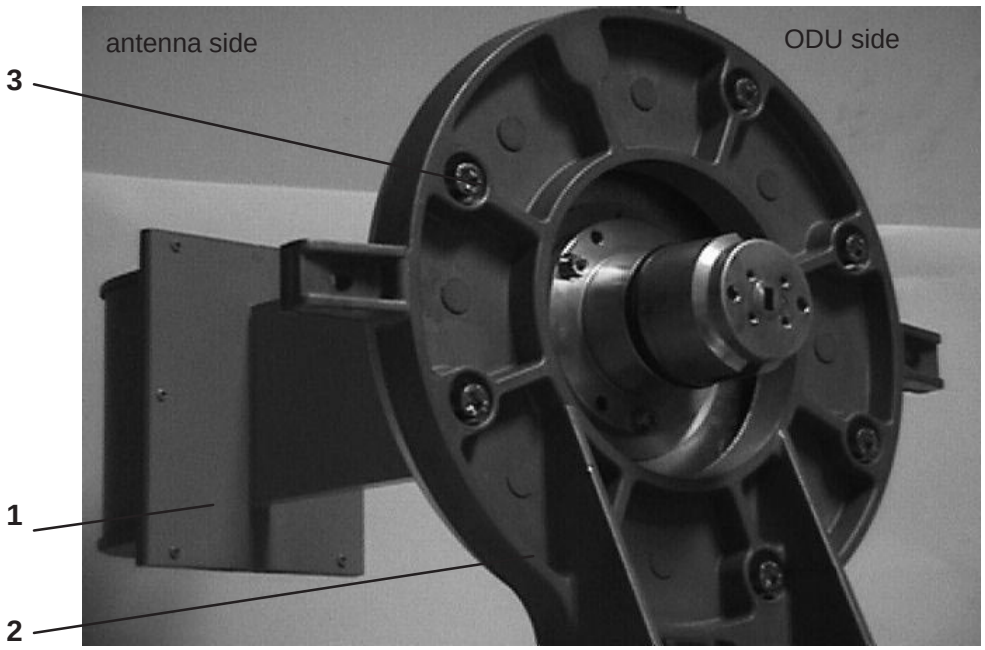


Figure 15 – Installing the RBS unit antenna

3.4.4 – Installation of the RBS Radio Unit (ODU)

	**IMPORTANT: THE RADIO UNIT ASSEMBLY MUST ALWAYS BE MANIPULATED BY ITS HANDLE ONLY.**

Stages

1. Take the ODU by the handle and place the two bosses in the “nose” of the unit against the two slots in the “nose” of the antenna (the ODU–IDU link cable should be towards the base of the ODU).

Nota : *According to the RBS antenna used, the ODU unit should be installed in horizontal or vertical handle position. This installation is not within polarization control. Refer to the antenna installation kayways.*

2. While holding the radio unit, begin by locking (Figure 16) the **two side snap–locks** on the support, then that at the **bottom**, followed by that at the **top**.

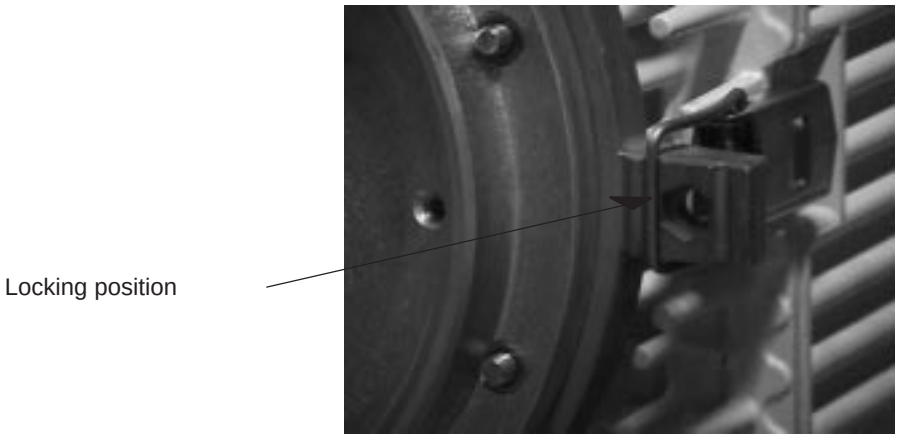


Figure 16 – Locking the Radio unit

⚠	**NEVER USE THE EXTERNAL KAYWAYS TO LOCK THE RADIO UNIT.**

REMINDER: The ODU/antenna assembly requires **no additional seal on the SHF flanges**; the two ends are smooth. Sealing is provided by the O–ring seal around the male “noses”.

3.4.5 – Antenna alignment

3.4.5.1 – Mechanical adjustments and deflection characteristics

The mechanical adjustment mechanisms are shown in Figure 17 :

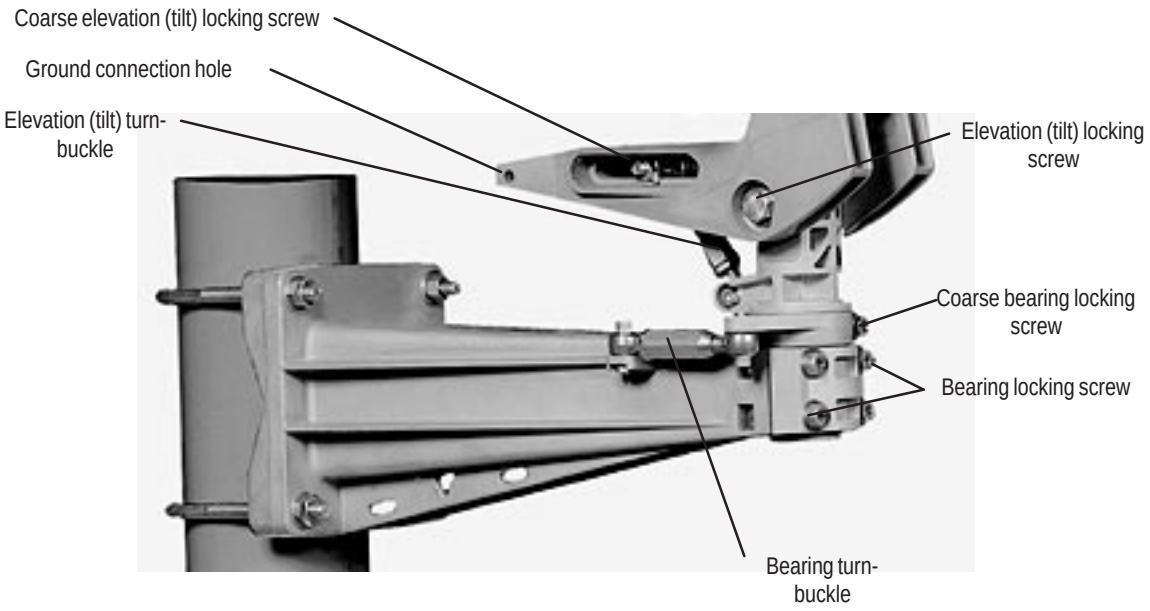


Figure 17 – Antenna alignment adjustment mechanisms

Deflection characteristics:

- The total deflection is: bearing = 270°, elevation = + – 25°; these values are obtained with the turnbuckles set to “maximum”.
- The deflection obtained with the turnbuckles is : elevation = + – 9° bearing = + – 9°.

3.4.5.2 – Alignment adjustment procedure

Stages

1. Using a control system (graduated level or inclinometer) positioned on the straight part of the antenna (Figure 18), ensure that it is perfectly horizontal (tilt 0°).
2. Make a bearing alignment in the direction intended by the radio planners (compass, ”TopoChaix”, etc.).
3. To avoid obstacles during installation, the “bearing” turnbuckle may be mechanically reversed on the pole–mounting. However, the bearing axis *must* remain vertical.
4. Tighten the “coarse” bearing locking screw. Turn the bearing turn–buckle. Tighten the four bearing front screws (alternate diagonal tightening) torque of 1.5m daN.
5. Check that the rough elevation screw is locked to a torque of 1.5m daN.
6. Using the “fine” elevation adjustment on the pole mounting (site elevation turnbuckle), set the tilt angle intended by the radio planners (e.g., tilt down 5°). Check this value with the control system (graduated level, inclinometer, ”TopoChaix”, etc.) positioned on the straight horizontal part of the antenna or the pole mounting.

Nota : *To minimize the unscrewing of the elevation turnbuckle, make careful use of the “coarse” adjustment in the first stage. The turnbuckle must remain in the mid–position (≈ 85mm center distance).* ***Never exceed a center distance of 94mm.***

7. Secure the two “elevation” side locking screws. Tighten completely the screws to lock the assembly in position, to a torque of 3 mdaN. Finish the operation by tightening the turnbuckle counter–screws to an reference torque of 2 mdaN. This ends the antenna alignment.

8. Check the bearing and elevation of the antenna once the assembly has been firmly secured. If a shift is noted, repeat the adjustement(s) in question.

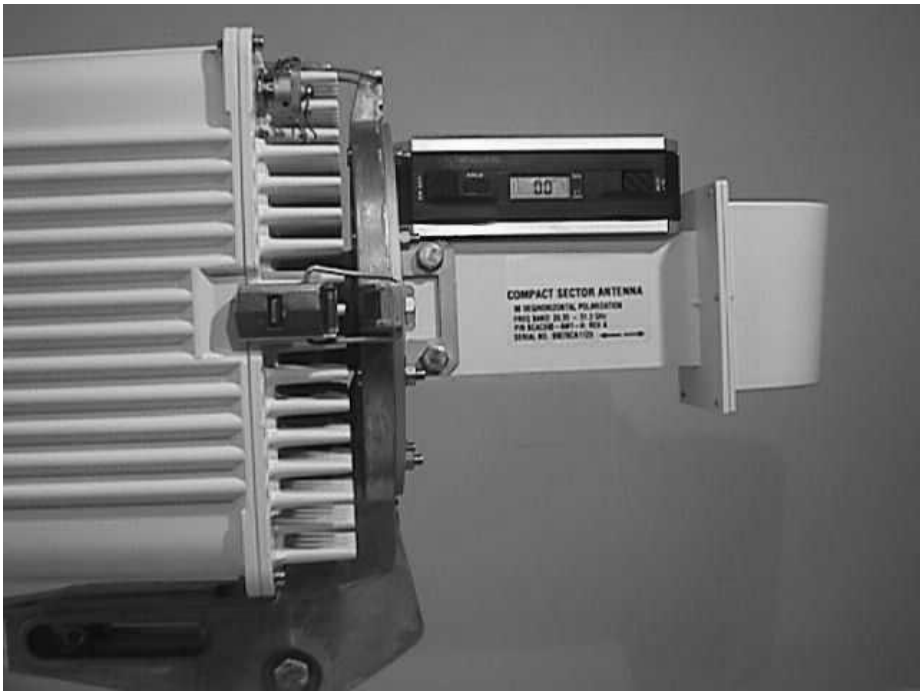


Figure 18 – Checking antenna positioning

3.4.5.3 – Definitions

Tilt or **Elevation**: Angle of tilt from the horizontal.

Tilt UP: The antenna points upwards.

Tilt 0: The antenna is horizontal.

Tilt DOWN: The antenna points downwards.

3.4.6 – Grounding of the outdoor equipment

Grounding of the outdoor equipment consists of:

- connecting the grounding of the RBS Unit with the pole–mounting grounding
- connecting the coupled RBS unit and pole–mounting grounding to the earthing system.

Considerations

- For grounding the RBS radio unit, a green/yellow cable with insulating sheath must be used. The minimum cross–section of the conducting wire is 16 mm^2.

- On the pole–mounting assembly, the ground terminal comprises two tapped holes et the rear of the metal cast supporting the RBS radio (see Figure 19). According to the installation, choose the most suitably positioned tapped hole. The grounding screw screws on in one of the two nuts inserted into the metal cast supporting the RBS. **When changing the grounding position block the nut to avoid to lose it.**

Storage

1. Crimp a terminal lug (ref. 16–6 CT) at each end of the cable linking the RBS unit and pole–mounting ground connections.

2. Screw one of the grounding cable lug into the tapped hole on the front of the RBS radio unit (see Figure 19). Use an M6 screw.
3. Crimp a lug (ref. 16–6 CT) on to the grounding cable of the pole–mounting and RBS assembly.
4. Connect both grounding cables to the one of the holes on the support back panel.

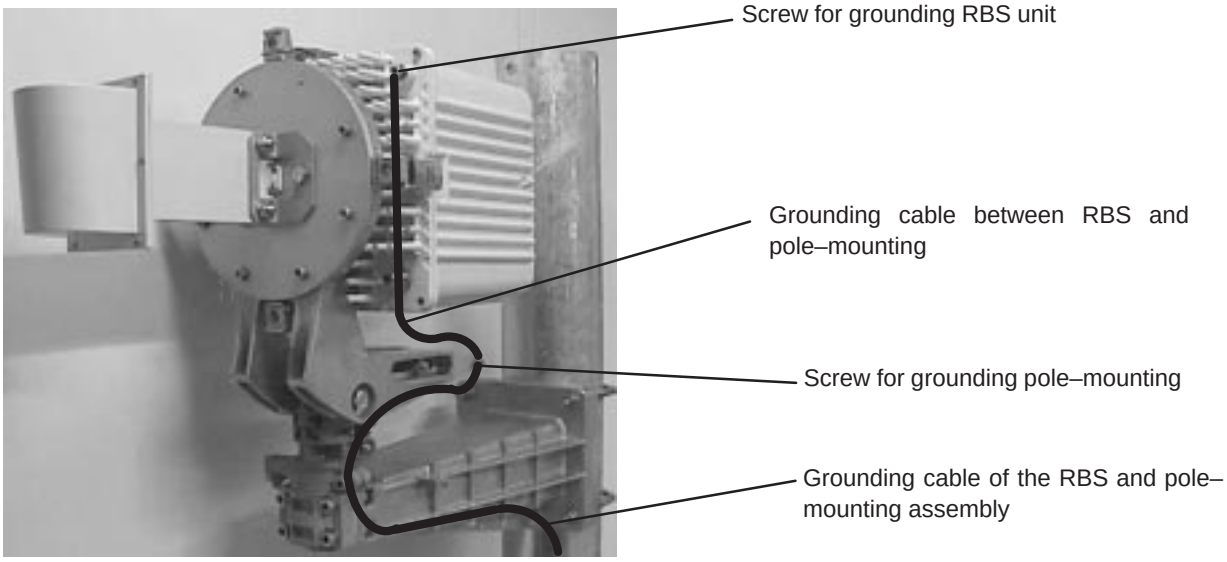


Figure 19 – Grounding the outdoor equipment

3.5 – Installation of the link between RBS and DBS

Considerations

– The electrical link between RBS unit and DBS rack of the Base Station is by **one single coaxial cable per T/R** (Figure 20)**.** This cable, using double–shielding, is of the ET 390998 type.

	**USE ONLY THE *ET 390998* CABLE.**

– Physical cable characteristics:

- diameter = 11 mm,
- maximum installed cable length = 200 meters,
- minimum bend radius: 60 mm.

RBS side connector

DBS side connector

Figure 20 – RBS / DBS connection

– It is essential to measure and record the length of cable actually deployed.

Storage

1. Fit the cable(s) with male “N” type elbow connectors, supplied with the equipment. To assemble the coaxial plugs, refer to the manufacturer’s Assembly handbook. The packaging of each plug also contains assembly instructions and tools.

Nota : *Crimping on to the cable can be carried out using the Daniels M 22520/5–01 tool and Y215P clamping jaws.*

Nota : *If soldering is used, do not overheat for fear of damage to the cable dielectric.*

2. Attach the cable at the RBS side to the pole–mounting via the rectangular clamp attachment windows.

Nota : *The cable should be attached as rigidly as possible to avoid all repetitive movements related to mechanical or atmospheric vibrations, which could eventually lead to damage of the cable or connector.*

3. Plug in the RBS / DBS connection cable.
4. Carry out the wiring between RBS and DBS.

Nota : *Make a drip groove where the cable enters the buildings, respecting the cables radius, in order to prevent water infiltration.*

Nota : *Lock the cable every meter using adapted clamps for the type of cable running.*

Nota : *Avoid a too long parallel walk between RBS/DBS coaxial link and electrical cables.*

	**NOT OVERTIGHTEN THE CABLE TIE ON THE CABLE; THIS COULD CAUSE DEFORMATION OF THE DIELECTRIC AND SUBSEQUENT LOSS OF PERFORMANCE.**

5. Note the length of the cable installed. This information will be entered into the database when the equipment is commissioned using the configuration software.

Nota : *The accuracy required by the configuration software is ± 10%.*

Grounding the RBS/DBS connection

- Cable grounding kits (reference 1AB128500002) may be supplied as an option.
- These kits are used for sites with high radioelectric interference, such as radio broadcasting stations, television transmitters, etc.
- The grounding diagram for these kits is illustrated in Figure 21.
- For the cable preparation and grounding operations, refer to the technical documentation of the cable supplier.

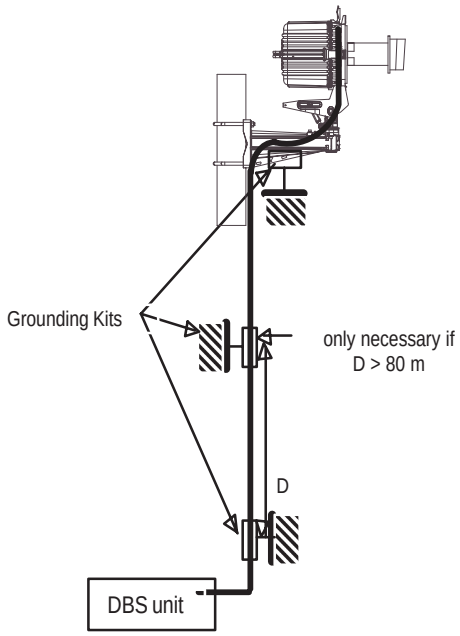


Figure 21 – Grounding the RBS/DBS connection in option

3.6 – Base Station indoor equipment installation

Considerations

Nota : *This manual deals with the DBS sub–rack and the DC/DC power supply units (PSU) installed in a rack (standard 20U 19" rack or other standardized 19"–wide rack).*

- The rack containing the DBS sub–rack assembly and DC/DC PSUs is for indoor installation only.
- The 9900BS indoor rack will be positioned according to user needs and technical constraints (e.g., respect of minimum distances, connections layout, RDS/DBS connection accessibility, power supply).
- The power supply is to be connected after installation of the 9900BS indoor rack, at the time of its commissioning.

Definition of racks

All components comprising the indoor station can be integrated:

- either in a standard, 22U 19" rack (see Figure 22),

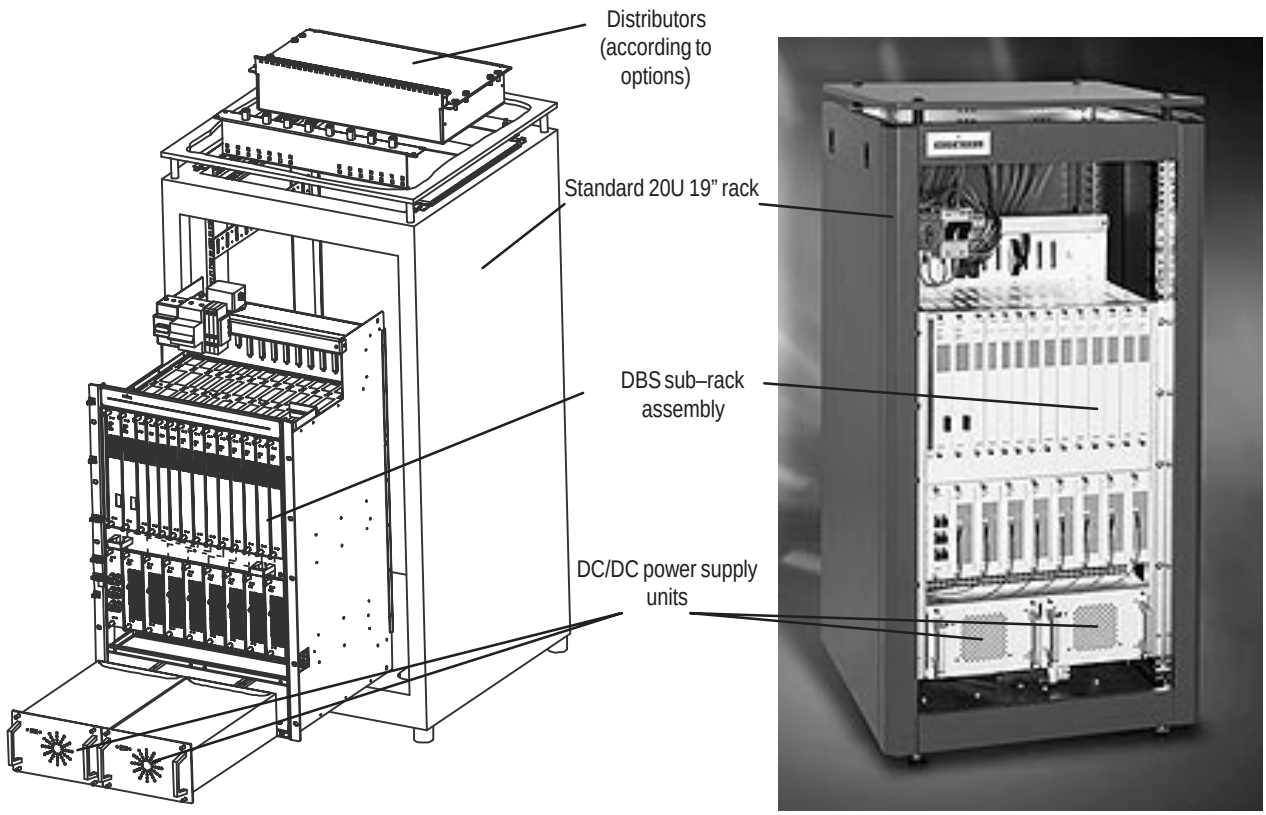


Figure 22 – Example of configuration of a 9900BS station in a standard rack

- or in another type of standardized, 19" rack.

3.6.1 – Mechanical installation

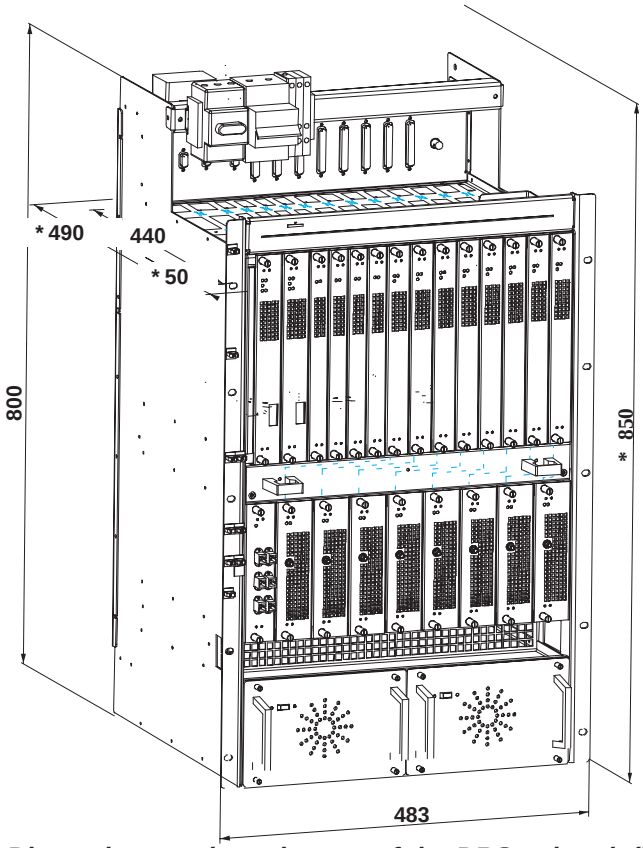


Figure 23 – Dimensions and equipment of the DBS subrack (in mm).

–Respect the requested clearances for the wiring, in order to avoid damage to the connecters(marked with an *)

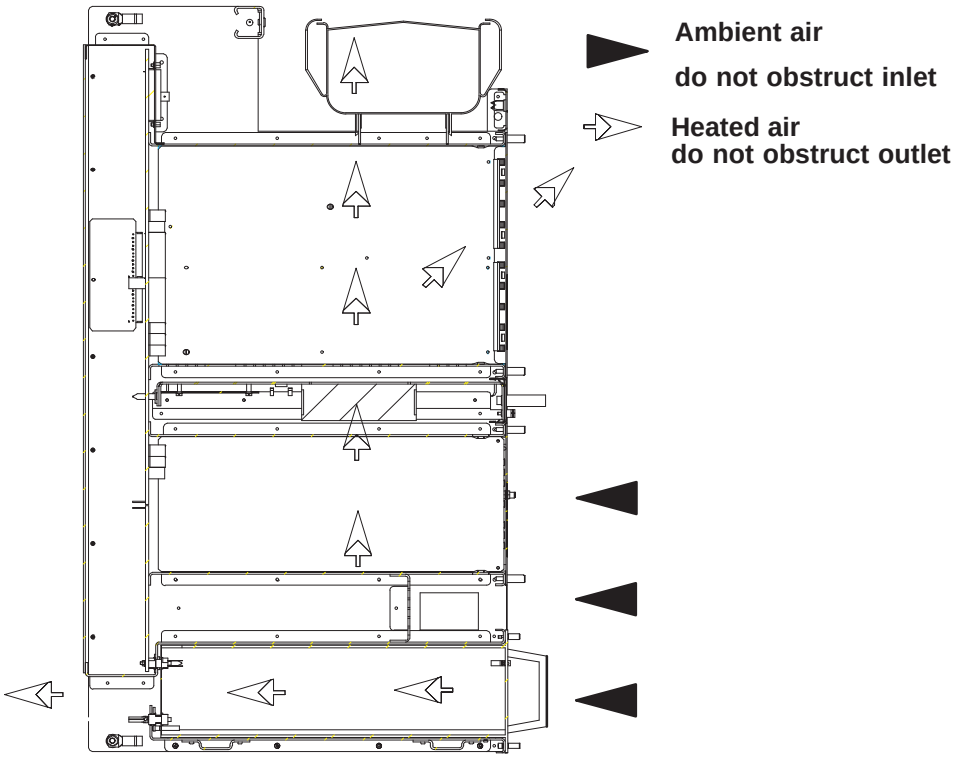


Figure 24 – Ventilation of the DBS subrack (cross–section).

–The installation of rack and subrack must enable the ventilation shown here. Do not obstruct the air inlets and outlets.

Storage

1. Choose the location where the equipment is to be assembled and unpack the standard rack. If its top cover is fitted, remove it (quarter–turn screw).

Nota : *Place the rack in such a way that the cable connections are accessible before the rack is installed definitively.*

2. Unpack the DBS sub–rack assembly and install it inside the rack. Screw into place.
3. Unpack the DC/DC PSUs; install and attach to the DBS sub–rack.
4. Carry out the electrical connection, cf.§ 3.6.2
5. Carry out the client terminal connections, cf.§ 3.6.3 and 3.6.4
6. Connect the RBS/DBS connection cable(s) cf.§ 3.6.5 .

3.6.2 – Electrical connection

WHEN MAKING THE POWER CONNECTIONS TURN OFF ALL DBS SUB–RACK EXTERNAL POWER SOURCES.

Considerations

- The DBS sub–rack is supplied from the rated DC voltage of –48V (minimum – 35V, maximum – 60V).
- The cable connecting the external DC power source to the DBS sub–rack will have a minimum cross–section of 3x10 mm^2 and a maximum length of 20 meters.
- The rack must be grounded to the general grounding system. For this, the rack mechanism will be connected by a cable with a minimum cross–section of 16 mm^2, attached using a 6 mm bolt
- For the power supply block diagram, refer to Figure 25:

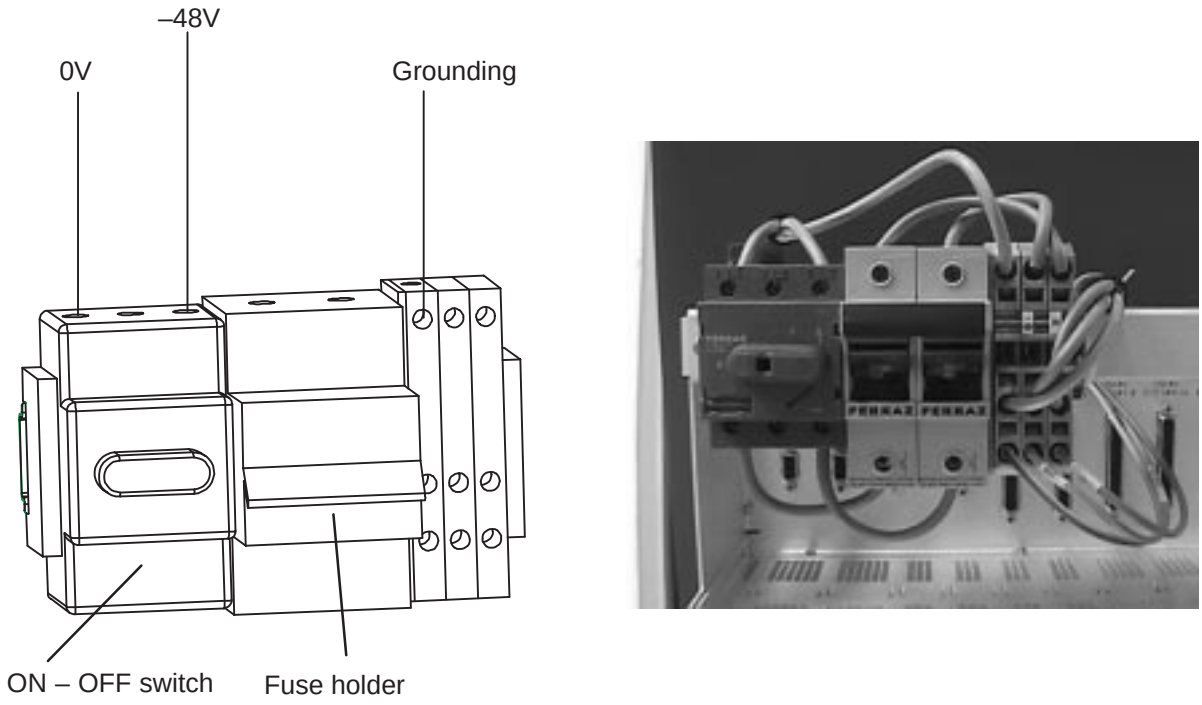


Figure 25 – DBS sub–rack power supply

Storage (Figure 26)

1. Connect the three–pole switch assembly at the top of the DBS sub–rack to the external DC power source. You are recommended to pass the power supply cable via the top of the rack.

DO NOT CONNECT THE GROUNDING CABLE TO THE THREE–POLE SWITCH BUT TO THE YELLOW/GREEN TERMINAL BLOCK.

2. Ground the rack and the DBS sub–rack.
3. Make sure that the fuses are inserted in the fuse–holder.

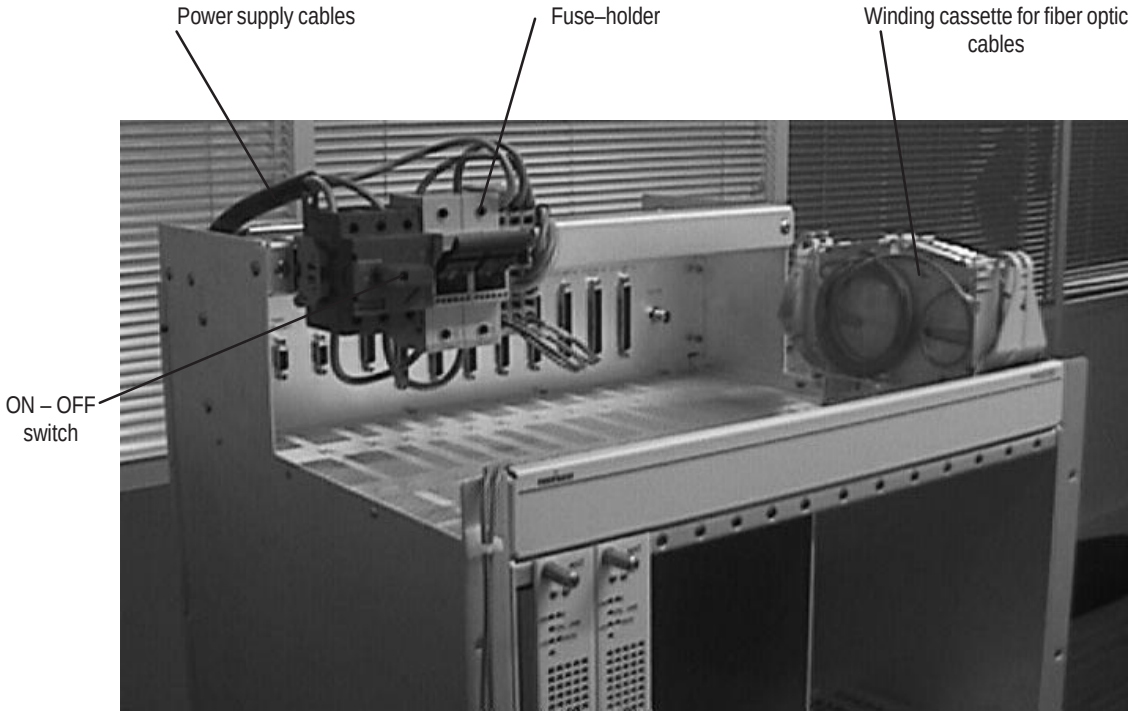


Figure 26 – DBS sub–rack power connection

3.6.3 – Customer access connections (circuits interfaces)

Considerations

– This involves the use of:

- connectors TNT1 to TNT4, at the top of the DBS sub–rack, if no distribution frames
- the distribution frames at the top of the DBS sub–rack or standard rack (coaxial cables for the 75 ohm links, balanced pair cables for the 120 ohm links).

3.6.3.1 – Direct connections to the connectors of the top panel of the DBS subrack.

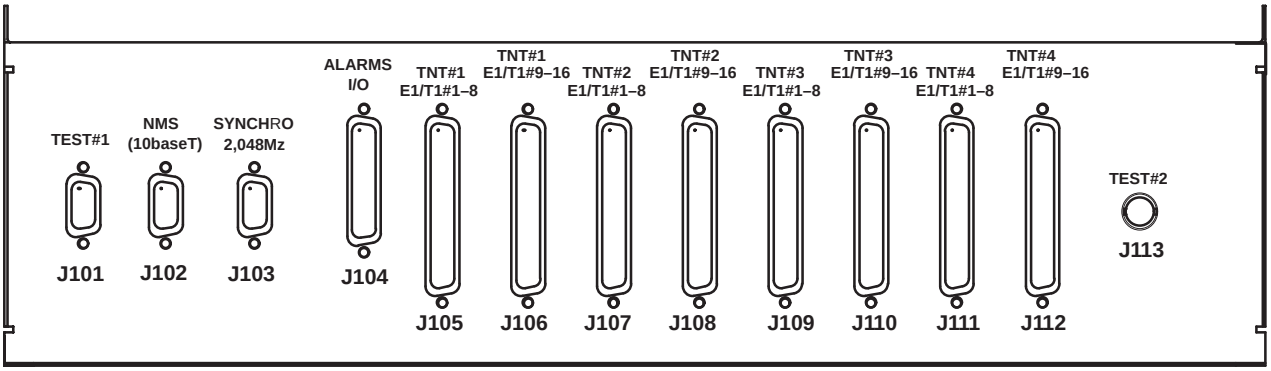
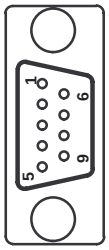


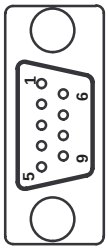
Figure 27 – DBS connections, connectors location

CONNECTOR TEST#1 J101



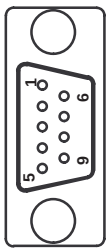
Pin 01 ––––>SDA_Fdp
Pin 02 ––––>ground
Pin 03 ––––>ground
Pin 04 ––––>PC_RS232_Rx_1
Pin 05 ––––>PC_RS232_Rx_0
Pin 06 ––––>SCL_Fdp
Pin 07 ––––>ground
Pin 08 ––––>PC_RS232_Tx_1
Pin 09 ––––>PC_RS232_Tx_0

CONNECTOR NMS J102



Pin 01 ––––>not connected
Pin 02 ––––>ground
Pin 03 ––––>ground
Pin 04 ––––>ground
Pin 05 ––––>not connected
Pin 06 ––––>10BT_RxD_M
Pin 07 ––––>10BT_RxD_P
Pin 08 ––––>10BT_TxD_M
Pin 09 ––––>10BT_TxD_P

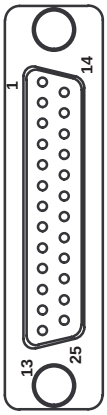
CONNECTOR SYNCHRO J103



Pin 01 ––––>Clk_2M_Out_P (do not connect)
Pin 02 ––––>ground
Pin 03 ––––>ground
Pin 04 ––––>ground
Pin 05 ––––>Clk_2M_In_M
Pin 06 ––––>Clk_2M_Out_M (do not connect)
Pin 07 ––––>ground
Pin 08 ––––>ground
Pin 09 ––––>Clk_2M_In_P

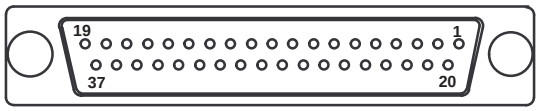
CONNECTOR J104

DO NOT CONNECT



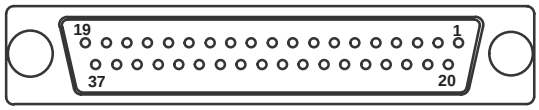
do not connect pins 01 et 06

Figure 28 – DBS connections, affectation access points



TNT#1 E1/T1#1–8 J105	TNT#1 E1/T1#9–16 J106	TNT#2 E1/T1#1–8 J107	TNT#2 E1/T1#9–16 J108
Pin 01 –––––>ground	ground	ground	ground
Pin 02 –––––>Input_1_P_1	Input_9_P_2	Input_1_P_3	Input_9_P_4
Pin 03 –––––>Input_2_P_1	Input_10_P_2	Input_2_P_3	Input_10_P_4
Pin 04 –––––>Input_3_P_1	Input_11_P_2	Input_3_P_3	Input_11_P_4
Pin 05 –––––>Input_4_P_1	Input_12_P_2	Input_4_P_3	Input_12_P_4
Pin 06 –––––>Input_5_P_1	Input_13_P_2	Input_5_P_3	Input_13_P_4
Pin 07 –––––>Input_6_P_1	Input_14_P_2	Input_6_P_3	Input_14_P_4
Pin 08 –––––>Input_7_P_1	Input_15_P_2	Input_7_P_3	Input_15_P_4
Pin 09 –––––>Input_8_P_1	Input_16_P_2	Input_8_P_3	Input_16_P_4
Pin 10 –––––>ground	ground	ground	ground
Pin 11 –––––>ground	ground	ground	ground
Pin 12 –––––>Output_1_P_1	Output_9_P_2	Output_1_P_3	Output_9_P_4
Pin 13 –––––>Output_2_P_1	Output_10_P_2	Output_2_P_3	Output_10_P_4
Pin 14 –––––>Output_3_P_1	Output_11_P_2	Output_3_P_3	Output_11_P_4
Pin 15 –––––>Output_4_P_1	Output_12_P_2	Output_4_P_3	Output_12_P_4
Pin 16 –––––>Output_5_P_1	Output_13_P_2	Output_5_P_3	Output_13_P_4
Pin 17 –––––>Output_6_P_1	Output_14_P_2	Output_6_P_3	Output_14_P_4
Pin 18 –––––>Output_7_P_1	Output_15_P_2	Output_7_P_3	Output_15_P_4
Pin 19 –––––>Output_8_P_1	Output_16_P_2	Output_8_P_3	Output_16_P_4
Pin 20 –––––>ground	ground	ground	ground
Pin 21 –––––>Input_1_M_1	Input_9_M_2	Input_1_M_3	Input_9_M_4
Pin 22 –––––>Input_2_M_1	Input_10_M_2	Input_2_M_3	Input_10_M_4
Pin 23 –––––>Input_3_M_1	Input_11_M_2	Input_3_M_3	Input_11_M_4
Pin 24 –––––>Input_4_M_1	Input_12_M_2	Input_4_M_3	Input_12_M_4
Pin 25 –––––>Input_5_M_1	Input_13_M_2	Input_5_M_3	Input_13_M_4
Pin 26 –––––>Input_6_M_1	input_14_M_2	input_6_M_3	input_14_M_4
Pin 27 –––––>Input_7_M_1	Input_15_M_2	Input_7_M_3	Input_15_M_4
Pin 28 –––––>Input_8_M_1	Input_16_M_2	Input_8_M_3	Input_16_M_4
Pin 29 –––––>ground	ground	ground	ground
Pin 30 –––––>Output_1_M_1	Output_9_M_2	Output_1_M_3	Output_9_M_4
Pin 31 –––––>Output_2_M_1	Output_10_M_2	Output_2_M_3	Output_10_M_4
Pin 32 –––––>Output_3_M_1	Output_11_M_2	Output_3_M_3	Output_11_M_4
Pin 33 –––––>Output_4_M_1	Output_12_M_2	Output_4_M_3	Output_12_M_4
Pin 34 –––––>Output_5_M_1	Output_13_M_2	Output_5_M_3	Output_13_M_4
Pin 35 –––––>Output_6_M_1	Output_14_M_2	Output_6_M_3	Output_14_M_4
Pin 36 –––––>Output_7_M_1	Output_15_M_2	Output_7_M_3	Output_15_M_4
Pin 37 –––––>Output_8_M_1	Output_16_M_2	Output_8_M_3	Output_16_M_4

Figure 29 – DBS connections, affectation of access points



TNT#3 E1/T1#1–8 J109	TNT#3 E1/T1#9–16 J110	TNT#4 E1/T1#1–8 J111	TNT#4 E1/T1#9–16 J112
Pin 01 –––––>ground	ground	ground	ground
Pin 02 –––––>Input_1_P_5	Input_9_P_6	Input_1_P_7	Input_9_P_8
Pin 03 –––––>Input_2_P_5	Input_10_P_6	Input_2_P_7	Input_10_P_8
Pin 04 –––––>Input_3_P_5	Input_11_P_6	Input_3_P_7	Input_11_P_8
Pin 05 –––––>Input_4_P_5	Input_12_P_6	Input_4_P_7	Input_12_P_8
Pin 06 –––––>Input_5_P_5	Input_13_P_6	Input_5_P_7	Input_13_P_8
Pin 07 –––––>Input_6_P_5	Input_14_P_6	Input_6_P_7	Input_14_P_8
Pin 08 –––––>Input_7_P_5	Input_15_P_6	Input_7_P_7	Input_15_P_8
Pin 09 –––––>Input_8_P_5	Input_16_P_6	Input_8_P_7	Input_16_P_8
Pin 10 –––––>ground	ground	ground	ground
Pin 11 –––––>ground	ground	ground	ground
Pin 12 –––––>Output_1_P_5	Output_9_P_6	Output_1_P_7	Output_9_P_8
Pin 13 –––––>Output_2_P_5	Output_10_P_6	Output_2_P_7	Output_10_P_8
Pin 14 –––––>Output_3_P_5	Output_11_P_6	Output_3_P_7	Output_11_P_8
Pin 15 –––––>Output_4_P_5	Output_12_P_6	Output_4_P_7	Output_12_P_8
Pin 16 –––––>Output_5_P_5	Output_13_P_6	Output_5_P_7	Output_13_P_8
Pin 17 –––––>Output_6_P_5	Output_14_P_6	Output_6_P_7	Output_14_P_8
Pin 18 –––––>Output_7_P_5	Output_15_P_6	Output_7_P_7	Output_15_P_8
Pin 19 –––––>Output_8_P_5	Output_16_P_6	Output_8_P_7	Output_16_P_8
Pin 20 –––––>ground	ground	ground	ground
Pin 21 –––––>Input_1_M_5	Input_9_M_6	Input_1_M_7	Input_9_M_8
Pin 22 –––––>Input_2_M_5	Input_10_M_6	Input_2_M_7	Input_10_M_8
Pin 23 –––––>Input_3_M_5	Input_11_M_6	Input_3_M_7	Input_11_M_8
Pin 24 –––––>Input_4_M_5	Input_12_M_6	Input_4_M_7	Input_12_M_8
Pin 25 –––––>Input_5_M_5	Input_13_M_6	Input_5_M_7	Input_13_M_8
Pin 26 –––––>Input_6_M_5	input_14_M_6	input_6_M_7	input_14_M_8
Pin 27 –––––>Input_7_M_5	Input_15_M_6	Input_7_M_7	Input_15_M_8
Pin 28 –––––>Input_8_M_5	Input_16_M_6	Input_8_M_7	Input_16_M_8
Pin 29 –––––>ground	ground	ground	ground
Pin 30 –––––>Output_1_M_5	Output_9_M_6	Output_1_M_7	Output_9_M_8
Pin 31 –––––>Output_2_M_5	Output_10_M_6	Output_2_M_7	Output_10_M_8
Pin 32 –––––>Output_3_M_5	Output_11_M_6	Output_3_M_7	Output_11_M_8
Pin 33 –––––>Output_4_M_5	Output_12_M_6	Output_4_M_7	Output_12_M_8
Pin 34 –––––>Output_5_M_5	Output_13_M_6	Output_5_M_7	Output_13_M_8
Pin 35 –––––>Output_6_M_5	Output_14_M_6	Output_6_M_7	Output_14_M_8
Pin 36 –––––>Output_7_M_5	Output_15_M_6	Output_7_M_7	Output_15_M_8
Pin 37 –––––>Output_8_M_5	Output_16_M_6	Output_8_M_7	Output_16_M_8

Figure 30 – Raccordement DBS, schéma

3.6.3.2 – Connections to 75 ohm coaxial distributors.

Connections are made beneath the roof of the standard rack or on the front panel for a different type of rack.

1.6 / 5.6, 75 ohm distributor for16 E1 / T1, ref: 3CC08061AAAA.

- One distributor per TNT board.

- TNT connectors (J105 to J112) connected to the top panel of the DBS subrack with (n) 3CC11236AAAA cable(s).

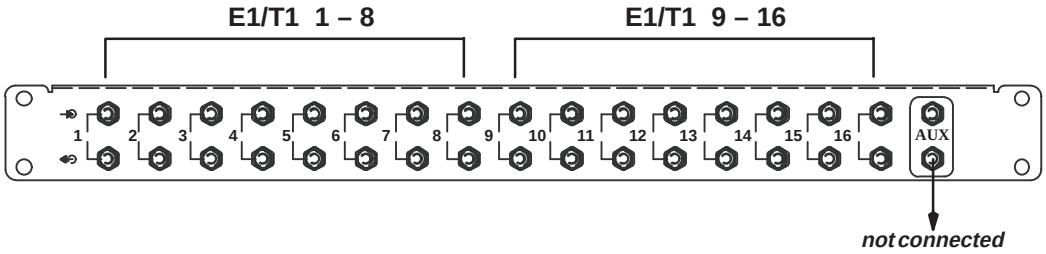


Figure 31 – 1.6/5.6, 75 ohms distributor

75 ohms BNC distributor for16 E1 / T1 ref,: 3CC08061ABAA.

- One distributor per TNT board.
- TNT connectors (J105 to J112) connected to the top panel of the DBS subrack with (n) 3CC11237AAAA cable(s).

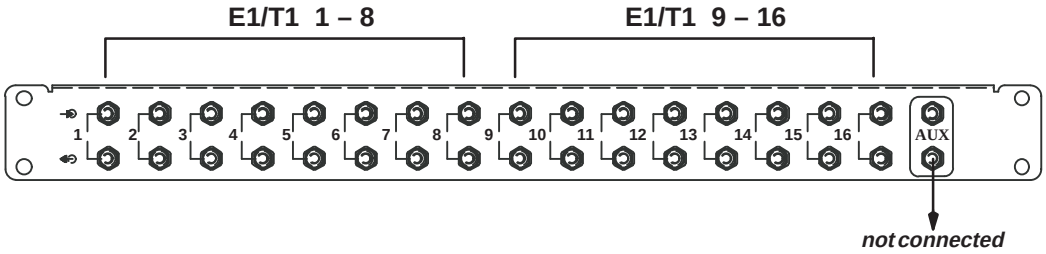


Figure 32 – BNC 75 ohms distributor

3.6.3.3 – Connections to 120 ohm distributors.

- Connections are made beneath the roof of the standard rack.
  TNT connectors (J105 to J112) connected to the top panel of the DBS subrack with (n) 3CC11238AAAA cable(s).

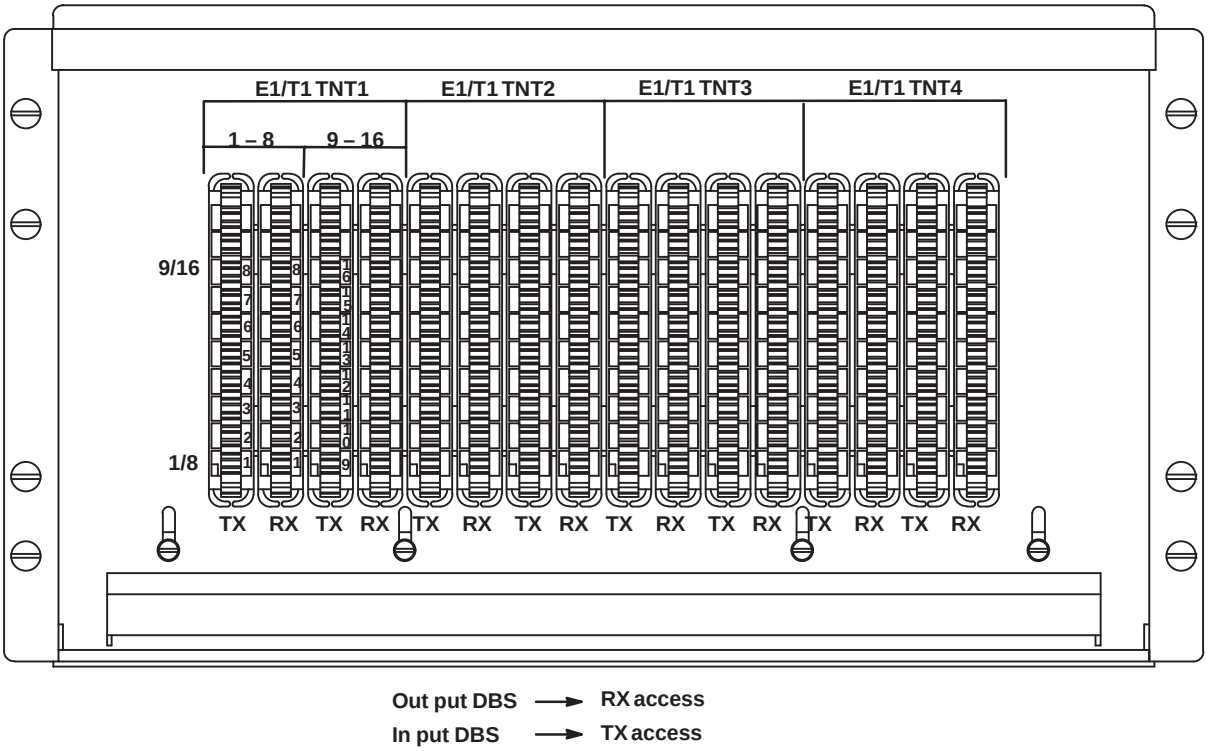


Figure 33 – Connection panel beneath the roof of the standard rack.

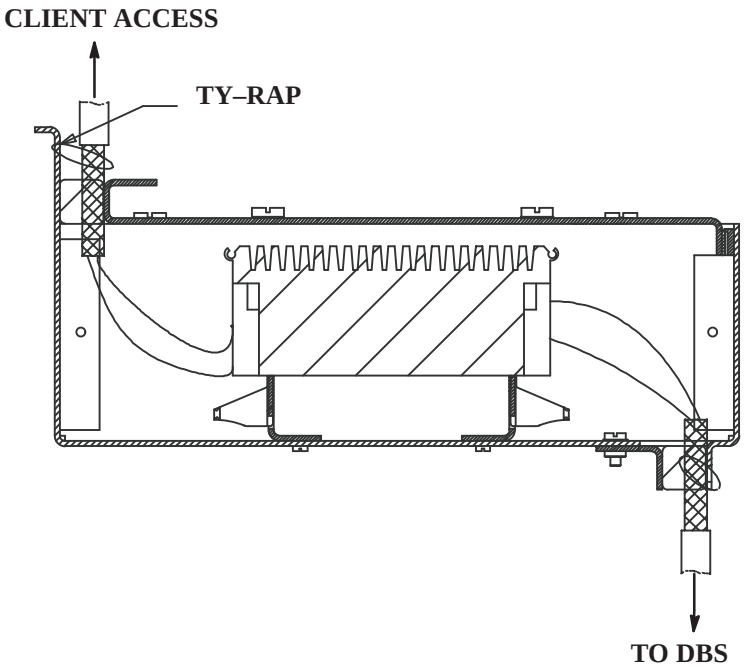


Figure 34 – Cable mounting and grounding.

3.6.4 – Customer access connections (ATM network interface)

- use the fiber optic connections on the FO board front panel.

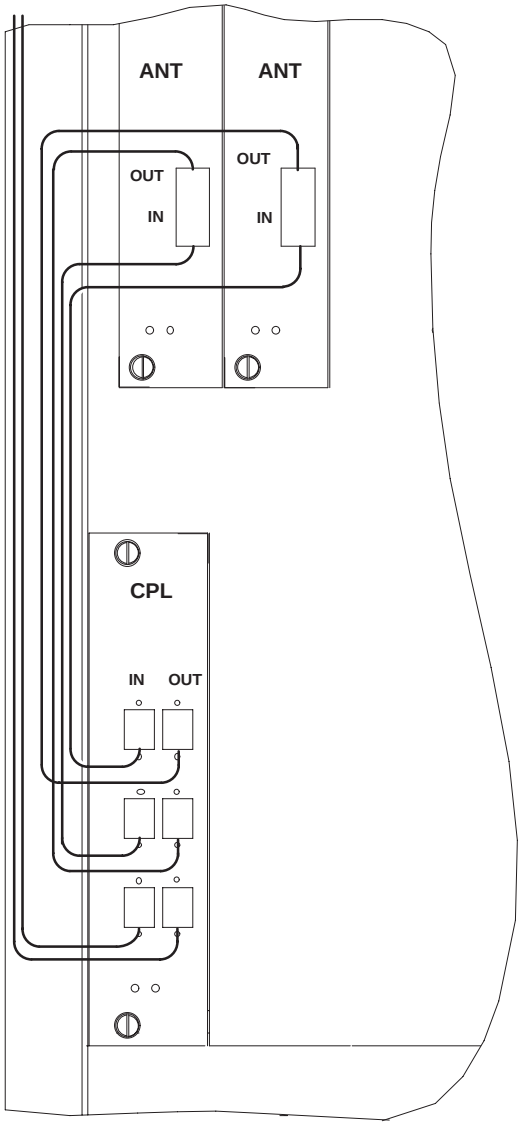


Figure 35 – Fiber optic cables connection

– To avoid damaging the fiber optic cables:
  - insert the jumpers in the direction indicated in Figure 37,
  - connect the fiber optic connection cable, fitted with its SC/PC connector, to the optical coupler board by passing it through the top of the rack and along the cable run provided.

– Use a winding cassette when connecting one or more fiber optic cables of over 10 meters in length.

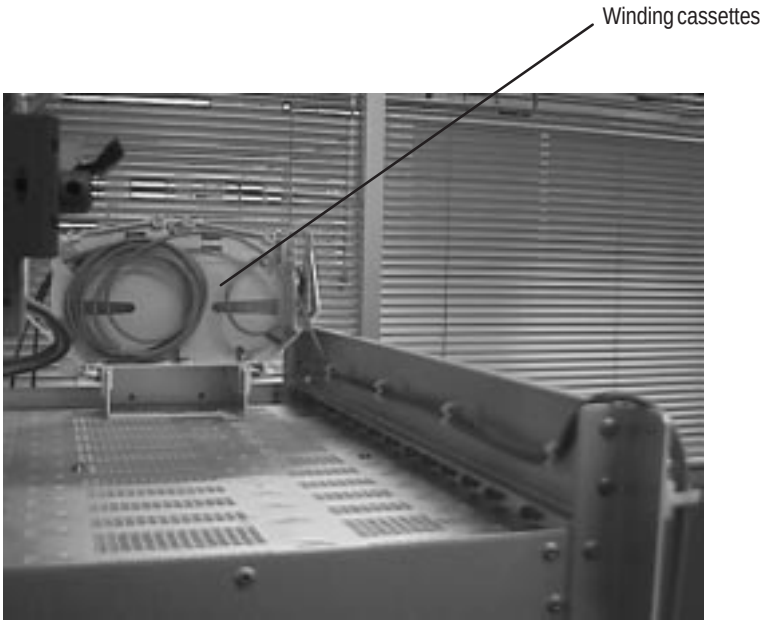


Figure 36 – DBS fiber optic winding cassettes

Storage

1. According to the site configuration, prepare the connection cables and fit them with the required connectors.

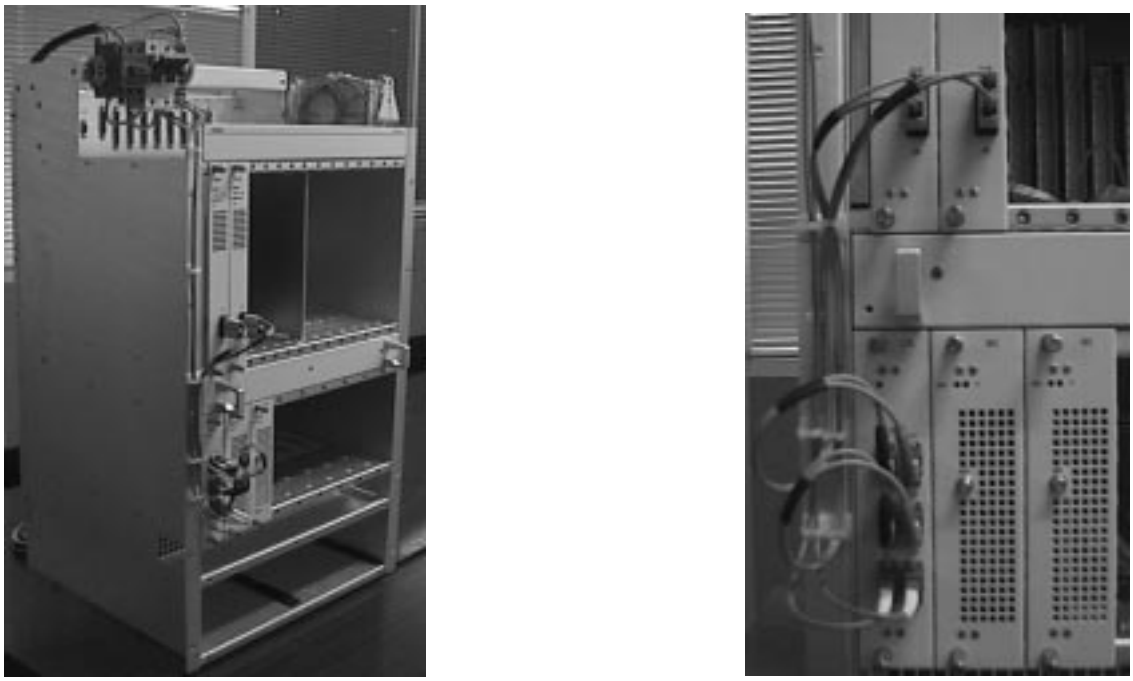


Figure 37 – Fiber optic cables wiring

2. Connect the fiber optic jumpers (see Figure 36 and Figure 37) and the main cables.

	**DO NOT SET THE FIBER OPTIC IN FRONT OF THE VENTILATION PLUG–IN UNIT: SET IT AS SHOWN IN FIGURE 37.**

3. Replace the (removable) top cover of the rack and secure.

3.6.5 – RBS/DBS Connection

– Each coaxial access is linked to an IBS board, via a coaxial cable included in the DBS sub–rack.

– Connect the RBS/DBS cables on the pannel located at the top of the rack or above the DBS sub–rack.

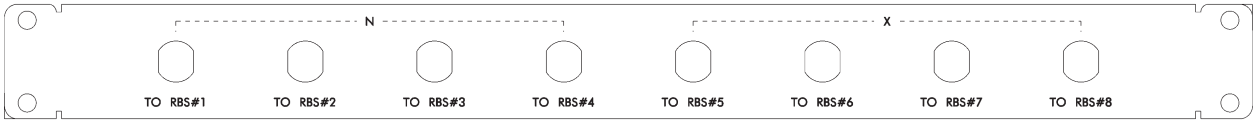


Figure 38 – RBS connection pannel

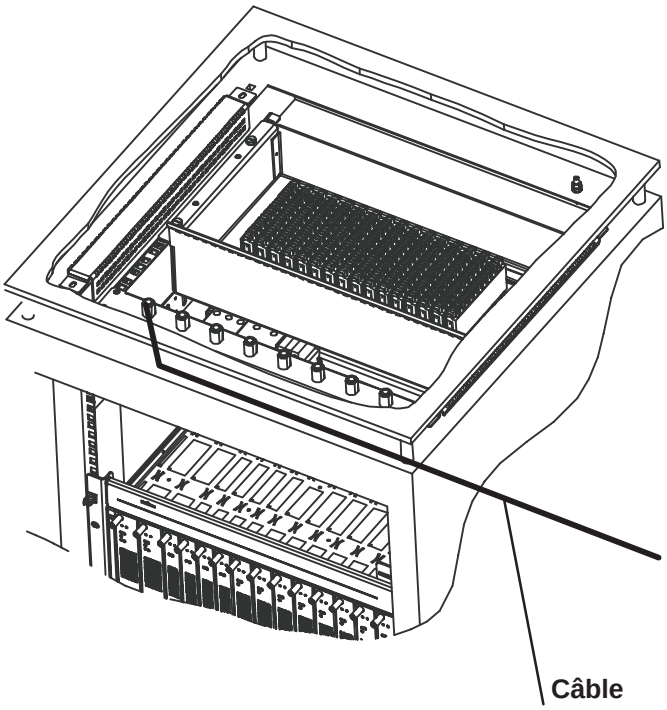


Figure 39 – RBS Cnnection

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4 – 9900LT software overview

4.1 – General information

The purpose of this chapter is to **present** the different **screens** of the 9900LT software supplied with the Base Station. The following chapters will make reference to this presentation each time the user needs to access the software for a particular action (commissioning, maintenance or evolution of the configuration). The same screen may apply for several types of action.

4.1.1 – Functionalities

The 9900LT software enables:

- **supervision** of both the system assembly as a whole (the NE (Network Element)), and of its sub–assemblies (DBS, RBS, NT);
- **configuration** of the sub–assemblies (DBS, RBS, etc.) (used when Commissioning, § 5);
- setting up **services** (E1 leased lines, IP cross–connection), (used when Commissioning, § 5);
- **downloading** (used in Maintenance, § 6).

Nota : The 9900LT software does not manage the radio part of the terminal stations (ODU). These generate no alarms, and therefore require no other configuration apart from the installation configuration

4.1.2 – Principles of the Man–Machine Interface (MMI) of the 9900LT

The user of the 9900LT software is expected to be familiar with the operation of software in the Windows NT™ environment. There follows a description of some of the basic principles of the Windows NT™ MMI along with others, more specific to the 9900LT.

4.1.2.1 – Opening, closing and resizing a window

Here is a reminder of how the boxes at the top right of an active window are used:

Click on....	To.....
	...**minimize** the active window to place the application on the taskbar. Click on the taskbar icon to restore the window.
	...**maximize** the window to full–screen size.
	...**restore** a window which was in full–screen size to its original size.
	...**close** the active window.

4.1.2.2 – Entry fields

The **grayed out** fields are for **consultation only**: their content cannot be modified;

The **fields on a white background** can be **modified**: left–click to make the cursor appear inside the field, then enter the character string required.

According to the same principle, the buttons, icons and items in the pull–down menus become **grayed out** when they are **inactive**.

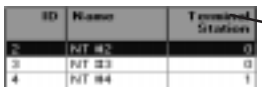
4.1.2.3 – Confirmation, closing a window, canceling an entry

In the lower part of the windows there may be **buttons** (which may or may not be active; cf. § 4.1.2.2), the principle of which is as follows:

Click on....	To.....
	**confirm** the data entry, while keeping the window open.
	**close** the active window, thereby canceling any unconfirmed data entries.
	**cancel** the data entry, while keeping the window open.

4.1.2.4 – Sorting and searching in a list

Certain screens contain **lists** which may contain many lines; a sort and/or search tool is therefore available via the MMI, in order to facilitate data management:



Left–click once on any column **title** in order to **sort** the alphanumeric entries in **increasing order of magnitude**; click **a second time** to sort in the **opposite order** (and so on).

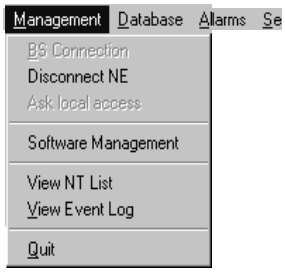
When the lists have **empty boxes above the titles**, it is possible to carry out a search to display the line required:

click on the box above the title under which to be searched, then enter the **first characters** of the sequence in question: the first line to correspond is selected.

4.1.2.5 – Title, menu, button and status message bars

The various information and functionalities of the 9900LT are accessible in several forms of MMI:

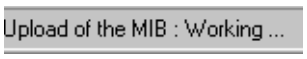
Title bars (at the top of the main window): for information only; this is the title of the window.



Menu bar (below the title bar): each menu contains **items**.

To access, open the pull–down menu by left–clicking on the title, then click on the desired item (for execution it must be active, cf. § 4.1.2.2).

Button bar (below the title bar): certain menu functionalities are also directly accessible by clicking on the buttons displayed at the top of the window.



Message bar (at the bottom of the active window): messages linked to current events are displayed on the fly in certain windows.

Status bar (at the bottom of the 9900LT main window), divided into 4 areas:

– on the left: global user's messages (states of progress, error messages, etc.)

– left of center: *local access*: information about write access (cf. § 4.4.3)

– right of center: *Number of NTs*: displays the number of NTs declared in the system by the Manager.

– on the right: "*Most critical alarm*": displays the color of the most critical alarm (see alarm color codes, § 4.10.4).

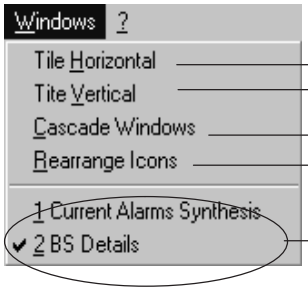
4.1.2.6 – Dynamic keys

Each time the cursor rests for several moments on a button (and sometimes on a field), a textual key on a yellow background defining this button (or field) is displayed.

4.1.3 – Rearrangement of active windows

During the use of the 9900LT software, several windows may be active simultaneously. The MMI allows you to rearrange them to optimize their visibility, in classic Windows fashion.

Access this function by opening the **Windows** pull–down menu:



horizontal rearrangement: horizontal display of several windows

vertical rearrangement: vertical juxtaposition of several windows

cascade rearrangement: diagonal alignment of several windows

list of active windows: select the particular one that you wish to display

4.2 – Running and quitting the software

4.2.1 – Installation of the 9900LT software

The 9900LT is either loaded on the PC which came with the BS, or comes on an installation medium (e.g., CD–ROM).

If you need to install the 9900LT software, refer to the “A9900 Craft installation” Appendix; otherwise, go directly to the next paragraph to run the already installed software.

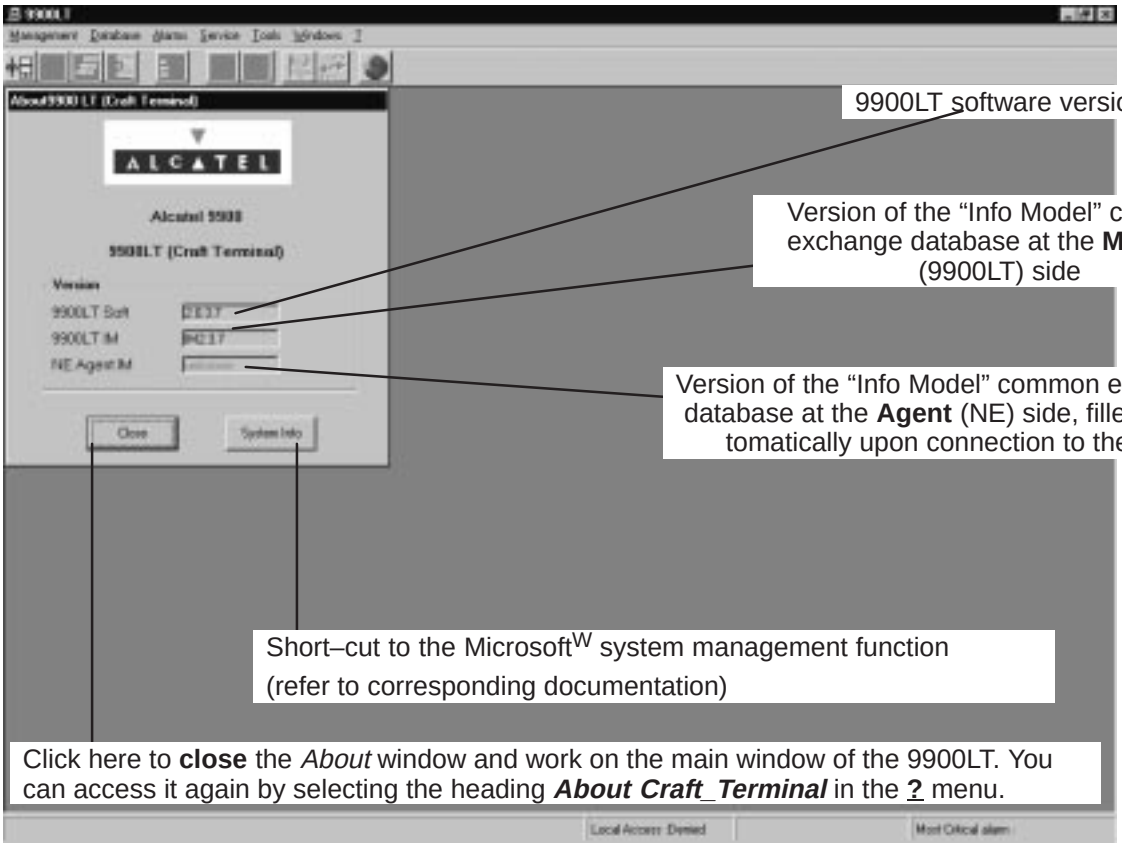
4.2.2 – Accessing and running 9900LT

To **run** 9900LT, go to the Windows® taskbar and left–click on the *Start* button: the *Start* menu is displayed. Next, select the *Progams* menu followed by the line *Craft_Terminal*.

or:

Click on the icon shown here which is on the desktop .

To run 9900LT, the following screen is displayed:

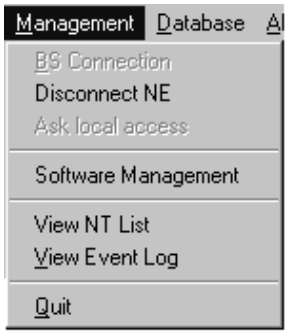


Nota : *The common IM database versions at the Manager and Agent sides must be identical.*

On the screen displayed, only two icons are active: the choice of language and the BS connection:

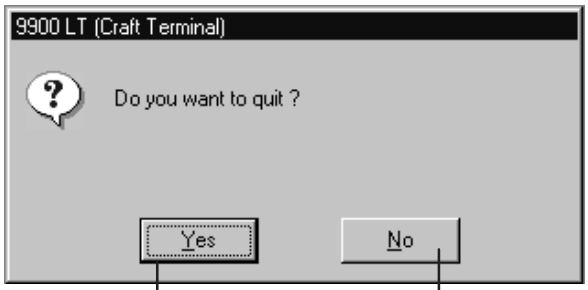
Click on....	To....
	...access the choice of **language**: French or (by default) English
	...access the **BS connection** (cf. comments in paragraph 4.3.1)

4.2.3 – Quitting the 9900LT



To **quit** the 9900LT, open the ***Management*** pull–down menu and click on ***Quit***.

A confirmation dialog box is displayed:



Click here to **confirm.**

Click here to **cancel** the request to quit the 9900LT and return to the previous window.

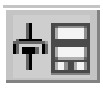
4.3 – Connection and Disconnection

4.3.1 – BS Connection

The BS connection process consists partly in the NE “Agent” identifying the “Manager” and partly in the retrieval of data for the NE assembly on the 9900LT software by manual request: this involves the **updating of site information**.

	**ONLY ONE LT SESSION IS OPERATIONEL ON ONE BS.FOR EXEMPLE A LOCAL LT CONNECTION AND A REMOTE LT CONNECTION AT THE SAME TIME ON THE SAME BS,IS NOT POSIIBLE.**

There are two possible ways of accessing the **BS Connection**:



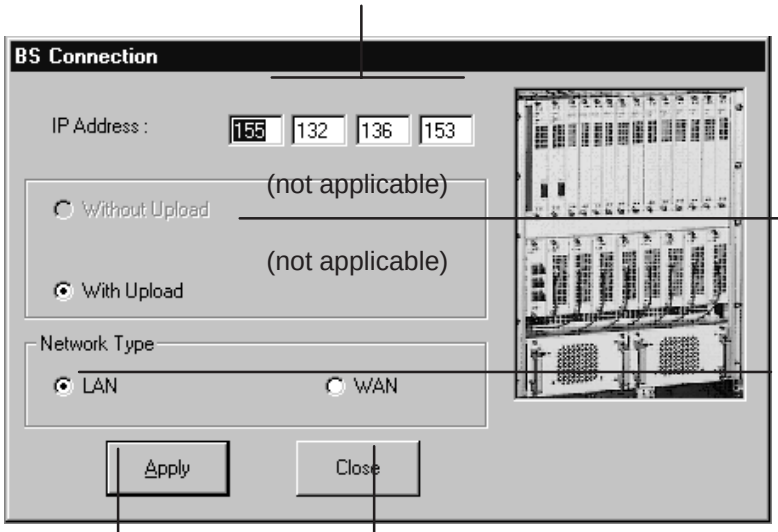
– click on the first button (provided that it is active; cf.§ 4.1.2.2) of the main menu button bar,

or else,

– open the ***Management*** pull–down menu and select the first item: ***BS Connection***.

The following screen is displayed:

IP Address of the **BS** to be connected: click in a byte field to modify the value;
by default, the address of the last BS to be connected is the value entered.



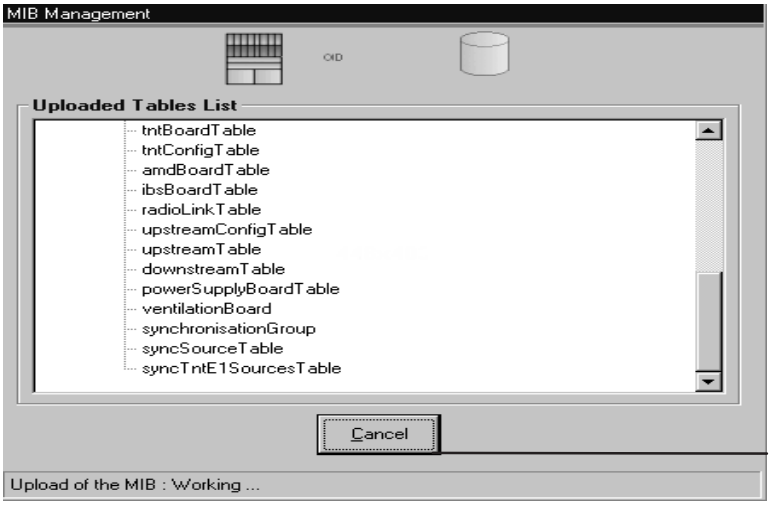
connection type: with data upload (default selection)

network type: there are two types of network: **local (**LAN) or **remote** (WAN): check the button for the type of network corresponding to the system configuration (see Commissioning, section 5).

Click here to return to the previous screen.

Click here to **run** the data update procedure.

Throughout the update, an **animated display** indicates to the user that data transmission is **underway**, with on–screen indication of the progress of the processed files.



click here to **cancel** the data update procedure.

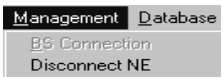
Once the update is completed, two new windows are displayed:

– one screen providing a global view of the **base station** (cf. § 4.5);

– and one screen summarising the **current alarms** (cf. § 4.10)

4.3.2 – Disconnecting the NE assembly

The NE disconnection process consists in closing the current session relating to a given BS in order to connect to another BS of the system.



To access the NE disconnection function, open the ***Management*** pull–down menu then select the first item: ***Disconnect NE***.

A confirmation screen is displayed:

4.4 – Supervision Principles

The 9900LT can be used for **supervising** the whole **A9900 Network Element (NE)** system.

The **NE** comprises of:

- a **Base Station** (**9900BS**) which mainly includes a Radio unit (**RBS**) and a MODEM rack (**DBS**)
- one or more **Terminal Stations** (**9900TS**) which mainly include a Radio unit (RT) and a User connection unit (NT). Nevertheless the 9900LT software does not manage RT units.

The display allows system **control**; alarms are activated in particular to signify any intervention.

The **supervision** items themselves are by definition **grayed out** and therefore unmodifiable, whereas those reserved for **configuration** can be configured by the user. They will be used in the following chapters concerning commissioning, maintenance and configuration evolution. For the **modifications** to be taken into account, **two conditions** must prevail: you must be in **supervision mode** (cf. section 4.4.1) and have **write access authorization** (cf. section 4.4.3).

4.4.1 – Supervision activation/ deactivation

It is possible to **delete** the supervision function for a sub–assembly (BS or NT) or assembly (NE), in order to avoid a stream of data and alarms (e.g. when modifying a sub–assembly).

The supervision activation/deactivation buttons are similar for each of the various screens relating to the different sub–assemblies. Supervision is symbolized by an **eye**:

Click on.....	To....
 ou 	...**activate supervision** of the BS or NT respectively.
 ou 	...**stop supervision** of the BS or NT respectively.

4.4.2 – Data retrieval

According to the same principle as for starting up the 9900LT (automatic data retrieval following connection), this update can be carried out **for each individual equipment item**; data recovery is symbolized by a **red arrow** on the screen buttons relative to the equipment:

Click on...	To...
 or  or 	...**activate** the data recovery function for the NE, BS, and NT respectively.

Nota : *these operations may take quite a long time (in particular for the NE) since they depend on the allocated bit rate of the connection between BS and manager.*

4.4.3 – Local access requests

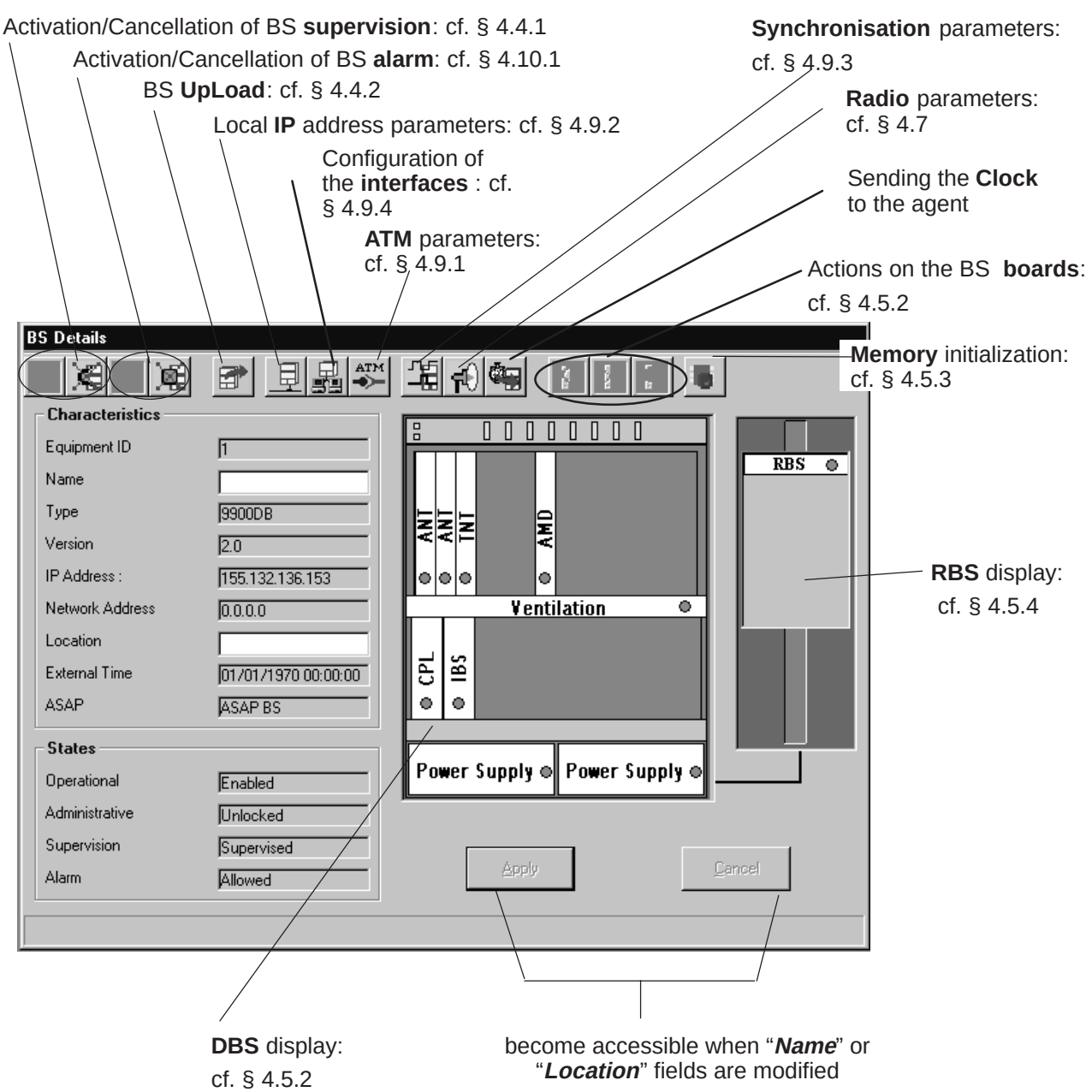
The general status bar (cf. section 4.1.2.5) displays in its central part the messages concerning write access authorization: "***Local Access : Denied / granted***". Where there are two system managers (9900LT and an Operating System (OS : ex:1353)), these access rights are allocated by the OS manager; otherwise, write access is authorized by default for the 9900LT.

4.4.4 – Administrative statuses

Locking the administrative status of sub–assemblies allows the maintenance operator to disable the sub–assembly manifesting an anomaly without disturbing the system.
Unlocking sub–assembly administrative status frees service use for the end user.

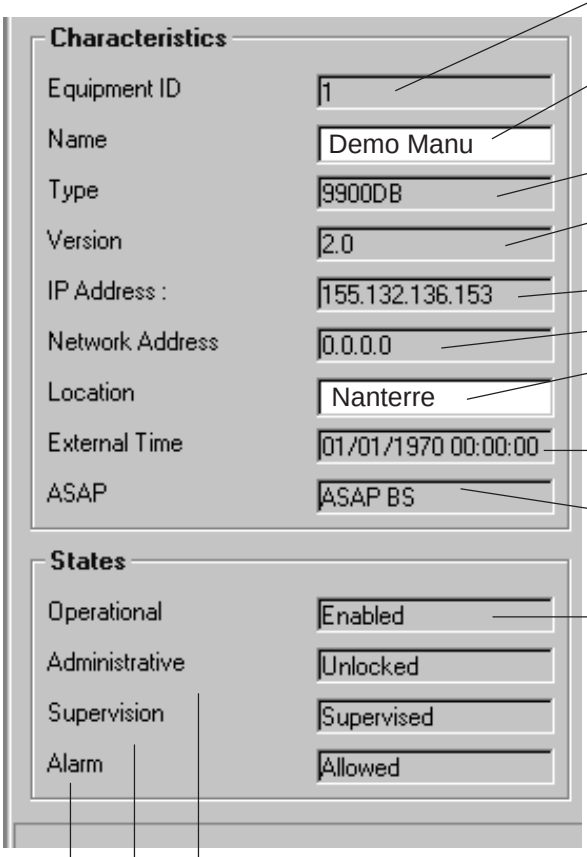
Operator is not able to modify the administrative state assembly. He only can change the ports and cross–connections.

4.5 – Base Station Supervision



4.5.1 – General parameters

The left side of the BS supervision screen shows the **characteristics** and associated **states**:



Identification No.: 1 for the BS

BS name: click to enter the BS name: it will appear in the title bar.

BS **manufacturer** No.

BS **version** No.

IP address of BS access via 10 Bt Eth port

IP address of BS access via ATM port

BS Location: click to enter the town or geographical sector where the BS is located.

Last BS time setting

Name of the alarms **correspondence base:** cf. § 4.10.4

Operational state (enabled/disabled): indicates the technical availability status of the equipment with respect to service provision.

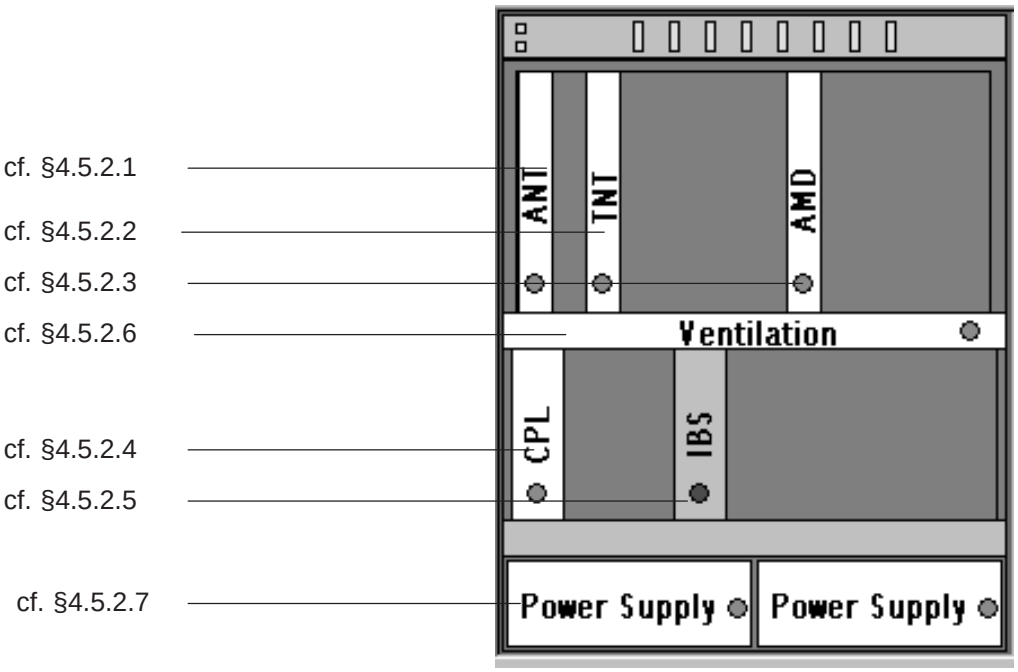
Administrative state (locked/unlocked): indicates whether locked or unlocked for modification at the network management level (cf. section 4.4.4).

Supervision state (supervised/unsupervised): cf.§ 4.4.1

Alarm state (allowed/locked): cf. § 4.10.1

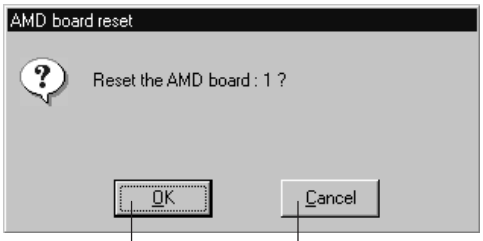
4.5.2 – DBS

The central part of the BS supervision screen shows the rack and its sub–assemblies as detected by the 9900LT:



On the BS screen button bar:

Click on.....	To....
	...**access** the details of a selected sub–assembly (or **double–click** directly on one of the sub–assemblies)
	...**delete** a selected sub–assembly; the data retrieval phase (BS upload) will be run automatically.
	...**reset** a selected board. A confirmation screen is displayed:



Click here to **confirm** reset of the selected board.

Click here to **cancel** the reset request for the selected board.

Symbols on the equipment representations:

– **green spot**: no alarm is detected;
– **colored spot** (other than green): alarm detected: the color displayed corresponds to the most critical alarm level (cf. §4.10.4);
– **white board**: board physically present in the rack;
– **gray board**: board physically removed but still present in the system management.

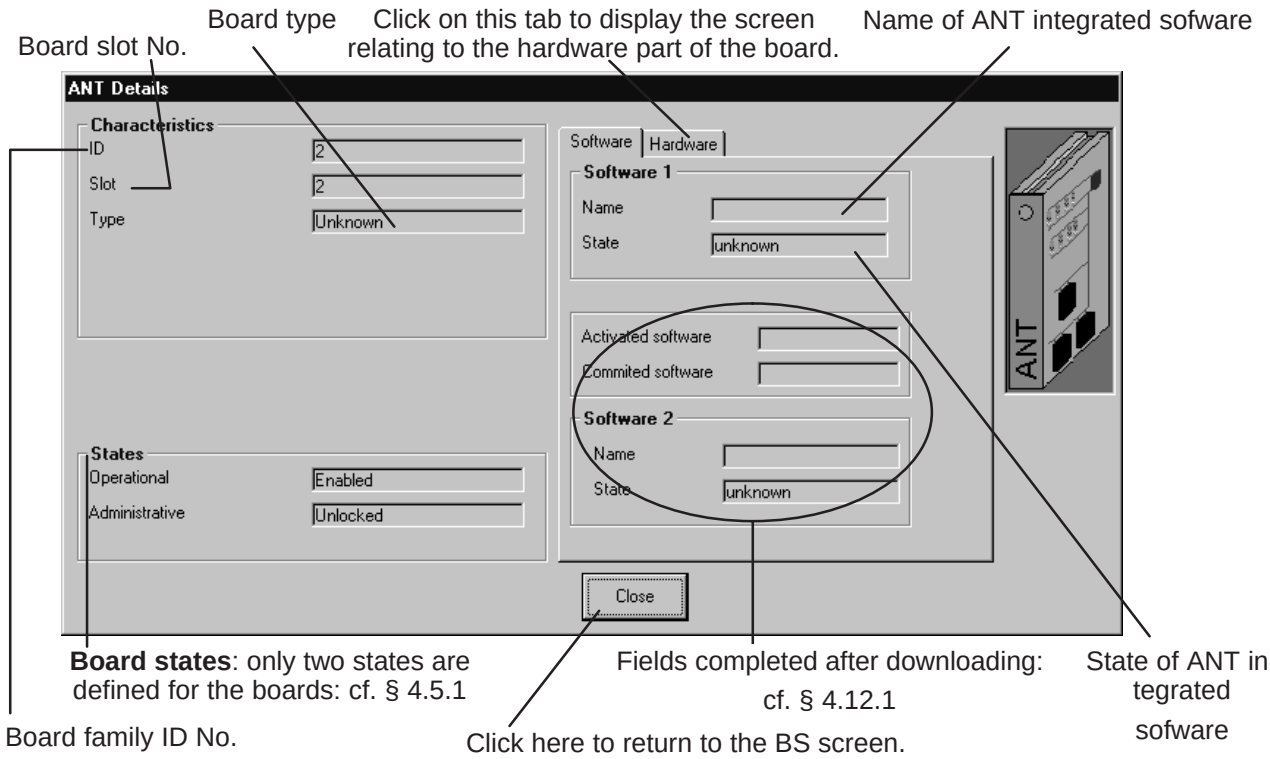
Number of equipments in the rack:

Equipment designation	Maximum number of equipments managed by the system	Maximum number of equipments that can be included in the BS
ANT board	1	2
TNT board	4	4
AMD board	4	8
CPL board	1	1
IBS board	4	8
Power Supply Unit	2	2
RBS	4	8

Nota: To activate a radio sector, the triplet of AMD, IBS and RBS must be present in the rack and configured on the 9900LT. When you physically insert in the rack, for example, an AMD board, an IBS board and an RBS ODU will automatically be created on the 9900LT.

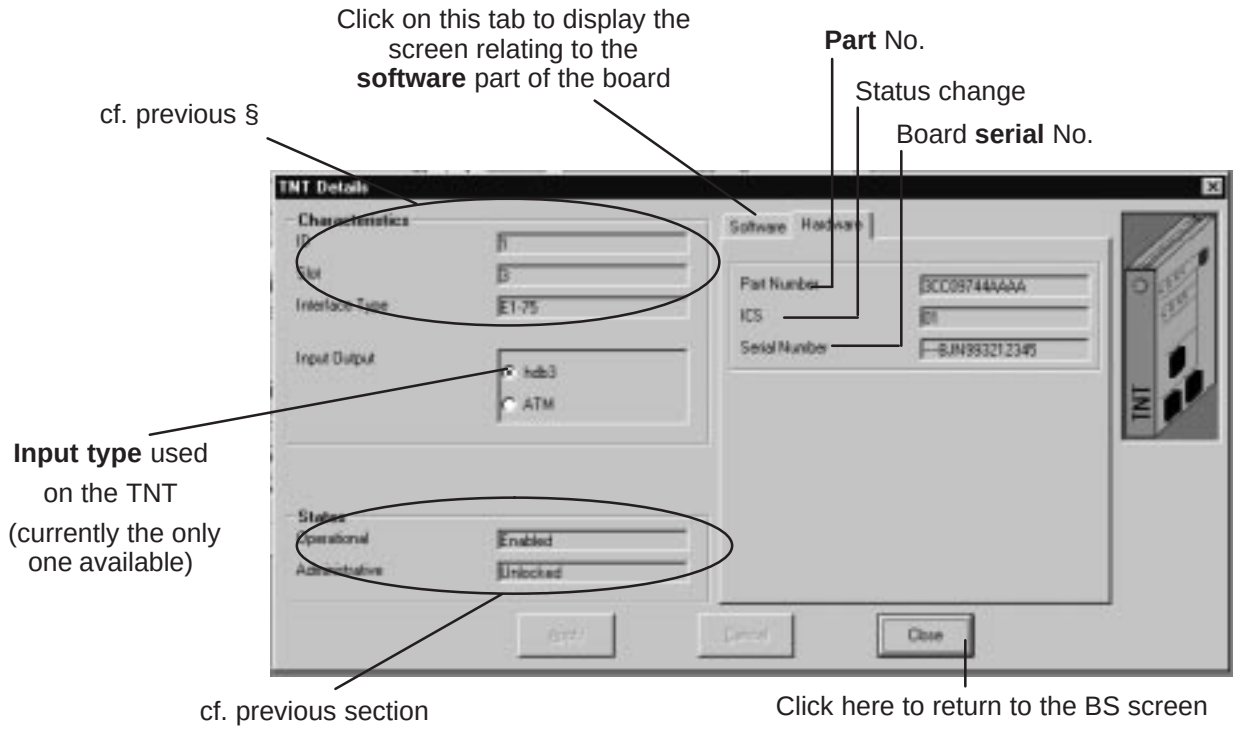
4.5.2.1 – ANT board screen

ANT (**A**TM **N**etwork **T**ermination): NE input board for network management.



4.5.2.2 – TNT board screen

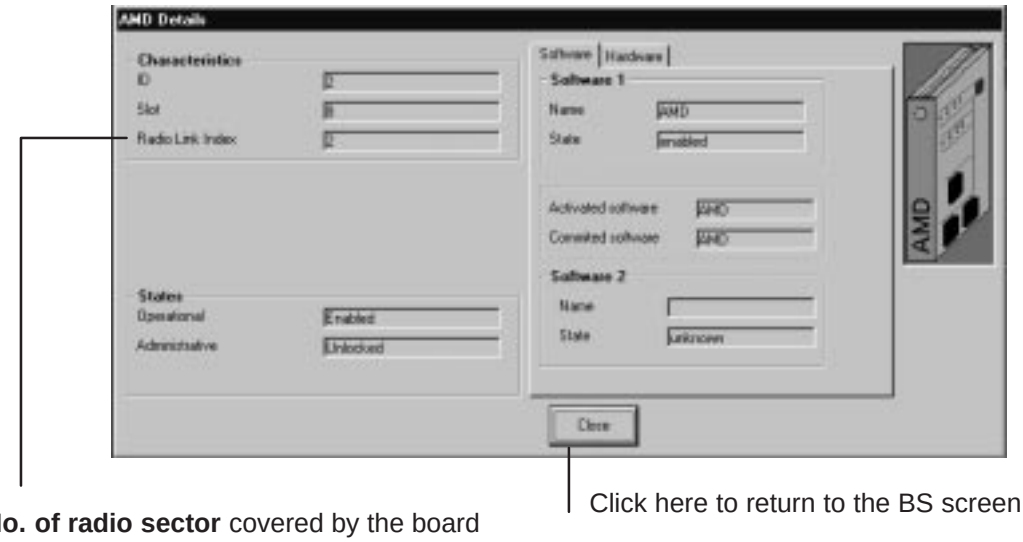
TNT (**T**elephony **N**etwork **T**ermination): board providing the leased line service (E1).



4.5.2.3 – AMD board screen

AMD (**A**ir **M**O**D**EM) : modem board

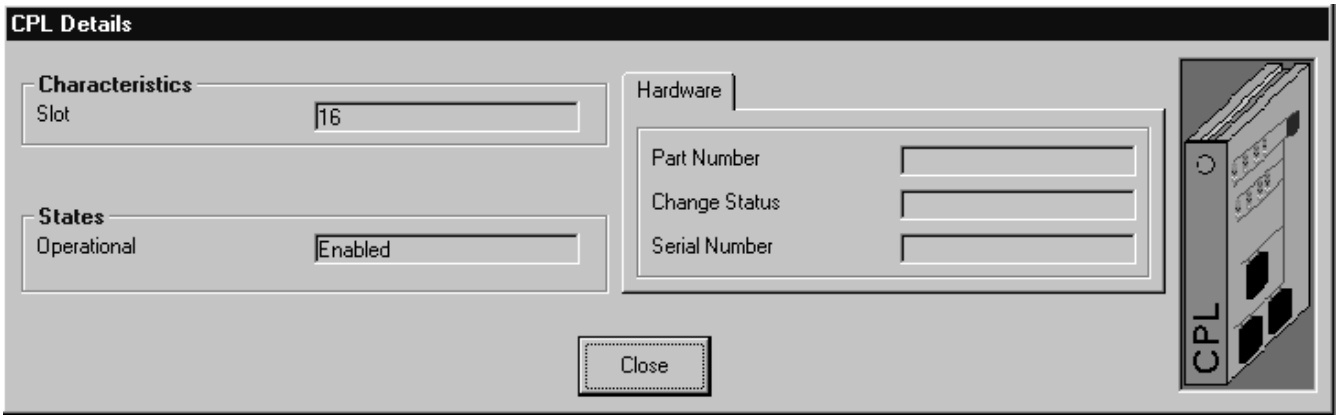
for the items on this screen, refer to the description of the ANT board (§ 4.5.2.1)



4.5.2.4 – CPL board screen

CPL (Coupler): network interface coupler board.

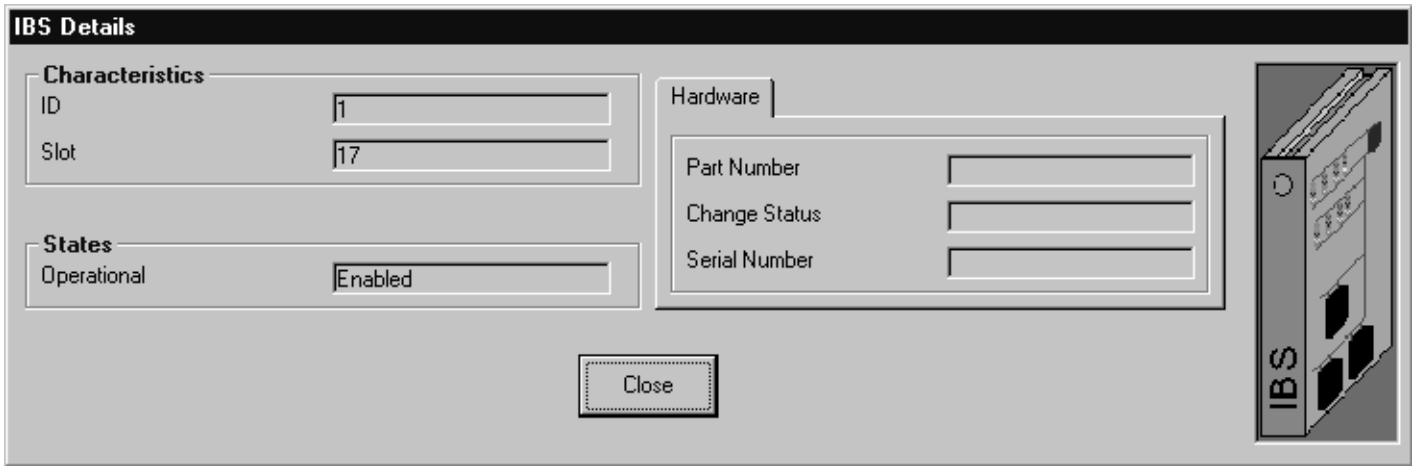
for the items on this screen, refer to the description of the ANT board (§ 4.5.2.1)



4.5.2.5 – IBS board screen

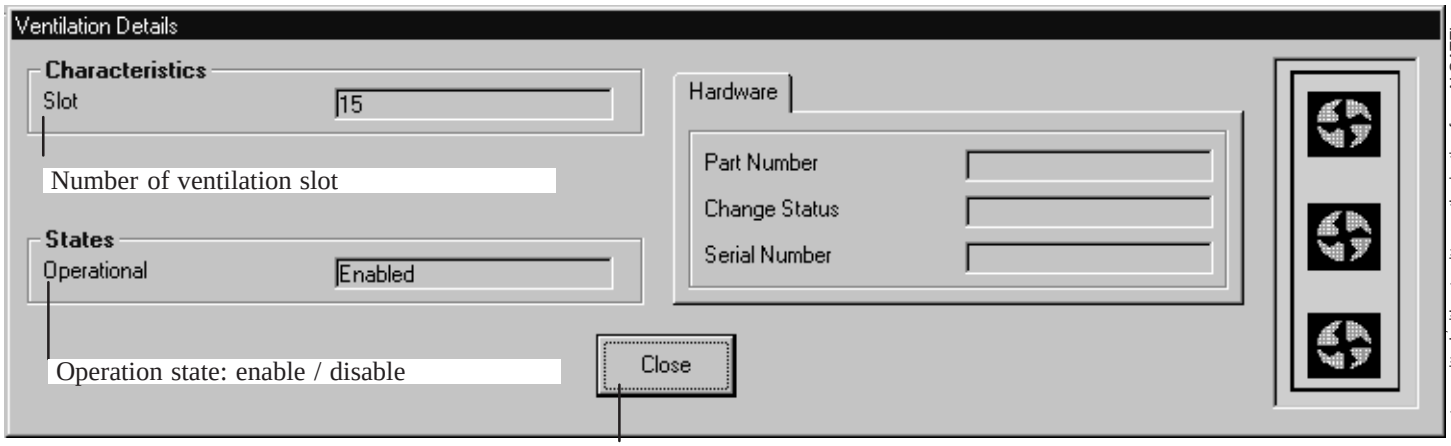
IBS: radio link intermediate board

for the items on this screen, refer to the description of the ANT board (§ 4.5.2.1)



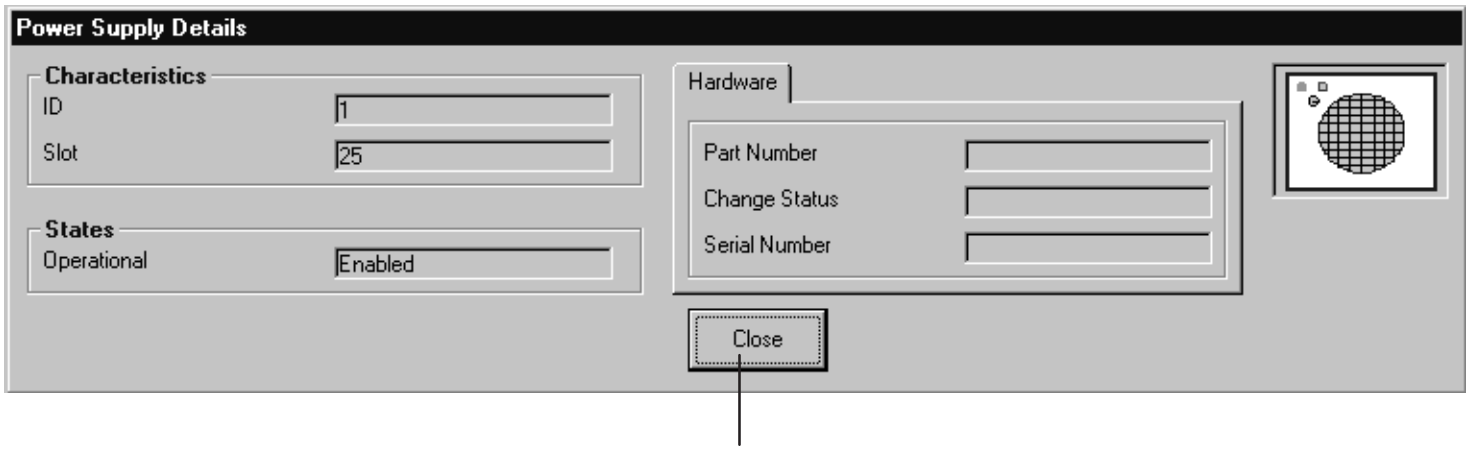
4.5.2.6 – Ventilation

for the items on this screen, refer to the description of the ANT board (§ 4.5.2.1)



4.5.2.7 – Power supply

for the items on this screen, refer to the description of the ANT board (§ 4.5.2.1)

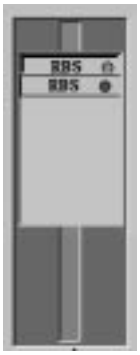


4.5.3 – Memory initalization

This function allows memory initialization by the SNMP agent located in ANT board.
The function, maintenance restricted, is **destructive** of the current configuration.

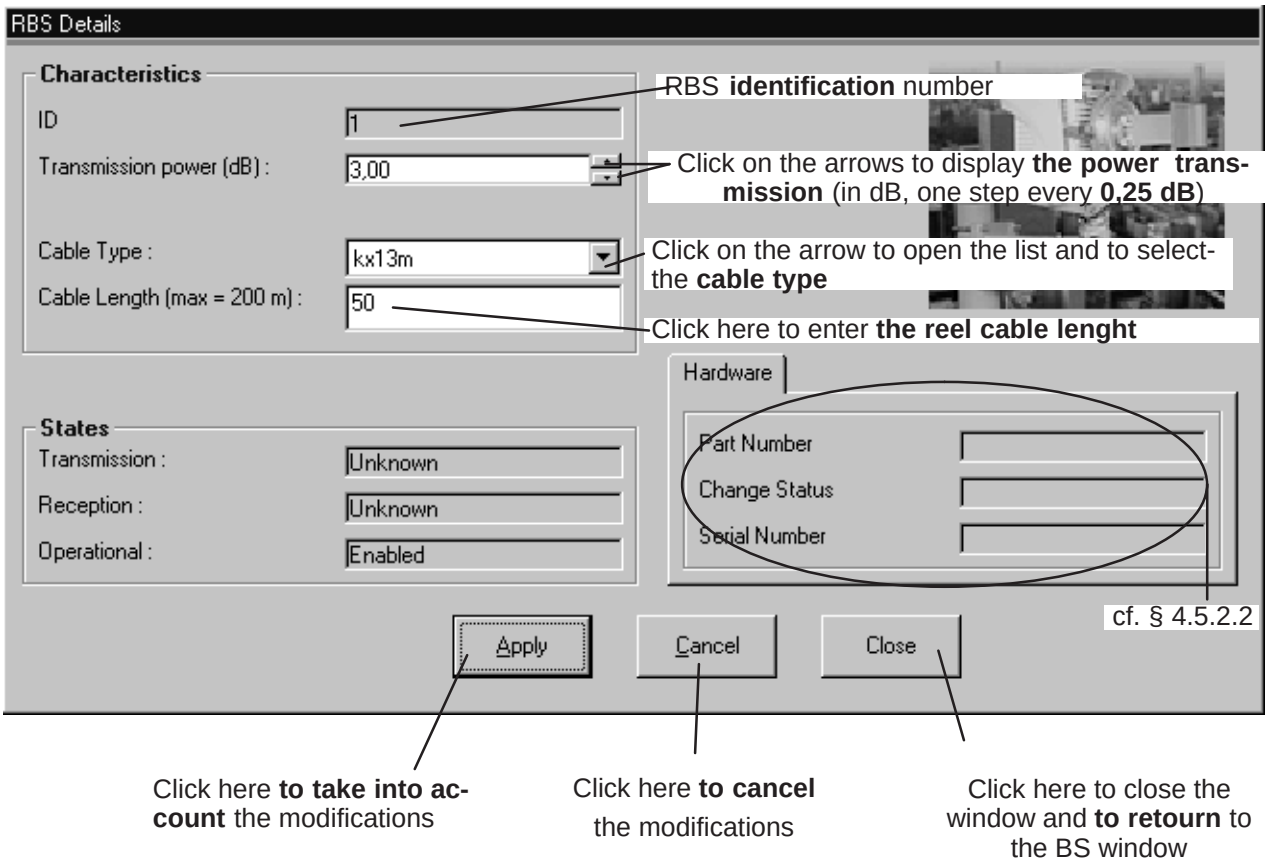
Operator has to enter the password to starting this function.

4.5.4 – RBS



On the right of the BS supervision screen are all the ODUs (RBS) associated with the BS:

Double–click on the **RBS** whose **details** you require, in order to display the following screen:



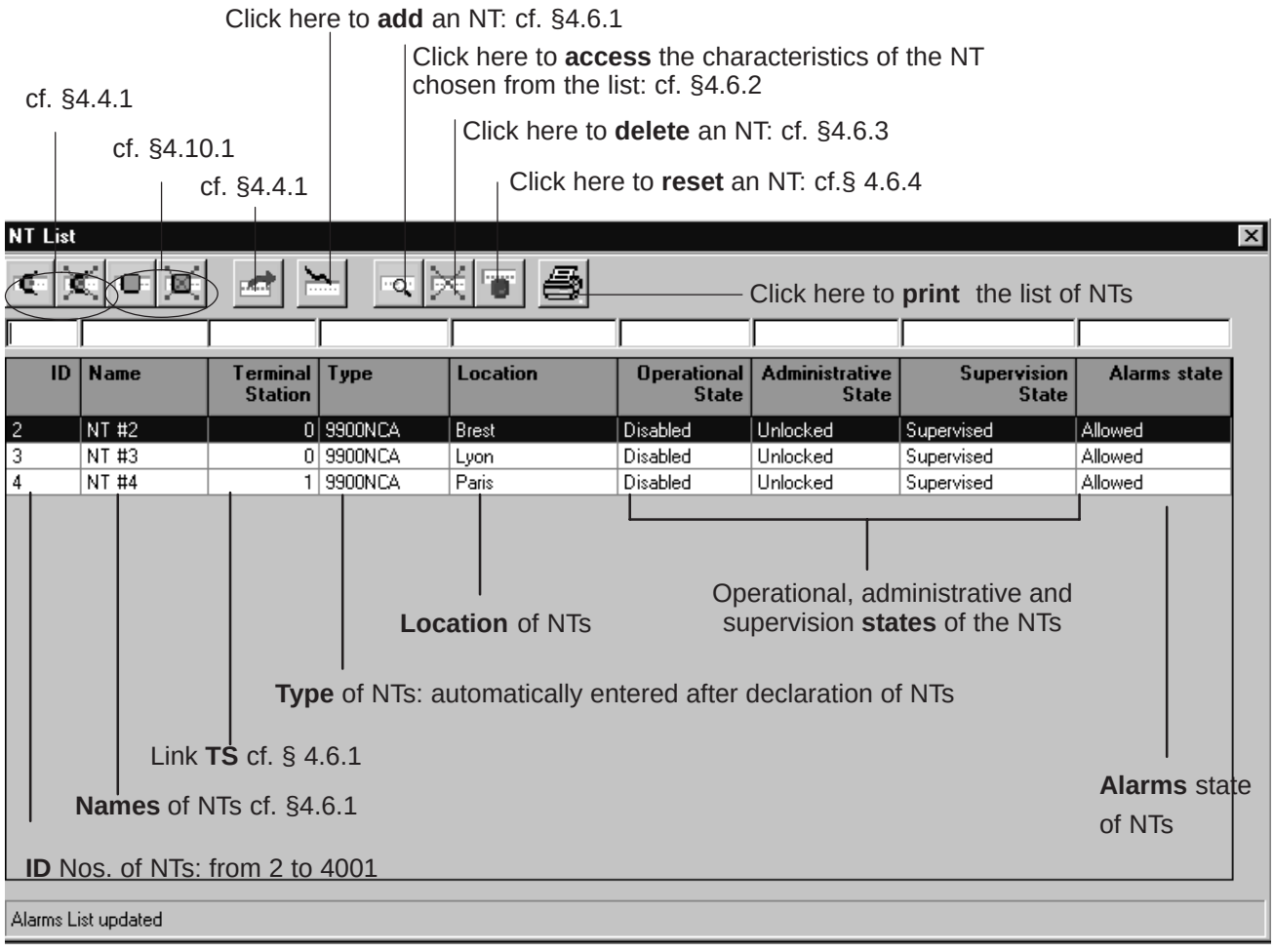
4.6 – NT Supervision

To access the list of declared NTs associated with the BS:

click on the third button of the main menu button bar,

or else,

open the ***Management*** pull–down menu and choose the first item: ***View NT List***.



Nota : *The number of NTs present in the list corresponds to the "number of NTs" displayed permanently on the main screen status bar (cf. § 4.1.2.5).*

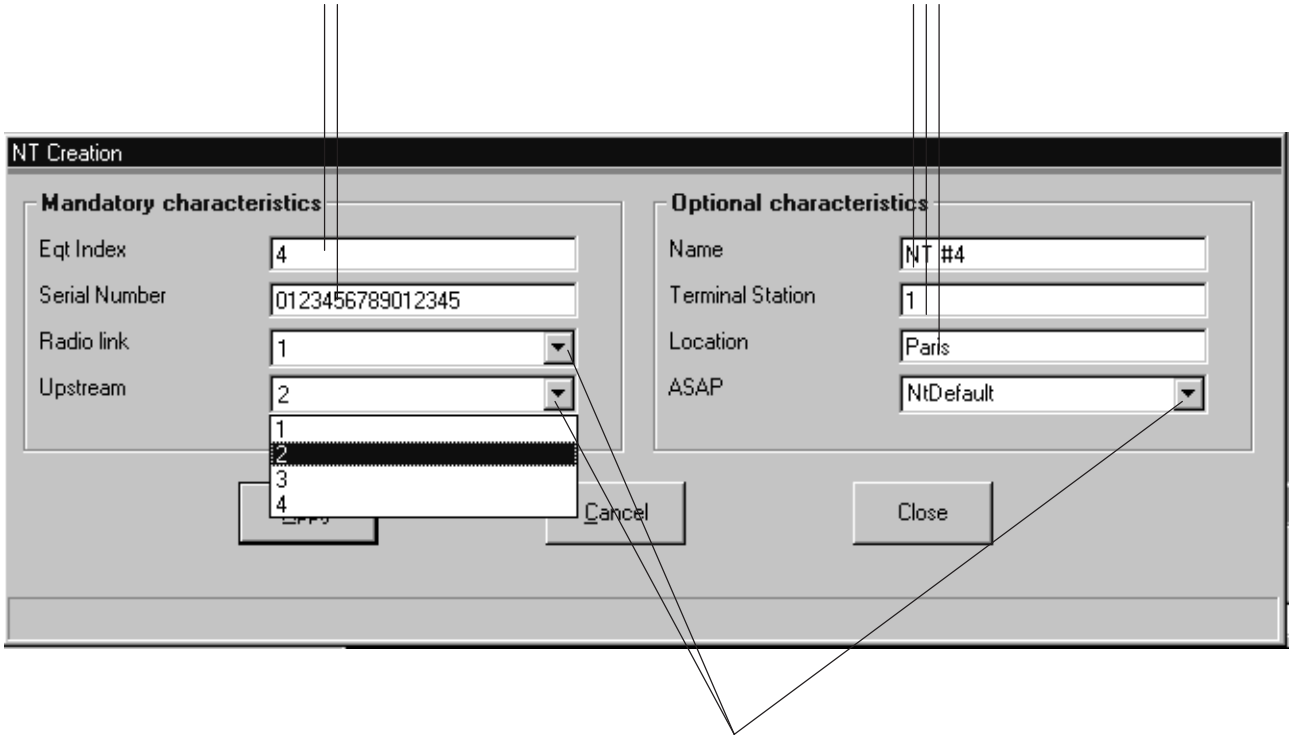
Nota : *Remember that it is possible to access a given NT rapidly from the list of all NTs via the sort and search functions (cf. § 4.1.2.4).*

4.6.1 – Declaring a new NT

To add an NT :

Click on the button shown here (on the NT screen button bar).
An input screen is displayed:

Click in the **fields** to enter the various information (described below)



Click on the **arrows** to display the list
then select : – the radio sector (radio link)
– the sub–band (upstream)
– the list of correspondence bases (ASAP)

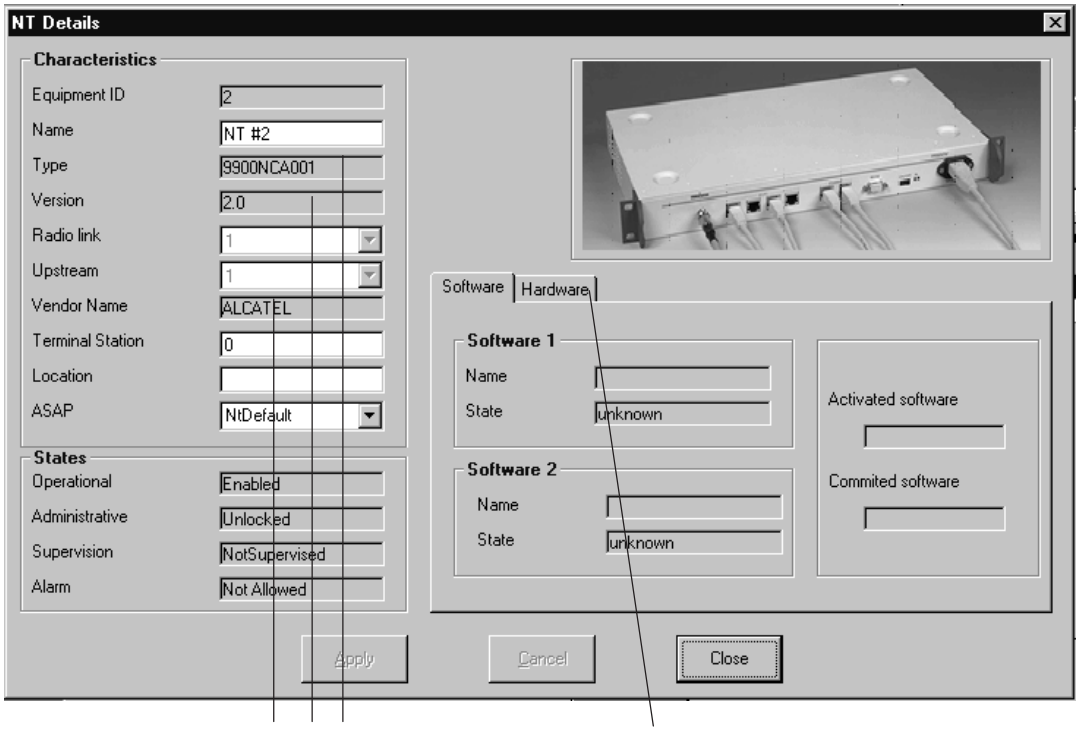
Mandatory NT characteristics to be entered	Optional NT characteristics to be entered
NT identification number (equipment index) (from 2 to 4001): see data supplied by planner. **NT serial number**: see data supplied by planner. The corresponding **Radio sector**: from 1 to 4 **Connected sub–band number**: from 1 to 4	**Name of NT**: by default displays NT#***Eqt Index*** ID **Terminal Station** link: numerical entry supplied by the planner **Location**: town or geographical sector **ASAP name**: alarms correspondence base.

4.6.2 – NT Details

To access the characteristics of an NT:

click on the button shown here (NT screen button bar) or else **double–click** directly on a line from the list of NTs.

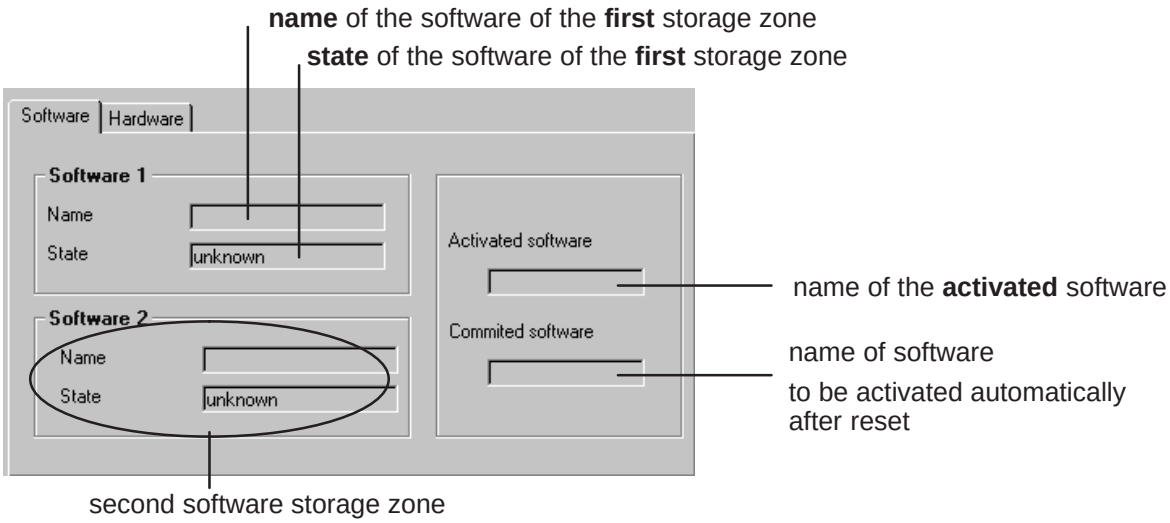
A global screen is displayed in which (under ***Characteristics***) the majority of the items in the previous section are to be found:



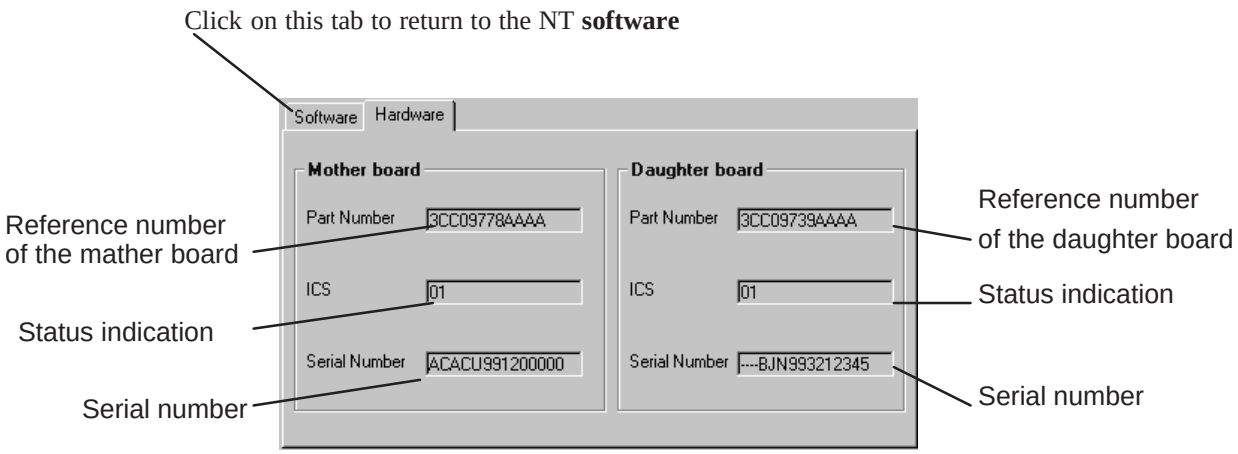
automatically filled in after declaration of the NTs

Click on this tab to display the **hardware** characteristics.

– NT software:



– NT hardware:



4.6.3 – NT deletion

To delete an NT :

– click on the NT in the list

– click on the button shown here (NT screen button bar)

A confirmation screen is displayed :

4.6.4 – NT reset

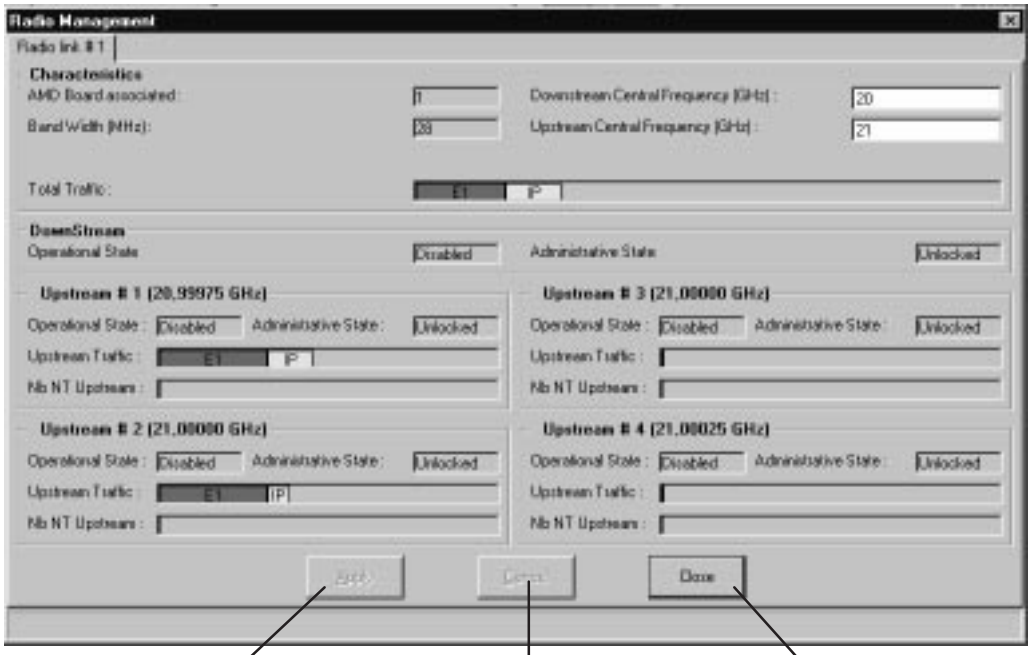
To reset an NT:

– click on the NT in the list

– click on the button shown here (NT screen button bar); a confirmation screen is displayed :

4.7 – Radio supervision and parameters

To access the supervision and parameters of the **Radio** link, click on the button shown here (BS screen button bar).



Click here to **apply** the modifications.

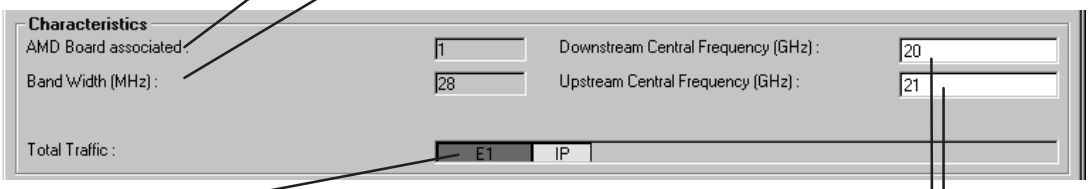
Click here to **cancel** the modifications.

Click here to **return** to the BS screen.

– *Radio characteristics*:

No. of the **AMD** board associated with the sector

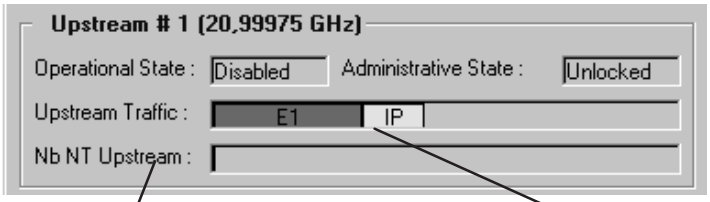
Bandwidth



Progress bar indicating the traffic on the **E1** and **IP** lines: the total space available represents the maximum possible flow on this radio link in the downstream direction

Click here to enter the **central frequencies.**

– *Upstream channel traffic*



number of NTs connected to Upstream channel No. 1

progress bar indicating the traffic on the **E1** and **IP** lines: the total space available represents the maximum possible flow on this radio link in the upstream direction

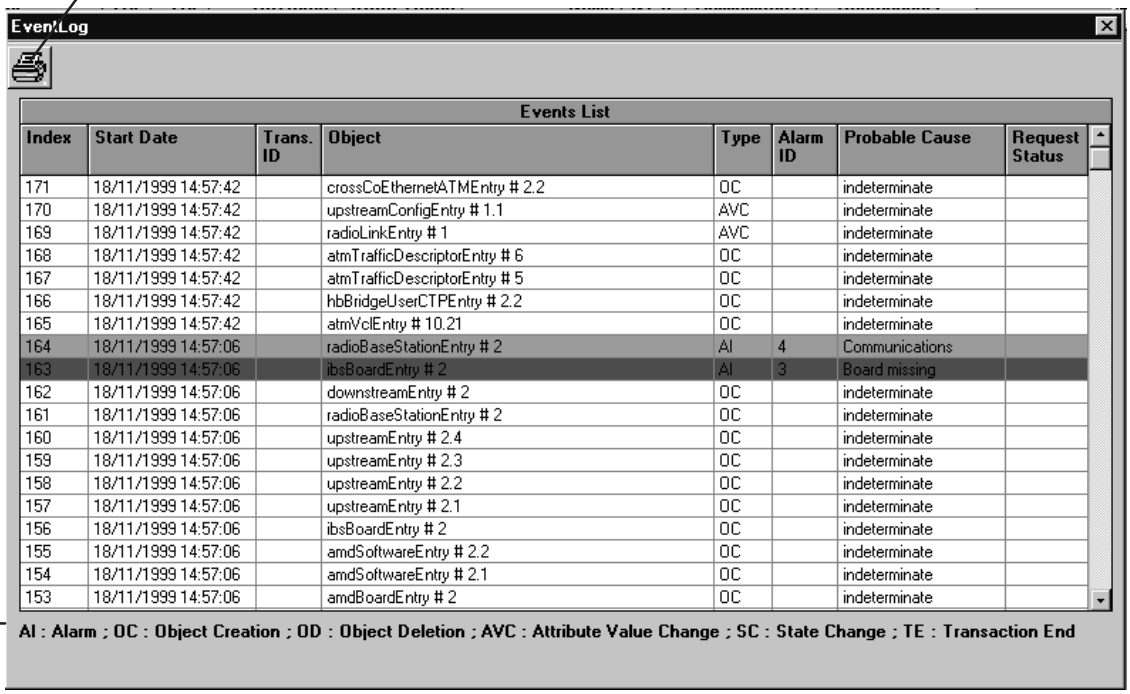
4.8 – NE supervision: Events log

The 9900LT software keeps a log of all the **events** taking place between the Agent (NE) and the Manager (9900LT). The main utility of this supervision tool is for maintenance purposes (cf.§6).

Nota : *The events log (in read only) is presented in reverse chronological order. The most recent event is at the top of the list.*

To access the ***events log***:
– click on the button shown here (on the main screen of the 9900LT),
– or, open the ***Management*** pull–down menu and choose ***View Event Log***.

Click here to **print** the events log on the default printer.



Key of the different possible event types

Index: this is the event number; an incremental cyclic counter is activated each time an event takes place.

Start date: time–stamping of the event (format: day/month/year, hour/minute/second)

Transaction ID: number of the transaction enabling a link to be made between an action and all the events that lead from it; in the above example, the action corresponding to event No. 181 has generated 10 other events (cf. ID 18 group).

Object: indicates the part of the system affected by the event (format: equipment ID designation followed by port number)

Type: Abbreviation (the key for which is permanently displayed at the foot of the window) of the event type: alarm, deletion, creation, etc.

Alarme ID: if an alarm is associated with the event, its number is entered.

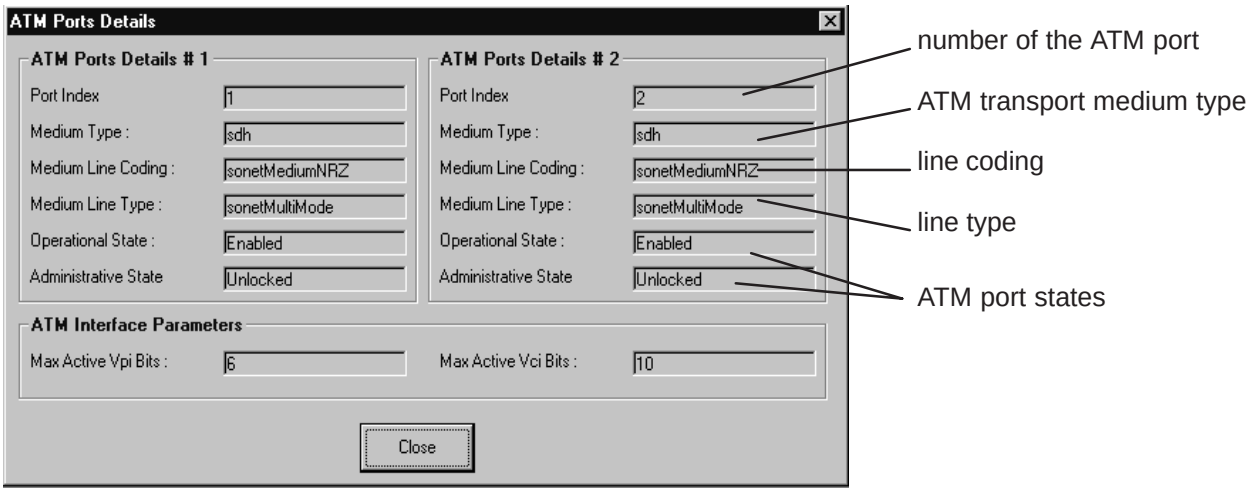
Probable cause: field associated with the alarm: description of the cause of the problem; the ASAP only gives the severity for a given probable cause.

Request status: abbreviation (the key for which is permanently displayed at the foot of the window) of the status of the event in question.

4.9 – Interface parameters

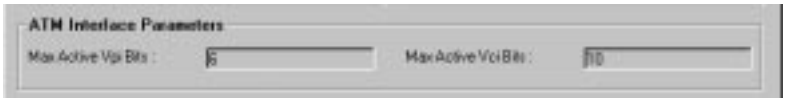
4.9.1 – ATM

To access the parameters of the **ATM** link, click on the button shown here (in the button bar of the BS screen).



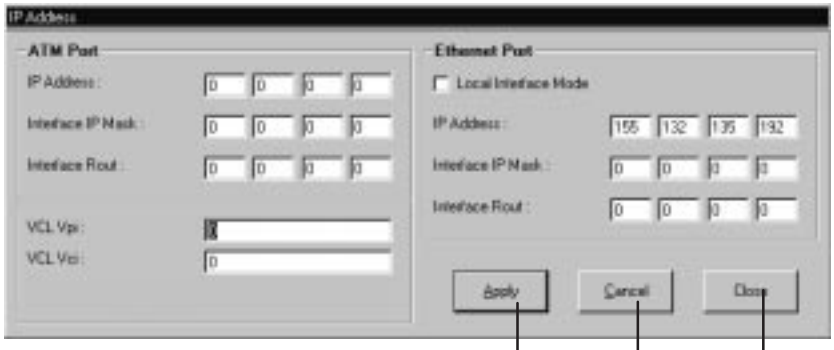
– ATM port parametres.

Display the number of VPI bits onthe ATM interface.



4.9.2 – IP addresses

To access the parameters of the **IP addresses** of the BS, click on the button “Close” shown here in the button bar of the BS screen.
A configuration screen is displayed:

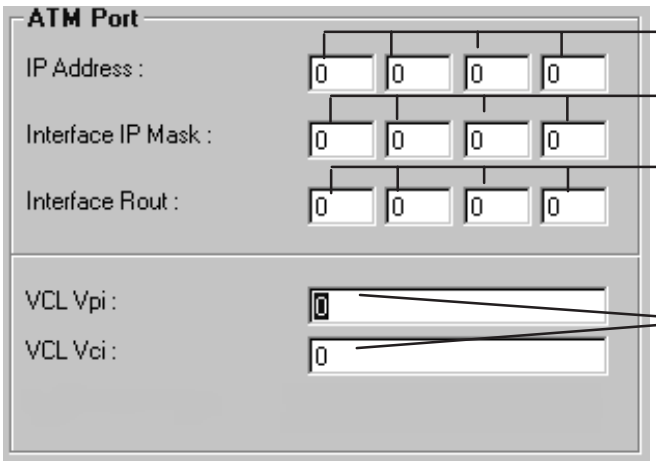


Click here to **apply** the modifications.

Click here to **cancel** the modifications.

Click here to **return** to the BS screen.

– TNT board side of the BS:



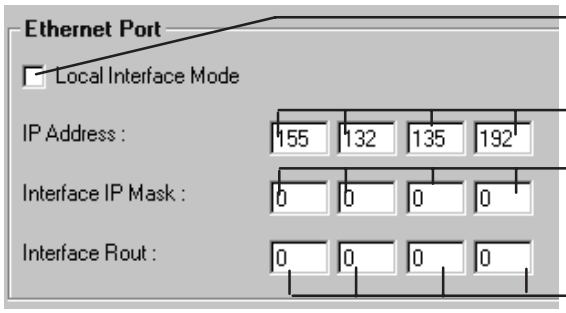
Click here to enter the 4 bytes of the address of the **BS at the ATM input**.

Click here to enter the 4 bytes of the address of the **IP mask** of the BS at the ATM input.

Click here to enter the 4 bytes of the address of the **router** of the BS at the ATM input.

Click here to enter the VCL coordinates (supplied by the provider) for the management link between a manager and the BS.

– ANT board side of the BS:



Click here if the system is in **local** mode.

Click here to enter the 4 bytes of the **IP address of the BS at the Ethernet input.**

Click here to enter the 4 bytes of the address of the **IP mask of the BS at the Ethernet input.**

Click here to enter the 4 bytes of the address of the **router of the BS at the Ethernet input.**

4.9.3 – Synchronization

To access the **synchronization** parameters, click on the button shown here (in the button bar of the BS screen).

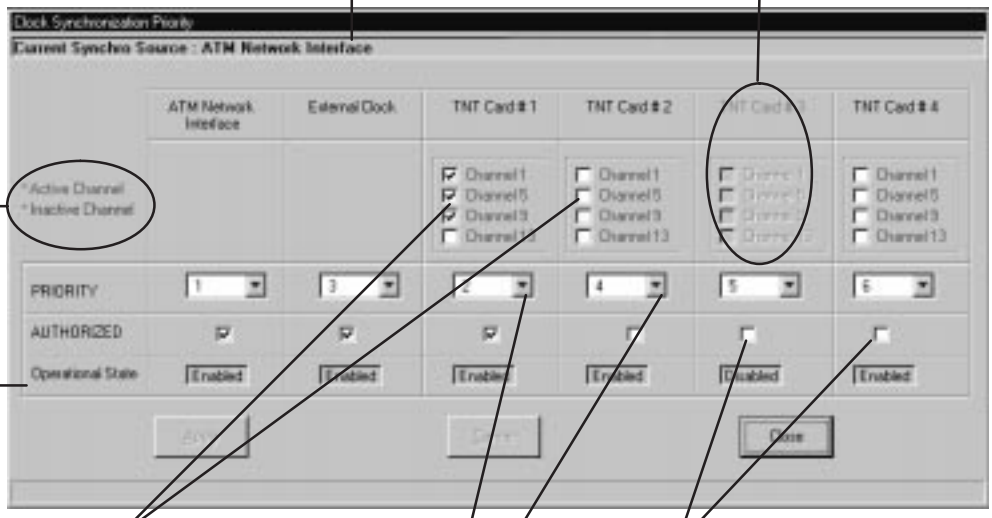
This involves defining the setup rules for the synchronization sources used .

There is one default sync source (internal oscillator) and six configurable sources: ATM, external clock and the four TNT boards. The TNT boards have 16 E1 ports and 4 can be used as synchronization ports: these are ports 1, 5, 9 and 13.

The message indicates the synchronization source currently used (chosen automatically by the system from the source configurations shown below).

Active channels are **green**, and inactive channels are **red.**

grayed out – unavailable



operational state of sub–assemblies

1. On each of the boards, choose the **reserved channels** to act as **potential** synchronization sources.

3. Checkboxes for enabling/ disabling sub–assemblies as synchronization sources.

2. Allocate to each sub–assembly an **order of priority number** (chosen from pull–down list). Each order number must be unique (1 specific No. / sub–assembly).

– *Priority principle*: the ***order of priority*** numbers take precedence, followed by the **channel numbers**, in increasing order of appearance.

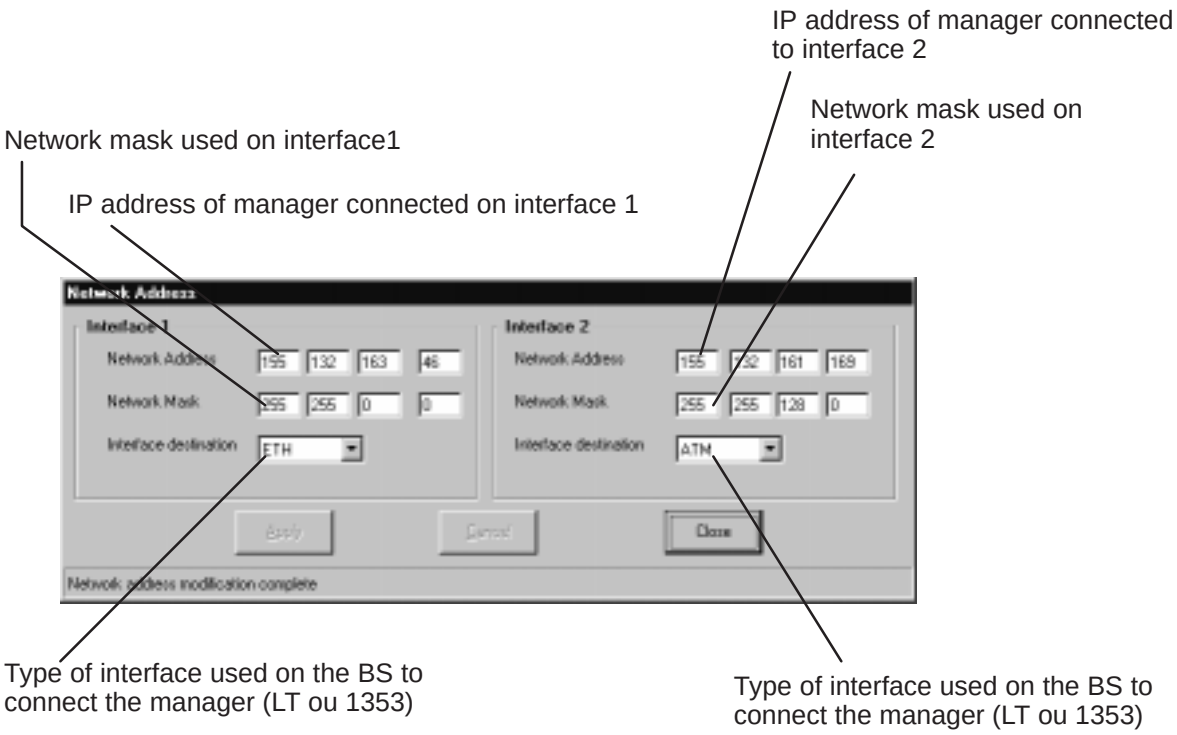
Two sub–assemblies cannot be assigned the same order of priority (an error message is displayed).

4.9.4 – Network address

To access the settings for configuring the interfaces, click the button on the BS screen button bar, shown here.

This involves informing the system of the interfaces used by the managers.

The manager is the network supervision software (9900LT or 1353)



4.10 – Alarms

For complete alarm management, refer to chapter 6 of this manual.

4.10.1 – Activation / Deactivation of alarms

It is possible to **delete** the alarm function for a sub–assembly (BS or NT, cf. § 4.5), or for the assembly (NE, cf. § 4.4), to avoid alarms overload (e.g., when replacing a sub–assembly, etc.), then to **reactivate it once more**.

The alarm activation/deactivation buttons are similar for the different sub–assemblies, with the alarm function being symbolized by a **green square**:

Click on...	To...
 or 	...**activate** the **alarm function** of (respectively) the BS, and NT.
 or 	...**deactivate** the **alarm function** of (respectively) the BS, and NT.

4.10.2 – Current alarms synthesis

The current alarms synthesis window is opened automatically for the first connection and remains active as long as the connection to the BTS is supervised.

Current Alarms Synthesis	
Critical	2
Major	1
Minor	0
Warning	0
Indeterminate	0
Total	3

This window offers a view of the **number of active alarms** in the system in terms of critical levels. There are five levels.

note: the highest level of criticality is displayed at the bottom right of the general status bar (cf. § 4.2.2)

The final line, "***Total***", totalizes the number of active alarms.

By double–clicking on one of the levels, the list of same level alarms is displayed; by double–clicking on the last line, the list of all the alarms is displayed (cf. next section).

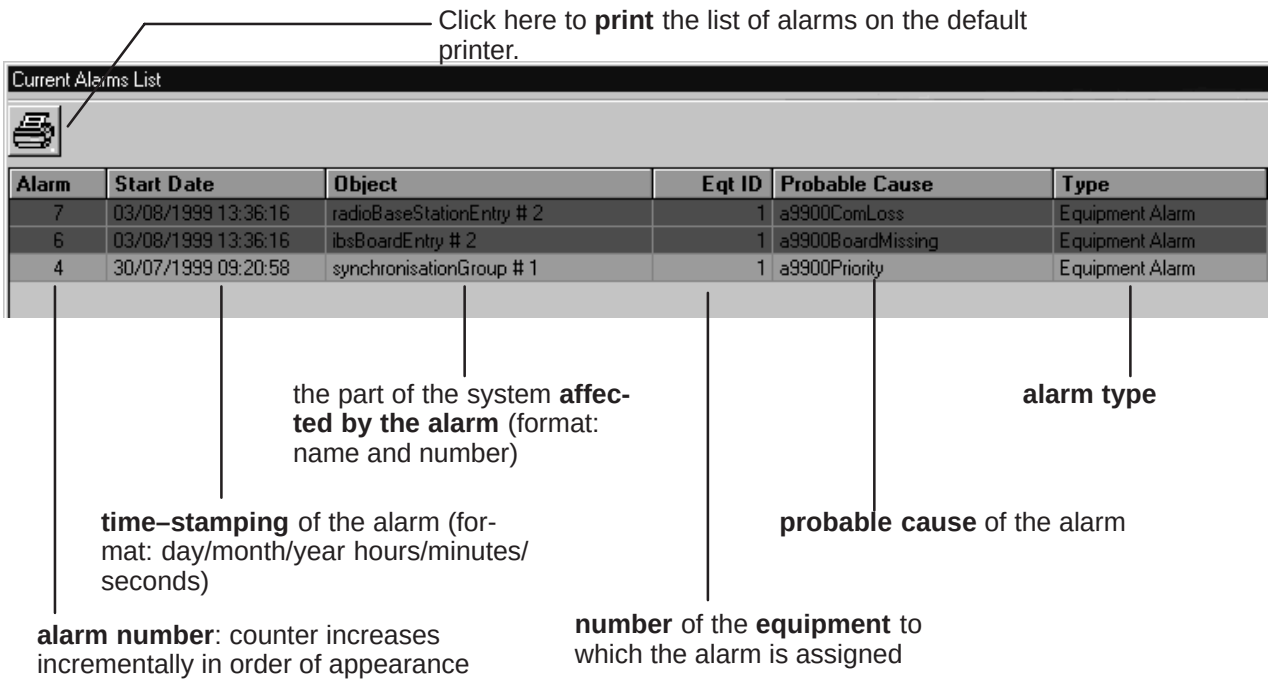
4.10.3 – Alarms list

To display at any time the alarms list:

– click on the button shown here (in the main screen of the 9900LT),

– or, open the ***File*** pull–down menu and choose the line ***Current alarms synthesis***

– or, open the ***Alarms*** pull–down menu and choose the item ***Alarms List.***



4.10.4 – Alarms color code

A color code has been adopted to symbolize the five critical levels:

red: critical alarm; **orange**: major alarm; **yellow**: minor alarm; **light blue**: warning alarm (note: configurable values); and **mauve**: indeterminate alarm.

Nota : *The correspondence between the alarms and the critical levels is determined by an ASAP data table.*

4.10.5 – Sound adjustment of alarms

It is possible to associate or disassociate the emission of a sound warning for alarms corresponding to a certain critical level:

To access the **alarm sound parameters**:

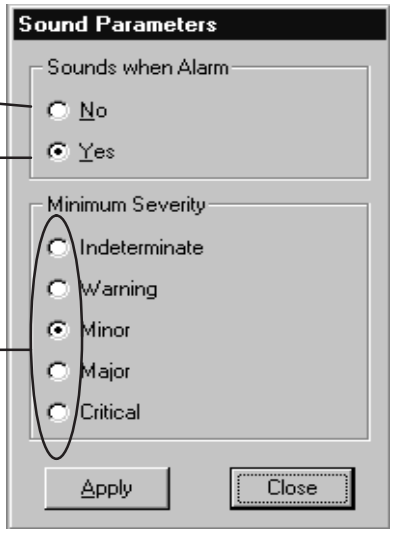
– click on the button shown here (on the main screen of the 9900LT),

– or, open the ***Alarms*** pull–down menu and choose the item ***Sound Parameters***.

Check ***No*** to **deactivate** the sounds associated with the alarms.

Check ***Yes*** to **activate** the sounds associated with the alarms.

Choose the critical level starting from which the sound warning should be emitted.



4.11 – Client services

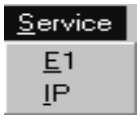
There are two types of service: leased lines and IP lines. For service traffic supervision, refer to § 4.7. For synchronization, refer to § 4.9.3.

4.11.1 – Leased lines (E1)

The purpose of this section is to explain the use of the 9900LT to carry out E1 type cross–connection (up to 2 Mbits/s), i.e. a link between a TNT card of the BS linked to the network and the NT terminal linked to the user peripheral devices.

To access E1 line management:

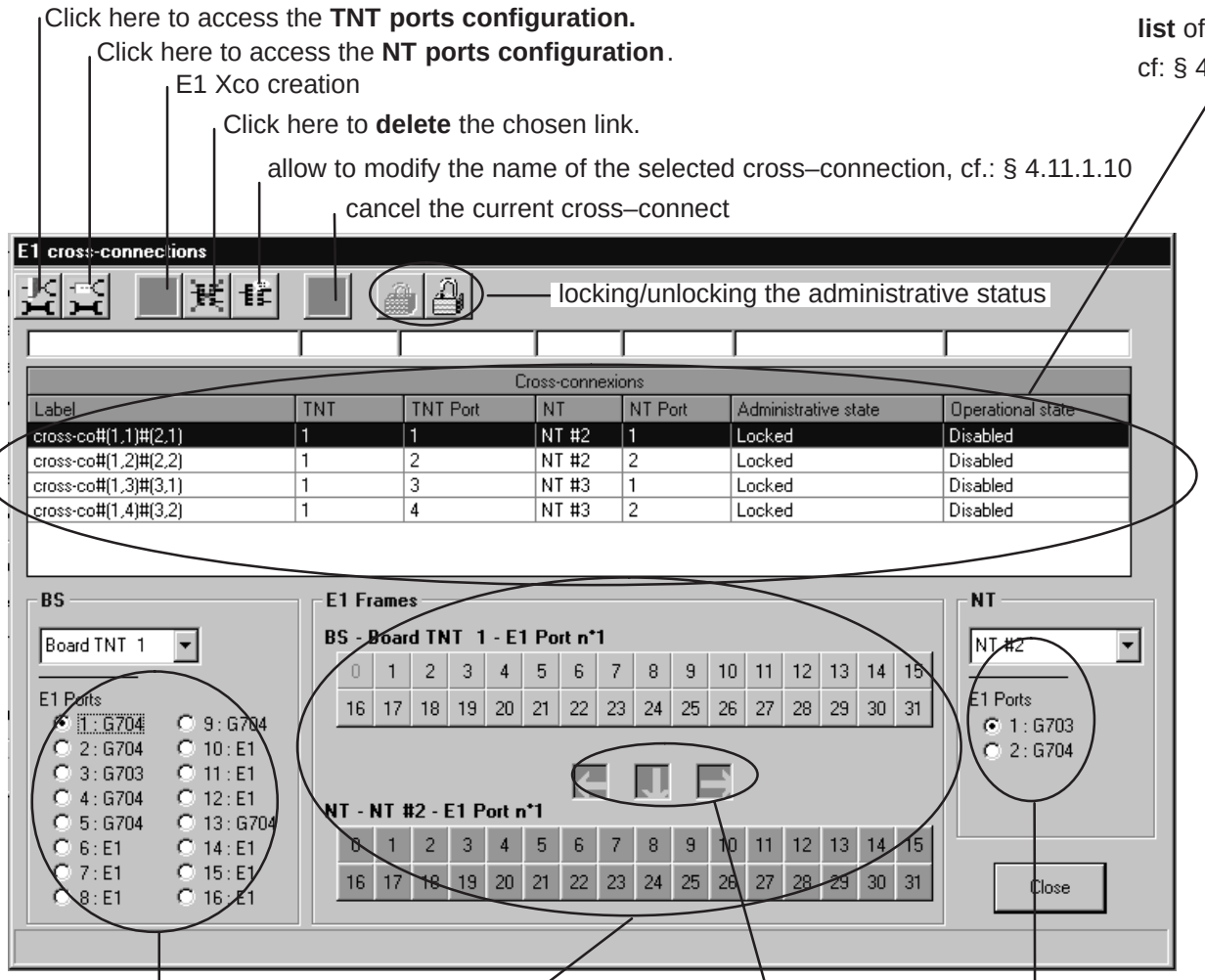
– click on the button shown here (in the main screen button bar),



or else,

– open the ***Service*** pull–down menu and choose the first item: ***E1***.

4.11.1.1 – Presentation



The implementation **stages** for an E1 cross–connection are as follows:

1. Ports configuration: BS side and NT side: cf. § 4.11.1.3;
2. Selection of configured ports for cross–connect: cf. § 4.11.1.4;
3. Cross–connect between time–slots of selected ports: cf. § 4.11.1.5;
4. Creation of an E1 link: cf. § 4.11.1.8;

4.11.1.2 – List of cross–connections

Cross-connexions

Label	TNT	TNT	NT	NT Port	Administrative	Operational state
cross-co#(1,4)#(2,2)	1	4	NT #2	2	Unlocked	Disabled
cross-co#(1,1)#(3,1)	1	1	NT #3	1	Locked	Disabled
cross-co#(1,2)#(3,2)	1	2	NT #3	2	Locked	Disabled
cross-co#(1,2)#(4,2)	1	2	NT #4	2	Locked	Disabled

Link designation

TNT used in the link

TNT port used in the link

NT used in the link

NT port used in the link

unlocking: authorizes terminal traffic: normal state

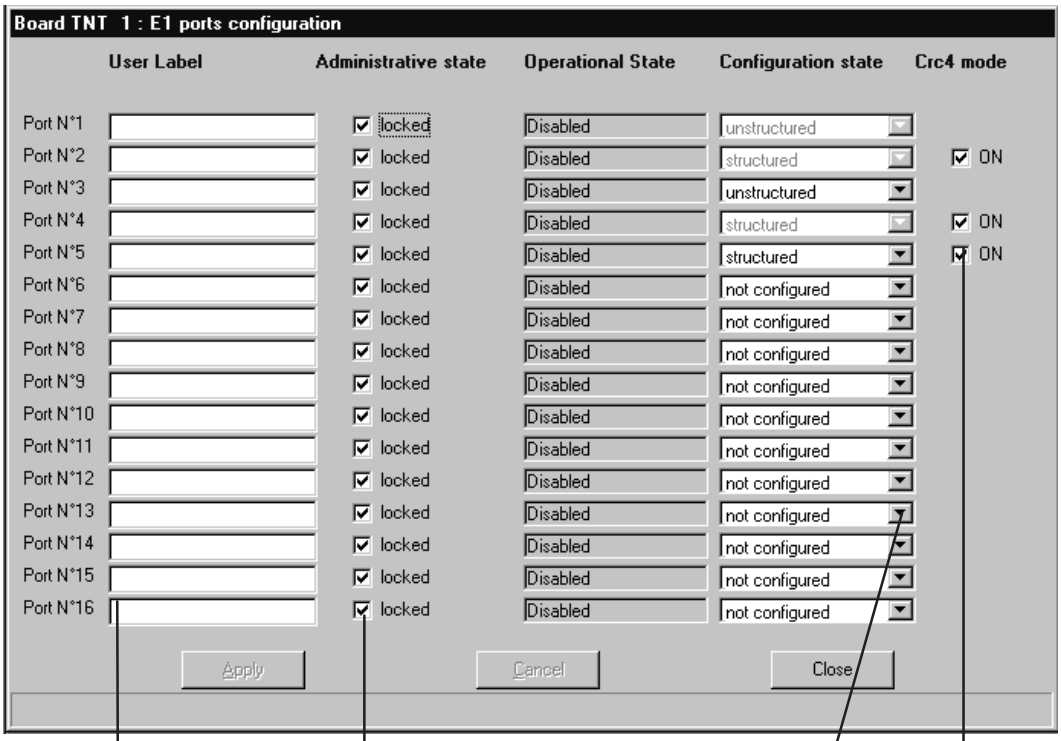
locking: an E1 link can be deleted without disturbing traffic: maintenance operation.

4.11.1.3 – Configuration of BS ports

Select first of all the **TNT board** concerned by the cross–connect by scrolling down the list.

Next, access the **ports configuration** of the TNT board selected by clicking on the first button, shown here (on the button bar of the E1 cross–connections screen).

The screen listing the E1 ports of the TNT is displayed:



Check box to **lock/unlock** the port's administrative status; by default, the port is locked.

Scroll down list to configure the port: structured or unstructured

Click here to specify the port **designation.**

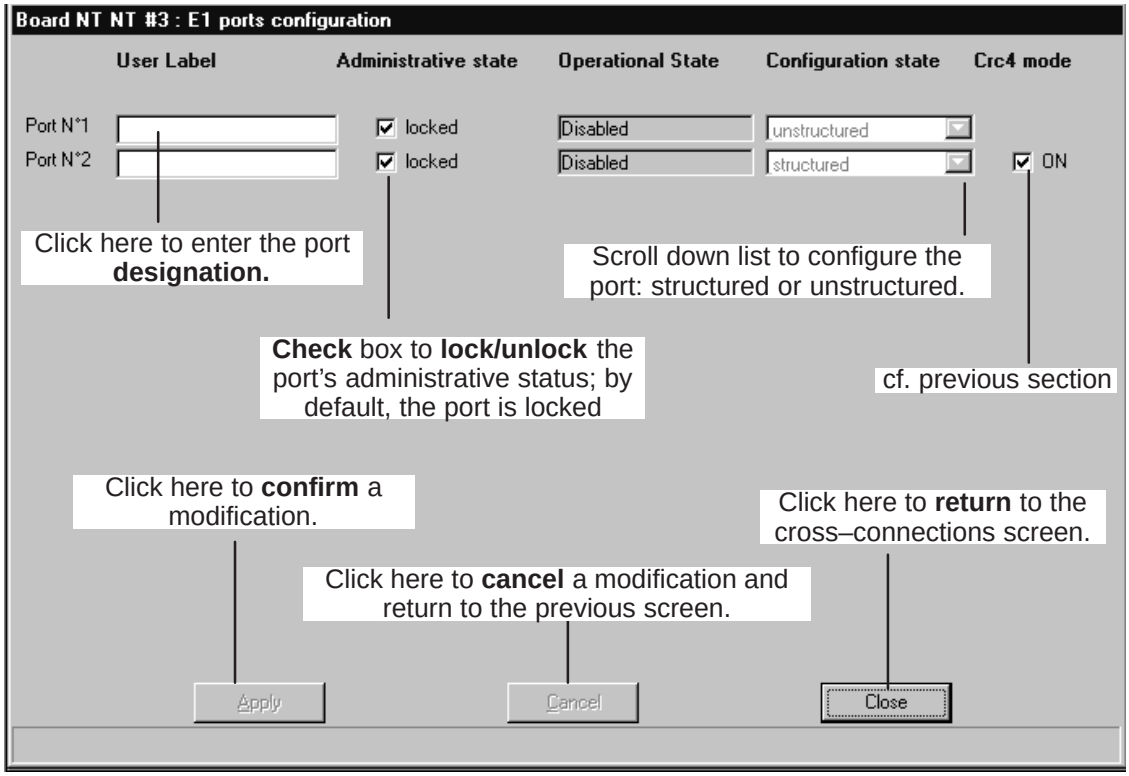
Reference for operator with a view to "hard" configuration:

appears if the configuration state is structured; to be checked if the corresponding hardware generates a checksum

4.11.1.4 – Configuration of NT ports

Select first of all the **NT board** concerned by the cross–connect by scrolling down the list..

Next, access the **ports configuration** of the chosen NT by clicking on the second button, shown here (on the button bar of the E1 cross–connections screen).

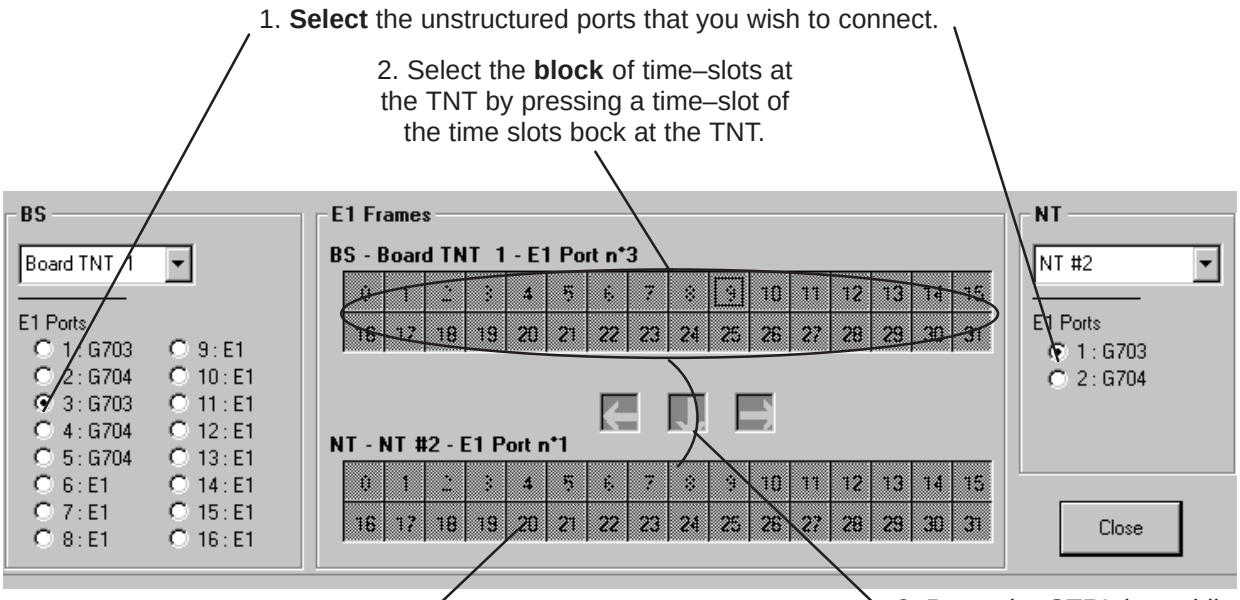


4.11.1.5 – Cross–connect

There are **two types** of cross–connect: between structured ports and between unstructured ports.

– *Unstructured case*:

In this case, the maximum bitrate (2 Mbit/s) is supplied by connecting **all** the time–slots of the selected TNT port to the time–slots of the NT port.



5. **Confirm** the cross–connect by **creating** the cross–connection: § 4.11.1.8

– *Structured case*:

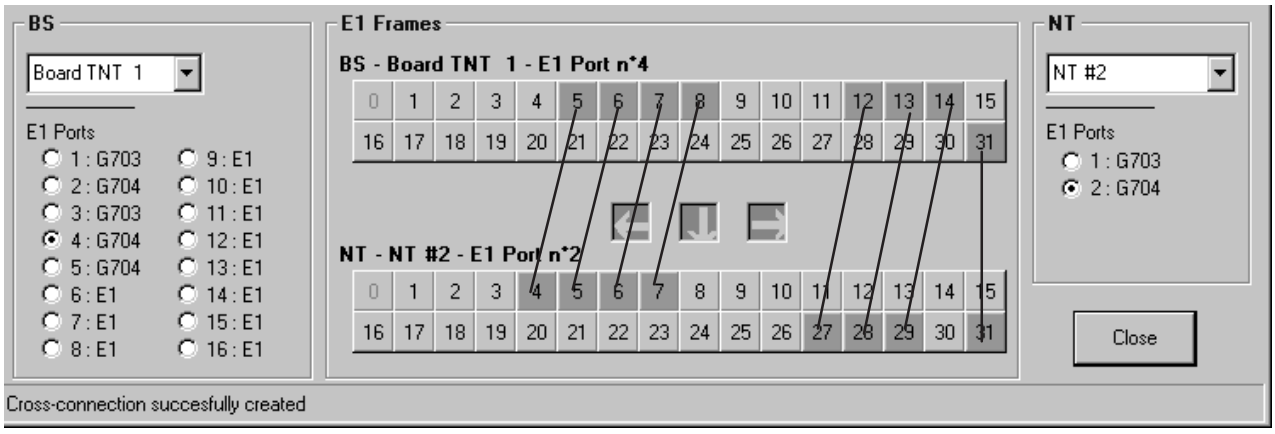
In this case, 31 time–slots can be cross–connected for each port; the maximum bitrate is 31*64 kbits/s, with the first time–slot (grayed out) reserved for synchronization.

To implement the cross–connect, proceed in the same way as for non–structured ports, but this time selecting the time–slots individually.

The **cross–connect** arrows offer you guidance for dragging the TNT slots to the available NT slots; if the current cross–connect correspond to “unauthorized” ones, an error message is displayed at the foot of the window and the cross–connect arrows indicate the NT time–slots to which the cross–connect is directed.

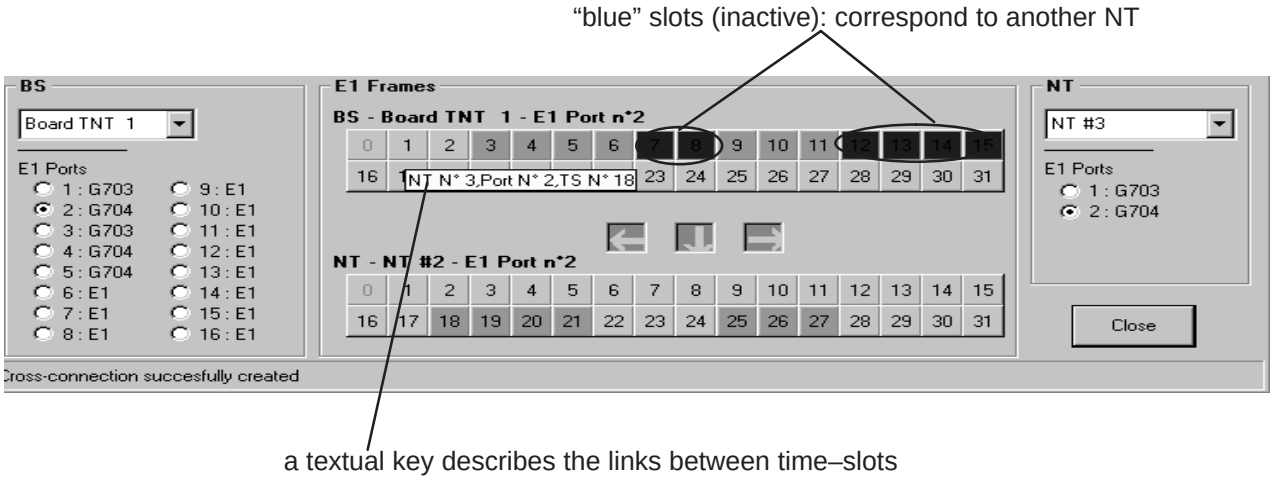
The slots of a real cross–connection (following the creation phase: cf.§ 4.11.1.8) are colored **green**.

Cross–connect illustration



4.11.1.6 – Grooming

Several NTs can be fed from a single TNT board and a single E1 port. This is known as “grooming”.

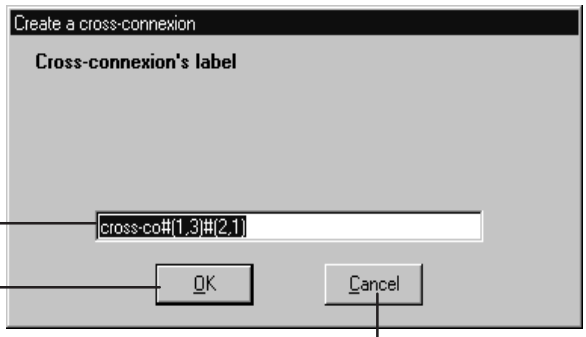


4.11.1.7 – Cancelling a current cross–connection

To **cancel** a cross–connection: click on the button shown here (in the button bar of the “E1 cross–connections” screen).

4.11.1.8 – Creation of an E1 link (E1 cross–connection)

Following cross–connection, access cross–connect creation by clicking on the button shown here (in the button bar of the “E1 cross–connections” screen).



Click in this field **to modify** the designation by default

Click here **to create** the E1 “cross–connection”

Click here **to cancel the** E1 “cross–connection” creation and to return to the previous screen

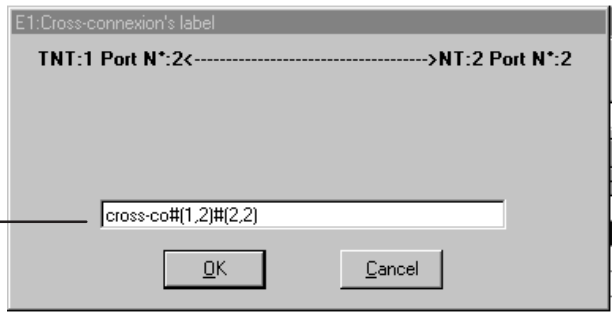
4.11.1.9 – Suppression of an E1 link

To **leave out** an E1 link : select the link in the “cross–connections” list (cf. § 4.11.1.2), then click on the button shown here opposite (on button bar of the IP screen).

Nota : (for commissioning refer to § 5) : To increase resources: firstly delete a “cross–connection” and then create a new one.

4.11.1.10 – Editing the name of an E1 link

To **edit** an E1 link: select the link in the “cross–connections” list (cf. § 4.11.1.2), then click on the button shown here opposite (on button bar of the IP screen).



Modify in this field the E1 link name

4.11.2 – IP links

The purpose of this section is to explain the use of the 9900LT to carry out IP type cross–connection (4 Mbits/s maximum), i.e. a link between an ATM input of the BS linked to the network and an Ethernet port of the NT terminal linked to the user peripheral devices.

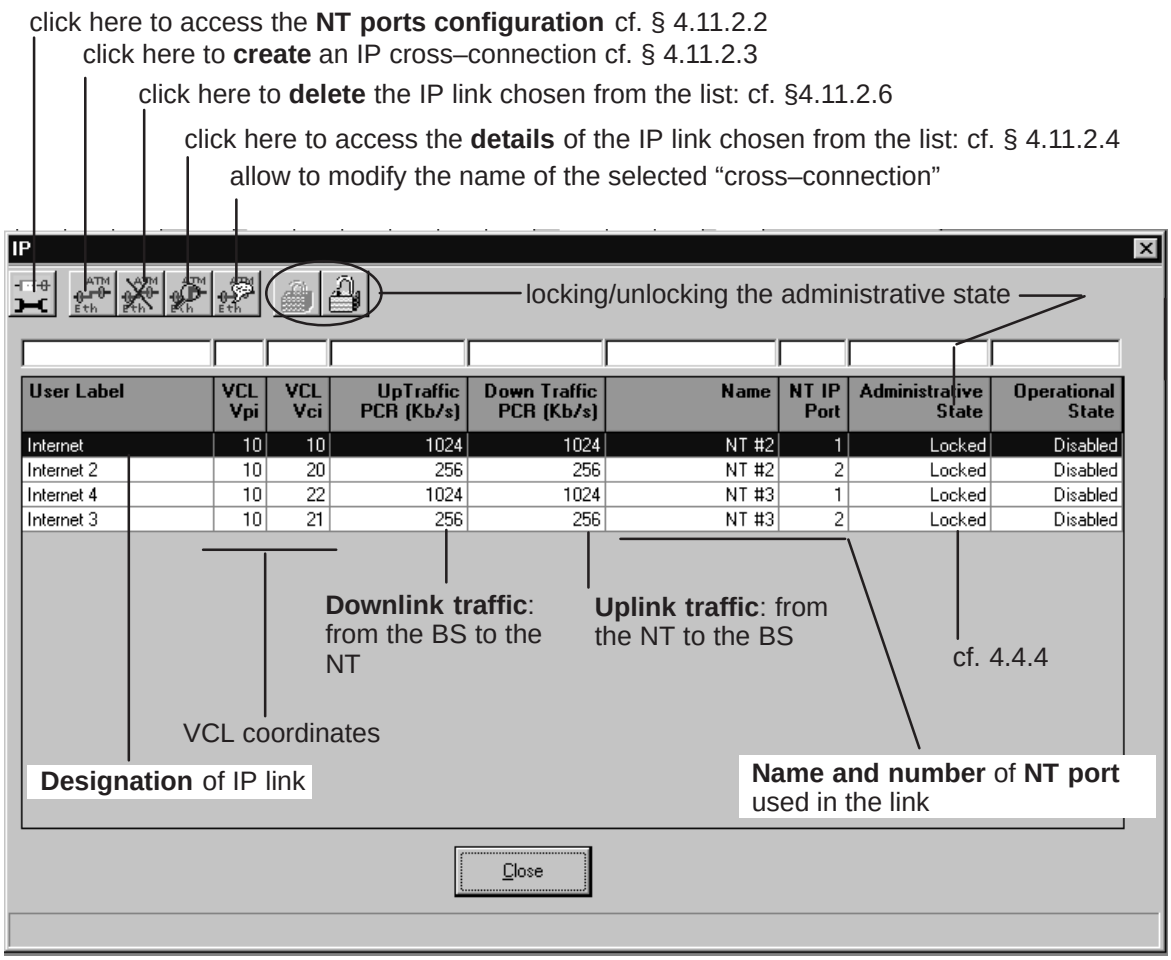
To access **IP services** management **:**

– click on the button shown here (in the main screen button bar),

or else,

– open the ***Service*** pull–down menu and choose the item: ***IP***.

4.11.2.1 – List of IPs

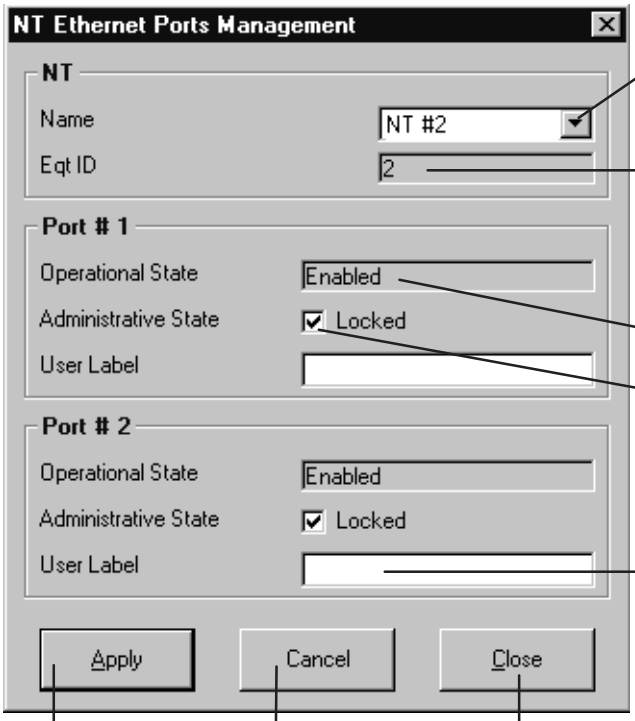


The implementation **stages** for an IP cross–connection are as follows:

1. ATM board configuration at the BS: cf. § 4.9.1;
2. Configuration of the NT Ethernet ports: cf. § 4.11.2.2;
3. IP link creation: cf. § 4.11.2.3;

4.11.2.2 – Configuration of NT Ethernet ports

To access the **NT Ethernet ports configuration**, click on the button shown here (on the button bar of the IP screen).



Click on the arrow to **select** the **NT** used in the cross–connection from the pull–down list.

The **NT ID number** is displayed automatically once the NT is selected.

Operational state of the first Ethernet port of the selected NT: ***enabled/disabled***

Administrative state of the first Ethernet port of the selected NT: locked or unlocked

Click here to enter the **designation** of the second Ethernet port of the selected NT.

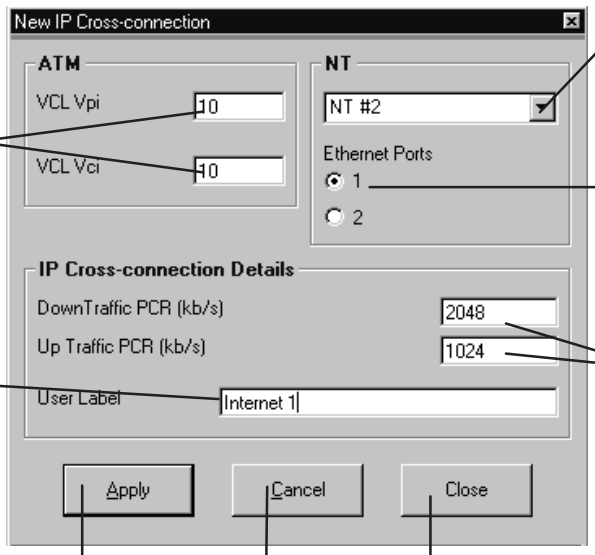
Click here to **return** to the IP links list.

Click here to **cancel** the current configuration.

Click here to **apply** the ports configuration.

4.11.2.3 – Creation of an IP link

To access **creation** of an IP link, click on the button shown here (in the button bar of the IP screen).



Click here to enter the **VCL coordinates** of the ATM board.

Click on the arrow to **select** the **NT** used in the cross–connection from the pull–down menu.

select the **Ethernet port** used in the cross–connection

Click here to enter the **name** of the cross–connection to be created.

Click here to specify the **uplink** and **downlink** bitrates, in **steps of 64 kbits/s** (max: 4 Mbps).

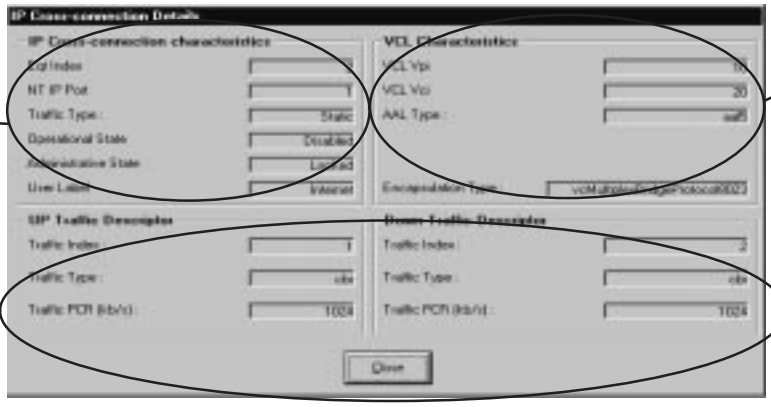
Click here to **return** to the IP links list.

Click here to **cancel** creation of the IP cross–connection.

Click here to **create** the IP cross–connection.

4.11.2.4 – Characteristics and traffic of an IP link

To access the **characteristics** of an IP link chosen from the list of IP cross–connections, click on the button shown here (in the button bar of the IP screen).

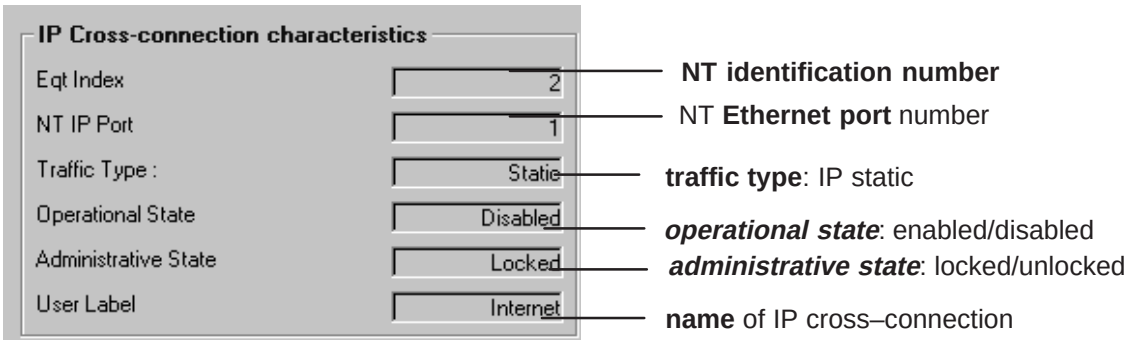


IP cross–connection characteristics

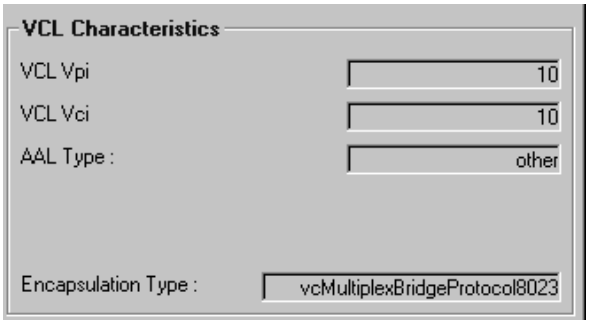
VCL characteristics

IP cross–connection traffic characteristics

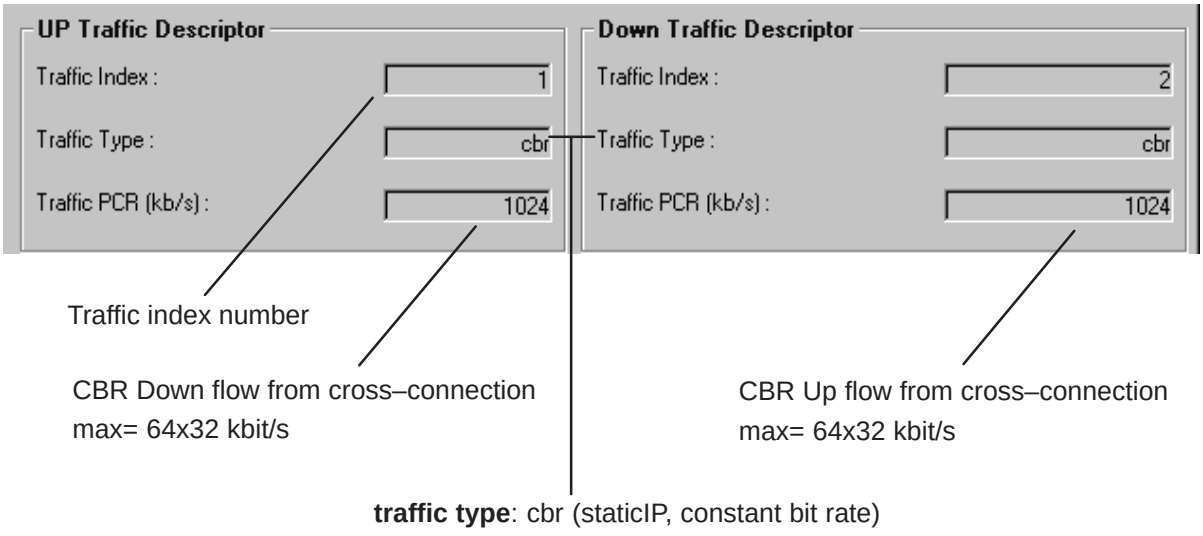
– *IP cross–connection characteristics*:



– *VCL characteristics*:

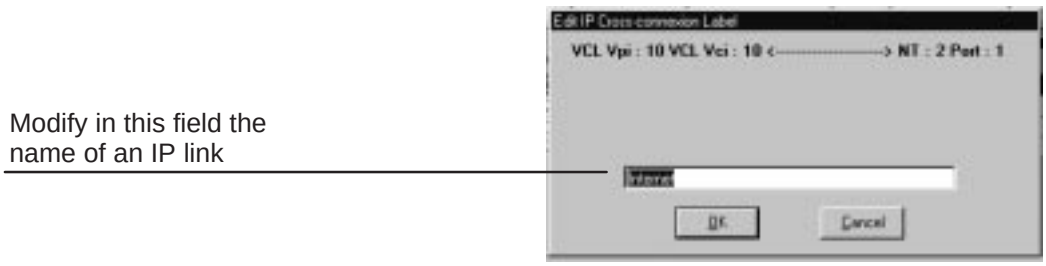


– *Uplink and downlink traffic description*:



4.11.2.5 – Editing the name of an IP link

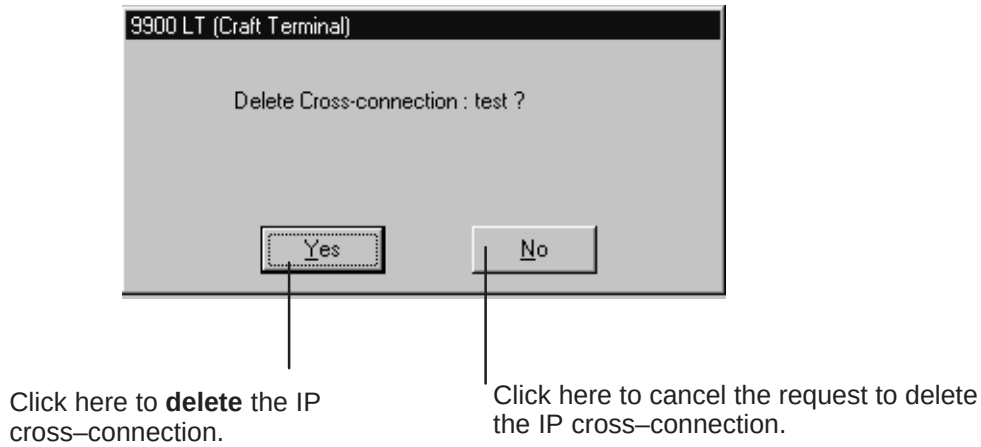
To modify the name of an IP link, selected in the IP “cross–connections” list, click on the button shown here opposite (on button bar of the IP screen).



4.11.2.6 – Deleting an IP link

To **delete** an IP link chosen from the list of IP cross–connections, click on the button shown here (on button bar of the IP screen).

A confirmation screen is displayed:



4.12 – Utilities

4.12.1 – Downloading

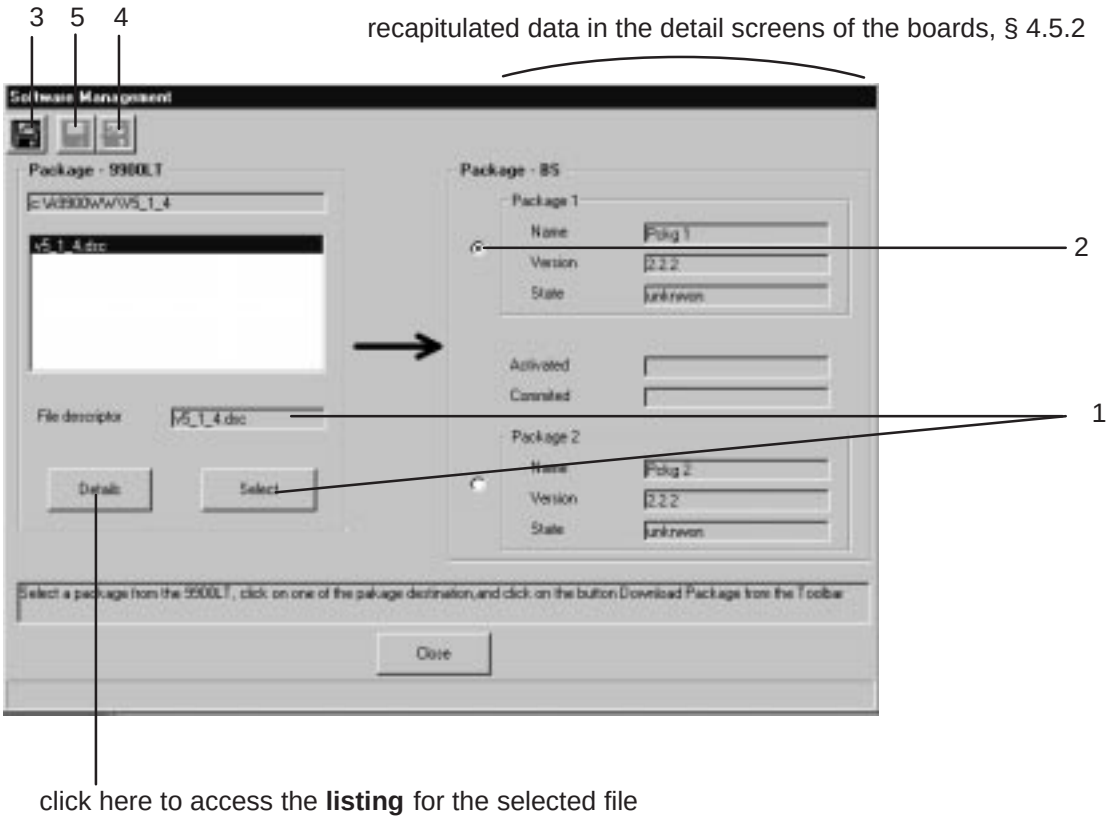
Downloading, mainly used during maintenance, replaces or upgrades the component software of the NE (BS + NTs).

To access the downloading function:

– click on the first button (provided it is active, cf.§4.1.2.2) on the button bar of the main menu (shown here),

or else,

– open the ***Management*** pull–down menu and choose the first item: ***Software Management***.



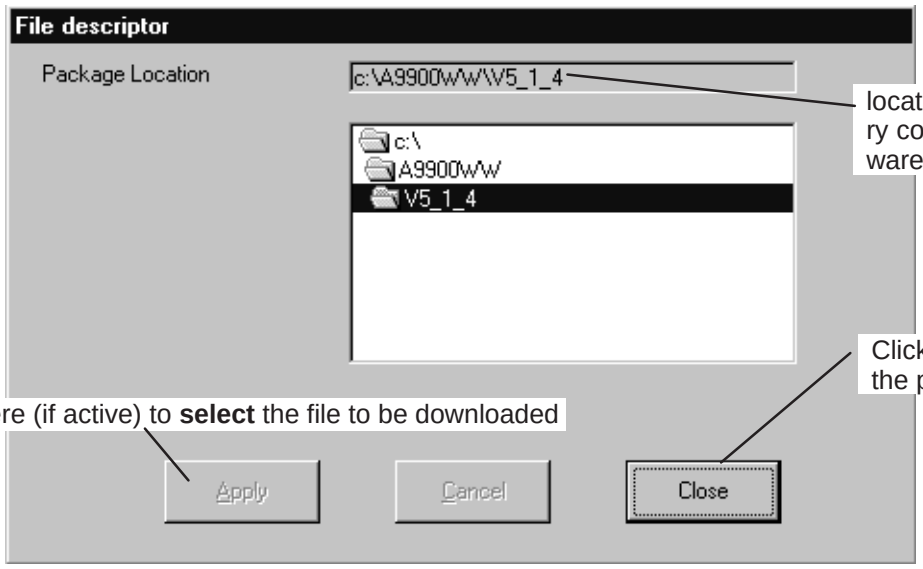
The downloading stages are as follows:

1. select the **file** describing the software configuration,
2. select the software **storage zone** on the BS,
3. **download** the software,
4. **activate** the selected software configuration,
5. **referencing of the software to be run by default, following reset.**

4.12.1.1 – Object and destination of the file to be imported

Select

To **select** the software to be downloaded, click on the button shown here; the updated list of software is displayed; click on the file to be imported



location of the directory containing the software configuration

Click here to **return** to the previous screen.

click here (if active) to **select** the file to be downloaded

Next, select **one of the two** board storage areas: cf stage 2 of the “Downloading” screen, § 4.12.1.

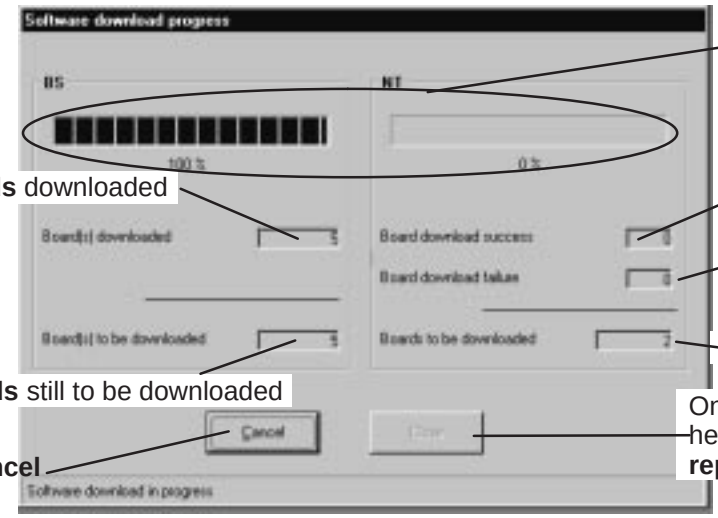
4.12.1.2 – Data import

To **load** the software in the chosen storage area:

click on the button (provided it is active) of the button bar on the “Downloading” screen.

Nota : This button is activated once the selections described in the previous paragraph have been made.

A screen indicating the **progress** of the downloading is displayed:



Progress bars

number of **boards** downloaded

number of **NTs** downloaded

No. of **NTs** that could not be downloaded

No. of **NTs** to be downloaded

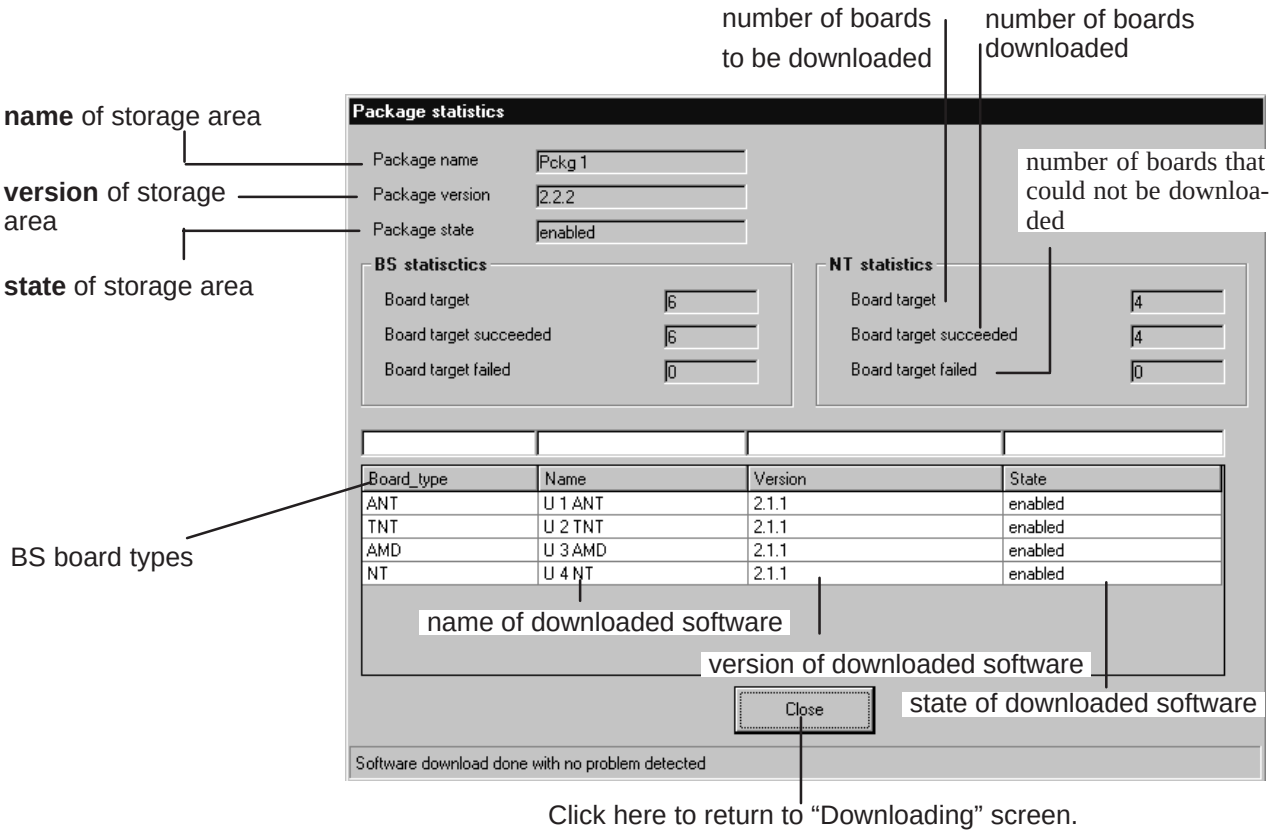
number of **boards** still to be downloaded

Once the process is over, click here to display the downloading **report**: cf. following paragraph.

Click here to **cancel** downloading.

4.12.1.3 – Downloading report

Once the downloading phase is over (cf. previous paragraph), a report is provided detailing the software present for the different board types of the BS :



4.12.1.4 – Activation of data

To **run** the downloaded software:

click on the button of the button bar on the “Downloading” screen shown here.

The “Activated” field in the “Downloading” screen is automatically filled in.

4.12.1.5 – Reference software

The reference software is **activated by default** when restarted:

select <u>first of all</u> the required storage area,
then click on the button of the button bar on the “Downloading” screen shown here.

Nota : This button is activated if the state of the software is “activated”.

The “Committed” field in the “Downloading” screen is automatically completed.

Nota : Once the software activated and in reference, a dowloading has to be done again if a new NT comes into the network.

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5 – Commissioning the 9900BS Base Station

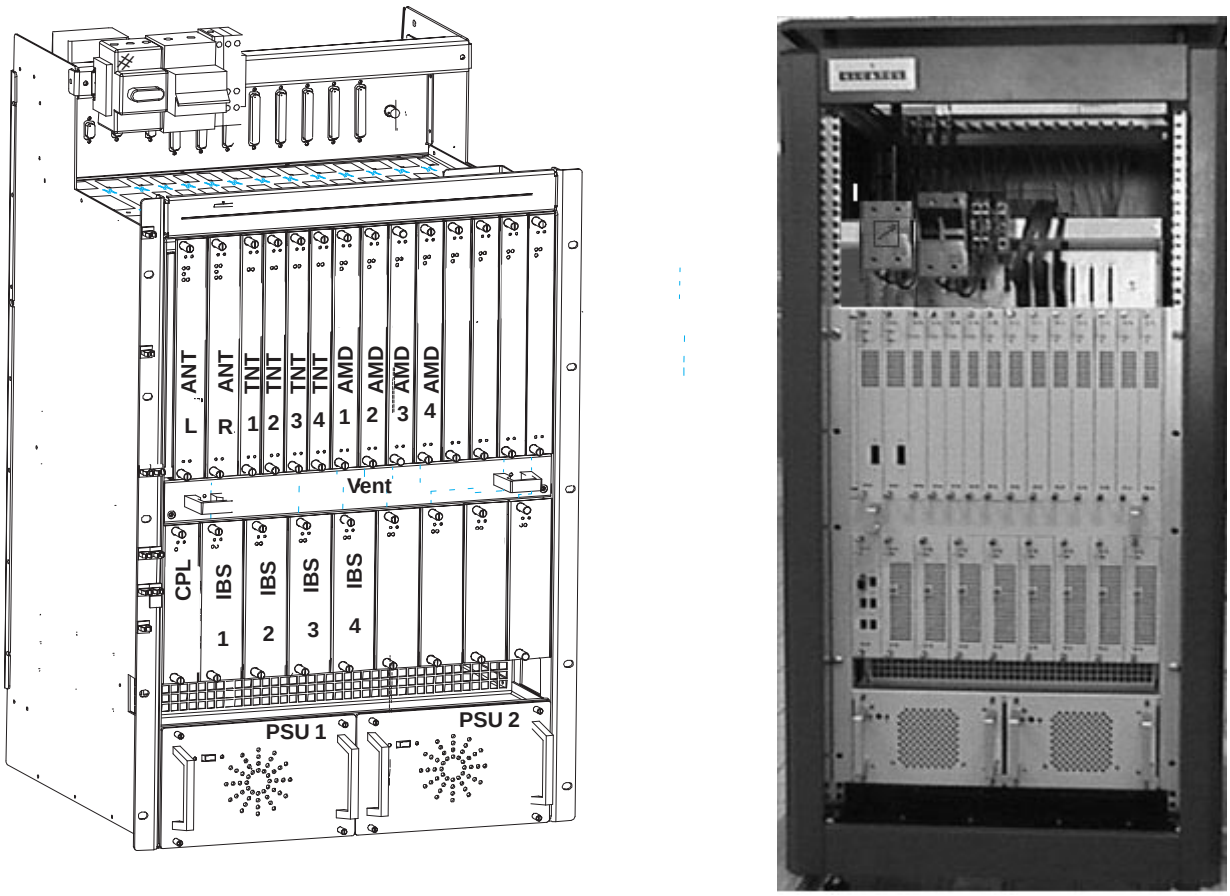

Figure 40 – Configuration of the base station.

Base Station commissioning is carried out using a compatible laptop PC fitted with the 9900LT installation and programming softare. The PC is connected directly to the DBS rack using a cable supplied with the equipment.

Commissioning involves:

- initialisation and configuration of Base Station parameters,
- control and validation of the installed parameters before running the system (see Figure 41 Base station configuratuion).

5.1 – Initialisation and configuration of parameters

Preliminary conditions

To commission a Base Station it is necessary:

- to have access to all sub–assemblies required for Base Station creation associated with the site specific installation sheet,
- to have access to the 9900LT software version corresponding to the site configuration,
- to have access, on the laptop PC, to an installation software compatible with the boards to be installed,
- that the network operator gives the mission order to the installer.

Main stages

To commission a Base Station it is necessary to carry out the following:

– installation of the DBS rack (see section 3 – “Base Station Installation” of the present manual),

– installation and configuration of the associated RBS(s) (see section 3 – “Base Station Installation” of the present manual),

– configuration and commissioning of the station using the 9900LT.

5.1.1 – Equipment required

To configure the Base Station parameters the following equipment is required:

– the **RBS ODU(s)**,

–A 50 ohm N/N connector coaxial cable (ref. 3CC07568AAA) or equivalent.

– the **DBS rack** assembly,

– a laptop **PC** equipped with:

–the **9900LT** Base Station initialisation and programming software,

–the Windows® **NT4 Workstation**® system,

–a data transfer application (e.g., OMNI® NFS).

The minimum PC specifications are as follows:

–microprocessor: Pentium II 300 MHz,

–RAM: 64 MB,

–Hard disk: min. 2 GB,

–Graphics board: 2 MB,

–3“ 1/2 floppy drive (internal or external),

–12x CD drive (internal or external),

–ports: 1 available serial (DB9) and one available parallel (centronix) port,

–mouse: 2 buttons (PS2 series) or tracking device,

–network board: Ethernet 10/100BT (RJ45), 10B2 (BNC),

–12” monitor (1024x768).

5.1.2 – Powering up RBS and DBS equipment in site configuration

Stages

1. Power up the DBS rack using the general ON/OFF switch (see Figure 26).

2. Check the DC/DC power coupling: the power supply is present if the LEDs on the front panel of the power modules are lit.

3. Check the power supply boards:

– board operational if green LED is lit, switch at ON, red LED unlit;

– board fault if green LED is lit, switch at ON, red LED lit;

4. Connect laptop PC to DBS rack using a dedicated cable (Ethernet link). Use the connector situated on the top panel of the DBS rack (see Figure 41).

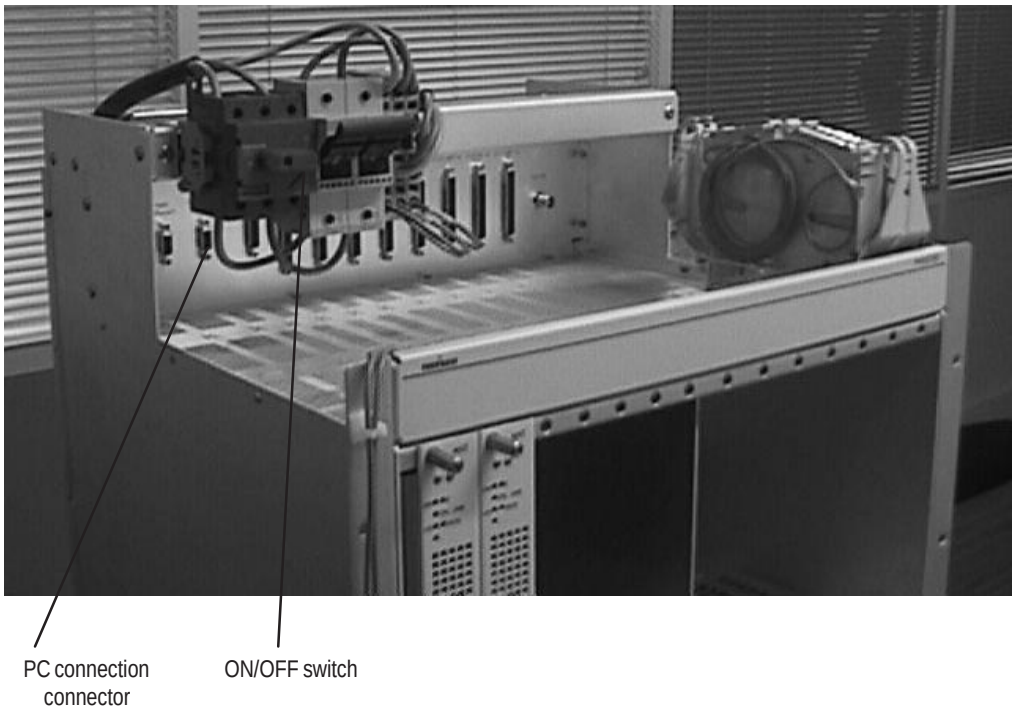

Figure 41 – Connecting laptop PC to DBS rack

5. Connect the PC to a power source and power up.

6. Define for the PC an IP address on the same network as the Craft Terminal for it to be able to connect. A valid address would be for example: 192.168.99.2, with the subnet mask: 255.255.255.0.

7. Check the initialization of the boards:

- board operational if switch is ON, green LED lit, red LED unlit;
- board inoperational if switch is ON, green LED unlit, red LED lit.

8. Implement Ethernet ANT/LT link (use appropriate cable and connectors).

9. Initialize and connect the system by running the 9900LT software: to do this, the configuration stages listed in the following table are executed by the system installer:

Order number of stages	Designation of stages linked to the 9000LT	Comments	reference of screen or paragraph (§4)
I	**Starting up the LT**	Follow the instructions described previously in the manual (§4.2.2) to start up the 9900LT software. Close the information window displayed when the program is run in order to access the 9900LT main screen.	4.2.2
II	**Choosing the User Interface language**	If you wish to change the User Interface language offered by default, follow the instructions in §4.2.2	4.2.2
III	**Connection to the BS**	Connect the BS following the instructions in §4.3.1. . *IP address*: enter the address which is blank on first start–up; for subsequent connections, the IP address is displayed by default Click ”Apply” to activate retrieval of MIBs on PC; this terminates with the opening of the BS supervision screen (§4.5).	4.3.1
IV	**Initializing the RAM ANT board**	On first start–up, it is wise to initialize the ANT board SNMP agent memory. To do this, follow the instructions in §4.5.3. Warning: this destructive function is not to be used subsequently for an operation, but is reserved for maintenance operations. This initialization causes a reboot of the 9900LT; return to stage III to reconnect.	4.5.3

10. Check, test and initialize the RBS **locally** (**without installation on pole**). To do this:
    - connect the RBS (use a test coaxial cable) to the test assembly or the DBS subrack,
    - the RBS is initialized using the 9900LT,
    - follow stage V (checking) below:

Order number of stages	Designation of stages linked to the 9000LT	Comments	reference of screen or paragraph (§4)
V	**Checking recognition of sub–assemblies (boards and RBS) by the LT**	Check on the rack represented in the BS supervision screen (§4.5) that the physically present sub–assemblies are taken into account by the LT. Running the 9900LT software automatically retrieves the serial number for each board, their modification index and their software version. Check the conformity of the data against the delivery slip.	4.5 4.5.2.1 à 4.5.2.7 4.5.4

11. Disconnect the RBS test assembly.

12. Carry out the RBS **pole–mounting** (cf. § 3.4 – “Installation of outdoor equipment”).

13. Connect the RBS to the DBS using the dedicated cable (cf. § 3.5 – “Installation of link between RBS and DBS”).

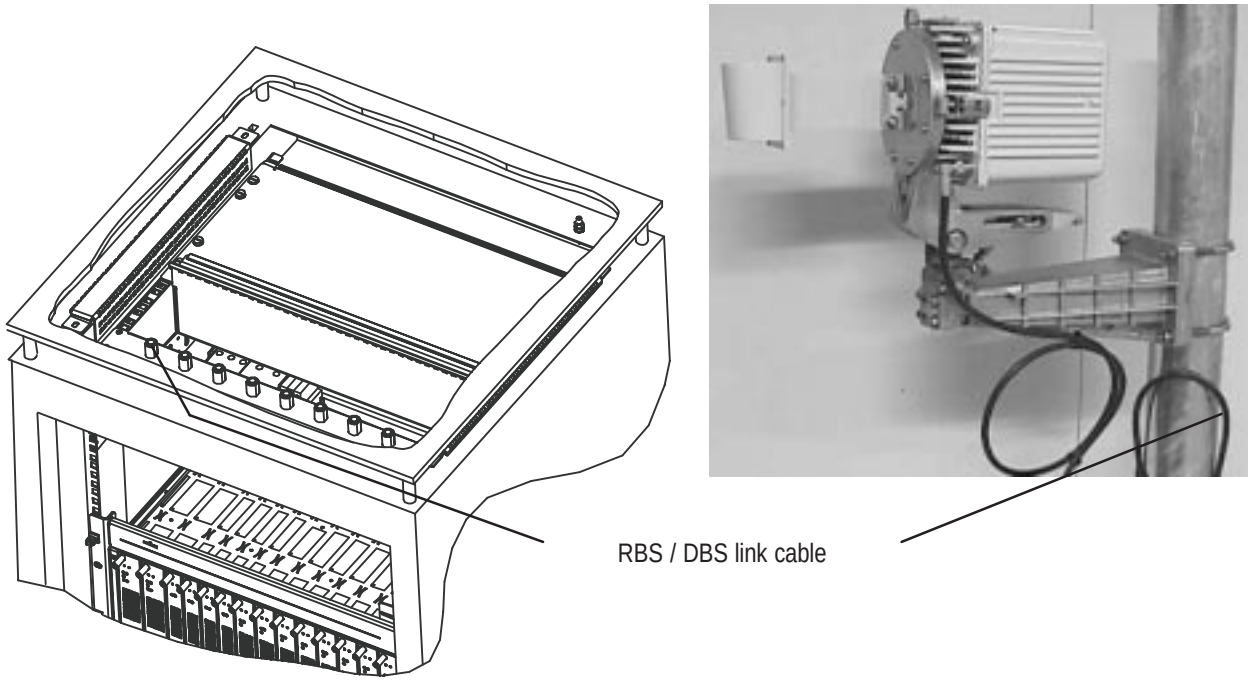

Figure 42 – Connecting RBS ODU to DBS rack

– resume start–up stages I and III described previously; the RBS is initialized when the 9900LT is run,
– follow the previously described stage V.

Next, follow the configuration stages using the 9900LT as described below:

Order number of stages	Designation of stages linked to the 9000LT	Comments	reference of screen or paragraph (§4)
VI	**Synchronization**	This involves defining the priority rules for the possible timing sources for the station. Priority 1 of course relates to an external source, since this allows the station to be immune to user error. For the moment, it is not possible to select one of the channels (1, 5, 9 or 13) of the TNT board present since they are not yet defined. You should come back to them once at least one has been configured. . *Operational State*: the effective presence of a signal used for synchronization is signaled by the wording ”Enabled”. If no signal is valid, the station works off its internal clock. —> Confirm the modifications and quit the screen to return to the BS supervision screen (§4.5). NB: Note the disappearance of the alarm in the ”Current Alarme Synthesis” table, which was due to the fault in the definition of the order of priorities.	4.9.3
VII	**Configuration of ODUs** RBS parameters: transmission power, type and length of cable.	Characteristics: . *ID*: field filled automatically with the radio link number. . *Transmission power* (offset value of 0 to 10 dB; 0 defines an output power of +7dBm) : Adjust the display value to give that required for the link study. If no value is supplied, use by default the value 10, which gives the greatest range. NB : If the specified value is 0, it is recommended not to leave it in this state, but to quit the value and return to it by using the up and down arrows. . *Cable type*: select the type of cable from the scroll menu. . *Cable length:* enter the length of the cable which connects the ODU to the IDU. NB: Never leave at 0, even for a tabletop bench. —> Confirm the settings to return to the BS supervision screen (§4.5) NB : Note that the alarm indicator on the RBS connection strip has changed from yellow to green, and that the number of alarms given in the “Current Alarm Synthesis“ table has diminished by one. Repeat the same operations for all the ODUs.	4.5.4

Order number of stages	Designation of stages linked to the 9000LT	Comments	reference of screen or paragraph (§4)
VIII	**Setting traffic frequencies**	ODU characteristics: *. AMD Board associated* & *Band Width*: fields filled automatically: check that the parameters are those anticipated. . *DownStream Central*: Enter the frequency of the downstream channel of the four upstream channels. . *Upstream Central*: Enter the central frequency of the four upstream channels. —> Confirm settings: after a few seconds, the four frequencies of the upstream channels, Upstream # 1, Upstream # 2, Upstream # 3 et Upstream # 4, are calculated and displayed. NB: there are as many tabs as installed AMD boards. Quit the screen to return to the BS supervision screen (§4.5). Note that the alarm indicator of the AMD card(s) has switched from yellow to green, to indicate the settings have been accepted.	4.7
IX	**Information about the BS**	. *Name*: enter the name of the base station (e.g., Base ST #1) . *Location*: enter the location of the base station (e.g., Orlando)	4.5

14. Quit the 9900LT software (cf. § 4.3.2)

15. Fill in the Installation Sheet (cf. Annex 1 of this Manual).

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6 – Operation and maintenance

6.1 – Network supervision

The status of the system is controlled in permanence by the supervision function provided by the 9900LT software. This function is described in sections 4.4 and 4.5 of the present Manual.

6.2 – Preventive maintenance

Preventive maintenance is carried out by:

– permanent monitoring of the system provided by the supervision function,

– periodic inspection of the equipment to ensure that:

- the link cables between the NE elements are not damaged,
- the external equipment is properly assembled,
- the internal equipment is correctly in place.

6.3 – Corrective maintenance

6.3.1 – Alarms processing

Knowledge of the implicitly induced alarms may be necessary for the operator to be able to carry out maintenance and estimate the quality of the services offered by the 9900NE. This is why the present document offers, in this chapter, a basic knowledge to the operator of the alarm correlation.

6.3.1.1 – Checking alarms for each equipment management function

The “alarms control” functions of each board’s equipment management for a given type of element are responsible for supervision, clearing and masking of alarms for this element. Each of its functions is responsible for notification to the SNMP agent of the starts and ends of alarms that it controls.

The ANT board is in addition responsible for the processing of alarm indicators of the three dry loops reserved for the BS (“ Critical ”, “ Major ” and “ Minor ” indicators). ***This processing is not carried out for the NR2.0***.

The AMD board implements an equipment management function for each of the following types of element:

- The AMD itself
- The IBS
- The RBS
- The NT
- The static cross–connects on the channels of a radio link

The TNT board implements an equipment management function for each of the following types of element:

- The TNT itself
- The E1–G703 port of the TNT

The NT implements an equipment management function for each of the following types of element:

- The E1–G703 port of the NT

- The E1–G704 port of the NT
- The Ethernet port of the NT

6.3.1.2 – Terminology relating to the alarms

Active alarm: an alarm is active as soon as the start of this alarm is notified to the ANT board, and remains so as long as its end is not notified

Anomaly: Discrepancy between the intended and real characteristics of an item. An anomaly may or may not affect the capacity of this item to carry out a required function. Several successive anomalies of the same type are generally considered a fault.

Defect: Limited interruption of the capacity of an item to carry out the required function. A defect may or may not necessitate maintenance action.

Alarm clearance: Clearing an alarm initiation by notifying its end.

Board alarm function: For AMD, TNT, IBS, RBS or NT boards, the alarm function is the totality of the “Alarms control” functions of the elements that they manage.

Alarm masking: Storage of an alarm without immediate notification of alarm initiation. Masking allows the seriousness of the alarms for a given element to be hierarchically ordered: masking is carried out when a higher order alarm appears. If on unmasking (carried out at the end of the higher order alarm) the alarm which was masked is still present, an alarm initiation must be notified.

6.3.1.3 – Abbreviations relating to the alarms

AIS	Alarm indication signal
CRC	Cyclic redundancy check
FAS	Frame alignment signal
LMFA	Loss of multiframe alignment
LOF	Loss of frame alignment
LOP	Loss of pointer
LOPC	Loss of polling cell
LORF	Loss of Radio Frame
LOS	Loss of signal
MSC	Message sequence chart
OOF	Out of Frame
PAIS	Pointer Alarm indication signal
RAI	Remote alarm indicator
RDI	Remote defect indication
REI	Remote error indication

6.3.2 – Definition of 9900NE alarms

6.3.2.1 – Alarms relating to boards

The actions described are not necessarily controlled by the management software (they can be controlled by the equipment itself). In this table, the term “board” may related to a board of the DBS (ANT, TNT, AMD, IBS, CPL, RBS, PSU, FANS) or of the NT.

6.3.2.2 – Alarms relating to the boards of 9900NE

Alarm name	Definition	Internal NE actions
Board_missing	The Board element is physically absent from the 9900NE, but known to the agent.	Depends on the functionalities and use of this board in the 9900NE.
Comm_loss	The connection (for management link set–up) between the active ANT board and the Board element is not set up or is l ost.	Reset (automatic or controlled) of the Board element if the board is a TNT or AMD board or a WW–NT No impact if the Board is an IBS or RBS board: these two elements can continue to function without their management link. The set–up or re–establishment of the connection requires the complete (re)configuration of this element. This procedure of (re) confguration is automatic and internal to the BS (as long as all the element's configuration parameters are valid)
Board_typeerror	The Board element configuration parameters, completed by the manager, are not compatible with this element type.	Rejection of new parameter values by the BS agent: error message sent to manager.
Board_configerror	The Board element configuration parameters list that must be completed by the manager is incomplete.	The configuration of the Board element by the ANT board is prohibited: error message sent to manager and wait for complete configuration.
Board_temperature	Detection by the Board element that the temperature threshold had been exceeded	The Board element goes "out of service", i.e., it blocks all its external interfaces, except the management link. If the management link is cut (inability of the microprocessor to operaate beyond the temperature threshold), the ANT board will detect the connection for this element. Interruption of all traffic supported by this board. Upon notification of the end of the " Board_temperature " alarm, the agent resets the board concerned.
Board_software_version	Alarms being downloaded: the downloaded version has been incorrectly saved, or part of the version data being downloaded is incorrect, or a request has been made for the abandonment of the version transfer. Alarms when activating the software: the software version to be activated has not been saved (and so is unknown to the Board element).	No action on the Board element during downloading. Rejection of the activation command if the software version to be activated is unknown to the Board element.
HW_failure	Hardware failure detected by a board.	Indicates that the board must be replaced.
Storage_pb	Indicates overloading of a buffer	No action, loss of management data or traffic.
FAN_degraded	The fans of an element function in degraded mode, i.e., a single fan is faulty.	No action

Alarm name	Definition	Internal NE actions
Synth	Synthesiser problem	For the RBS, automatic cut–out of the transceiver For the IBS, no action
TX_power	RBS output power	Automatic cut–out of the transmitter

6.3.2.3 – Alarms relating to ports

Table 2 provides the list of alarms specific to the 9900NE ports, along with their definition and describes the automatic actions internal to the 9900NE–NR2.0 caused by the presence of each of these alarms. The actions described are not necessarily controlled by the management software (they may be controlled by the equipment itself).

Alarm name	Definition	Internal NE actions
Ais	Detection of “all–1” signal in the useful data (either in the data transported in the G.704 frame or in the SDH frame container).	No action
LAIS	Detection of “all–1” ATM signal received on line (i.e., before unframing; this alarm only exists for the ATM port (ATM over SDH).	No action
Crc (*)	Detection of errored blocks in the received frame	No action
Fas (*)	Detection of frame alignment word of errored frame	No action
Lmfa (*)	Loss of multi–frame alignment	No action
Lof (*)	Detection of loss of frame alignment word	No action
Lop (*)	Errored container pointer	No action
Los	Absence of received signal: detection of the absence of transition in the received signal (”frame” level).	No action
Rai (*)	Alarm indication on the transmitted signal, signalled by remote	No action
Rei (*)	Error indication on the transmitted signal, signalled by remote	No action
Rdi (*)	Fault indication on the transmitted and unframed signal, signalled by remote (either for the G.704 frame or in the SDH container)	No action
LRdi (*)	Fault indication on the ATM signal transmitted on line.	No action
(*) : this alarm can only exist if the signal transmitted/received by the port is framed.		

6.3.2.4 – Functional alarms

Table 3: 9900NE functional alarms provides the list of alarms specific to the functions of the 9900NE, along with their definition and describes the automatic internal actions to the 9900NE caused by the presence of each of these alarms. The actions described are not necessarily controlled by the management software (they may be controlled by the equipment itself).

The 9900NE functions, for which the “Alarm” function of the ANT board manages the alarms, are as follows:

- Time management of the 9900NE
- Synchronisation of the 9900NE
- Security
- Activation of leased line cross–connects.

Alarm name	Definition	Internal NE actions
Clock_missing	Loss of BS internal clock used for slaving PLL of the ANT board	No direct immediate impact
Priority	Absence or loss of priority reference clock for 9900NE synchronisation	Fallback to next priority clock
Synchro	Desynchronisation of the PLL of the ANT board.	No action
Unknown_manager	Intrusion of an unknown manager in the 9900NE	No impact
NT_crypt_key	Intrusion of a non–declared NT in the 9900NE	Interruption of the network entry procedure
Alloc_error	Impossible to allocate resources to set up a Leased Line cross–connection, since the Round Trip Delay minimisation requirement cannot be respected (and yet the number of resources required for setting up this cross–connection are sufficient => Defragmentation).	Rejection of the cross–connection set–up request by the AMD board.

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7 – Changes of configuration

The changes to the transmission network may require changes to the equipment configurations in order to meet new requirements. The A9900 equipment is likely to satisfy these changes either by modifying just the equipment software configuration or by physically modifying the equipment and its configuration

These changes may involve either changes of configuration with or without physical intervention on the equipment, or changes to the 9900LT itself.

The possible changes using the 9900LT software only are:

- use of local supervision,
- change of bit rate,
- modification of channel frequency:
  - change of frequency in the same sub–band,
  - change of frequency in another sub–band or a different band,
- change of transmit power level,
- change of physical address of the equipment**,**

The possible changes with physical intervention are:

- change of DBS rack,
- change of RBS unit,
- change of DC/DC power supply unit for DBS racks,

Before any configuration change, block all remote command signals
(Procedure to be detailed subsequently.)

For carrying out work of any kind on boards (disassembly/assembly, configuration modification), the operator must be equipped with a grounding strap (e.g., a "Disposable Wrist Strap" 3M, reference 2209).

THESE OPERATIONS ARE ONLY TO BE CARRIED OUT BY QUALIFIED TECHNICIANS AUTHORISED BY ALCATEL.

Update the reference documents and labels in order for them to comply with the new configuration.

The presence of the symbol ✂ at the start of the description of an intervention indicates that this involves the temporary interruption of the link.

7.1 – Use of local supervision

For the use of this function, carry out the commands indicated in sections 4.4 and 4.5 of the present Manual.

7.2 – Change of bit rate

To make this change:

- update the "Installation information" sheet required for station installation (refer to Annex 1 of the present Manual),.
- modify the bit rate via the "Radio Management" screen menu (refer to section 4.7 of the present Manual),

– validate by clicking on “Apply” and close the application,

– use the 9900LT software applications to check the absence of alarms (see section 4.10).

7.3 – Change of frequency

7.3.1 – Change of frequency in the same sub–band

To make this change:

– update the “Installation information” sheet required for station installation (refer to Appendix 1 of the present Manual),

– modify the output power via the “Radio Management“ screen menu (refer to section 4.7 of the present Manual),

– validate by clicking on “Apply” and close the application,

– use the 9900LT software applications to check the absence of alarms (see section 4.10 of the present Manual).

7.3.2 – Change of frequency in a different sub–band or band

The change of frequency in a different sub–band requires the RBS to be changed.

The change of frequency in a different band requires, in addition, the antenna(s) to be changed.

In both cases, therefore, the change of frequency requires the physical presence of the technician in each station. The change of software configuration is carried out locally in each station.

The operations described below must be carried out **in each station**:

– update the “Installation information” sheet required for station installation (refer to Annex 1 of the present Manual),

– turn off the power to the DBS rack(s),

– modify the Outdoor part with respect to the new configuration (exchange of RBS(s) and, where applicable, antenna(s)), with reference to Chapter 3 of the present Manual,

– repeat the commissioning operations by programming the new operational parameters, as indicated in Chapter 5 of the present Manual,

– use the 9900LT software applications to check that the duplex spacing between transmission and reception frequencies is respected (see section 4.7),

– validate by clicking on “Apply” and close the application,

– use the 9900LT software applications to check the absence of alarms (see section 4.10 of the present Manual).

7.4 – Change of power level (RBS)

To make this change:

- update the “Installation information” sheet required for station installation (refer to Appendix 1 of the present Manual),
- modify the output power using the “RBS Details” screen menu (refer to section 4.5.3 of the present Manual),
- validate by clicking on “Apply” and close the application,
- use the 9900LT software applications to check the absence of alarms (see section 4.10 of the present Manual).

7.5 – Changing the physical address of the equipment

To make this change:

- update the “Installation information” sheet required for station installation (refer to Annex 1 of the present Manual),
- open the 9900LT application as indicated in section 4.9.2 of the present Manual.
- use the 9900LT software applications to change the physical address number of the NE,
- validate by clicking on “Apply”, close the application and wait (several minutes) for the terminal to be configured,
- use the 9900LT software applications to check the absence of alarms (see section 4.10 of the present Manual).
- signal the physical address to the network supervisor.

7.6 – Updating the software

7.6.1 – Updating the 9900LT on PC

For NE operation, the 9900LT installation and programming software version must always correspond to the system hardware configuration.

For any modification of the 9900LT software, remember to update the “Installation information” sheet in Annex 1.

To update the software:

- install the diskette (or CD–ROM) containing the update in the appropriate drive of the laptop PC used for system supervision,
- from the Windows program, run the software installation on the PC hard disk,
- use the 9900LT software applications to check the absence of alarms (see section 4.10 of the present Manual).

7.6.2 – Downloading software

For updating the NE component (BS and NTs) software, the system is provided with a download facility.

To carry out the download procedures, refer to section 4.12.1 of the present Manual.

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Appendix 1 – Installation sheet

A.1.1 – 9900DBS Operator..... Date..... Visa.....

General information

		Operator
Name Address	..... No ..... Street..... Bld..... Stair..... Floor..... Town ..... Country	
Site identification		
Name of Base Station		
Version		

Equipment characteristics

Designation	Reference	ICS	Serial No.
Subrack			
Fan			
Power sup 1			
Power sup 2			
CPL			
IBS 1			
IBS 2			
IBS 3			
IBS 4			

Equipment characteristics and onboard software

Designation	Référence	ICS	Serial No.	Boot	Downloaded software
ANT					
TNT 1					
TNT 2					
TNT 3					
TNT 4					
AMD 1					
AMD 2					
AMD 3					
AMD 4					

A.1.2 – 9900 RBS Operator..... Date..... Visa.....

General information

		Operator
Name Address	..... No ..... Street..... Bld ..... Stair ..... Floor ..... Town ..... Country	
Site identification		
Name of Base Station		
Version		

Equipment characteristics

Designation	1	2	3	4
Mains				
Reference				
ICS				
Serial No.				
Tx level				
Band				
Sub–band				
Onboard software version				
Type of cable				
Length of cable				
Tilt				
Azimuth				
Height of ODU				
Type of mounting				

Appendix 2 – Installation of 9900LT Craft Terminal

A.2.1 – Stage 1: Pre–requirements

Log onto the PC to an account with “administrator” rights.

To install the Craft Terminal from a different account, follow the restrictions detailed in paragraph 2.8 Installing the Craft Terminal from an account without “administrator” rights.

A.2.1.1 – Checking a previous Craft Terminal installation

To know if an installation has already been carried out on the PC, click in succession on the following icons:

- Workstation (Windows desktop)
- Control panel
- Add/remove programs

The list of applications present appears in the window: “Add/Remove Programs Properties”.

If the application ” 9900LT (Craft_Terminal) ” appears in the list, deinstall the Craft Terminal (cf. How to deinstall the Craft Terminal ?) before going to 2.1.3, or go directly to 2.1.3.

A.2.1.2 – Closing all other applications

A.2.1.3 – Renaming DLLs

WARNING

- If the 9900LT version to be installed is less recent or equivalent to version 2.0.3.7,

=> GO TO STAGE 2

- If the 9900LT version to be installed is more recent than version 2.0.3.7:
- If no version of 9900LT more recent than version 2.0.3.7 has already been installed,

=> RENAME THE DLLs AS SHOWN BELOW

- If a more recent version of 9900LT than version 2.0.3.7 has already been installed,

=> GO TO STAGE 2

Before going to stage 2, rename the following DLL files (in c:\Winnt\System32) :

Files	Renamed files
MFC42.dll	MFC42.dll.old
MSVCRT40.dll	MSVCRT40.dll.old

A.2.2 – Stage 2: Installation of the Craft Terminal

- Run the Setup.exe program

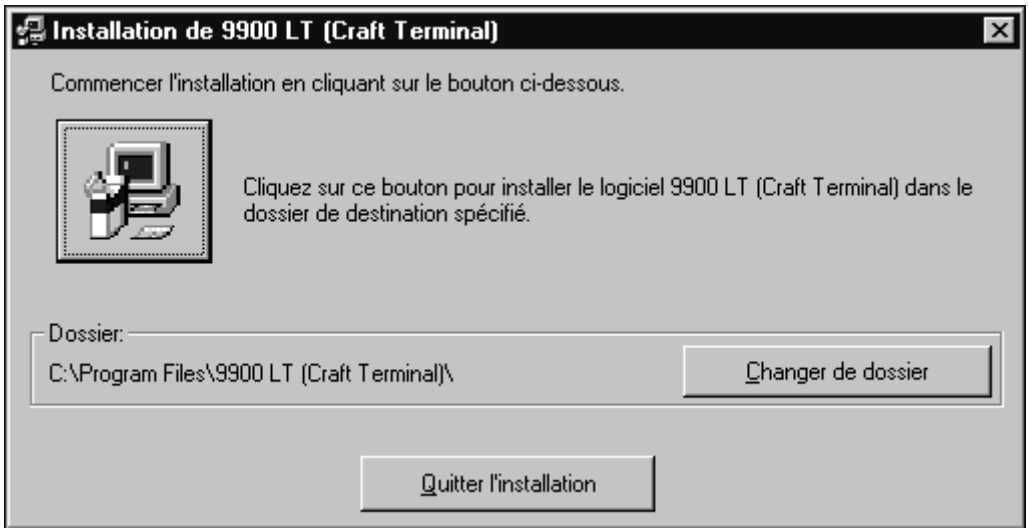
If the delivery kit is in the form of diskettes, insert the installation diskette and double–click A:\Setup.exe in Windows Explorer.

If not, copy the installation kit into a temporary file (c:\Temp par exemple) and run Setup.exe.

The following window is displayed:

- Click OK

This window is then displayed:



- Click the button representing a PC (top left of window) to continue installation.

Follow the progress of the installation program.

A window indicating that installation has been successful terminates the process.

The installation program asks to reboot the PC: click OK.

After reboot, log on and go to stage 3.

A.2.3 – Stage 3: Registering the OCX license

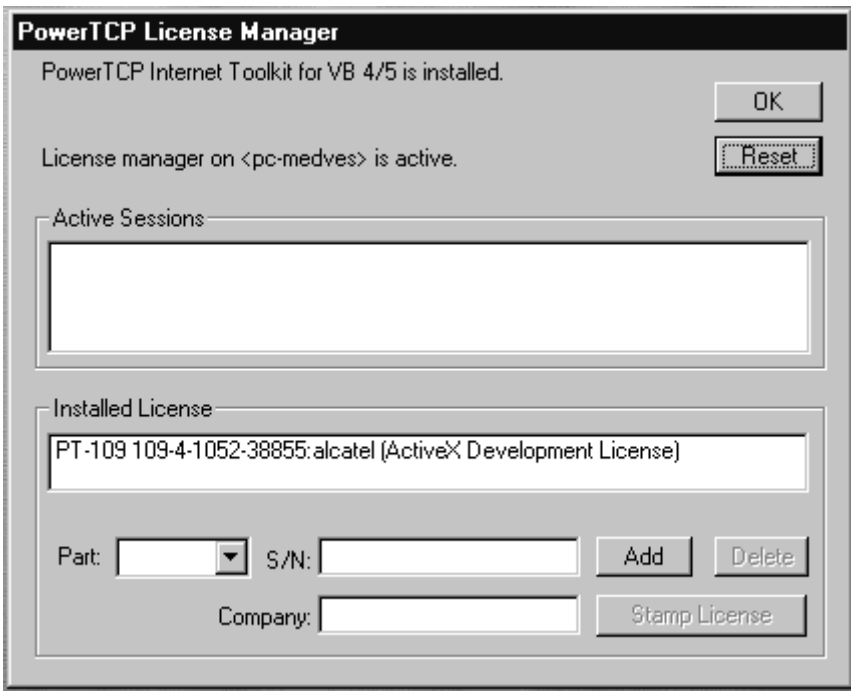
- Run the Ptlic32.exe program:

C:\Program_files\9900LT (Craft Terminal)\Ptlic32.exe

The ” Power TCP ” window is displayed

- Click the ” Licensing ” button

The following window is displayed



- Complete the following fields:

Text field	Field value
Part (scroll menu)	PT–109
S/N	109–4–1052–38855
Company	Alcatel CIT

- Click ADD

The license appears in the ”Installed License” zone

- Click on the license
- Click on the ” Stamp License ” button
- Select the OCX file to register the license:

C:\WINNT\System32\ptsnmp32.ocx

A window indicates that the registration has succeeded

- Return to the main window (above) and click on the license displayed in the ” Installed License ” block, then click Delete
- Click OK then OK in the following window

Remarque :

An error message may appear when registering the OCX license.

In this case, make sure that no other application using the OCX is active.

A.2.4 – Stage 4: Configuring the Craft.ini file (optional)

In the Craft.ini file (C:\ProgramFiles\9900LT\Craft.ini) check the value of the following parameters:

Parameter	Value
IP Address	IP address of the BS
Local port	161 (Tx port for SNMP requests from the Craft Terminal)
Remote port	161 (Rx port for SNMP requests to agent)
Trap port	161 (Rx port for ”Traps” to Craft Terminal)

A.2.5 – Stage 5: Installation of NFS server

This procedure is necessary to be able to implement the Craft Terminal’s “Software Download” feature.

If the server installation has already been carried out on the PC (cf. Is the NFS server available on the PC?), go to the stage: Installation of Software Packages.

A.2.5.1 – *Reference of NFS server product*

Product	Omni–NFS Server for NT/98/95 – Xlink Technology
Version	4.01
Serial Number/Password	cf. Certificate of Authenticity
Documentation	Omni–NFS for Windows 98/95 & NT – User Guide

A.2.5.2 – *Installation of NFS server*

- Log on to an account with administrator rights

From the Windows NT Explorer:

- Click on the D: drive
- Double–click on the Setup.exe program

The following window is displayed:

- Click on the menu: ”Install Omni Product”

A window requesting the product serial number and a password appears.

- Enter the requested information (cf. paragraph Reference of NFS server product) and click OK

A window containing the following phrase appears:

”This program requires a member of Administrator group to setup”

- Click YES

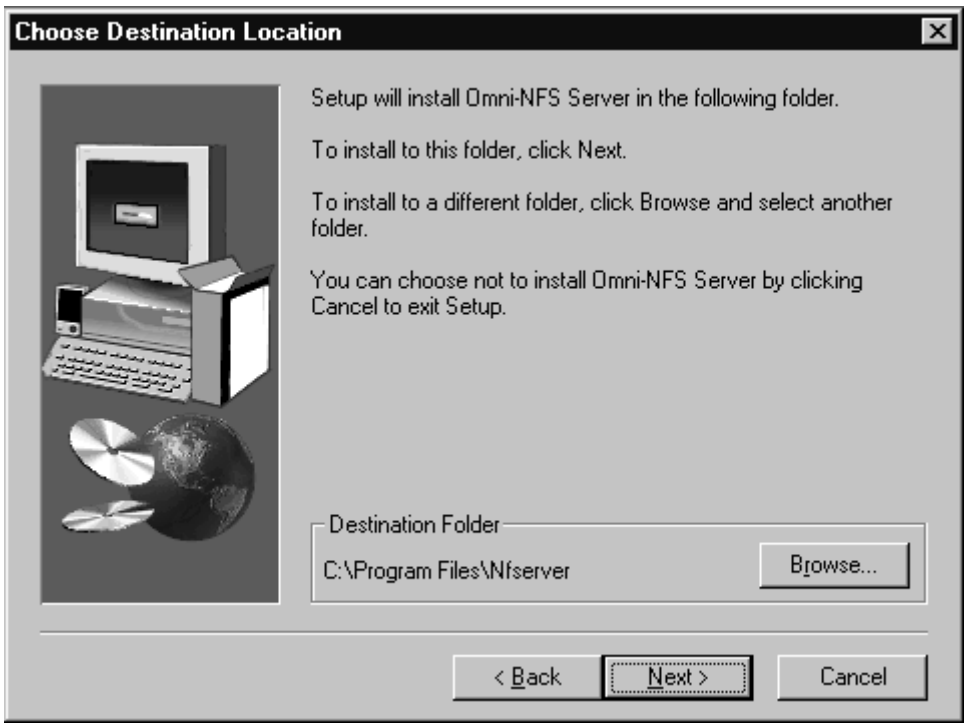
A window titled ”Omni NFS”, ”full screen” is displayed along with a small ”Welcome” window

- Click Next

A window titled ”Software License agreement” appears

- Click YES

The following window appears:



- Click Next

A window titled ”Select Program Folder” appears

- Click Next

Installation begins.

After about ten seconds, the following window appears:

- Click ”Yes, I want to restart my computer now” then Finish

The PC reboots.

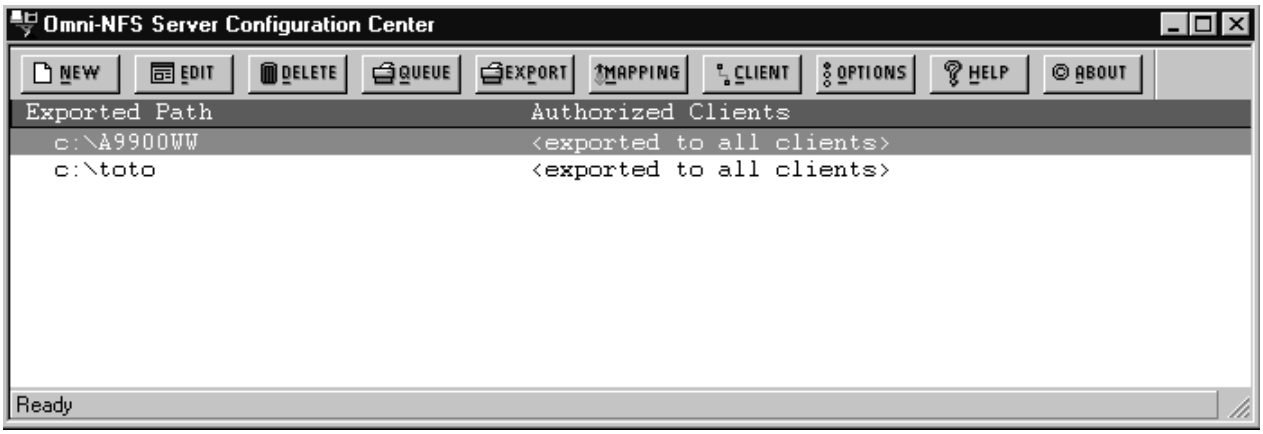
- Log on to an Administrator account before going to stage 5.2

A.2.5.3 – *Configuring the NFS server*

- Run the wnfsd.exe program:

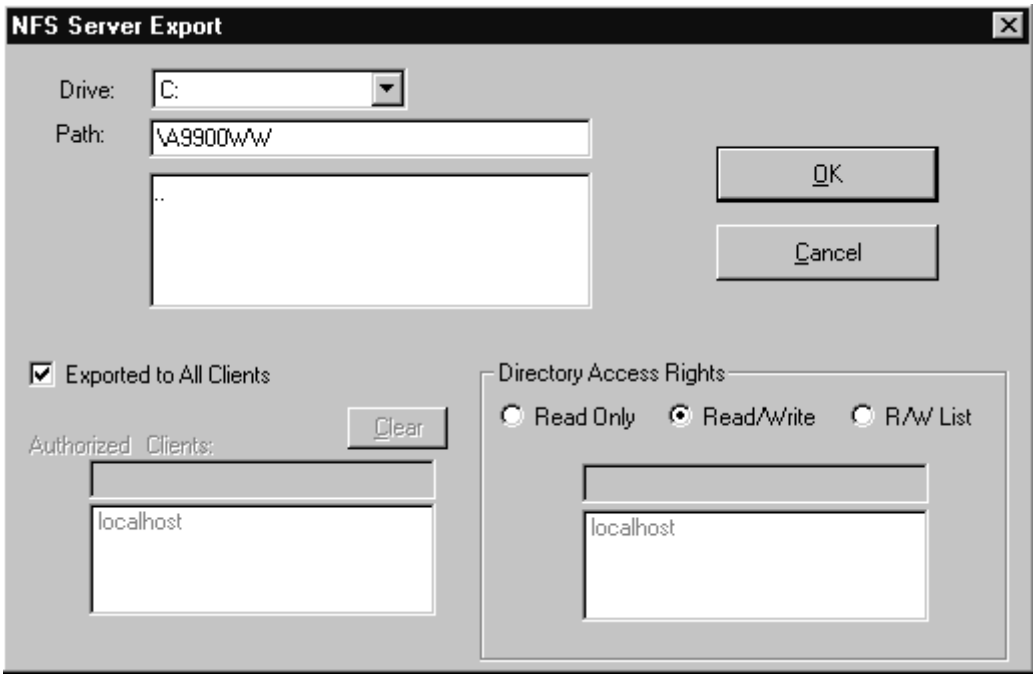
C:\Program_files\nfserver\wnfsd.exe

A window similar to the following appears:



- Click on ”New” in the tool bar

The following window appears:



For the path, select the directory where the Craft Terminal software packages are to be installed.

Choose the following options:

– Exported to All Clients

– Directory Access Rigths : Read/Write

Click OK

Note:

In case of access error to a sub–directory of an exported directory, export each of the directories containing a package.

A.2.6 – Installation of Software Packages

From Windows NT Explorer, copy the directories containing the software packages to be downloaded to the NFS assembly directory.

A.2.7 – How to deinstall the Craft Terminal ?

In Windows desktop, click successively on the following icons:

- Workstation (desktop)
- Control Panel
- Add/Remove Programs
- In the ” Add/Remove Programs Properties ” window , select the 9900LT program
- Click ” Add/Remove ”
- Confirm removal of application

Note

If a message is displayed indicating that certain components could not be removed from the computer:

- Click OK
- Click OK in the ” Add/Remove Programs Properties ” window
- In Windows Explorer, remove the folder:

C:\ProgramFiles\9900LT (Craft Terminal)

A.2.8 – Installing the Craft Terminal from an account without “administrator” rights

During stage 2, no window appears to indicate the end of the Craft Terminal installation, and the installation program remains blocked.

It is then necessary to stop “manually” the installation of the Craft Terminal when the installation program has finished installing all the files.

Installation is over once the following conditions are fulfilled:

– the installation progress window indicates that all files have been installed,

– no disk access is detectable,

– a “reasonable” time (around 5 minutes) has elapsed since the end of file installation.

To stop the Craft Terminal installation program:

– Press simultaneously Alt,Ctrl, Del

The ”Windows NT Security” window appears.

– Click ”Task manager..”

– Select the Setup.exe program and click ”End of task”

Reboot the PC, log on and go to stage 3.

A.2.9 – Is the NFS server available on the PC?

To know if the NFS server is available on PC:

- Press simultaneously Alt,Ctrl, Del

The ”Windows NT Security” window appears.

- Click ”Task manager..”

If the line ”nfsd.exe” is present in the list of tasks, the NFS server is available on the PC.

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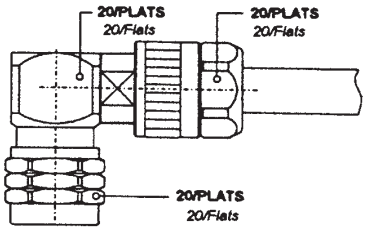
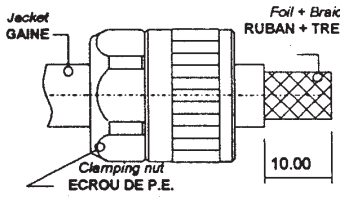
Appendix 3 – Mounting coaxial connector

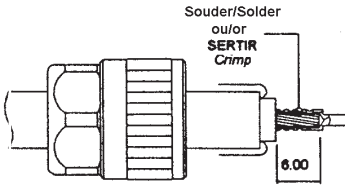
Mounting on cable ET 390 998

connector DELTA OHM
08 250 173

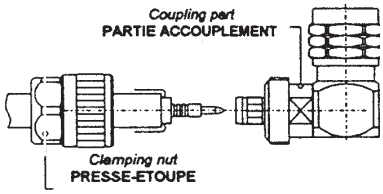




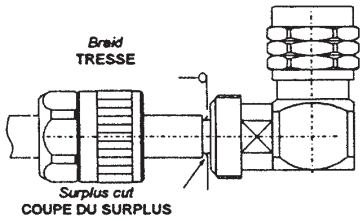
Dénuder la gaine sur 10 mm, mettre l'écrou sur la gaine.
Strip cable (10 mm), put the clamping nut on the cable.



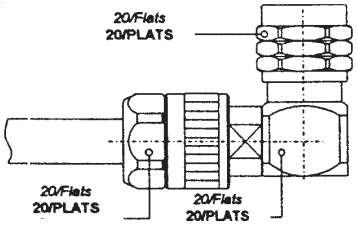
Rabattre les 10 mm de tresse sur la gaine.
Flange the 10 mm of braid on the jacket.
Couper le diélectrique et le ruban sur 6 mm.
Cut dielectric & foil on 6 mm.
Souder ou sertir le contact central.
Solder or crimp the contact on the inner conductor.



Monter la partie accouplement entre le ruban et la tresse du câble.
Mount the coupling part between the foil and the braid of the cable.



Rabattre la tresse vers l'avant du connecteur et couper le surplus.
Flange the braid to the front of the connector and cut the braid surplus close to the connector.



Assembler la partie presse étoupe et accouplement, serrer avec une clé plate 20 mm. (couple maxi 35 N/m)
Mount the clamping part and the coupling part, press with end, wrench the clamping nut (20 mm) (Max coupling torque 35 N/m)

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Informations non contractuelles
Code Alcatel: 1AC001100022

COAXIAL CABLE 50 Ohms

PRODUCT REFERENCES

FILOTEX ref. : **ET 390 998**

CONSTITUTION

① Core: 7x0.85 red copper

② Insulation: Cellular PE
Ø 7.25 +/- 0.2 mm

③ Screening foil: alu/pet

④ Tinned copper braid

⑤ Sheath: IN & OUT
Color: Grey.
Ø 10.30 +/- 0.3 mm.

Main applications

Coaxial for MELODIE application

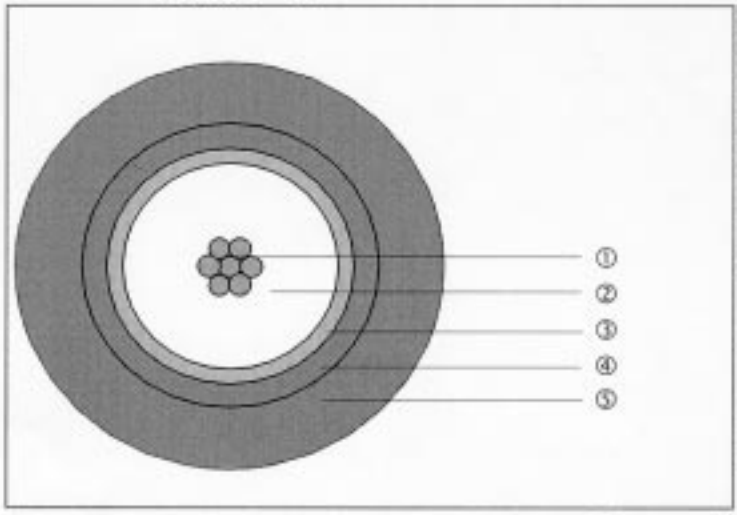
Main characteristics

Sheath IN & OUT.
Fire resistance: IEC 332-1
NF-C 32 070 testing N°1,category C2
UL 1581§ 1080 comply V-W 1
CSA testing FT 1
HD 405-1S1

Electrical values

Insulation resistance : > 5000 MΩ
Voltage withstanding : > 4 kV eff
Velocity propagation: 78%
Characteristic impedance : 50 Ω ± 2
Nominal mutual apacitance: 85 pF/ m
Screening attenaution: >= 90 db from 100 to 1000 Mhz
Nominal attenuation at 20 °C (db/100m):

1 Mhz.	0.7
3 Mhz.	1
10 Mhz	1.65
25 Mhz	2.5
50 Mhz	3.6
67 Mhz	4.3
100 Mhz	5.25
134 Mhz	6
400 Mhz	10



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ALCATEL

Appendix 4 – List of abbreviations/Liste des abréviations

MNEMONIC	ENGLISH	FRENCH
ADM	Add and Drop Multiplexer	(MIE) Multiplex insertion extraction
AGC	Automatic Gain Control	(CAG) Commande Automatique de Gain
AIS	Alarm Indication Signal	(SIA) Signal d'indication d'alarme
AMD	AirModem	
ANT	ATM Network Termination	
ATM	Asynchronous Transfer Mode	(?) Mode de transfert asynchrone
AS	Automatic switching	(CA) Commutation automatique
AT	Attend alarm (on CT)	(AT) Alarme en attente (sur PEX)
BER	Bit Error Rate	(TEB) Taux d'erreur binaire
BNC	Bayonet–locking Connector	(BNC) connecteur BNC
BS	Base Station	(BS) Station de base
CEPT	Conference of European Post and Tele-communications administrations	(CEPT) Conférence Européenne des Postes et Télécommunications
CCIR	International radio consultative comitee	(CCIR) Comité consultatif international des radiocommunications
CPL	coupling (in CPL board)	(CPL) coupleur (carte CPL)
CT	Craft Terminal (ECT, NCT or RCT)	(PEX) Poste d'exploitation (PEE, PER ou PED)
DBS	Digital Base Station	(DBS) Station de base numérique
EMC	ElectroMagnetic Compatibility	(CEM) Compatibilité ElectroMagnétique
EPROM	Electronically Programmable Read–Only Memory	(EPROM) Mémoire fixe programmable de façon électronique
ETSI	European Telecommunications Standards Institute	(ETSI) Institut de standardisation des télécommunications européennes
FEC	Forward error correction	(CCE) Code correcteur d'erreurs
HDB3	High Density Binary 3 code (3rd order)	Code Haute Densité Binaire d'ordre 3
I^2C or IIC	Inter Integrated Circuit	(I^2C or IIC) Inter Circuits Intégrés
IDU	InDoor Unit	(IDU) Coffret intérieur
IEC	International Electrotechnical Commission	(IEC) Commission internetionale d'électrotechnique
IP	Internet Protocol	(IP) Protocole internet
ITU	International Telecommunication Union	Union Internationale des Télécommunications
LED	Light Emitting Diode	Diode électroluminescente
LMCS	Local Multipoint Communication Systems	(LMCS) Système de communication multipoint en mode local

MNEMONIC	ENGLISH	FRENCH
LMD(S)	Local Multipoint Distribution (System)	(LMD(S)) Distribution multipoint en mode local
MAC	Medium Access Control	(MAC) sous couche MAC de l'OSI
MUX	Multiplexer	(MUX) Multiplexeur
ODU	OutDoor Unit	(ODU) Coffret extérieur
NE	Network Element	(NE) Elément de réseau
NRZ	Non return to zero	(NRZ) Non retour à zéro
NT	Network Terminal	(NT) Terminal de réseau
PC	Personal Computer	(PC) Odinateur individuel
QAM	Quadrature amplitude Modulation	(MAQ) Modulation d'amplitude en quadrature
RBS	Radio of Base Station	(RBS) Radio de la station de base
RF	Radio Frequency	(FR) Fréquence radio
RT	Radio Terminal	(RT) Terminal radio
RX	Receiver	(Rx) Récepteur
STP	Shielded Twisted Pair	(STP) Câble 1 paire trssadée blindé
SMD	Surface Mounted Device	(SMD) Composant monté en surface
TNT	Telefony Network Termination	(TNT) Terminal réseau téléphonique
TS	Terminal Station	(TS) Station Terminale
TX	Transmitter	(Tx) Emetteur

END OF DOCUMENT