# SPS-6, SPS-12

## *Multiprotocol FRAD Switch for Frame Relay / X.25 / IP / Async / HDLC*

## FEATURES

- FRAD/PAD and multiprotocol packet switch
- Protocols supported: Frame Relay, X.25, IP, HDLC, SLIP, PPP, ML-PPP and Async
- IP support:
  - RIP1, RIP2 and static routing
  - Standard IP encapsulation over Frame Relay (RFC 1490), or X.25 (RFC 1356) networks
- Standard bridging
- Telnet client / server to support terminal / server applications
- SNMP management using RADview PC / UNIX platforms
- Optional built-in Ethernet, allowing easy integration of LAN segments
- Optional support for ISDN: Frame Relay / X.25 / PPP / ML-PPP can be transmitted over the ISDN media
- FLASH memory for software upgrade

# SPS-6, SPS-12

## *Multiprotocol FRAD Switch for Frame Relay / X.25 / IP / Async / HDLC*

## DESCRIPTION

- SPS-6 and SPS-12 are multiprotocol packet switches with six or twelve ports respectively. They are intended for the remote branch office. Every three ports support aggregated data rate of up to 2 Mbps.
- A typical applications shows access for the remote office in a multi-protocol environment (see *Figure 1*)

**FRAME RELAY**

- SPS-6 and SPS-12 provide access and switching to public or private Frame Relay networks.
- SPS-6 and SPS-12 consolidate Async, HDLC, IP and X.25 over the Frame Relay cloud.
- As a Frame Relay switch, the units can integrate DLCIs from several sources into a single port. SPS-6, SPS-12 can also support BECN/FECN signaling for congestion avoidance.
- A unique funneling mechanism adjusts feeder throughput to CIR levels.
- For each DLCI, an optional backup Frame Relay link is available.
- The Frame Relay multicasting feature (complies with FRF-7), enables multicasting frames from one DLCI onto several DLCIs. The feature supports one-way, two-way and broadcast communication options.
- 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-6 and SPS-12 support 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-6 and SPS-12 support 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.
- SPS-6 and SPS-12 support X.25 multicasting.

**X.32**

- SPS-6 and SPS-12 support 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.

## APPLICATION

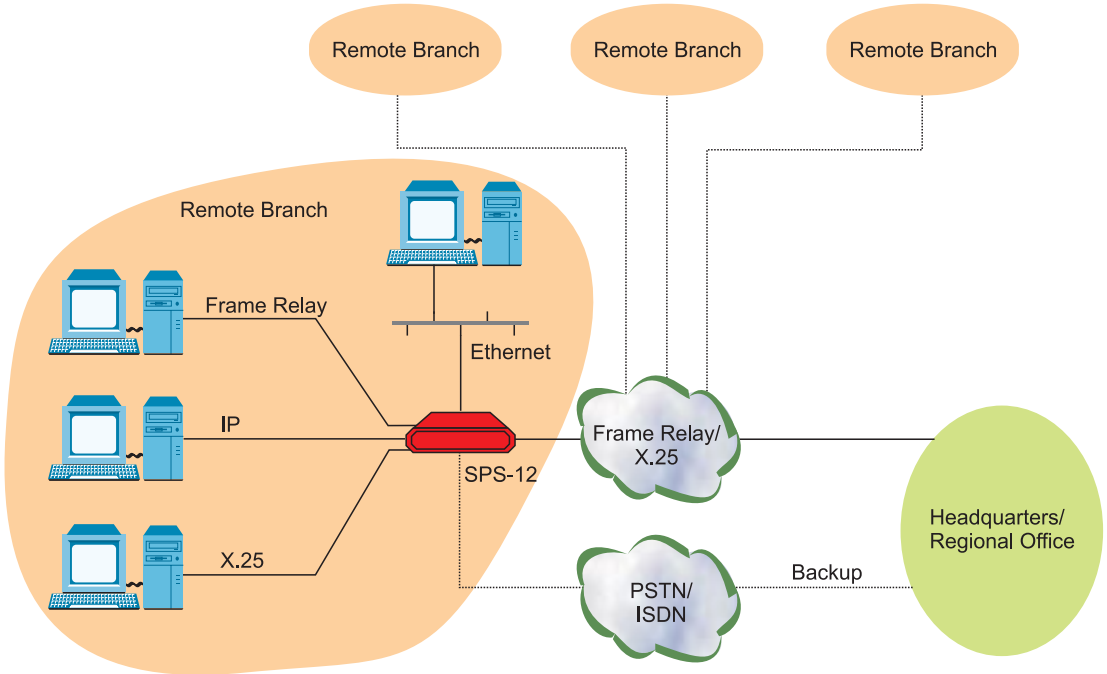


**Figure 1. Access for a Remote Office in a Multiprotocol Enviorment**

# SPS-6, SPS-12

## Multiprotocol FRAD Switch for Frame Relay / X.25 / IP / Async / HDLC

### 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.

### ASYNC ACCESS

- All async channels can act according to X.3, X.28 and X.29 profiles at traffic speeds of up to 115.2 kbps. Async 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 management agent of SPS-6 and SPS-12.
- Each one of the SPS-6 and SPS-12 ports can be configured to SLIP or PPP modes, operating at data rates of up to 115.2 kbps.
- IP PAD facilities allow easy migration of terminal / server applications to an IP environment, at the same time improving its durability.

### IP ROUTING

- IP datagrams can be routed over Ethernet, PPP or SLIP links and over Frame Relay networks (according to RFC 1490) or over an X.25 network (according to RFC 1356).
- SPS-6 and SPS-12 support RIP1, RIP2 and triggered acknowledgment RIP messages (according to RFC 1058, 1723 and 1724). The RIP support enables easy 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.
- Static IP routing is supported. IP packets are routed to destination via SLIP, PPP, LAN (Ethernet), X.25 or Frame Relay link, according to the IP address.

### ETHERNET

- The Ethernet interface enables bridging and/or routing of LAN packets over a Frame Relay network (according to RFC 1490) and over an X.25 network (according to RFC 1356).

### ISDN

- PPP/FR/X.25 can be transmitted over the ISDN media.
- ISDN support includes up to 128 kbps (Bundle two B channels).

### NETWORK MANAGEMENT

- SPS-6 and SPS-12 contain an SNMP agent, which enables remote configuration, collection of statistics / status reports, and diagnostics. The management agent can be programmed to periodically send statistics and status reports to a maximum of five management stations.
- Configuration, monitoring and controlling of all network resources can be performed from a RADview-PC or RADview-HPOV/UNIX SNMP management station.
- A management station can be connected directly to SPS-6 and SPS-12 using LAN, PPP or SLIP.
- SPS-6 and SPS-12 SNMP agents support 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

- Enhanced backup facilities include PSTN/ISDN support.
- Frame Relay, X.25 and PPP can be transmitted over the ISDN media.
- SPS-6, SPS-12 feature an automatic return to main link facility after a network recovery.

# SPS-6, SPS-12

## *Multiprotocol FRAD Switch for Frame Relay / X.25 / IP / Async / HDLC*

## SPECIFICATIONS

### COMMUNICATIONS

- **Number of Ports**
  6 (SPS-6), 12 (SPS-12)
- **Data Rate**
  2 Mbps aggregate on every three associated ports (115.2 kbps for async)
- **Throughput**
  Up to 450 packets per second for X.25 / Frame Relay
- **Interfaces**
  V.24, V.35, X.21, RS-530 (see *Ordering*)
  IBE, UTP and DDS on port 1, port 7 (SPS-12 only)
- **Connectors**
  Port 1 (DTE or DCE), Port 7 (SPS-12 only):
  V.24: 25-pin D-type, female
  V.35: 34-pin D-type, female
  X.21: 15-pin D-type, female
  RS-530: 25-pin D-type, female
  DDS: RJ-48, socket (DTE)
  IBE: 'S' interface, RJ-45
  UTP: 10BaseT, RJ-45 (DTE)

  All other ports (DTE or DCE):
  V.24: 25-pin D-type, female
  V.35: 34-pin D-type, female
  X.21: 15-pin D-type, female
  RS-530: 25-pin D-type, female

***Note***: Adapter cable is supplied for all V.35 and X.21 interfaces.

- **Protocols**
  Compatibility: X.25, Frame Relay, HDLC, STM, Asynchronous, IP, PPP, ML-PPP
  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

***Note:*** Each port is soft-selectable.

### CONTROL PORT

- **Data Rate**
  75 bps to 38.4 kbps
- **Interface**
  V.24/Rs-232
- **Connector**
  RJ-45
- **Flow Control**
  XON/XOFF ,CTS/RTS
- **Command Modes**
  X.28, X.29

### GENERAL

- **Indicators**

| | |
|---|---|
| PWR (green) | ON when the unit is powered |
| ERR (red) | ON when failure in operation is detected |
| OVF (red) | ON when overflow is detected |
| SYNC (green) | ON when synchronization in the protocol layer is achieved |
| ACTIV (yellow) | ON when data is transmitted on the line |

- **Physical**
  Height: 4.4 cm / 1.7 in
  Width: 43.2 cm / 17.0 in
  Depth: 29.8 cm / 11.7 in
  Weight:
  SPS-6: 2.0 kg / 4.4 lb
  SPS-12: 2.5kg / 5.5 lb
- **Environment**
  Temperature: 0-50°C / 32-122°F
  Humidity: Up to 90%, non-condensing
- **Power**
  100 to 230 VAC (±10 %)
  50 to 60 Hz, 20W

## ORDERING

**SPS-6/*/$**
6-port Multiprotocol FRAD/Switch

**SPS-12/*/$**
12-port Multiprotocol FRAD/Switch

***** Specify optional DC power supply:
**24** for 24 VDC
**48** for 48 VDC

**$** Specify special interfaces:
**UTP** for 10BaseT Ethernet interface
**BNC** for 10Base2 interface
**IBE** for ISDN BRI 'S' interface
**IBU** for ISDN BRI 'U' interface
**DDS** for integral DDS interface
(default is without special interfaces)

**SPS-M/#**

**#** Specify interface:
**V24** for V.24/RS-232 interface
**V35** for V.35 interface
**V36** for V.36/RS-449 interface
**X21** for X.21 interface
**530** for RS-530 interface

***Note***: All V.35, X.21 and V.36 interfaces include an adapter cable.


RAD
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