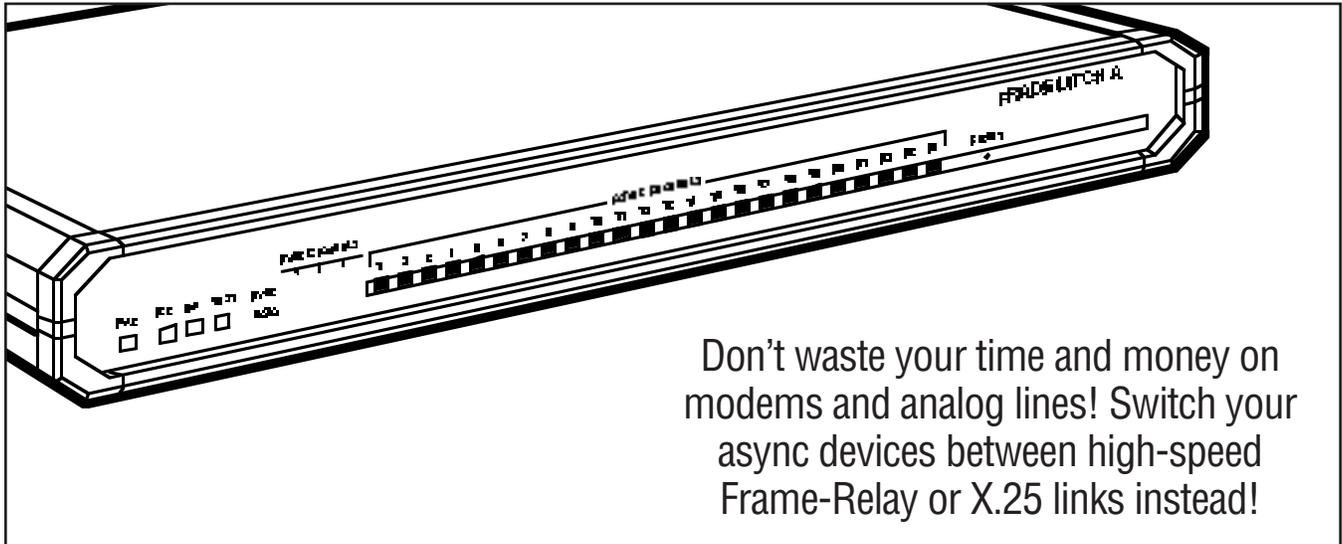


# BLACK BOX<sup>®</sup>

## NETWORK SERVICES

### FRADSWITCH A



Don't waste your time and money on modems and analog lines! Switch your async devices between high-speed Frame-Relay or X.25 links instead!

### Key Features

- ▶ Connect 8, 16, or 24 async devices to any of three X.25 or Frame Relay links.
- ▶ Main links can be RS-232, V.35, or X.21, and have a top aggregate data rate of 2.15 Mbps.
- ▶ Async channels can be set for data rates up to 115.2 kbps.
- ▶ Supports async, X.25, Frame Relay, HDLC, SDLC, STM, and SLIP.
- ▶ Built-in management agent for configuration, monitoring, diagnostics, statistics, and reports.

Do you have X.25 or Frame Relay service? Would you like to hook up a set of async equipment to one, two, or three synchronous Frame Relay/X.25 wide-area links and switch between them all?

That's exactly what the Fradswitch Asynchronous (Fradswitch A) is designed to do. It's a high-performance switch that you can use for routing between async devices and X.25 or Frame Relay connections.

All of the Fradswitch A models have three synchronous main-link ports. These ports can be RS-232, V.35, or X.21—order the interface you need. Various models have 8, 16, or 24 async ports; these are all RS-232, proprietary pinned out on RJ-45 connectors.

The main-link ports can be set to use any of several protocols: Besides the standard ones for X.25 and Frame Relay, the Fradswitch also supports HDLC and SDLC,

the proprietary stat-mux protocol STM (for use with our Stat-4, Stat-8, and Stat-24 muxes), plain async, and SLIP/encapsulated IP.

If you configure these ports for async or IP/SLIP operation, their maximum data rate is 115.2 kbps for each port. (This is also the top rate for each async channel.) If you configure the main-link ports to use a sync protocol, they have an aggregate data rate of 2.15 Mbps; that is, the total of the three ports' data rates, added together, can't exceed 2.15 Mbps.

The Fradswitch A has a powerful terminal-based menu system that lets you configure it for many types of packet-switching applications, then operate it with little or no maintenance. The unit supports:

- Permanent virtual circuits (PVCs) and switched virtual circuits (SVCs).

- Call IDs.
- NUI databases.
- Aliasing.
- IP routing and routing tables.
- Frame Relay funneling.
- X.32 (XID) tables.
- SNMP management and event reporting.
- X.25 multicasting.
- And much, much more.

Multi-session is also provided on each async channel; each channel can access up to four separate sessions simultaneously. This Fradswitch feature makes it easy for you to compare data from different sources.

The Fradswitch A is rackmountable, and it also has flash memory, so you can keep upgrading it—with *even more* features—for as long as we keep releasing new firmware revisions.

# Specifications

## Interfaces —

Async channels: EIA/TIA RS-232, DCE, proprietary pinned on RJ-45;

Main-lk. ports (all DTE): Models with “-232T” in their product codes: EIA/TIA RS-232/ITU-T V.24;

Models with “-35T” in their product codes: ITU-T V.35;

Models with “-21T” in their product codes: ITU-T X.21

Protocols — Async channels (async only) and main-link ports set as async: ITU-T X.28 or IP/SLIP, user-selectable;

supports IP encapsulation over X.25 (as per RFC 1356) or Frame Relay (as per RFC 1490);

also supports dialup links for X.25 with X.32 protocols;

Main-link ports set as sync: Packet-switching: ITU-T X.25 or Frame Relay (user-selectable); X.25: Complies with ITU-T X.25

(1988), LAP-B; Frame Relay: Complies with ANSI T1.606, T1.617 Annex D, and T1.618, as well as ITU-T Q.922 Annex A; also supports CLLM, LMI, and ANSI PVC management protocols;

Protocols (continued) —

Main-link ports, sync (continued): Data link (optional): HDLC,

SDLC, or STM (proprietary, user-selectable);

STM: Compatible with Stat-4 (our product code MX864A), Stat-8 (MX866A), and Stat-24 (MX868A) statistical multiplexors;

Management: SNMP

Packet Size — X.25: Up to 4096 bytes (4 KB); Other protocols: Up to 8192 bytes (8 KB)

Data Rate — Each async channel and each main-link port set as sync: 75, 110, 150, 300, or 600 bps, or 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, or 115.2 kbps, user-selectable;

Main-link ports set as sync (aggregate): Any combination of data rates that, when added together, does not exceed 2.15 Mbps

Clock Source — Internal or recovered from receive signal (independently user-selectable for receive and transmit paths)

Flow Control — Async channels only: X-ON/X-OFF

Logon Messages — Async channels only: Herald and bulletin (user-definable)

Command Modes — Async channels only: ITU-T X.28 and proprietary extensions; ITU-T X.29

Terminal Handling — Enhanced, beyond ITU-T X.3 requirements

Maximum Distance — Standard maximum for each interface

Memory — 2 MB RAM

User Controls —

On-screen terminal-based menu system, including SNMP management;

(1) Front-mounted recessed reset pushbutton;

(1) Internal jumper on motherboard for power-up configuration loading

Indicators —

(18), (26), or (34) Front-mounted LEDs: All models:

(1) for unit power;

(1) for hardware error;

(1) for buffer overflow;

(1) for test mode;

(3) for main-link synchronization (one for each main-link port);

(3) for main-link activity (one for each main-link port);

MT720 models only:

(8) for async-channel activity (one for each async channel);

MT721 models only:

(16) for async-channel activity (one for each async channel);

MT722 models only:

(24) for async-channel activity (one for each async channel)

Connectors — All rear-mounted:

MT720 models: (8) RJ-45 female

for async channels; MT721 models: (16) RJ-45 female

for async channels; MT722 models: (24) RJ-45 female

for async channels; Models with “-232T” in their product codes: (3) DB25 female for main-link ports; Models with “-35T” in their product codes: (3) M/34 female for main-link ports; Models with “-21T” in their product codes: (3) DB15 female for main-link ports;

Power —

From utility-power (mains) outlet, through included 2-m (6.5-ft.) power cord and rear-mounted IEC 320 male inlet, to internal transformer:

Input: 100 to 240 VAC, 50 or 60 Hz (autosensing);

Fuse: Integral 0.5 A, 250 V; Consumption: Up to 20 watts

Temperature Tolerance —

0 to 50°C

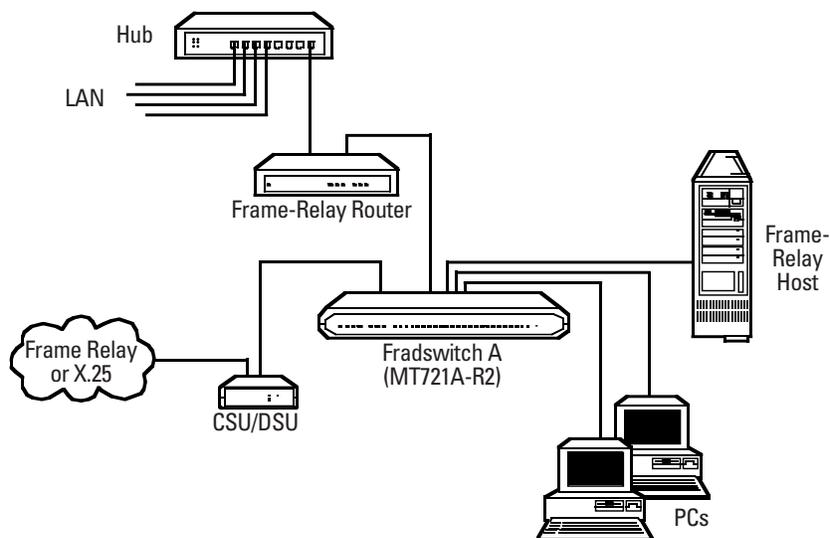
Humidity Tolerance —

Up to 90% noncondensing

Size — 4.4H x 43.2W x 24.6D cm

Weight — 1.8 kg

The Fradswitch can be the centerpiece of just about any packet-switched network.



## The complete package

- The Fradswitch A itself.
- Its power cord.
- A control cable.
- A rackmount kit.
- A user's manual.
- The Packet Switching Guide.

## What else you might need

- A CSU/DSU, sync modem, or other WAN-access device.
- An STM-compatible statistical multiplexor such as our Stat-4, Stat-8, or Stat-24.
- Async shielded twisted-pair cables and modular adapters.
- Depending on which model you have, RS-232, V.35, or X.21 cable to run from the Fradswitch to your WAN device.
- Power-line and data-line surge protectors.

## Ordering Information

ITEM	CODE
Fradswitch A:	
With X.21 Main-Link Ports:	
8-Channel .....	MT720AE-X21T-R2
16-Channel .....	MT721AE-X21T-R2
24-Channel .....	MT722AE-X21T-R2
Modular Statistical Multiplexors:	
Stat-4 .....	MX864AE
Stat-8 .....	MX866AE
Stat-24 .....	MX868AE
Cables (specify length):	
RS-232 (async, modular): Straight-pinned RJ-45 male to RJ-45 male shielded twisted-pair cable	EVNSL60
<i>To purchase a modular adapter, or for help building one, call Black Box Technical Support.</i>	
RS-232 (sync): Straight-pinned DB25 male to DB25 male shielded RS-232 cable	EDN25C
V.35: Straight-pinned M/34 male to M/34 male cable	EYN450-MM
X.21: Straight-pinned DB15 male to DB15 male cable (3 metre)	ESX213MM
Surge Protectors:	
RS-232 (on RJ-45)      SP250A	
RS-232 (on DB25)     SP360A	
V.35                    SP143A	
X.21                    SP508A	