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OPERATIONS MANUAL

UNIVERSAL DATA CONVERTER

Rate Adapter

UDC-RA

10 January 2011

FOR TECHNICAL SUPPORT CALL:

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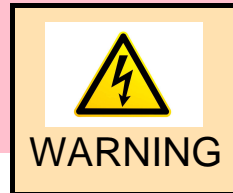
Manual Part
Number 184050
Rev - B

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 servicing the device.*** Line voltages are present within the device when the power cord is attached to the device.

DO NOT attempt to repair this device. Only qualified service personnel can service this device.



For AC powered devices which have 3 conductor power plugs (L1, L2 & GND or Hot, Neutral & Safety/Protective Ground), the wall outlet (or socket) must have an earth ground.

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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; lightning strikes, electrical surges, water damage, misuse, alterations, mishandling (dropped and damaged) 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 E.C.D. assumes no liability for losses incurred as a result of out-of-date or incorrect information contained in this manual.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

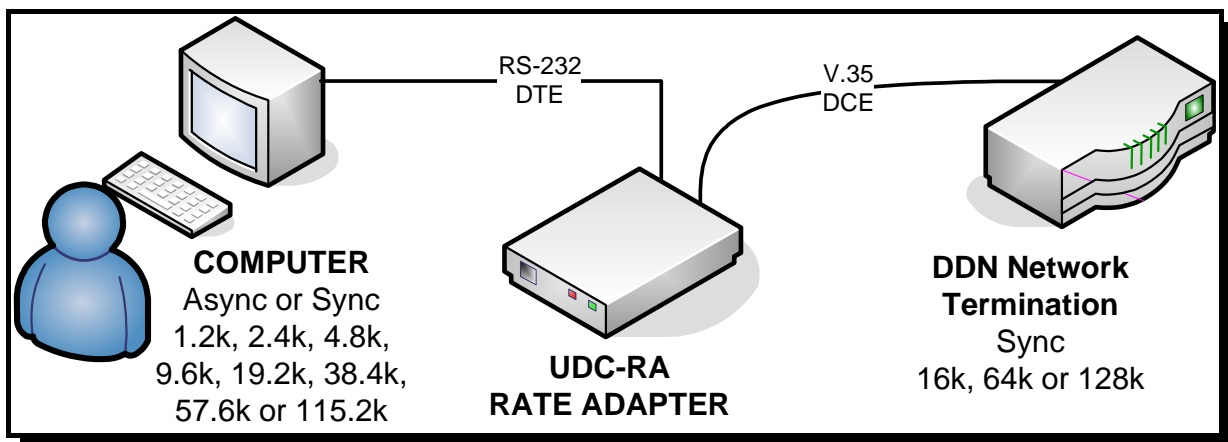
1.1 FUNCTIONAL DESCRIPTION

The UDC-RA Rate Adapter allows low speed async or sync RS-232 data terminal equipment(DTE) to transmit over a higher speed 16k, 64k or 128k sync data communication equipment(DCE) link. Additionally, the unit supports matched data rates for basic Async to Sync conversion such as 19.2k async over sync 19.2k. The UDC-RA devices are used in pairs, one at each end of the communications link or in multiples as when used in a multi-point or broadcast link. The UDC-RA will support bi-directional or simplex data transmissions.

The UDC-RA supports async character lengths of 8, 9, 10 and 11 bits including the start and stop bit. The low speed async interface is RS-232 and supports data rates of 1.2k, 2.4k, 4.8k, 9.6k, 19.2k, 38.4k, 57.6k and 115.2k. The high speed sync data interface supports rates of 16k, 64k or 128k and must be a *clear channel* with no overhead status bits being passed. The sync channel supports data interfaces for V.35, RS-530, RS422/449 and X.21.

The UDC-RA has internal switch options to force control signals. Additionally, the user may set RTS to be in-band with the data to DCD, DSR or CTS. This is useful for networks that have no control signals passed. Extended Signal Rate(ESR) is provided to ensure the async input data rate matches the sync output data rate, ensuring reliable data communications.

The UDC-RA has two TTL level interfaces for connecting each data interface module. The unit is shipped with two user specified data interfaces. Additional data interfaces are sold separately. The individual data interfaces are available in DCE or DTE formats. The UDC-RA is housed in a sturdy aluminum enclosure and is supplied with an internal linear power supply for 110/220VAC. The unit has a three year warranty and a 24 hour turnaround on warranty repairs.



TYPICAL APPLICATION

Figure 1.1

CHAPTER 2 - PRODUCT OVERVIEW

2.1 FRONT PANEL INDICATORS

A *Green* LED marked **PWR** 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 INTERNAL SWITCHES

Located inside of the UDC-RA are five(5) dip switches. The switches are marked **SW1**, **SW2**, **SW3**, **SW4** and **SW5**. Switch **SW1** has no function(future use) and all positions should be set to **OFF**. The remaining four switches allow configuration of the UDC-RA.

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. For 220 VAC +/- 10% operation the unit is equipped with slow blow 80ma Fuses.

2.4 REAR PANEL DATA INTERFACE PORTS

Located adjacent to the IEC Power receptacle are the **DATA INTERFACE PORTS**. The ports are metal stamped **PORT A** and **PORT B**. The data interface modules plug into the UDC-RA main printed circuit board through these openings. The top two screws on the interface module hold the card into place. The front panel Port A and Port B indicators flash in union with Port A and Port B data interfaces.

2.5 CLOCKING

The UDC-RA must be externally clocked from **PORT B**.

2.6 DATA INTERFACES

The UDC-RA has a host of available **DATA INTERFACES** comprised of RS-232, V.35, RS-422/449, RS-530, X.21 and TTL. Each interface module is available in a DCE or DTE configuration, the true EIA or ITU recommended connector and gender male or female is provided. The V.35 interface modules are MR-34 male, with factory optional DB-25 female. *This option can reduce cabling costs.*

2.7 EXTENDED SIGNAL RATE(ESR)

Extended Signal Rate(ESR) is provided to ensure the async input data rate matches the sync output data rate. When enabled the tolerance is +/- 2.5% on the async side.

2.8 CONTROL SIGNAL FORCING

DO NOT USE THE 3-PIN STRAPS ON THE INTERFACE CARDS TO FORCE CONTROL SIGNALS

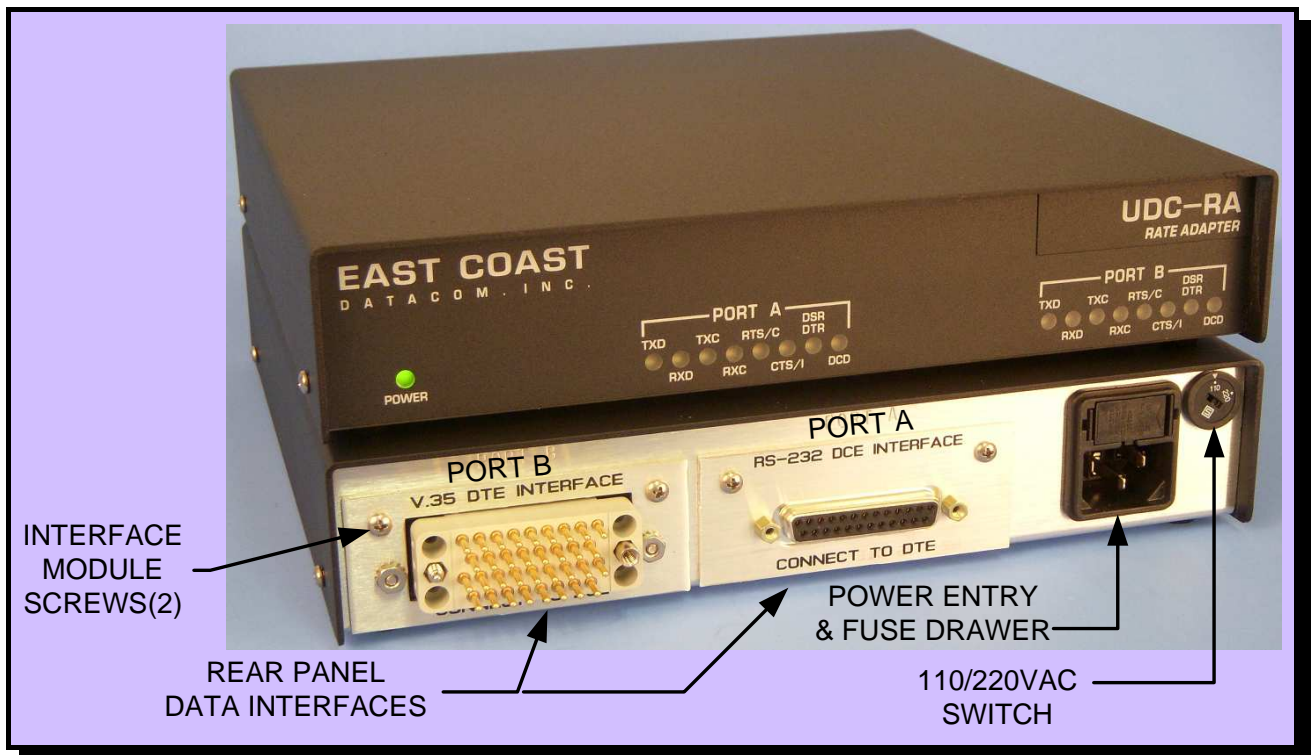
The UDC-RA **Control Signals** are forced on the main printed circuit card located at switch position **SW2 and SW3**. **ONLY** use the Dip Switches to force control signals.

When forcing control signals via SW2 and SW3, you should see the control signal LED light illuminate on Channel A or Channel B.

While each Data Interface Module has straps(3 pin header) that force select control signals, those straps are for other East Coast Datacom products. It will not harm the unit, but utilizing them can give false LED lights or operation.

2.9 DATA INTERFACE REMOVAL

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



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 contacting the fuse manufacturer: Little Fuse www.littlefuse.com or Shurter, Inc. at www.schurter.com

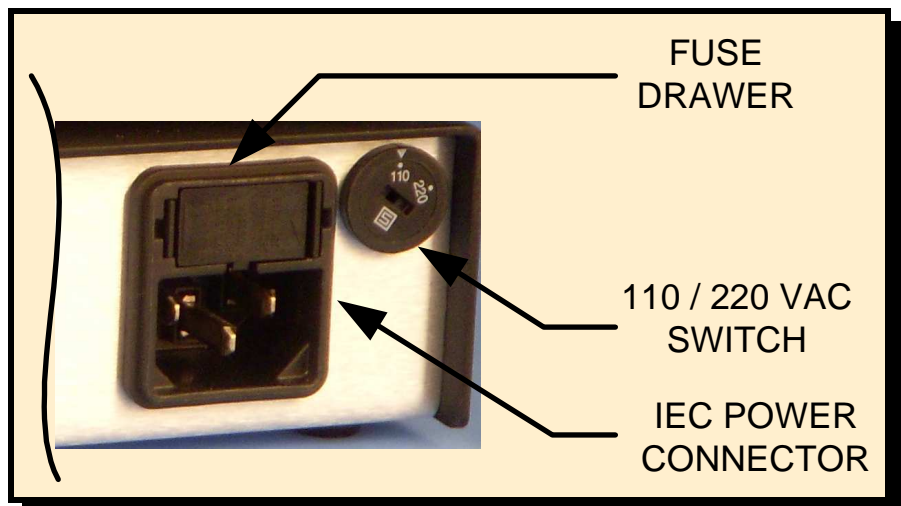
Little Fuse Part #'s are: 160ma = 218.160 and 80ma = 218.080

Schurter, Inc. Part #'s are: 160ma = 034.3109 and 80ma = 034.3106

3.3 POWER CONNECTION

Before connecting the UDC-RA 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 UDC-RA is factory configured as follows:

- 1) Clock Source - **Port B (Connect to Modem or DCE device)**
- 2) Control Signals - **All Signals Passed if present**
- 3) Sync Clock Rate - **64k**
- 4) Async Data Rate - **9.6k**
- 5) Async Character Length: **10 bit Data: 8, N, 1**
- 6) Extended Signal Rate(ESR) - **OFF** (Async Rate can be -2.5% to +1% to sync clock)
- 6) RTS in Band with Data - **OFF** (RTS and Data passed normal)
- 7) Chassis to Signal GND - **Not Connected**

If your system application requires one or more of the default settings to be changed, this is accomplished by removing the top cover to change Dip Switches **SW2-SW5** or to connect chassis to signal ground.

3.5 DATA PORT CONNECTIONS

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

3.6 SWITCH SETTINGS

3.6.1 DIP SWITCHES

The UDC-RA has *five(5) Dip Switches* that are accessible inside the unit. The switches are marked **SW1, SW2, SW3, SW4 and SW5**. Switch **SW1** has no function(future use) and all positions should be set to **OFF**. The remaining four switches allow configuration of the UDC-RA.

3.7 CONNECTING AN ASYNC OR SYNC DCE(MODEM) TO PORT A

The UDC-RA is supplied with a RS-232 DCE Interface Module in Port A for connection to Data Terminal Equipment(DTE). If the user wishes to connect a DCE(Modem) type device to Port A it will be necessary to use a RS-232 Cross Over Cable for ASYNC data transfer. If the data is RS-232 SYNC, then the user will need to order a Tail Circuit Buffer. East Coast Datacom, Inc model number TCB-V24, Part # 200001 that is a RS-232 selectable 64bit buffer for data rates up to 128Kbps. The 64-bit circular buffers compensate for differences between modem clock rates and limits errors to occasional data losses when the buffer overruns.

4.0 - APPENDIX

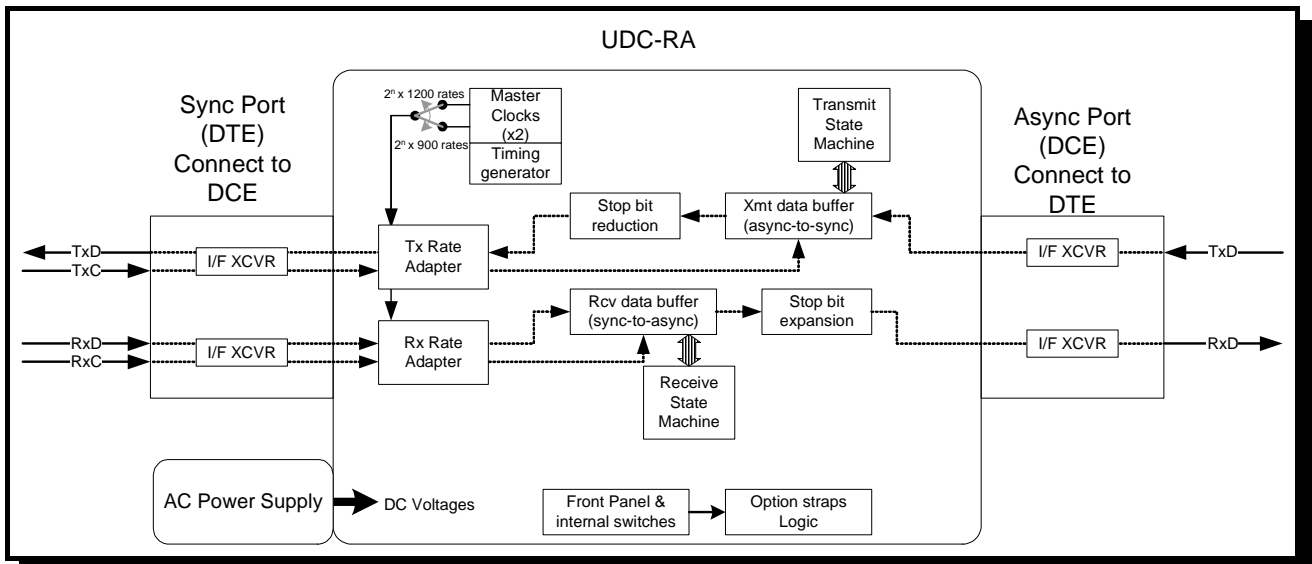
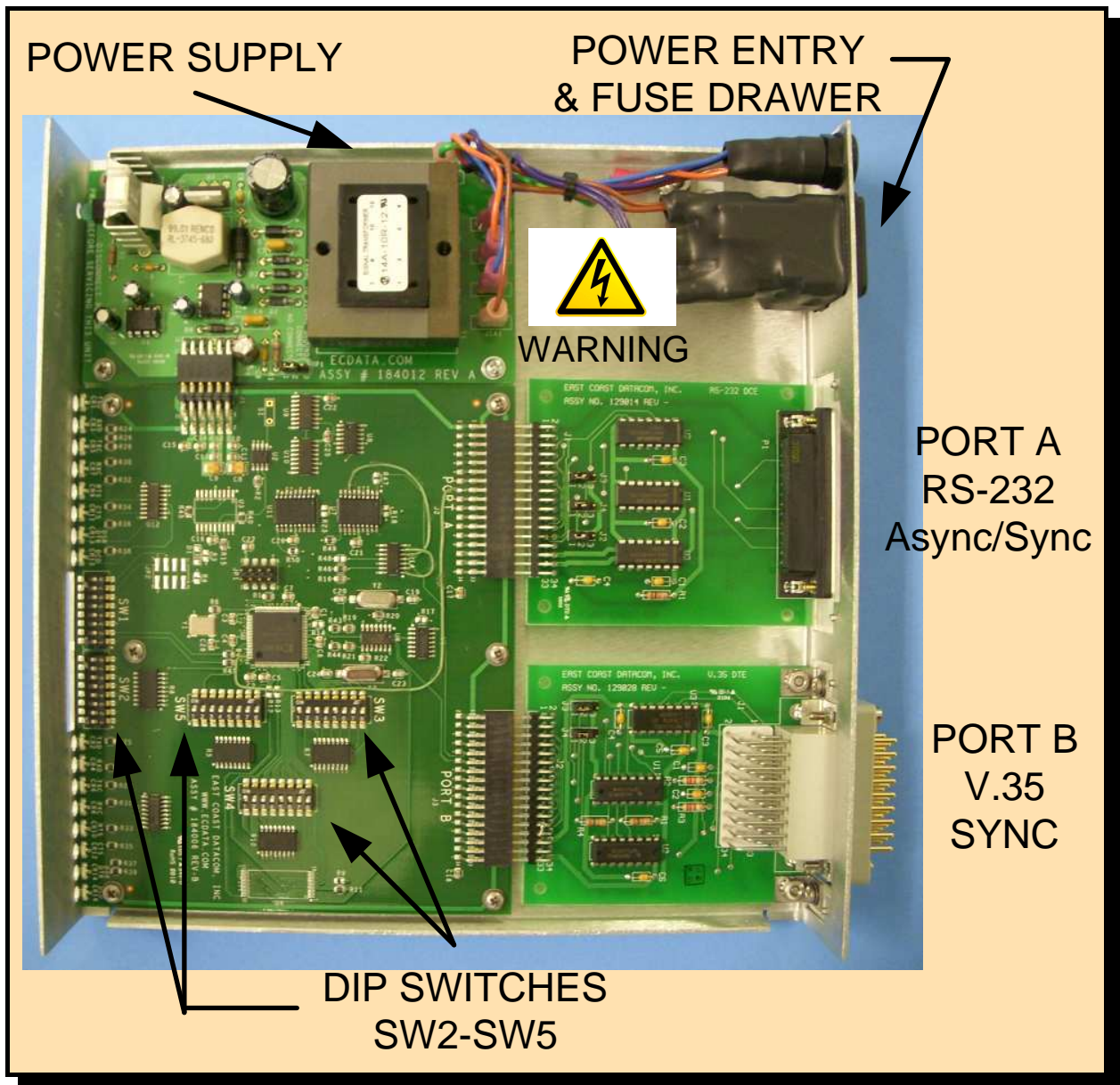
4.1 STRAP CHART

RS-232 Async Data Rate and V.35 Sync Link Rate Settings**Dip Switch SW1 - NOT USED (Future Use)**

RS-232 Async Data	Sync V.35 Link								
Dip Switch SW2		Pin 1	Pin 2	Pin 3	Pin 4	Pin5	Pin6	Pin7	Pin 8
115200	128k	On	On	On	On				
57600	64k	Off	Off	Off	On				
38400	64k	On	Off	Off	On				
19200	64k	Off	On	Off	On				
9600	64k	On	On	Off	On				
4800	64k	Off	Off	On	On				
2400	64k	On	Off	On	On				
1200	64k	Off	On	On	On				
9600	16K	Off	On	On	Off				
4800	16K	On	Off	On	Off				
2400	16K	Off	Off	On	Off				
1200	16K	On	On	Off	Off				
* Pass Thru - Same	Rate both ends	On	On	On	Off				
Async Data Rate	Sync Link								
115200	Matched Rate					On	On	Off	On
57600	Matched Rate					Off	Off	On	Off
38400	Matched Rate					Off	On	Off	Off
19200	Matched Rate					Off	On	On	Off
9600	Matched Rate					Off	On	On	On
4800	Matched Rate					On	Off	Off	On
2400	Matched Rate					Off	On	Off	On
1200	Matched Rate					Off	Off	Off	On

Port A, Async Data Set-Up								
Switch SW5	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
RS-232 Sync		Off						
RS-232 Async		On						
11 Bit Data			On	Off				
10 Bit Data			Off	Off				
9 Bit Data			On	On				
8 Bit Data			Off	On				
ESR On					On			
ESR Off					Off			
Port B, RTS Source								
Switch SW3	Pin 1	Pin 2	Pin 3	Pin 4				
RTS Forced Off	On	On						
Follows Port A Async RTS	On	Off						
RTS Forced On	Off	On						
Port B, DSR Source								
Switch SW3								
DSR Forced Off			On	On				
Follows Port A Async DTR			On	Off				
DSR Forced On			Off	On				
Port A, Async CTS Source								
Switch SW3	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
CTS Forced Off					On	On	On	
Follows Port B Sync CTS					On	On	Off	
CTS Forced On					On	Off	On	
Follows Port A Async RTS					On	Off	Off	
Follows Remote RTS In Band With Data					Off	On	On	
Follows Port B DCD					Off	On	Off	
Port A, Async DCD Source								
Switch SW4	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
DCD Forced Off	On	On	On					
Follows Port B Sync DCD	On	On	Off					
DCD Forced On	On	Off	On					
Follows Port A Async RTS	On	Off	Off					
Follows Remote RTS In Band With Data	Off	On	On					
Port A, Async DSR Source								
Switch SW4								
DSR Forced Off				On	On	On		
Follows Port B Sync DSR				On	On	Off		
DSR Forced On				On	Off	On		
Follows Port A Async RTS				On	Off	Off		
Follows Remote RTS In Band With Data				Off	On	On		

4.2 UNIT OVERVIEW



4.3 TECHNICAL OVERVIEW

RS-232 DCE Interface CARD (EIA RS-232 Compliant)

Connects to a DTE(Terminal)

Ordering PT# 129014

Gender: DB-25 Female

Pins Supported 1,2,3,4,5,6,7,8,15,17,20,22,24

V.35 DTE Interface CARD (ITU V.11 compliant)

Connects to a DCE(Modem)

Ordering PT# 129028

Gender: MR-34 Male

Pins Supported A,B,C,D,E,F,H,J,P,R,S,T,U,V,W,X,Y,AA

Trouble Shooting communication problems:

To help pinpoint the communication problem, the user should confirm the following:

- A)** Data Cables: If you are using your own data cables, confirm the pin outs to the UDC-RA Pin outs as shown above.
- B)** Sync DCE communications link is working error free end to end.
- C)** Async DTE communications are set to match the UDC-RA units settings on both ends of the link.
- D)** If possible, direct connect the two Async DTE devices together using a crossover cable between the devices to confirm that the Async devices are indeed working.
- E)** Single sided operation using one PC, one UDC-RA and one DCE device:
Set the PC and UDC-RA data rate and character length to the same rates and character length, such as 19.2k and 8,N,1(10 bit data). Set the Sync DCE at 19.2k and put the DCE(modem) into Local Loop back. Plug in the data cables. Now exit and restart Hyper Terminal. Single sided communications should now work. If the user can establish single sided communications on each side of the Sync communications link, in all probability there is a sync communications problem between the two sync devices.

5.0 Technical specifications

Application

Interconnection of low speed Async terminal or DTE device to a sync 16k, 64k or 128k clear channel modem or DCE device

Capacity

One DCE and one DTE

Serial Data Interface

Available in V.35, RS-530, RS-422/449, RS-232, X.21, HSSI, TTL
 * other interfaces available by special order

Data Format

Synchronous or Asynchronous
 Data Transparent at all Data Rates

Data Rates

ASYNC: 1.2k, 2.4k, 4.8k, 9.6k, 19.2k, 38.4k, 57.6k and 115.2k
 SYNC: 16k, 64k, and 128k

Indicators

POWER(PWR), TXD, RXD, TXC, RXC, RTS, CTS, DTR, DCD

Surge Protection

Main power supply

Power Source

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

DC Mains: DC Voltage, Input Range of -36 to -72vdc Current Draw at 48vdc: 75ma @ 3.6watts

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 9.00 inches (20.86 cm)
 Length 9.00 inches (20.86 cm)

Weight

3 pounds (1.36Kg)

Warranty

Three Years, Return To Factory

Regulatory Approvals

UL 60950-1, 2nd Ed 2007; CAN/CSA 22.2 No. 60950-1-07; EN 60950-1:2006; EN 55022:2006; FCC Pt 15/ICES-003 Class A

ORDERING INFORMATION

Main Unit Part Number: 192000
 Model: UDC-RA
 Description: UDC-RA Rate Adapter, 110/220VAC

Serial Interface Cards, **Two Cards Required**
 Per UDC-RA, pick one DCE and one DTE card.

PART #	SERIAL CARD DESCRIPTION
PORT A ASYNC CARDS	
129014	RS-232 DCE I/M, Female DB-25
PORT B SYNC CARDS	
129028	V.35 DTE I/M, Male MR-34
129029	RS-530 DTE I/M, MaleDB-25
129030	RS-422 DTE I/M, Male DB-37
129031	X.21 DTE I/M, Male DB-15
129057	TTL I/M, 2-In & 2-Out BNC 75Ohm
Optional V.35 Connectors	
151038	V.35 DTE I/M, Female DB-25

Optional DC Supply

Part Number: 184018
 Model: UDC-DC -36 to -72 DC Power Supply

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, 110VAC, Qty (2) Part # 714000
 - B) 80ma Fuse, 220 VAC, Qty (2) Part # 714001
 - 2) 712005, DB-25 to V.35 Adapter Cable
 - 3) TCB-V24, RS-232 Tail Circuit Buffer
- For further detailed technical information on this product, contact East Coast Datacom, Inc at: support@ecdata.com