

TABLE OF CONTENTS

CHAPTER 1 - INTRODUCTION	Page 1
1.1 FUNCTIONAL DESCRIPTION	Page 1
CHAPTER 2 - BASIC OPERATION	Page 2
2.1 FRONT PANEL INDICATORS	Page 2
2.2 FRONT PANEL SWITCHES	Page 2
2.3 REAR PANEL POWER CONNECTOR	Page 2
2.5 CLOCKING	Page 2
2.6 DATA INTERFACES	Page 2
2.7 CLEAR TO SEND(CTS) CONTROL SIGNAL	Page 3
2.8 DATA INTERFACE MODULE STRAPS	Page 3
2.9 DATA INTERFACE REMOVAL	Page 3
2.10 DATA INTERFACE MODULE STRAPS	Page 3
CHAPTER 3 - INSTALLATION	Page 4
3.1 VOLTAGE SELECTION	Page 4
3.2 VOLTAGE SELECTION FUSES	Page 4
3.3 POWER CONNECTION	Page 4
3.4 DEFAULT CONFIGURATION SWITCH SETTINGS	Page 5
3.5 DATA PORT CONNECTIONS	Page 5
3.6 SWITCH SETTINGS	Page 5
3.6.1 DIP SWITCHES	Page 5
3.6.2 DELAY ENTER SWITCH FUNCTION	Page 5
4.0 - APPENDIX	Page 6
4.1 V.35 INTERFACE CHART	Page 6
5.0 - TECHNICAL SPECIFICATIONS	Page 7

OPERATIONS MANUAL

ROUTER DELAY SIMULATOR *Satellite Buffer*

RDS-SB

July 1, 2000

FOR TECHNICAL SUPPORT CALL:

East Coast Datacom, Inc.
571 Haverty Court, STE N
Rockledge, FL 32955 USA
TEL: (800) 240-7948 or (321) 637-9922
FAX: (321) 637-9980
Email: info@ecdata.com

Manufactured By:

East Coast Datacom, Inc.

PT # 730009-A

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

The information contained herein is proprietary to East Coast Datacom, Inc. Any reproduction or redistribution of this publication, in whole or in part, is expressly prohibited unless written authorization is provided by East Coast Datacom, Inc.

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 RDS-SB is a device intended to provide a unidirectional 2.097 Mbit elastic data buffering (FIFO memory) function between two systems having nominally equivalent clocking rates. The two systems may be either running asynchronously, or may be traceable to a common timing source while one or both systems possess a high degree of clock jitter.

The RDS-SB provides two DTE interfaces optionally configured as RS-449, X.21, EIA-530, or V.35. The maximum data transfer rate at each interface is 2.048 Mbps.

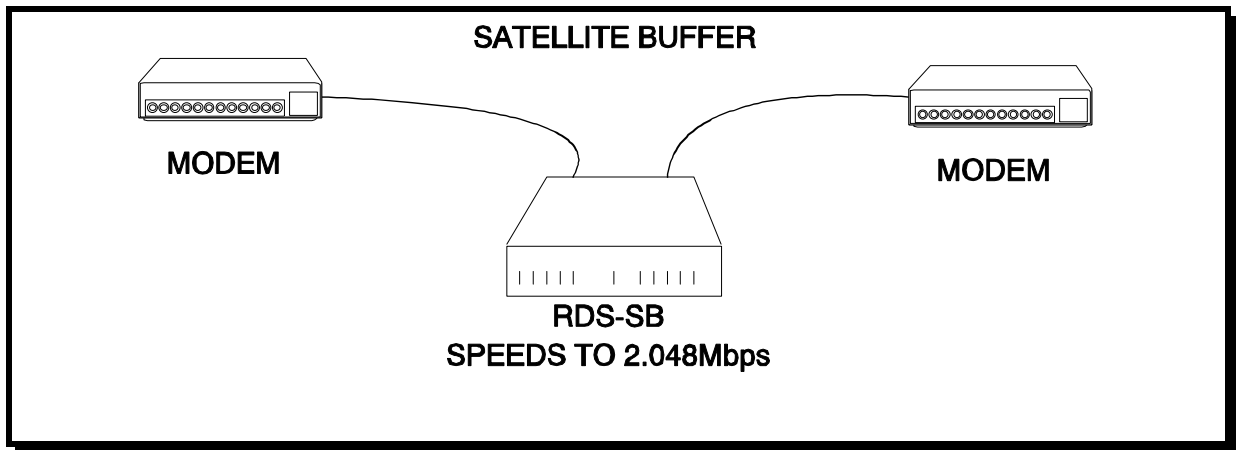
An option switch on the front panel allows the RDS-SB internal buffer memory to utilize a Differential Frequency Discriminator to prevent the FIFO memory from re-centering after an underrun or overflow until the frequency difference between the two external clocks is within a set range.

The RDS-SB has status LED's for each attached device which allows the user to visually confirm the presence of control signals.

The RDS-SB uses state of the art digital CMOS technology to provide a feature filled product at an affordable price. The units design offers a field programmable gate array(FPGA) for fast customer specified changes.

The RDS-SB is housed in a sturdy metal enclosure and operates on 110/220VAC.

The unit has a three year warranty and a 24 hour turnaround on warranty repairs.



TYPICAL APPLICATION

Figure 1.1

CHAPTER 2 - BASIC OPERATION

2.1 FRONT PANEL INDICATORS

A *Green* LED marked **POWER** illuminates when AC Power has been applied. Two adjacent sets of *Green* LEDs, one for **PORT A** and another for **PORT B**, illuminate in union with individual port control signal activity. Both Port A and Port B indicators flash in union with Port A and Port B data interfaces(see section 2.4 Data Interfaces)

2.2 FRONT PANEL SWITCHES

User configuration Dip Switches are marked **S1** and **S2**. The RDS-SB utilizes **S1 position 1**, as the only user switch option for setting the Differential Frequency Discriminator. Additionally, a red momentary switch is marked as "**DELAY ENTER**". Delay Enter allows the user to enter the delay time into the RDS-SB after dip switch selection. ** Each time a new delay is entered via the dip switch, Delay Enter **MUST** be pushed to initialize the new delay time.

2.3 REAR PANEL POWER CONNECTOR

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.

2.4 REAR PANEL DATA INTERFACE PORTS

Located adjacent to the IEC Power receptacle are the user selectable **DATA INTERFACE PORTS**. The ports are marked PORT A and PORT B. The data interfaces plug into the RDS-SB main printed circuit board through these openings. The top two screws on the interface module hold the card into place. Both Port A and Port B indicators flash in union with Port A and Port B data interfaces.

2.5 CLOCKING

The RDS-SB must be externally clocked at data rates up to 2.048Mbps.

2.6 DATA INTERFACES

The RDS-SB has selectable **DATA INTERFACES** of V.35, RS-422/449, RS-530, X.21 and RS-232. The data interfaces are purchased separate from the main RDS-SB unit.

2.7 DATA PATH

Data buffering is provided from the Receive Data (RD) input lead of **Port A** through the FIFO memory to the Send Data (SD) output lead of **Port B**. Data input on **Port A** is sampled on the clock edge occurring at the center of the data bit time period. Data output on Port B is latched on the clock edge occurring at the beginning of the data bit time period.

For loop test purposes, connectivity between the RD input of **Port B** and the SD output of **Port A** is also provided, but is not buffered in any way. To facilitate clocking of test equipment on **Port A**, the Receive Timing (RT) input on **Port B** is routed to the Terminal Timing (TT) output of **Port A**. This clock should be used to sample SD output on **Port A**.

2.8 BUFFER FUNCTION

The 2.097 Mb First-In, First-out (FIFO) memory is used to buffer data in and out of the unit. Receive data may be simultaneously written into the FIFO while transmit data is read out. Internal counters track the FIFO level and are used to indicate underrun and overflow conditions, as well as indicate when the FIFO is half-full (centered) after initialization.

After a power-on cycle, or an underrun or overflow condition, the state of the FIFO is reset to an initial empty state, whereupon it will begin to accept input data at the **Port A** clock rate while inhibiting the output of data. Upon reaching a half-full (re-centered) state, the FIFO is enable to clock data out at the **Port B** clock rate.

2.9 CONDITIONAL FIFI RE-CENTERING USING DIFFERENTIAL FREQUENCY DISCRIMINATOR

A **Differential Frequency Discriminator** (DFD) may be invoked to conditionally hold off accepting received data and re-centering the FIFO after a power-on cycle, or an underrun or overflow condition occurs, until the frequency difference between the two port clocks falls within a set range of approximately 400 Hz. The purpose of this function is to prevent an out of range clocking source from repeatedly producing frequent underrun or overflow conditions.

When this function is invoked, and only after an underrun or overflow condition occurs, the FIFO memory is held in an initial state of empty if the DFD indicates that the absolute frequency differential is outside the range. If at any time within the sample window of the DFD (approx. 20mS), this differential should fall within the range, the FIFO will re-center normally and begin transferring data. (NOTE: It is possible in some cases that the average frequency differential will be outside the range, but may at times fall within the range due to clock jitter. This will be sufficient to trigger re-centering of the FIFO and transfer of data.)

The output of the DFD will be ignored as long as the FIFO continues to transfer data without an underrun or overflow condition occurring.

The conditional FIFO re-centering option may be invoked via **SW1-1** (DIP Switches recessed on front panel), by putting the switch in the **ON position**.

2.9 DATA INTERFACE REMOVAL

Disconnect the AC power source from the RDS-SB and disconnect the users data cables from the Data Interface Module(DIM). Located on back panel of the RDS-SB are **PORT A** and **PORT B**. Each DIM is plugged into and out of these ports through mating connectors. Using a phillips screwdriver, remove the top two screws of the DIM. Gently pull the module from the RDS-SB housing. It may be easier to remove the top cover and while holding the edges of the DIM, rock the DIM back and forth as you pull the DIM out of the socket.

2.10 DATA INTERFACE MODULE STRAPS

The RDS-SB has user selectable data interfaces that are purchased seperatly from the main RDS-SB unit. The available interfaces are V.35, RS-422/449, RS-530, X.21 and RS-232. Each Data Interface Module has straps(3 pin header) that force select data interface signals. Please refer to each interface modules documentation for a detailed explanation of both control signals supported and the available options for forcing control signals.

-

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).

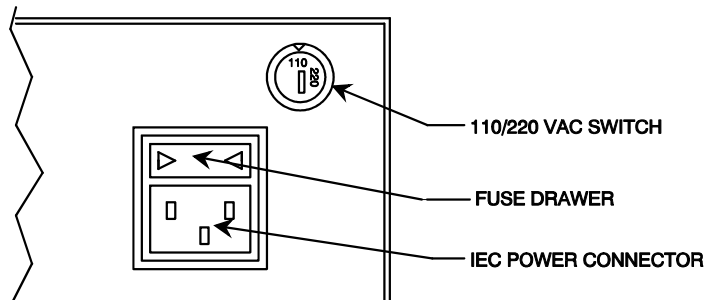
3.2 VOLTAGE SELECTION FUSES

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 RDS-STB to an AC power source the top cover should be installed with the supplied #6-32 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 RDS-SB is configured prior to shipping with the Dip Switches set as follows:

- 1) Clock Source - **Port B (Connect to DCE device)**
- 2) Port A CTS follows Port B CTS
- 3) Control Signals - *Not Forced*
- 4) Chassis to Signal GND - *Not Connected*
- 5) Delay Time - *250mS*

If your system application requires one or more of the default settings to be changed, this is accomplished via the front panel switches.

3.5 DATA PORT CONNECTIONS

Before applying AC Power to the unit, the users cabling to the RDS-SB Data Interfaces should be connected. Straight through shielded cables should be used. **PORT A** must *always* have a DTE interface module plugged into the port and connect to a DCE device. **PORT B** must *always* have a DTE interface module plugged into the port and connect to a DCE device.

3.6 SWITCH SETTINGS

3.6.1 DIP SWITCHES

The RDS-SB has two *Dip Switch's* that are accessible via the front panel. The Dip Switch's are marked **S1** and **S2**.

Switch **S1-1** allows the user to set the Differential Frequency Discriminator.

Switch **S2** has no functionality and should remain in the **OFF** position.

To change the settings, you may use your finger tip or a small non-conductive instrument. It is recommended NOT to use metal objects to push on the *Switches*.

3.6.2 ENTER SWITCH FUNCTION

If the Differential Frequency Discriminator is utilized(SW1-1) the user **MUST** push the Delay Enter switch.

DELAY ENTER allows the user to enter the user selectable delay time into the RDS-SB after dip switch selection. Each time a new delay is entered via the dip switch, Delay Enter **MUST** be pushed to initialize the new delay time.

Additionally, if the Clock Rate is changed, the user **MUST** push the Delay Enter switch. The user selected delay time will not be effected by the clock rate change.

4.0 - APPENDIX

4.1 V.35 INTERFACE CHART

V.35 INTERFACE CHART

Pin No	CCITT Circuit No.	Circuit Name	Signal Description	From DCE	To DCE
A	101	AA	Protective Ground	---	---
B	102	AB	Signal Ground	---	---
P	103	BA(A)	Transmit Data (A)		X
S	103	BA(B)	Transmit Data (B)		X
R	104	BB(A)	Receive Data (A)	X	
T	104	BB(B)	Receive Data (B)	X	
C	105	CA	Request to Send		X
D	106	CB	Clear to Send	X	
E	107	CC	Data Set Ready	X	
H	108	CD	Data Terminal Ready		X
F	109	CF	Received Line Signal Detect	X	
U	113	DA(A)	External Transmit Timing (A)		X
W	113	DA(B)	External Transmit Timing (B)		X
Y	114	DB(A)	Transmitter Signal Element Timing (A)	X	
AA	114	DB(B)	Transmitter Signal Element Timing (B)	X	
V	115	DD(A)	Receiver Signal Element Timing (A)	X	
X	115	DD(B)	Receiver Signal Element Timing (B)	X	

TECHNICAL SPECIFICATIONS

Application

Elastic data buffering (FIFO memory) function between two systems having nominally equivalent clocking rates

Buffer Size

2.097Mb First-in, First-out(fifo) memory

Capacity

Two(2) DCE devices, one for each port

Data Rates

Up to 2.048Mbps

Data Channel Interfaces

Available in V.35, RS-530, RS-422/449, RS-232 or X.21

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....32° to 122° F (0° to 50° C)

Relative Humidity.....5 to 95%

Non-Condensing

Altitude.....0 to 10,000 feet

Dimensions

Height 1.75 inches (4.44 cm)

Width 17.00 inches (43.18 cm)

Length 9.00 inches (22.86 cm)

Weight

2 pounds (0.914Kg)

Warranty

Three Years, Return To Factory

ORDERING INFORMATION

PT# 132000

Model: RDS-SB

Description: Router Delay Simulator

Interfaces Available:

V.35, PT# 129010

RS-530, PT# 129011

RS-422/449, PT# 129012

X.21, PT# 129013

RS-232, PT# 129014

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