

## Alcatel-Lucent 1511 BA

BUSINESS ACCESS MULTIPLEXER | 2 MB/S 30-CHANNEL PRIMARY RATE MULTIPLEXER

The Alcatel-Lucent 1511 BA is a 2 Mb/s 30-channel multiservice access multiplexer, which can be used across a wide range of companies for business access and utility network applications. It also provides grooming functionalities for GSM and wireless local loop networks. For example, railway networks, pipelines for oil, gas and water and power utilities use utility network applications with different sets of service requirements. Whereas railway and pipeline installations require a linear or ring type of network with drop-and-insert functions, other installations require a mesh type of network. For all of these applications the Alcatel-Lucent 1511 BA offers the ideal solution.



### Features

- Channel bank for 30 x 64 kb/s channels
- 2 Mb/s G.703/G.704 aggregates
- Variety of tributary boards for voice, data and Ethernet
- Local or remote craft terminal and centralized element management platform
- Drop-and-insert facility at 64 kb/s granularity
- Voice and data conference circuits
- Built-in ringing generator and 12 or 16 kHz metering pulses for coin boxes and private meters
- Support for incorporation of PDH terminal units for transport of E1 streams over optical fiber and copper cable (G.shdsl)
- Automatic trail protection of N x 64 kb/s payload
- 48 V DC power supply or 110 V AC or 220 V AC with optional battery backup
- Redundant DC/DC or AC/DC conversion

### Benefits

- Protection of business-critical services with high reliability, APS and trail protection
- Ease of upgrading with a modular architecture for rapidly growing or changing networks
- Full software control of network configuration, maintenance and supervision

### Network Element Management

Fast, efficient and flexible management is the key to success for any network. Alcatel-Lucent's network management software, based on ITU-T M.3010, satisfies all three of these criteria in an easy-to-learn and easy-to-use package. Network management of all elements in a system is performed from a single terminal comprising a compatible PC running Windows or a workstation loaded with Alcatel-Lucent network management software.

## Architecture

The PCM Controller (PCMC2) interfaces the users and the E1 aggregate side.

The controller connects the analog, data or N x 64 kb/s data terminal channels of the tributary boards, or the PCMC2 in slave mode, to the 2,048 kb/s G.703/G.704 aggregate via an internal serial bus.

The PCMC2 provides:

- A transmission/switching interface and HDB3 to binary coding/decoding, retiming, frame alignment and supervision, cyclic redundancy check #4 (CRC4) generation/monitoring, channel mapping, CAS, alarm treatment and test facilities
- An asynchronous serial communication channel to a central alarm supervising unit through which the user can communicate about equipment configuration, status and alarms
- Two serial channels for embedded operation channel (EOC). These channels can be used for transport of network management protocols between the network element and its centralized management units.

Power unit boards for DC/DC and AC/DC conversion are provided for each subrack assembly and can be duplicated for redundancy.

## Applications

### POTS Subscriber Multiplexer

The POTS subscriber multiplexer is used in the subscriber network and allows a flexible mix of voice and data interfaces. Adaptation of the signaling to the customer's requirements can be done easily.

### ISDN-BRI

The Alcatel-Lucent 1511 BA can be used for ISDN-BRI applications. Both 2- and 4-wire (U with line code 2B1Q and S0/I.430) interfaces are available. Each interface uses three timeslots (2B + D16/M) on the 2 Mb/s G.703 link.

### Hot Line

Hot Line is a bi-directional application, with a centralized battery set, where one subscriber hooks off and the other is called without dialing. It uses the same board as the POTS application. This board's lines can be programmed either as a POTS or Hot Line.

### Ringdown

Manual Ringdown (MRD) is an Alcatel-Lucent 1511 BA application that permits the connection of two local battery (LB) telephone sets or the connection of a local battery telephone set to a central switch board. This application is widely used by stock market brokers. It requires the use of a special ring-down board.

### Direct Dialing In

The Alcatel-Lucent 1511 BA provides direct dialing in (DDI), a feature whereby the dialing information is sent directly from the PSTN to the PABX, which then sets up the connection to the PABX subscriber.

### Data Multiplexer

The Alcatel-Lucent 1511 BA can be used as a data multiplexer. The possible data tributaries are:

- 64 kb/s G.703 co-directional — with optional E&M signaling
- 64 kb/s G.703 contra-directional
- 2 Mb/s and N x 64 kb/s G.703/G.704. (fractional E1)
- Low speed: 75 b/s to 64 kb/s for V.36, V.35, V.28 and X.21
- N x 64 kb/s (N = 1 to 31); interfaces: V.35, V.36 and X.21

### Remote Data Unit

The Alcatel-Lucent 1511 BA provides an integrated digital interface to remote data units (RDUs). The RDUs are provided with one or two of the following interfaces in any combination: V.35, V.36, X.21 and V.24/V.28 up to 128 kb/s, analog and 64 kb/s G.703 co-directional interfaces. Performance monitoring on the RDU is foreseen on the digital link.

### High Quality Audio Tributaries

The Alcatel-Lucent 1511 BA can perform unidirectional audio transmission. This audio board uses MPEG-2 15 kHz sampling.

### 2/4-Wire Audio Interface

Connection between analog modems or PABX ports for tie-line connections can be achieved with the 2/4-wire audio board. Variants with or without E&M wires are available.

### Conference Bridge

Two types of conferences are possible:

- Master-slave conference: One participant is considered the "master" and all others are considered "slaves." One master with up to 29 slaves is possible.
- Full conference: This type of conference is used when all participants need to share information equally. Every participant receives information from all other participants but himself or herself.

These two types of conferences can be used for voice, data or signaling.

The conference bridge is a simple and useful board in networks with supervisory control and data acquisition (SCADA) and/or audio dispatching requirements.

### Dry Relay Contacts

This board has a number of detectors for dry relay contacts. It is used for collecting alarm indications of collocated equipment and enables the visualization of alarm states on the same craft terminal or server as that being used for the multiplexer functions.

### Integrated Optical Transport

Boards for optical PDH transport of 4 or 16 E1 streams can be plugged into the Alcatel-Lucent 1511 BA subrack and managed by the same management tools. See the Alcatel-Lucent 1521 FL and the Alcatel-Lucent 1531 FL.

Figure 1. Alcatel-Lucent 1511 BA User Interfaces

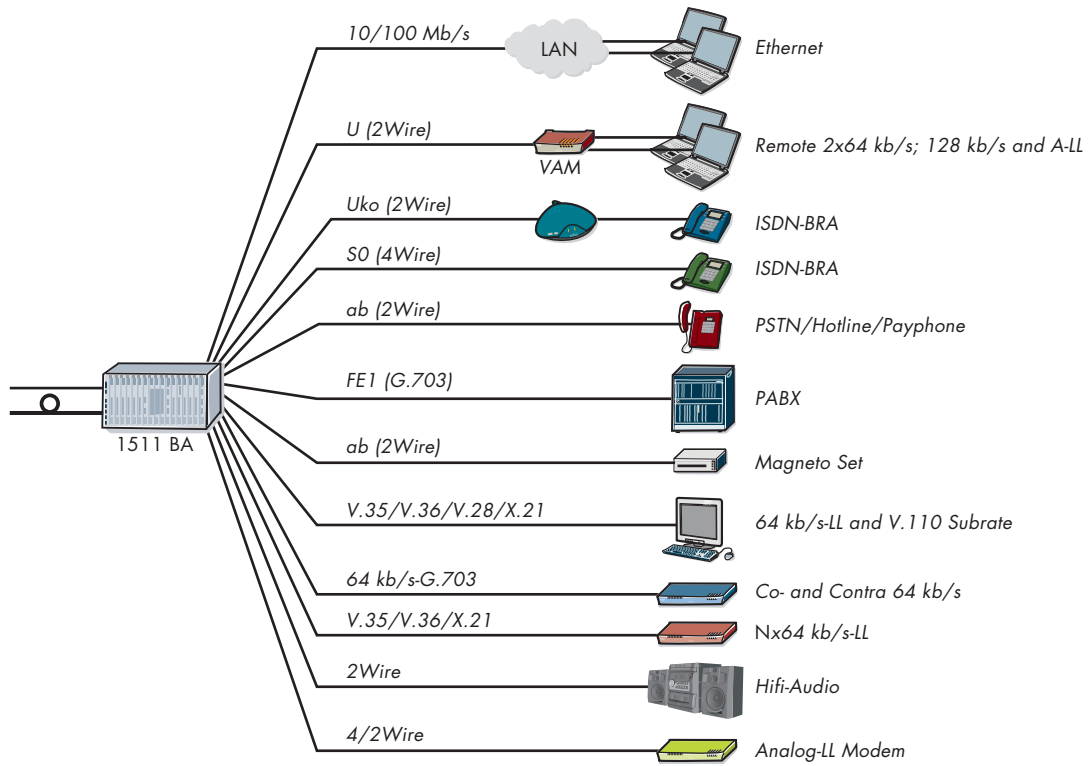
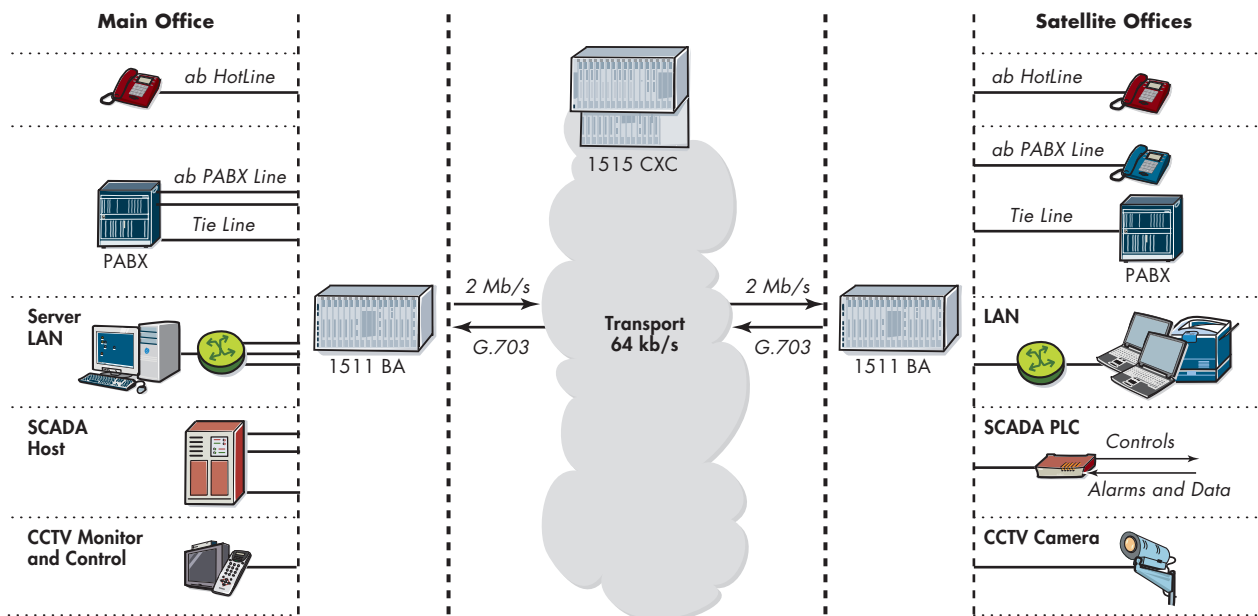


Figure 2. Alcatel-Lucent 1511 Typical Applications



## Automatic Protection Switch

The automatic protection switch (APS) enables route protection on E1 level. If used, the Alcatel-Lucent 1511 BA transmits data via two different E1 routes. At the receive side, data coming from the preferred route is used; if this route fails, data is taken from the other side.

## Ethernet Switching

On an E1 trail across multiple Alcatel-Lucent 1511 BA multiplexers, a group of 64-kb timeslots (N: 1...31) is reserved to carry Ethernet frames. In each Alcatel-Lucent 1511 BA, one 10/100Base-T LAN board (LANtrib) can drop/insert its local Ethernet traffic onto these reserved timeslots. To connect multiple Ethernet-based end devices, the LANtrib offers five external RJ-45 interfaces. The LANtrib also switches LANs across multiple and distinct Alcatel-Lucent 1511 BA multiplexers. Switching between the local five Ethernet ports runs at wire speed.

## Technical Specifications

### Main Characteristics

- Compliant with all relevant ITU-T recommendations including: G.703, G.704, G.706, G.711, G.712, G.732, G.784, G.823, G.826, V.28, V.35, V.36, and X.21

### Clock Synchronization

- Internal clock (50 ppm)
- Extracted from E1 port
- External via 2,048 MHz clock (ITU-T G.703 § 10) or 64 kHz (G.703 § 1.2.2)

Clock and backup priority rules are selectable via configuration management.

### Mechanical Design

- Uses same technology as the other products in the Alcatel-Lucent access product family
- Plug-in printed boards with Double Euro format. State-of-the-art components ensure low power consumption and high reliability.
- Subracks (can be mounted in rack or cabinet):
  - T9 subrack: Width of 120 mm (4.72 in.), 240 mm (9.45 in.), 360 mm (14.17 in.) or 480 mm (18.89 in.)
  - 19-in. subrack:
    - height: 7U (1U = 44.45 mm, 1.75 in.)
    - Can be mounted in a 300-mm deep (11.81 in.) ETSI rack
- ETSI T9 and 19-in. racks:
  - available in two heights: 2,200 mm (86.61 in.) (with six Alcatel-Lucent 1511 BA subrack mounting levels) and 1,800 mm (70.87 in.) (with five mounting levels)
- Cabinets: Both indoor and outdoor variants available

### Power Supply

- -38.5 V to -72 V DC
- 110/220 V AC ± 20%

### Environment

- > Operating temperature: -5 C to +50 C (23 F to 122 F)
- > Transport and storage temperature: -40 C to +70 C (-40 F to +158 F)
- Compliant with:
  - ETS 300 019-2-1
  - ETS 300 019-2-2
  - ETS 300 019-2-3

### EMC

- EMC on rack basis (EMC directive 89/336/EEG [EN 50081-1, EN 50082-1])
- EMC on subrack basis (ETS 300-386-1)