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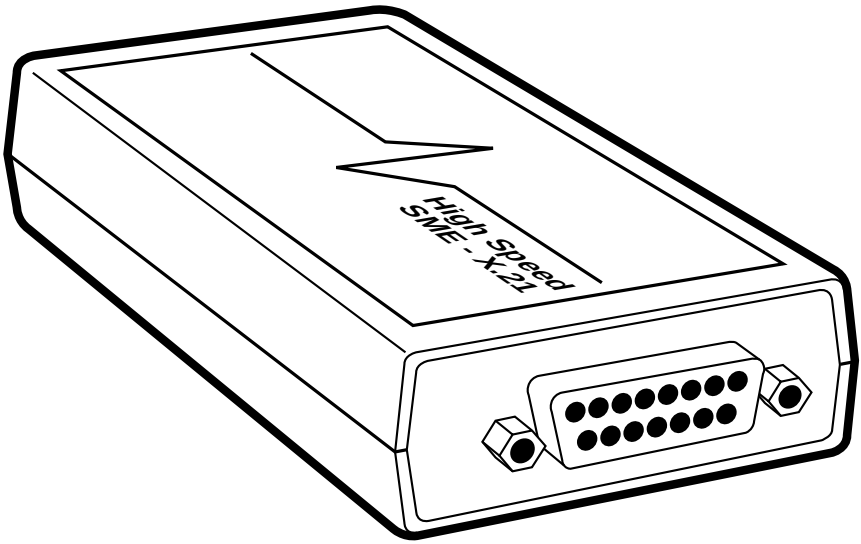
BLACK BOX®
NETWORK SERVICES

SEPTEMBER 1994
ME121A
ME121AE

High Speed SME-X.21



CUSTOMER SUPPORT INFORMATION

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FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

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1. Specifications

Interface —	ITU X.21
Protocol —	Synchronous
Data Rate —	ME121A: 1544, 768, 384, 192, 96, or 48 Kbps (user-selectable); ME121AE: 2048, 1024, 512, 256, 128, or 64 Kbps (user-selectable)
Clock Source—	Internal
Maximum Distance —	Using line power: Up to 100 ft. (30.5 m) on each side, depending on cable quality and data rate; Using optional power supply: Up to 2000 ft. (610 m) on each side, depending on cable quality and data rate
User Controls —	(3) Internal DIP switches: (1) 4-position for selecting data rate and power source; (2) 8-position for activating/deactivating external-power-supply circuitry
Indicators —	None
Connectors —	(3): (2) DB15 female for data communication, (1) 2.1-mm barrel (tip negative, ring positive) for power
Mean Time Between Failures (MTBF) —	200,000 hours
Temperature —	Operating: 32 to 149˚F (0 to 65˚C) Storage: –4 to 158˚F (–20 to 70˚C)
Humidity —	0 to 95% noncondensing
Maximum Altitude —	40,000 ft. (12,190 m)

Enclosure — Plastic

Power — Either directly from line interface or from optional external power supply:
ME121A: Wallmount power supply PS021:
Input: 120-VAC, 60 Hz at 60 mA maximum;
Output: 5 VDC ±5% at 600 mA;
ME121AE: Desktop power supply PS021E:
Input: 220-VAC, 50 Hz at 60 mA maximum;
Output: 5 VDC ±5% at 1 amp

Size — 1.4"H x 2.7"W x 4.5"D (3.6 x 6.9 x 11.5 cm)

Weight — 0.2 lb. (0.1 kg)

2. Introduction

2.1 Overview

With a High Speed SME (Synchronous Modem Eliminator)-X.21, you can establish a ITU X.21 synchronous communication link between two devices (mainframes, controllers, etc.) at greater distances than would be possible without a SME, without having to buy a modem or line driver.

Before you install your SME, you'll have to configure it by setting its internal switches (see **Chapter 3**).

Once the unit is configured, installation is simple: Run cable from the devices to connectors J1 and J2 on the SME. See **Chapter 4**.

Figure 2-1 below shows a typical application.

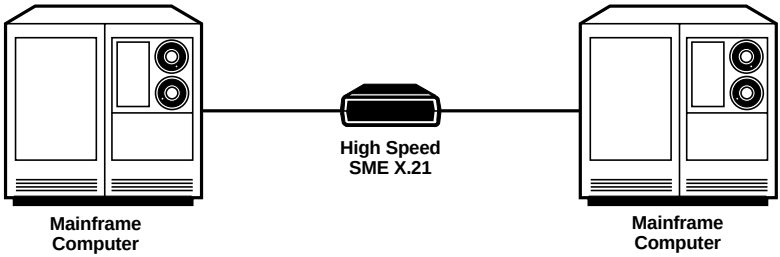

Figure 2-1. Typical SME application.

2.2 Power Supply

The High Speed SME-X.21 is designed to draw power from its X.21 interface. This means that the SME draws as much power as it can from the transmit and control signals on the cables running between it and the devices attached to it. This technique works well when the two communicating devices are relatively close together (within 100 ft. [30.5 m] of each other). However, when devices are farther apart, so much power is expended pushing the signals through the cable that there's not enough left over to run the SME. In these situations, you can order the optional external power supply (PS021 for 120-VAC utility power, PS021E for 220-VAC utility power); this will allow the SME to operate even when the two communicating devices are as much as 4000 ft. (1219 m) apart (see **Section 2.3**).

2.3 Guidelines for Cable Lengths

The primary factor determining the maximum length of cable you can run between the High Speed SME-X.21 and either of the devices you want to attach to it is whether the SME uses interface (line) power or an optional external power supply (see **Section 2.2**). However, the maximum distance also depends heavily on two other things: the data rate you select (higher data rates often require shorter cable runs) and the quality of the cable you are using (high-quality cable can often successfully carry data much farther than lower-quality cable).

Other concerns not mentioned here might also affect the maximum distance attainable in your application. For additional information, refer to the published standard for the ITU X.21 interface.

3. Configuration

Before you power up or operate the High Speed SME-X.21, you must use its internal switches (shown in Figure 3-1 on the next page) to configure the unit for your desired power source and data rate. To reach these switches, open the unit by unscrewing four Phillips-head screws on the bottom of the unit and removing the cover.

- To configure the SME to get its power *from the line*, set position 4 (the rightmost position) of DIP switch S1 to 1 (closed, ON) and all positions of DIP switches S2 and S3 to 0 (open, OFF). To configure the SME to get its power *from an optional external power supply*, set position 4 of switch S1 to 0 (open, OFF) and all positions of switches S2 and S3 to 1 (closed, ON). The factory-default setting is line power.
- Use positions 1 through 3 (the left three positions) of DIP switch S1 to select the SME's data rate, as shown in Table 3-1 below.

Table 3-1. Setting the Data Rate with DIP Switch S1

ME121A:

DIP Switch S1

Position 1	Position 2	Position 3	Data Rate (Kbps)
0	1	0	1544 (full T1)
0	1	1	768
1	0	0	384
1	0	1	192
1	1	0	96
1	1	1	48*

ME121AE:

DIP Switch S1

Position 1	Position 2	Position 3	Data Rate (Kbps)
0	1	0	2048 (full E1)
0	1	1	1024
1	0	0	512
1	0	1	256
1	1	0	128
1	1	1	64*

KEY: 0 = open (OFF), 1 = closed (ON), * = factory-default setting

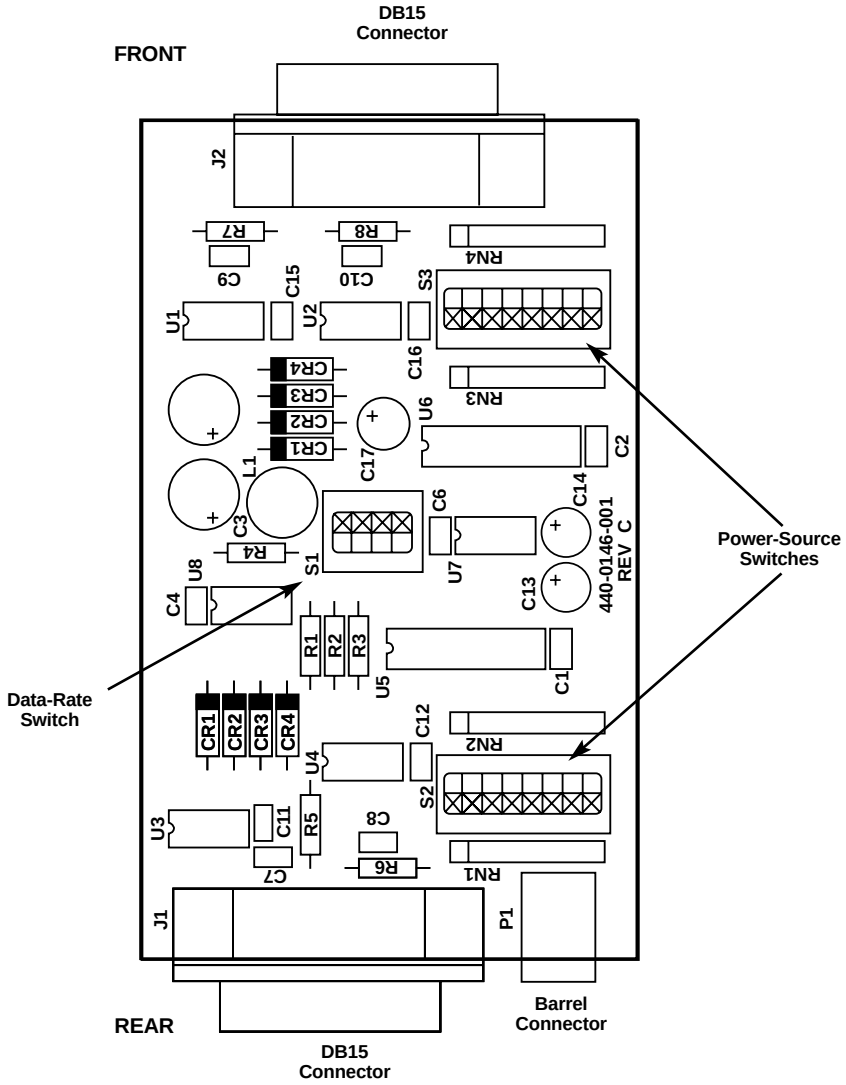

Figure 3-1. Printed-Circuit-Board Layout of the High Speed SME-X.21.

4. Installation

To install your High Speed SME-X.21 after you've finished configuring it:, run a cable from one of the SME's rear-panel DB15 connectors, labeled J1 or J2, to one of the devices you want to connect. Run a second cable from the other device to the SME's other connector. (Make sure the cables don't exceed the recommended cable length specified for the X.21 interface.) Make sure all cable connections are secure.

Your SME is now ready for continuous operation.

5. Troubleshooting

5.1 Calling Black Box

If you determine that your High Speed SME-X.21 is malfunctioning, *do not attempt to alter or repair the unit.* Contact Black Box; the problem may be solvable over the phone.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

5.2 Shipping and Packaging

If you need to transport or ship your High Speed SME-X.21:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the SME for repair, and you use an optional power supply with it, include this power supply. If you are returning the SME, make sure you include everything you received with the unit. Before you ship, contact Black Box to get a Return Materials Authorization (RMA) number.

Appendix: Connector Pinout

Any signal or pin designation that does not appear in this table is not supported by the High Speed SME-X.21.

Table A-1. Pinout for DB15 Connectors J1 and J2

PIN	SIGNAL	DESCRIPTION	SIGNAL TYPE	DIRECTION
1	—	Shield	Ground	——
2	T (A)	Transmit (A)	Data	To DCE
3	C (A)	Control (A)	Control	To DCE
4	R (A)	Receive (A)	Data	From DCE
5	I (A)	Indication (A)	Control	From DCE
6	S (A)	Signal Element Timing (A)	Timing	From DCE
7	B (A)	Byte Timing (A)	Timing	From DCE
8	G	Signal Ground	Ground	——
9	T (B)	Transmit (B)	Data	To DCE
10	C (B)	Control (B)	Control	To DCE
11	R (B)	Receive (B)	Data	From DCE
12	I (B)	Indication (B)	Control	From DCE
13	S (B)	Signal Element Timing (B)	Timing	From DCE
14	B (B)	Byte Timing (B)	Timing	From DCE

NOTES