

"Liberator-SIM"

ISDN Simulator for E1 T1 PRI and/or BRI

Supports 1, 2 or 3 PRI/E1/T1 interfaces and 4, 8 or 16 "S/T" BRIs



- PRI E1 or T1 ISDN simulator
- BRI ISDN simulator
- PRI and BRI simulator
- Full cross-connection between all "B" channels
- Local connectivity between any ports
- Tones generated from network and/or by Liberator
- Large NV event log with remote reporting mechanisms
- Remotely manageable and software upgradeable

1. OVERVIEW

The Liberator models detailed within this document simulate ISDN networks for testing and demonstration purposes.

They are available in a number of versions, supporting up to 3 PRIs (both E1 and T1) and up to 16 BRIs. The minimum configurations are 1 PRI or 4 BRIs.

The PRI ports support user-selectable E1 and T1 ISDN.

The unit will connect any port to any port, irrespective of whether they are PRI or BRI, and any "B" channel to any "B" channel giving full non-blocking cross-connectivity between all local ports.

2. OPERATION

• 2.1 ISDN Services

Signalling is carried/converted between ports and ISDN types.

Supplementary services are supported and generated by Liberator.

Sub-addressing is supported.

Contents:

1. Overview
2. Operation
 - 2.1 ISDN Services
 - 2.2 Configuration Management
3. Ports, Inter-Connectivity & Routing
 - 3.1 Ports, Channels and Groups
 - 3.2 Call Routing
 - 3.3 Cross-Connection or Conversion
 - 3.4 Number Translation or Conversion
 - 3.5 Tone Generation
 - 3.6 CLI Generation
 - 3.7 Power Feed
4. General
 - 4.1 Clocking
 - 4.2 Real-Time Clock
 - 4.3 Events
 - 4.4 Configuration
 - 4.5 Software
5. Specification
 - 5.1 Interfaces
 - 5.1.1 PRI/E1/T1
 - 5.1.2 BRI
 - 5.1.3 Control Ports
 - 5.2 LEDs
 - 5.3 Power
 - 5.4 Environment
 - 5.5 Physical
 - 5.6 Maintenance
6. Configurations and Port numbers/types
7. History

Bearer capability (data or voice).
 CLIs can be locally generated.
 SPIDs (US-based BRIs) are supported.

• 2.2 Configuration/Management

Liberator is configured and managed by Patapsco's DbManager Version 8.0 or above. See separate Tech Sheets.
 DbManager is an intuitive GUI which supports multiple real-time workstations and is the common platform for all Patapsco products.
 Configuration/management sessions can be established remotely via an ISDN call or locally through one of the Control Ports (Asynchronous RJ or Ethernet).
 SNMP Traps & Alarms are supported as is a call analysis tool.

3. Ports, inter-connectivity and routing

• 3.1 Ports, Channels and Groups

Liberator employs a simple system where BRI and PRI ports or individual "B" channels can be allocated to one or more customer-named Groups.

These Groups form the basis of all configurations, making it fast, simple and intuitive. As an example you can refer to a Group of 4 BRI ports as "Video 1" and subsequently use this term on all routing parameters.

"Hunt Groups" or "rotaries" are as easy to establish.

• 3.2 Call Routing

Calls can be routed on the number dialled, the sub-address, CLI, originating port or time-of-day or a combination of the above.

• 3.3 Cross-Connection

Any "B" channel can be connected to any other within Liberator, so local devices can inter-connect through Liberator without making a call to the exchange.

Any port can be barred from calling any other port or number.

Any call can be routed to a Group of ports or "hunt-group". Multiple devices can be configured to accept calls dialling to a range of numbers. In-coming calls can be automatically re-routed to alternate pre-programmed numbers if the main number is unavailable.

• 3.4 Number Translation or Conversion

Any in-coming dialled number can be converted by Liberator and presented on any ISDN interface. For example an in-coming call to 12345 is converted to 98765 because the original extension at 12345 has moved onto a VoIP gateway on a different ISDN PRI and now has a different DDI number.

Any out-going number dialled by a local device can be converted into any other number or have leading digits added for LCR.

• 3.5 Tone Generation

Liberator can generate tones (dial, ring, busy, unavailable).

• 3.6 CLI Generation

Liberator is able to generate a CLI field. The number of the CLI can be programmed for individual ports or calling numbers.

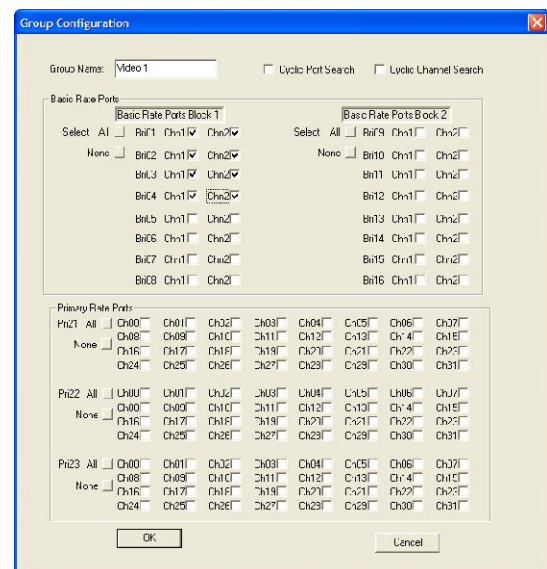


Image taken from DbManager

• 3.7 Power Feed

Some ISDN devices do not have a power supply and are powered through the BRI interface. Liberator supports Power feed for BRI NT interfaces with an option that is specified at the time of ordering.

4. GENERAL

• 4.1 Clocking

Software-selectable clock source using any E1/T1/PRI/BRI interface which provides clock or the use of an Internal Clock.

Auto-switchover to secondary/tertiary clocks on clock loss.

Up to 19 different hierarchical clock sources can be configured.

Internal clock accurate to +/- 25ppm

• 4.2 Real-Time Clock

Internal battery-backed real-time clock for Event Log time-stamps.

• 4.3 Events

Up to 5000 Events are held within the Liberator in NV RAM on a FIFO basis

Events include all call information such as port dialling, number dialled, sub-address, time of call and time of call clear-down, time of incoming call and to which port and if there is a CLI attached, time of clear-down and which "end" cleared.

• 4.4 Configuration

Held in non-volatile RAM (retained during power-off) and downloadable to/from the DbManager

• 4.5 Software

New versions of software can be remotely uploaded to Liberator via the DbManager.

5. SPECIFICATION

• 5.1 Interfaces

5.1.1 PRI/E1/T1 - 1, 2 or 3 PRI E1/T1 ports.

Marked as "PRI21" "PRI22" and "PRI23".

All present as "NT" and simulate a network.

See Section 6 below for Models available.

• E1

RJ45 120Ohm balanced (E1)

G.704 HDB3 encoded

Software selectable CRC4 or non-CRC4 framing (Multiframe or Doubleframe).

Support of non-switched E1 and Fractional E1 services.

ISDN PRI ETSI Q.931/921.

• T1

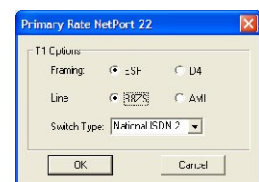
RJ45 100Ohm balanced T1

ESF or D4 Framing selectable

B8ZS or AMI Line Code selectable

NI-2, DMS-100, AT&T 5ESS Switch selectable

AT&T TR-62411 and ANSI T1.403 Compliant



Images taken from DbManager

5.1.2 BRI 0, 4, 8 or 16 Ports (depending upon Model)

- Marked as "BRI1" through to "BRI16".
- RJ45.
- 4-wire S0 compatible presenting as "NT".
- Optional SPID settings for US-based applications. Support for NI-1, DMS100, AT&T 5ESS
- Single and Dual SPID configurations
- Driving distance on UTP CAT5 cable typically up to 750m depending upon DTE and environment.
- Optional Terminal Power-Feed with external 40VDC supply. Provides 40V 1W to ISDN BRI devices which do not have their own power supply.

5.1.3 Control Ports

- **RJ11.**
Marked "Cmd".
Asynchronous.
8 data, 1 stop bit no parity.
19.2kbps.
Password protected.
- **Ethernet RJ45**
Marked "LAN".
10baseT or 100baseT.
Password protected.

• 5.2 LEDs

PRI x 3

Each PRI has 2 associated LEDs.
Upper LED – fl=synchronising to Layer 1; solid=Layer 2 established.
Lower LED - fl=call establishing; solid=at least 1 call in place.

BRI x 8 or 16

Each BRI has 2 associated LEDs, 1 for each "B" channel.
Fl=call establishing/dialling; solid=call in place.

LAN COL x 1

Red=data collision on LAN.

PWR x 1

Unlit=no power.
Green=power on unit.

Run x 1

Slow flash=microprocessor OK and configured; fast flash=internal error or lost base configuration.

LAN ACT x 1

Activity on the LAN.

LAN 100 x 1

Off=LAN running at 10baseT; on= LAN running at 100baseT.

• 5.3 Power

Power (mains)

Internal switch-mode supply
IEC connector
Voltage range 85-264VAC auto-sensing
Input frequency 47-63Hz
Max current consumption 200mA @ 230VAC

Power (optional for Power Feed)

External in-line supply
Input
IEC connector
Voltage range 90-264VAC
Input frequency 47-63Hz
Current consumption 700mA @230VAC
Max DTE draw 1W @ 40VDC

• 5.4 Environment

Operating 0 – 45 °C

Humidity 10-90% non-condensing

Natural convection cooling

• 5.5 Physical

290mm wide x 199mm deep x 41mm high.

Weight 1.2kgs

Optional 19" rack-mounting kit is available.

• 5.6 Maintenance

There are no serviceable parts or maintenance required.

The battery used for the real-time clock and some NV RAM elements has a 10 year (typical) life-time.

6. Configurations and Port numbers/types

Prices start from US \$990!					* A single non-upgradeable version is available as well as a version which can be remotely upgraded to 2 or 3 PRIs.
Qty and Type of BRI's	0 PRI	1 PRI*	2 PRI**	3 PRI***	
Zero		y	y	y	** The 2 PRI version is remotely field-upgradeable to 3 PRIs
4 NT	y	y	y	y	
8 NT ***	y	y	y	y	
16 NT	y	y	y	y	
<ul style="list-style-type: none"> • NT means Network Presentation (connects to CPE). Simulates a network interface. • Power-Feed option is available on all products with NT BRI interfaces. Power Feed provides 40VDC at 1 Watt for non-powered CPE. • PRI interfaces can be user-configured as E1 or T1 ISDN. 					<p style="text-align: center;">Need more PRI and/or BRI ports?</p> <p>See our DB120 chassis system on our main web site at www.patapsco.co.uk</p>

7. History

Release 1.1 May '04.

"Liberator" is a registered mark of Patapsco Designs Ltd