



### Advanced Layer 3 and 2 features

Extensive IP routing and Ethernet functionalities with advanced QoS mechanisms

Data protection with IPSEC encryption and firewall security

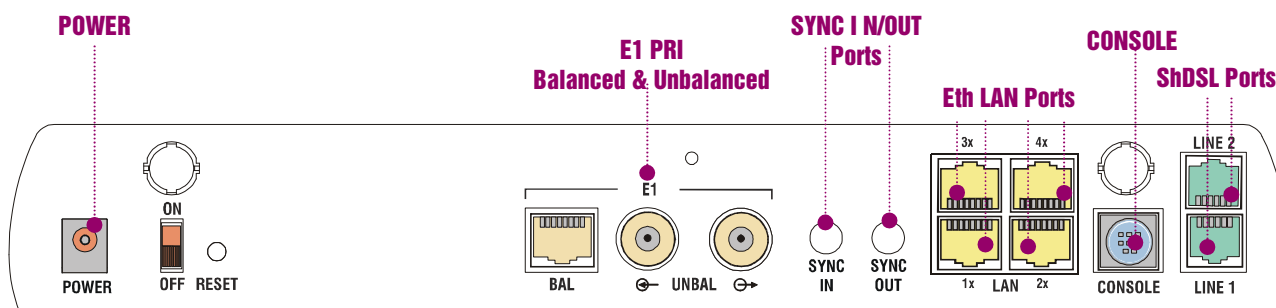
### Next Generation Networks Introduction

Ideal solution for integrating high-quality voice and data services over IP networks

One-box solution providing Data and Voice services through ISDN PRI, Ethernet and ShDSL interfaces

### Flexible

E1 PRI interface provides up to 30 independent channels while the 4-port Ethernet switch allows data connectivity with enhanced layer3/layer2 capabilities



### Fast Integration and “Five-9s” Service Availability

The SV22P1 IAD guarantees seamless installation and the highest degree of compatibility with every type and brand of legacy PBX.

### Powerful Configuration and Management

SV22P1 offers a web-based interface for easy configuration and monitoring. It includes remote management via an internal web server or telnet server using the Command Line Interface. Syslog protocol can also be used to send event notification messages across the IP network.

### Full IP Services & Security Features

SV22P1 provides enhanced routing and bridging capabilities, also offering firewall functionality and VPN data protection (including IPsec hardware encryption) on transmission between two sites. Moreover, Virtual Router Redundancy Protocol configuration increases reliability performing a physical backup.

### Traffic Management Capabilities

SV22P1 supports Traffic Shaping and layer2/layer3 QoS providing interworking mechanisms between the two layers.

## LED Indicators

- Power
- RDY (Fail)
- EMERG.
- E1
  - ACT
  - AIS
  - LFA
  - LOS
- LAN (1-4)
- Internet
- Line

## Physical Interfaces

- 4-port 10/100bT Ethernet switch with RJ-45 connectors (Eth0)
- Sync IN/OUT ports with 2 Stereo Jack 3,5 mm connectors
- Balanced and unbalanced E1 G.703/G.704 with RJ-45 or coax connectors
- 1-port console with MiniDIN 8P connector

## ShDSL Network Interfaces

- ShDSL 2/4-wire with two RJ-11 connectors
- ETSI TS 101 524
- ITU G.991.2 Annex B
- Line rate up from 200 kbps to 4608 kbps

## Voice Interfaces

- ISDN-PRI
  - Fully compliant to L1 standards (ITU-T I.413, ETSI ETS 300 011)

## Voice Processing

- Voice Codes
  - ITU-T G.711 (A-law,  $\mu$ -law)
  - ITU-T G.729a
  - Transparent pass-through
- ITU-T G.165/G.168 echo cancelation
- Voice Activity Detection and Comfort Noise Generation
- RTP/RTCP (RFC 1889)
- 15/30 Voice Channels (factory setup option)

## Signalling

- Euro ISDN EDSS-1
- ETS 300 125 (ITU-T Q.921)
- ETS 300 102-1 (ITU-T Q.931)
- Q-SIG (PSS-1)
- SIP 2.0 according to RFC 3261 (TCP or UDP transport)
- En-block and Overlap sending
- ISDN speech, audio and data (Fax Gr 4, UDI 64, RDI 64)
- DTMF detection and carrying (RFC2833), DTMF info
- Local Generation of:
  - Dial tone
  - Ring back tone (180 Ringing reply)
  - Call Waiting tone- Busy tone
  - Fast Busy tone

## Fax and Modem Support

- T.38 fax relay
- Automatic G.711 Fax and Modem Pass-Through

## Supplementary Services<sup>1</sup>

- Locally managed<sup>2</sup> or Softswitch-based
  - Call hold
  - Consultation call
  - Call waiting
  - Call forwarding
  - Caller Identity Presentation (CLIP)
  - Identity restriction
  - Call transfer
- DDI Bundle
  - GNR Management

## IP Functions

- IP Routing
  - RIP v1/v1c/ v2, BGP, OSPF
  - Enhanced Network Address and Port Translation (NAPT) engine, with multiple ALGs (including SIP, TFTP and H.323)
  - DHCP Server/Client/Relay, DHCP Learning
  - Multicast IGMP v1/v2/v3, PIM-SM, Static
- Routing Filtering Redistribution
- Firewalling
  - Extended Access Lists
  - Stateful Packet Inspection including Denial of Service attacks
- IP Services
  - DNS proxy
  - DDNS client
  - VPN (GRE, IP, PPTP server/client)
  - IPSec with DES, 3DES and AES
  - ICMP, IGMP snooping, Telnet, TFTP
  - Layer 3 QoS according to DiffServ model (RFC2474, RFC2475)
  - Priority based queuing (Absolute Priority, WFQ, RED)
  - Extensive monitoring, tracing and troubleshooting facilities

## Ethernet Services

- Self Learning Bridge with up to 1k MAC addresses and automatic ageing
- Full-Duplex IEEE 802.3x
- Half-Duplex back pressure flow control
- Automatic MDI/MDI-X crossover
- Broadcast/Multicast storm protection
- VLANs (802.1Q and 802.1p) port based management
  - Tag/Re-Tag/Untag
  - Trunking (VLAN multiplexing)
  - Priority based queuing

## ATM

- Services
  - Up to 8 VCCs
  - Class of Services (CBR, VRB-rt, VBR-nrt, UBR+, UBR)
  - Voice and Data packets over different VCCs (VC bundling)
  - Selective CLP marking
  - F4/F5 OAM cells, AIS and RDI

- Access protocols
  - IP over AAL-5, Ethernet over AAL-5 (RFC2684)
  - PPP over AAL-5 (RFC2364)
  - PPP over Ethernet (RFC2516)
  - LLC/SNAP and VC encapsulation

## Authentication

- PAP/CHAP/MS-CHAPv1 and v2 authentication
- Basic and Digest schemes (RFC2617)

## Service Resiliency

- o VRRP (RFC2338)

## Management & Configuration

- Password Protected Access
  - 2 login levels
  - AAA and local authentication
- Local Management
  - Console port
  - Extensive CLI
  - Windows® based wizard for configuration and firmware download
- Remote Management
  - CLI (internal Telnet Server)
  - HTTP (embedded WEB Server)
  - SNMP Agent (v1, v2c)
  - SSH
  - Syslog
  - Network Performance Monitor
  - Ping MIB
  - TR-069
- Firmware upgrades: Local and Remote (TFTP & FTP client embedded)

## Environment

- Operating Temperature:
  - $-5^{\circ} \div 45^{\circ}\text{C}$  ( $23^{\circ} \div 113^{\circ}\text{F}$ )
- Non-Operating Temperature:
  - $-40^{\circ} \div 70^{\circ}\text{C}$  ( $-40^{\circ} \div 158^{\circ}\text{F}$ )
- Operating Humidity:
  - $10 \div 93\%$  (noncondensing)

## Compliance & Approvals

- Storage: ETSI EN 300 019-2-1 T 1.3
- Transportation: ETSI EN 300 019-2-2 T 2.3
- Operating Conditions: ETSI EN 300 019-2-3 T 3.2
- EMC: EN 55022, EN 55024, EN 61000-3-2, EN 61000-3-3
- Protection: ITU-T K.21
- Safety: EN 60950-1

## Power

- External power supply
- AC input voltage: 100 to 230 Vac
- AC input frequency: 50 to 60 Hz
- AC input current: 0.6 A

## Notes

*1 Supplementary Services management is not yet fully standardised by international bodies and their implementation could be subject to revisions*

*2 Depending on the specific service, a common implementation between the IAD and the Softswitch needs to be agreed*