



Multiprotocol Packet Switch



FEATURES

- 3-link multiprotocol packet switch, with an optional UTP link
- Allows legacy protocols, such as X.25 and Frame Relay to run over IP networks
- Designed to be integrated in existing IP networks
- Supports a backup channel over cellular GPRS networks
- Protocols supported: X.25, Frame Relay, IP, HDLC, SLIP, PPP, ML-PPP and asynchronous
- IP support:
 - RIP1, RIP2 and static routing
 - Standard IP encapsulation over Frame Relay (RFC 1490) or X.25 (RFC 1356) networks
- Low bandwidth traffic load:
 - Allows seamless integration of all sites in an organization
 - Does not strain the network
- Standard bridging
- Built-in Telnet client/server to support terminal/server applications
- Flash memory for software upgrades
- Dedicated 9-pin D-type port for GPRS packet stream backup
- Compact, half 17" wide enclosure

DESCRIPTION

- SPS-4 is a 3-link multiprotocol packet switch, providing multiprotocol connection between the enterprise headquarters and remote branches (see Figure 1).
- The unit allows the X.25 and Frame Relay protocols to run over an IP backbone.
- While retaining the functionality of the SPS family products, other features include:
 - Support for the Legacy over IP architecture
 - Asynchronous backup channel for GPRS packet streams
 - ISDN interface.

FRAME RELAY

- SPS-4 provides access and switching to public or private Frame Relay networks, and consolidates asynchronous, HDLC, IP and X.25 traffic over the Frame Relay network.
- As a Frame Relay switch, SPS-4 integrates DLCIs from several sources into a single port. It also supports BECN/FECN signaling for congestion avoidance.
- A unique funneling mechanism adjusts feeder throughput to CIR levels.
- The Frame Relay multicasting feature (complies with FRF-7) enables multicasting frames from one DLCI onto several DLCIs. This feature supports one-way, two-way and broadcast communication options.

Multiprotocol Packet Switch

- LMI and ANSI PVC management protocols are supported in compliance with ANSI T1.606, T1.618, T1.617 Annex D, and ITU Rec. Q.922, Annex A.
- SPS-4 supports CLLM management protocol and complies with ITU REC Q.933, Annex A.

X.25

- X.25-configured links support permanent virtual circuits (PVCs) and switched virtual circuits (SVCs). Link packet size is up to 4096 bytes.
- SPS-4 handles both mandatory and additional ITU X.25 facilities.
- Dial-up X.25 links are supported via a dial-up modem, controlled by a DTR signal or V.25 bis commands.
- X.25 multicasting is supported.

X.32

- SPS-4 supports the X.32 protocol for a dial-up X.25 link. This enables users to access an X.25 network remotely via a dial-up modem with X.32, or to use the backup dial-up link for an X.25 or Frame Relay network.

ISDN

- SPS-4 allows PPP/FR/X.25 data to be transmitted over ISDN media.
- The ISDN data rate is up to 192 kbps.

HDLC TRANSPARENT ACCESS

- Each port can be programmed to operate in transparent HDLC mode for connecting bridges, routers and other HDLC communication devices over X.25 or Frame Relay networks. The HDLC protocol is encapsulated over X.25 or Frame Relay, providing end-to-end transparent operation.

ASYNCHRONOUS ACCESS

- All asynchronous channels function according to the X.3, X.28 and X.29 profiles, at traffic speeds of up to 115.2 kbps. Asynchronous traffic can be packetized directly over the Frame Relay network, or packetized over the X.25 network. All channels are configured and monitored by the SPS-4 management agent.
- Each SPS-4 port can be configured to SLIP or PPP mode, operating at data rates of up to 115.2 kbps.
- IP PAD facilities allow straightforward migration of terminal/server applications to an IP environment, while improving its durability at the same time.

IP ROUTING

- SPS-4 routes IP datagrams over Ethernet, PPP or SLIP links and over Frame Relay networks (according to RFC 1490), or over X.25 networks (according to RFC 1356).
- SPS-4 supports RIP1, RIP2 and triggered acknowledgment RIP messages (according to RFC 1058, 1723 and 1724). The RIP support enables trouble-free IP connection while minimizing IP user configuration. The triggered RIP enables reduction of the overhead associated with the RIP mechanism, by minimizing the number of periodic messages sent.

MANAGEMENT CAPABILITIES

- The unit can be managed using different ports and applications:
 - Local out-of-band management via an ASCII terminal connected to the RS-232 port
 - Remote inband management using RADview-Lite, RAD's SNMP-based management system.
- The SNMP agent can be programmed to periodically send statistics and status reports to a maximum of five management stations.
- A management station can be connected directly to SPS-4 using LAN, PPP or SLIP.
- The SPS-4 SNMP agents recognize both private and standard MIBs, including MIB II with RFC 1213, RFC 1381 and RFC 1382 for X.25, and RFC 1315 for Frame Relay.

BACKUP AND RECOVERY

- SPS-4 supports stream backup over PSTN, ISDN and GPRS networks.
- Frame Relay, X.25 and PPP can be transmitted over the ISDN media (see *Figure 2*).
- After a network recovery, SPS-4 automatically synchronizes itself with the main facility link.

Multiprotocol Packet Switch

SPECIFICATIONS

PHYSICAL PORTS

- **Number of Ports**
 - 4 link ports
 - 1 control port

PROTOCOLS AND STANDARDS

- **Supported Protocols**
X.25, Frame Relay, HDLC, STM, Asynchronous, IP, PPP, ML-PPP
- **Packet Size**
Up to 4096 bytes for X.25
Up to 8 Kb for all other protocols
- **Standards**
X.25: complies with 1988 ITU X.25 LAP-B
Frame Relay: supports CLLM, LMI, and ANSI PVC management protocols; complies with ANSI T1.606, T1.617 Annex D, T1.618, ITU Rec. Q.922 Annex A, and Q.933 Annex A

SYNCHRONOUS LINKS

- **Number of Links**
2
- **Interface Type and Connector**
 - RS-232/V.24 (DCE or DTE):
25-pin, D-type, female
 - V.35 (DCE or DTE):
25-pin, D-type, female, via adapter cable
- **Data Rate**
Up to 2 Mbps
- **Timing Modes**
External or internal

ASYNCHRONOUS LINK

- **Number of Links**
1
- **Interface Type**
RS-232/V.24 (DTE)
- **Connector**
9-pin, D-Type, female
- **Data Rate**
75 bps to 115.2 kbps, user-selectable
- **Main Link/Backup Channel**
For PSTN/GPRS packet streams

- **Flow Control**
XON/XOFF
- **Channel Log-on Messages**
Herald and bulletin (user-selectable)
- **Command Modes**
 - ITU-T Rec. X.28 and proprietary extensions
 - ITU-T Rec. X.29
- **Terminal Handling**
Enhanced, beyond ITU-T Rec. X.3 requirements

ISDN INTERFACE

- **Number of Links**
1
- **Data Rate**
192 kbps
- **Connector**
RJ-45

APPLICATIONS

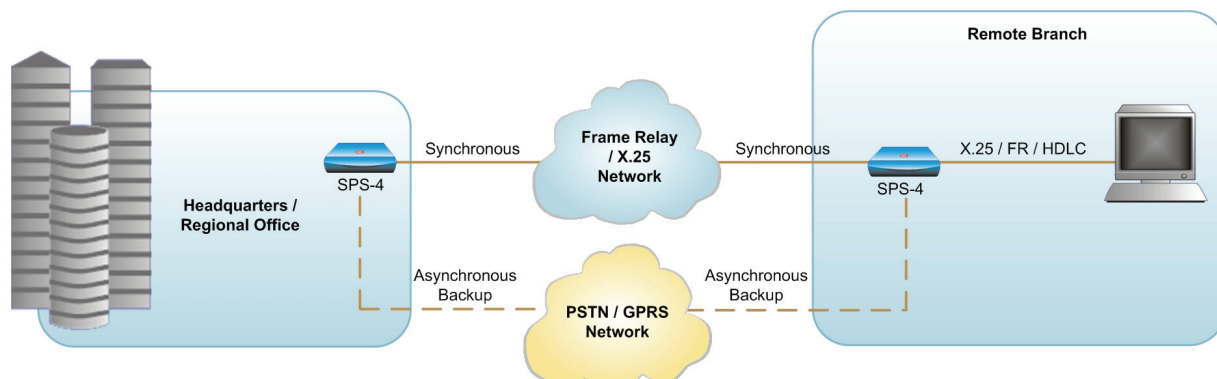


Figure 1. Multiprotocol Connection Between the Headquarters and a Remote Branch

SPS-4

Multiprotocol Packet Switch

CONTROL PORT

- **Interface Type**
RS-232/V.24 (DCE)
- **Connector**
9-pin, D-type, female
- **Data Rate**
75 bps to 115.2 kbps, user-selectable

GENERAL

- **Indicators**
ERR (red)
On: Loss of synchronization
Off: Synchronization is active
LINK 1–3 (green)
On: Link is synchronized
Blinking: Link is not synchronized
- **RAM Size**
2048K
- **Power**
AC: 100–240 VAC (±10%),
50–60 Hz
DC: 48–60 VDC
- **Power Consumption**
15W max
- **Physical**
Height: 43.2 mm (1.7 in)
Width: 215.9 mm (8.5 in)
Depth: 172.7 mm (6.8 in)
Weight: 1.8 kg (3.9 lb)

- **Environment**
Temperature: 0–50°C (32–122°F)
Humidity: Up to 90%, non-condensing

ORDERING

SPS-4/@-*/&-*

Multiprotocol packet switch

- @ Specify Link 1 interface type:
V24 for V.24 (RS-232) interface
V35 for V.35 interface
- * Specify clocking mode:
DCE for DCE mode
DTE for DTE mode
- & Specify Link 2 interface type:
V24 for V.24 (RS-232) interface
V35 for V.35 interface

SUPPLIED ACCESSORIES

Power cord

AC/DC adapter plug

CBL-8H/F

Adapter cable for V.35 interface
(if V.35 interface is ordered)

CBL-RJ45/D9/F/STR

Adapter cable for converting RJ-45 control to DB-9 control

OPTIONAL ACCESSORIES

CBL-DB9F-DB9M-STR

DB-9 to DB-9 control port cable

RM-33-2

Hardware kit for mounting one or two SPS-4 units into a 19-inch rack

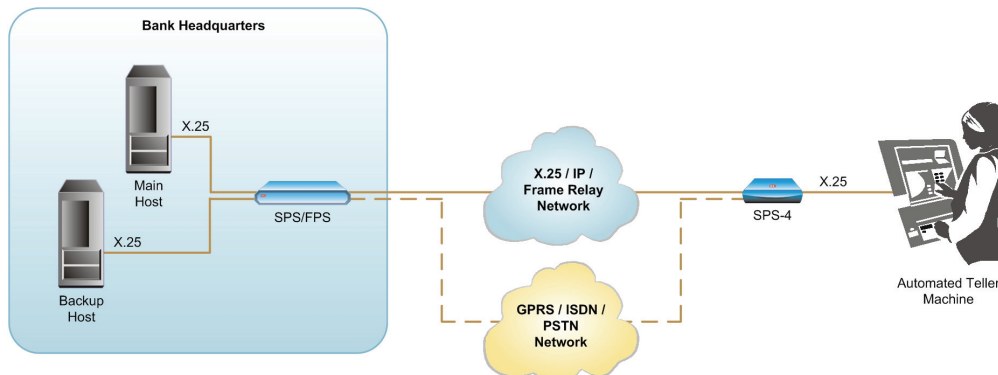


Figure 2. X.25 over IP Network



data communications

www.rad.com

- **International Headquarters**
24 Raoul Wallenberg Street
Tel Aviv 69719, Israel
Tel: 972-3-6458181
Fax: 972-3-6498250
Email: market@rad.com
- **North America Headquarters**
900 Corporate Drive
Mahwah, NJ 07430, USA
Tel: (201) 529-1100
Toll free: 1-800 444-7234
Fax: (201) 529-5777
Email: market@radusa.com

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