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OPERATIONS MANUAL

X.21 SYNCHRONOUS MODEM ELIMINATOR

SME-X21

02 January, 1998

FOR TECHNICAL SUPPORT CALL:

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Manufactured By:

PT # 719009-A

East Coast Datacom, Inc.

SAFETY WARNING

Always observe standard safety precautions during installation, operation and maintenance of this product. To avoid the possibility of electrical shock, be sure to disconnect the power cord from the power source before you remove the IEC power fuses or perform any repairs.

PROPRIETARY NOTICE

WARRANTY NOTICE

WARRANTIES: East Coast Datacom, Inc. (hereafter referred to as E.C.D.) warrants that its equipment is free from any defects in materials and workmanship. The warranty period shall be three (3) years from the date of shipment. E.C.D.'s sole obligation under its warranty is limited to the repair or replacement of defective equipment, provided it is returned to E.C.D., transportation prepaid, within a reasonable period. This warranty will not extend to equipment subjected to accident, misuse, alterations or repair not made by E.C.D. or authorized by E.C.D. in writing.

PUBLICATION NOTICE

This manual has been compiled and checked for accuracy. The information in this manual does not constitute a warranty of performance. E.C.D. reserves the right to revise this publication and make changes from time to time in the content thereof. E.C.D. assumes no liability for losses incurred as a result of out-of-date or incorrect information contained in this manual.

CHAPTER 1 - INTRODUCTION

1.1 FUNCTIONAL DESCRIPTION

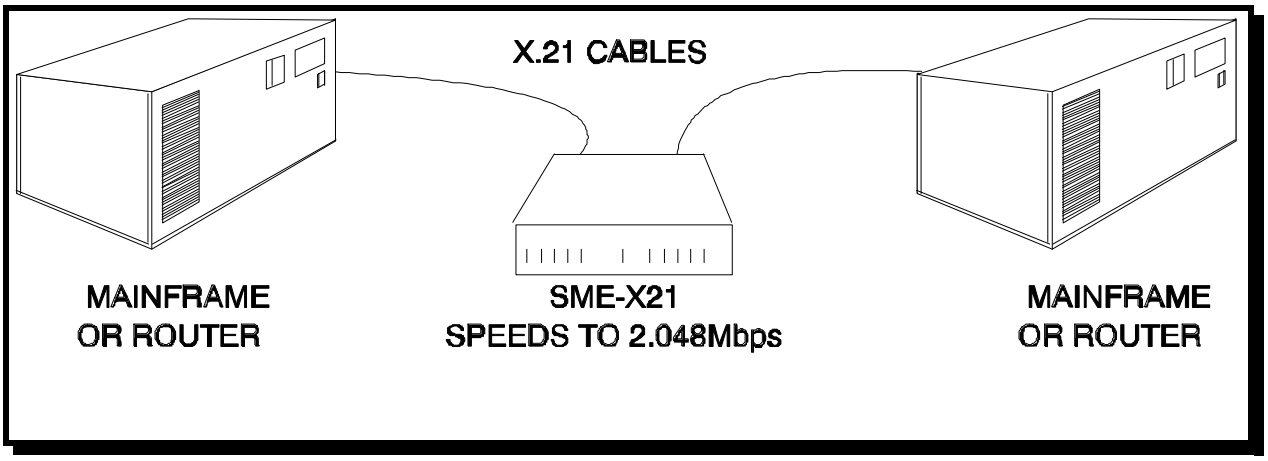
The SME-X21 allows two X.21 DTE devices to communicate within proximity of each other. The SME-X21 transmits data bi-directionally at data rates up to 2.048Mbps between DTE devices. All clocking and signal crossover are provided within the SME-X21. The unit is equiped with two female DB-15-P connectors.

The SME-X21 is an excellent choice for interconnecting your LAN or mainframe equipment. Substantial cost savings are derived by eliminating the need for 56/64Kbps CSU's and T1 CSU's.

Installation is fast and simple by setting the internal switches for Clocking and Control(C) to Indicate(I) delay. The SME-X21 has status LED's for each attached DTE device which allows the user to visually confirm the presence of control signals.

The SME-X21 utilizes state of the art digital CMOS technology to provide a feature filled product at a very affordable price. Our Field Programmable Gate Array (FPGA) design has allowed us to offer this product with a wide selection of user Baud Rates. This design approach has also reduced the amount of clock jitter for high speed 2.048Mbps transmissions.

The SME-X21 is housed in a sturdy metal enclosure and operates on 110/220VAC. Typical MTBF figures are in excess of 100,000 hours of operation.



TYPICAL APPLICATION

Figure 1.1

CHAPTER 2 - BASIC OPERATION

2.1 FRONT PANEL INDICATORS

A *Green* LED marked ***PWR*** illuminates when AC Power has been applied. Two adjacent sets of *Green* LEDs illuminate in union with individual DTE port control signal activity.

2.2 REAR PANEL CONNECTORS AND FUSES

Located on the back or rear of the product you will find an IEC Power receptacle. The supplied power cord plugs into this receptacle. This receptacle also contains a fuse drawer. Two (2) fuses are located in this compartment. For 110 VAC +/- 10% operation the unit is equipped with slow blow 160ma Fuses, Part # 714000. For 220 VAC +/- 10% operation the unit is equipped with slow blow 80ma Fuses, Part # 714001. Additionally, DB-15 female connectors, marked *PORT A* and *PORT B.*

2.3 CLOCKING

The SME-X21 provides an internal baud rate generator with user defined clock rates from 19.2Kbps up to 2.048Mbps.

2.4 ELECTRICAL INTERFACE

The SME-X21 is V.11 compliant utilizing the international ITU V.11 specification. The unit is equiped with female DB-15-P connectors. Refer to the interface chart in the Appendix for detailed interface information.

2.5 INDICATE(I) FOLLOWS CONTROL(C)

The SME-X21 has individual settings for each user port so that *Indicate(I)* follows *Control(C)*.

2.5.1 CONTROL(C) DELAY

The SME-X21 has individual user port settings for Control(C) delay. Options of no delay, 6ms, 12ms and 24ms are provided.

CHAPTER 3 - INSTALLATION

CAUTION: Disconnect Power Before Servicing
ATTENTION: Couper Le Courant Avant l' Entretien
VORSICHT: Befor Deckung Abnehmen Mach Strom Zu

3.1 VOLTAGE SELECTION

It is ***very*** important to check that the unit is set to the correct voltage setting for your application before applying AC power. Located on the rear of the unit you will find a rotary 110/220 VAC switch. Using a coin or small screwdriver, *gently* turn the switch to the appropriate power position as required for your installation (110 or 220 VAC).

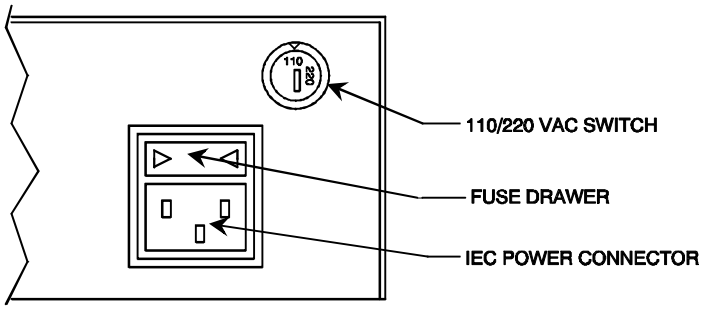
3.2 VOLTAGE SELECTION FUSES

Located on the back or rear of the product you will find an IEC Power receptacle. This receptacle contains a fuse drawer. Two (2) fuses are located in this compartment. For 110 VAC +/- 10% operation the unit is equipped with slow blow 5 x 20mm 160ma Fuses, E.C.D. Part # 714000. For 220 VAC +/- 10% operation the unit is equipped with slow blow 5 x 20mm 80ma Fuses, E.C.D. Part # 714001. Spare fuses may be purchased by calling East Coast Datacom or by calling the fuse manufacturer: Little Fuse at (312) 824-3024 or Shurter, Inc. at (707) 778-6311
Little Fuse Part #'s are: 160ma = 218.160 and 80ma = 218.080
Shurter, Inc. Part #'s are: 160ma = 034.3109 and 80ma = 034.3106

3.3 POWER CONNECTION

Before connecting the SME-X21 to an AC power source the top cover should be installed with the supplied #4-40 screws. AC power is supplied to the unit through a 2.3m (6.6 ft) cord terminated by a grounded 3-prong plug. Select an appropriate location accessible to and within four to five feet of an AC outlet. The AC Power source MUST be grounded or the units Warranty will be void.

Power Connection
Figure 3-1



3.4 DEFAULT CONFIGURATION SWITCH SETTINGS

The SME-X21 is configured prior to shipping with the Dip Switches set as follows:

1) Clock Rate - *19.2Kbps*
2) Port A / Port B Indicate(I) - *Follows Control(C)*
3) Port A / Port B Control(C) delay - *No Delay*
4) Chassis to Signal GND - *Not Connected*

If your system application requires one or more of the default setting to be changed, it will be necessary to remove the top cover. Disconnect the AC Power source before servicing the unit. Removal of the top cover is accomplished by using a small Philips screwdriver and removing the four outside screws. After setting the switches, replace the top cover before applying AC power.

3.5 TERMINAL (DTE) CONNECTION

Before applying AC Power to the unit, the DCE and DTE cabling should be connected. Straight through Male to Male DB-15 shielded cables, no longer than 2000 feet in any direction should be used. If your cables are not shielded or over 2000 feet long, transmission errors may occur.

3.6 INTERNAL SWITCH SETTINGS

3.6.1 DIP SWITCHES

The SME-X21 has two *Dip Switch's* that are accessible by removing the Top Cover. Located safely inside the unit, you will find a 4 position Dip Switch marked **S1** and a 10 position Dip Switch marked **S2**. To change the settings, you may use your finger tip or a small nonconductive instrument. It is recommended **NOT** to use metal objects to push on the *Dip Switches*, as you may slip and damage a component trace.

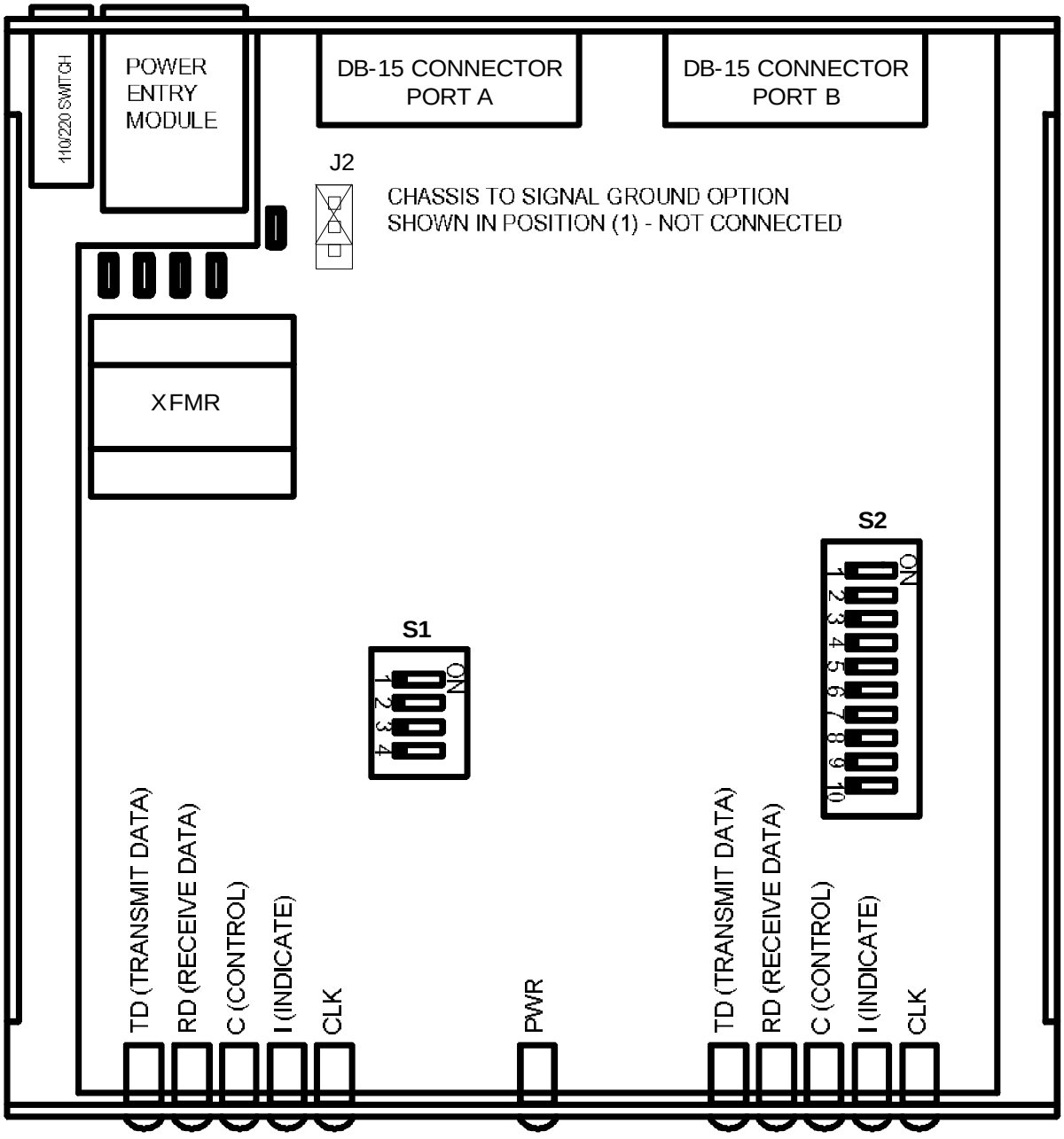
3.6.2 SWITCH FUNCTIONS

The following two pages provide a chart for the SME-X21 switches and the function of each switch. Please refer to this chart for all settings.

SME-X21 STRAPPING CHART

Switch	S4	S3	S2	S1				
S1	Internal							
	Baud Rate Generator							
	|	|	|	|				
	V	V	V	V				
	off	off	off	off	- Clock = 19.2 KHz			
	off	off	off	on	- Clock = 28.8 KHz			
	off	off	on	off	- Clock = 38.4 KHz			
	off	off	on	on	- Clock = 48 KHz			
	off	on	off	off	- Clock = 56 KHz			
	off	on	off	on	- Clock = 57.6 KHz			
	off	on	on	off	- Clock = 64 KHz			
	off	on	on	on	- Clock = 72 KHz			
	on	off	off	off	- Clock = 128 KHz			
	on	off	off	on	- Clock = 192 KHz			
	on	off	on	off	- Clock = 256 KHz			
	on	off	on	on	- Clock = 384 KHz			
	on	on	off	off	- Clock = 512 KHz			
	on	on	off	on	- Clock = 1.536 MHz			
	on	on	on	off	- Clock = 1.544 MHz			
	on	on	on	on	- Clock = 2.048 MHz			

Switch	S10	S9	S8	S7	S6	S5	S4	S3	S2	S1
S2	Not	Port B		Port B	Not	Not	Port A		Port A	Not
	used	CTS Delay		CTS	Used	Used	CTS Delay		CTS	Used
		|	|	|			|	|	|	
		|	|	|			|	|	V	
		|	|	|			|	|	off	- INDICATE follows CONTROL according to S4, S3
		|	|	|			|	|	on	- INDICATE is forced on
		|	|	|			V	V		
		|	|	|			off	off	- no delay from CONTROL	
		|	|	|			off	on	- 6 mS delay from CONTROL	
		|	|	|			on	off	- 12 mS delay from CONTROL	
		|	|	|			on	on	- 24 mS delay from CONTROL	
		|	|	V							
		|	|	off	- INDICATE follows CONTROL according to S9, S8						
		|	|	on	- INDICATE is forced on						
		V	V							
		off	off	- no delay from CONTROL						
		off	on	- 6 mS delay from CONTROL						
		on	off	- 12 mS delay from CONTROL						
		on	on	- 24 mS delay from CONTROL						



PORT "A" INDICATORS

PORT "B" INDICATORS

4.0 - APPENDIX

4.1 X.21 INTERFACE CHART

ITU X.21 INTERFACE CHART

PIN NUMBER	PIN NAME	FROM DCE	FROM DTE
1	SHIELD	-	-
2	TRANSMIT(A+)		X
3	CONTROL (A+)		X
4	RECEIVE (A+)	X	
5	INDICATE (A+)	X	
6	SIGNAL TIMING (A+)	X	
7	BYTE TIMING (A+)	X	
8	GROUND	-	-
9	TRANSMIT (B-)		X
10	CONTROL (B-)		X
11	RECEIVE (B-)	X	
12	INDICATE (B-)	X	
13	SIGNAL TIMING (B-)	X	
14	BYTE TIMING (B-)	X	
15	NOT USED		

5.0 - TECHNICAL SPECIFICATIONS

Application
Interconnection of two X.21 DTE (Terminal) devices located within proximity of each other

Capacity
Two (2) X.21 DTE's

Interface
X.21 using V.11 electrical specification

Data Rates
Up to 2.048Mbps
Option for T2 (6.312Mbit)

Channel Interface
Two Female DB-15 Connectors

Surge Protection
Main power supply

Power Source
100-120 to 200-220VAC @10%, 50/60Hz, 0.16/0.08A, external 110/220 volt select switch, IEC Power Inlet, (2) 5mm Fuses

Environmental
Operating Temperature....32º to 122º F (0º to 50º C)
Relative Humidity.....5 to 95% Non-Condensing
Altitude.....0 to 10,000 feet

Dimensions
Height ..... 1.75 inches (4.44 cm)
Width ..... 7.90 inches (20.07 cm)
Length ..... 9.00 inches (22.86 cm)

Weight
2 pounds (0.914Kg)

Warranty
Three Years, Return To Factory

ORDERING INFORMATION
Model: SME-X21
Description: Synchronous X.21 Modem Eliminator

INCLUDED WITH EACH UNIT:
1) Operations Manual
2) U.S.A. Grounded Power Cord, Part # 713015
3) Optional Power Cords
   A) United Kingdom, Part # 713016
   B) Continental Europe, Part # 713017
   C) Other: Specify Country on Purchase Order

OPTIONAL ACCESSORIES
1) Spare Data Center Fuses
   A) 160ma Fuse, Qty (2) Part # 714000
   B) 80ma Fuse, Qty (2) Part # 714001

For further detailed technical information on this product, contact East Coast Datacom Technical Assistance toll free at (800) 240-7948

OTHER EAST COAST DATACOM PRODUCTS

MODEM AND PORT SHARING DEVICES
INTERFACE CONVERTERS
SIGNAL REGENERATORS
LINE DRIVERS