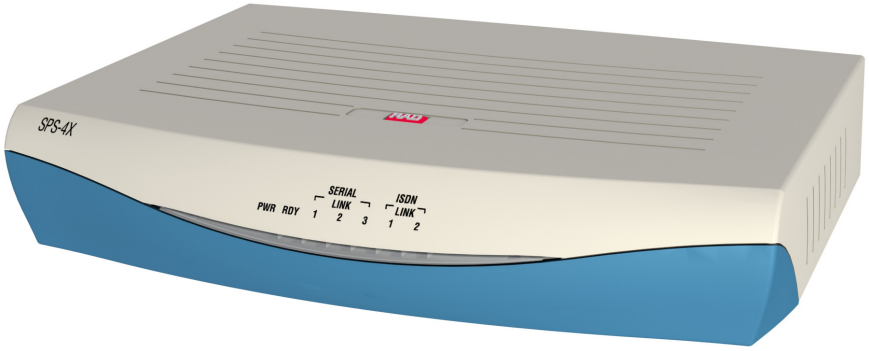
preliminary

Data Sheet

SPS-4X

Multiprotocol Packet Switch

Delivering legacy traffic (X.25, HDLC, Frame Relay) over next-generation packet-switched networks



- Encapsulation of legacy protocols, such as X.25, Frame Relay and HDLC over packet-switched networks
- Pseudowire Emulation Edge-to-Edge (PWE3) connectivity
- Transmission of X.25 packets over TCP/IP (XOT) connections
- A dedicated backup channel over cellular GPRS networks
- Low bandwidth traffic load, allowing seamless integration of all sites in an organization

SPS-4X is a multilink packet switch, providing multiprotocol connection between the enterprise headquarters and remote branches.

The unit carries the X.25, Frame Relay and HDLC legacy data over next-generation packet-switched networks, using edge-to-edge pseudowire (PW) connections.

In addition to pseudowire connectivity, X.25 traffic can be carried over TCP/IP connections instead of over LAPB (Link Access Procedure, Balanced) connections.

While retaining the functionality of the SPS product family, SPS-4X supports an asynchronous backup channel over PSTN, ISDN and GPRS networks.

The unit includes two Ethernet (UTP), one ISDN and three serial link interfaces.

PSEUDOWIRE CONNECTIVITY

Uniquely-formatted Ethernet packets are sent and received by SPS-4X in order to transport legacy protocols (X.25, HDLC, Frame Relay) over packet-switched networks.

RAD
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SPS-4X
Multiprotocol Packet Switch

X.25 AND XOT CONNECTIVITY

SPS-4X handles both mandatory and additional ITU X.25 facilities.

X.25-configured links support permanent virtual circuits (PVCs), switched virtual circuits (SVCs) and multicasting.

Dial-up X.25 links are supported via a dial-up modem, controlled by a DTR signal or V.25 bis commands.

Up to 16 XOT (X.25 over TCP/IP) sessions are supported over an IP network.

HDLC CONNECTIVITY

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, Frame Relay or pseudowire connections, providing transparent end-to-end 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 a Frame Relay network, or over an X.25 network. All channels are configured and monitored by the SPS-4X management agent.

Each SPS-4X port can be configured to PPP (point-to-point) 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-4X routes IP datagrams over Ethernet, or PPP links and over Frame Relay networks (according to RFC 1490), or over X.25 networks (according to RFC 1356).

SPS-4X supports RIP1, RIP2 and triggered acknowledgment RIP messages (according to RFC 1058, 1723 and 1724). The RIP provides 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.

FRAME RELAY

SPS-4X 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-4X integrates DLCIs from several sources into a single port. It also supports BECN/FECN signaling for avoiding congestion.

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.

ISDN LINKS

SPS-4X allows PPP/FR/X.25 data to be transmitted over ISDN media, which features a data rate of up to 192 kbps.

The unit's ISDN port supports one ISDN link.

MANAGEMENT

A management station can be connected to SPS-4X using LAN or point-to-point connection.

The unit can also be managed out-of-band using an ASCII-based terminal connected to the RS-232 port.

SPS-4X has a built-in Telnet client/server to support terminal/server applications.

After a network recovery, SPS-4X automatically synchronizes itself with the main facility link.

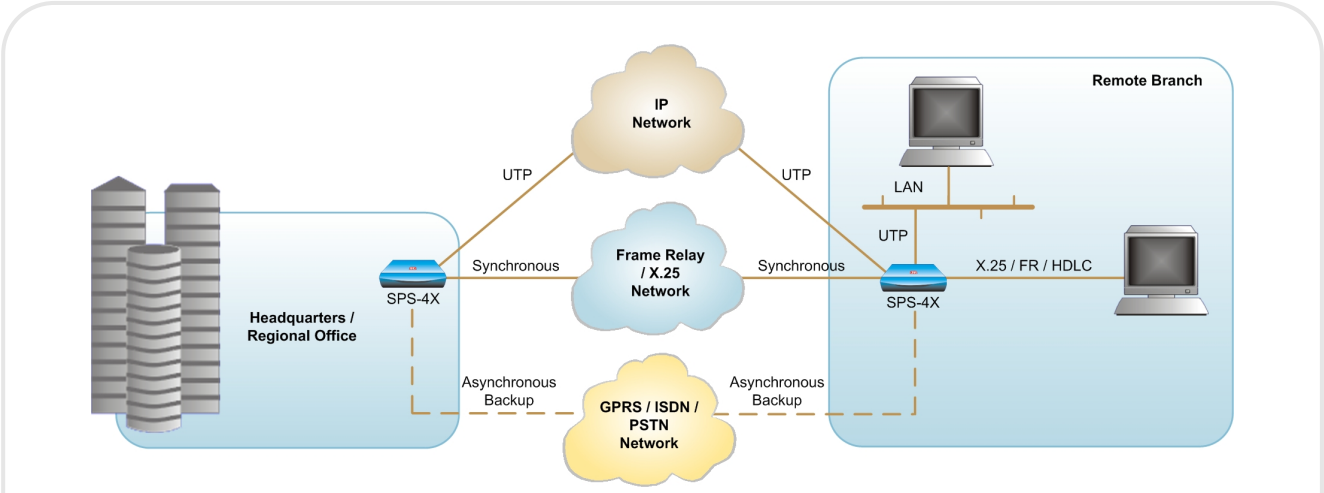


Figure 1. SPS-4X Providing Multiprotocol Connection between the Headquarters and a Remote Branch

Specifications

PHYSICAL PORTS

Number of Ports
3 serial link ports
2 Ethernet ports
1 ISDN port
1 control port

PROTOCOLS AND STANDARDS

Supported Protocols
X.25, Frame Relay, HDLC, asynchronous, IP, PPP, ML-PPP

Packet Size
Up to 2048 bytes for X.25, Frame Relay and HDLC

Standards
X.25: 1988 ITU X.25 LAP-B

Frame Relay: supports CLLM, LMI, and ANSI PVC management protocols; ANSI T1.606, T1.617 Annex D, T1.618, ITU Rec. Q.922 Annex A, and Q.933 Annex A

XOT (X.25 over TCP/IP): RFC 1613

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

SYNCHRONOUS SERIAL LINKS

Number of Links
2

Interface Type and Connector
RS-232/V.24 (DCE or DTE): 25-pin, D-type, female
RS-530/V.35 (DCE or DTE): 25-pin, D-type, female, via adapter cable

Note: *A V.24 interface works in either synchronous or asynchronous mode. A V.35 interface works in synchronous mode only.*

Data Rate
Up to 2 Mbps

Command Modes
RTS, CTS, DSR, DCD, DTR

Timing Modes
External or internal

ASYNCHRONOUS SERIAL LINK

Number of Links
1

Interface Type and Connector
RS-232/V.24 (DTE): 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

ETHERNET INTERFACE

Number of Ports
2

Interface Type
10/100BaseT, half/full duplex, autonegotiation

Compliance
IEEE 802.3

Data Rate
10 Mbps, 100 Mbps

Connector
RJ-45

ISDN INTERFACE

Number of Links
2 (per single ISDN port)

Data Rate
192 kbps

Connector
RJ-45

TERMINAL CONTROL PORT

Interface Type
RS-232/V.24 (DCE)

Data Rate
75 bps to 115.2 kbps, user-selectable

Connector
9-pin, D-type, female

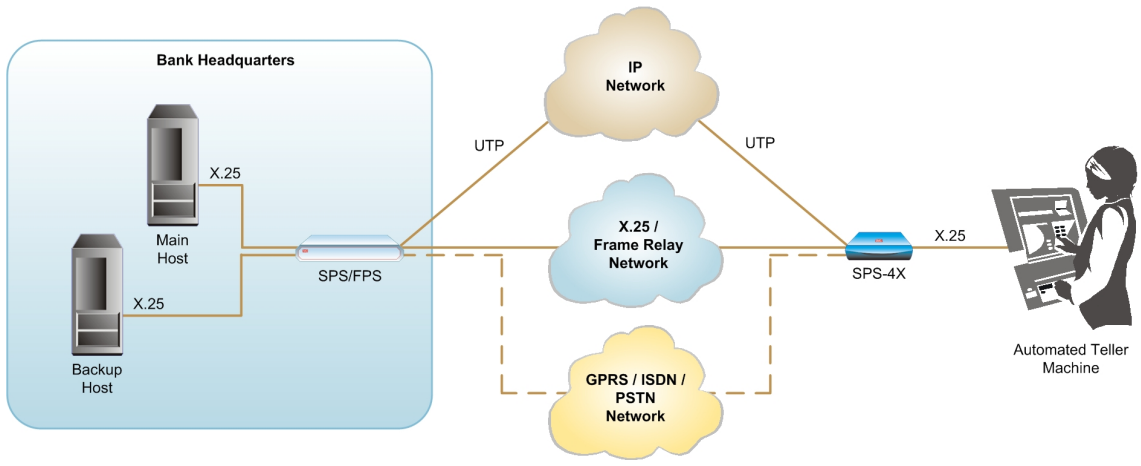


Figure 2. SPS-4X in an X.25 over IP Connectivity Solution

Data Sheet

SPS-4X

Multiprotocol Packet Switch

GENERAL

LED Indicators
PWR (green): Power supply status

RDY (green): Self-test result

SERIAL LINK 1–3 (green): Serial link synchronization status

ISDN LINK 1–2 (green): ISDN synchronization status

Ethernet ports (rear panel) –
LINK (green): Ethernet link status
ACT (yellow): Ethernet traffic indication

Memory Size
32 MB of RAM (SDRAM)
8 MB of Flash memory

Power
AC: 100–240 VAC (±10%), 50–60 Hz
DC: 48/60 VDC nominal (40–72 VDC)

Power Consumption
15W max

Physical
Height: 4.32 cm (1.7 in)
Width: 21.59 cm (8.5 in)
Depth: 17.27 cm (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-4X/@-*/&-*

Legend

@ Link 1 interface type:
- **V24** V.24 (RS-232) interface
- **V35** V.35 (RS-530) interface
- **X21** X.21 (RS-530) interface

* Clocking mode:
- **DCE** DCE mode
- **DTE** DTE mode

& Link 2 interface type:
- **V24** V.24 (RS-232) interface
- **V35** V.35 (RS-530) interface
- **X21** X.21 (RS-530) interface

SUPPLIED ACCESSORIES

Power cord

AC/DC adapter plug

CBL-8H/F
Adapter cable for V.35 interface (if V.35 interface is ordered)

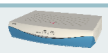
CBL-530T/21C/F
Adapter cable for X.21 interface (if X.21 interface is ordered)

OPTIONAL ACCESSORIES

CBL-DB9F-DB9M-STR
Standard DB-9 to DB-9 control port cable

RM-33-2
Hardware kit for mounting one or two SPS-4X units in a 19" rack

Product Comparison Table

Features	 SPS-4X	 SPS-4	 SPS-6
Serial ports	3	3	6
Ethernet ports	2	None	1
X.25 over TCP/IP (XOT)	✓		
X.25 over packet	✓	✓	✓
Frame Relay over packet	✓	✓	✓
HDLC over packet	✓		
X.21 support	✓		✓
Built-in interfaces	✓	✓	

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