OPERATIONS MANUAL

8-PORT DATA BROADCAST UNIT
WITH DUAL DATA INPUT PORTS

Model: DBU-2328_C

Ordering Part Number: 293000
2-Port Data Sharer with 8-Port RS-232 Data Broadcast Ports
RJ-45 Connectors, 1U Rackmount Chassis

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Common terms used in this user manual.

DCE = data communication equipment

DTE = data terminal equipment

Async = asynchronous

ECDATA = East Coast Datacom, Inc.

PCB = printed circuit card

RXD = Receive Data

TXD = Transmit Data

SAFETY WARNINGS

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. Service and repairs by are to be conducted by qualified/authorized personnel only.

AVERTISSEMENTS DE SÉCURITÉ

Respectez toujours les précautions de sécurité standard lors de l'installation, du fonctionnement et de la maintenance de ce produit. Pour éviter tout risque de choc électrique, assurez-vous de débrancher le cordon d'alimentation de la source d'alimentation avant de retirer les fusibles d'alimentation CEI ou d'effectuer toute réparation.

CAUTION: FOR CONTINUED PROTECTION FROM RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING FUSE. FUSES TO BE RELACED BY QUALIFIED/AUTHORIZED PERSONNEL ONLY. EQUIPMENT INSTALLATION BY QUALIFIED/AUTHORIZED PERSONNEL ONLY. AFTER INSTALLATION, ANYONE CAN USE THIS EQUIPMENT.

ATTENTION: POUR UNE PROTECTION CONTINUE CONTRE LES RISQUES D'INCENDIE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MÊME TYPE ET DE MÊME CALIBRE. LES FUSIBLES DOIVENT ETRE REMPLACES UNIQUEMENT PAR DU PERSONNEL QUALIFIE/AUTORISE. INSTALLATION DE L'ÉQUIPEMENT PAR DU PERSONNEL QUALIFIÉ/AUTORISÉ UNIQUEMENT. APRÈS L'INSTALLATION, TOUT LE MONDE PEUT UTILISER CET ÉQUIPEMENT.

CAUTION: RISK OF ELECTRIC SHOCK: GROUNDED CONDUCTOR (NEUTRAL) PROVIDED WITH OVERCURRENT PROTECTION. TEST COMPONENTS BEFORE TOUCHING.

ATTENTION: RISQUE DE CHOC ÉLECTRIQUE: CONDUCTEUR MIS À LA TERRE (NEUTRE) ÉQUIPÉ D'UNE PROTECTION CONTRE LES SURINTENSITÉS. TESTEZ LES COMPOSANTS AVANT DE TOUCHER.

FCC CLASS A INFORMATION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications to this product not expressly approved by ECDATA could void the user's authority to operate the equipment.

PROPRIETARY NOTICE

WARRANTY NOTICE

WARRANTY: ECDATA 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. ECDATA's sole obligation under its warranty is limited to the repair or replacement of defective equipment, provided it is returned to ECDATA, transportation prepaid, within a reasonable period. This warranty will not extend to equipment subjected to accidents, misuse, alterations, or repair not made by ECDATA or authorized by ECDATA in writing.

CHAPTER 1 - PRODUCT DESCRIPTION

The DBU-2328_C is an 8-port data broadcast unit with a single or dual input data ports. The product supports any RS-232 asynchronous data protocols such as 8, N, 1 character formatting. The input data ports are marked Port-A and Port-B and the output data parts are marked Port-1 through Port-8.

The units dual RS-232 RJ-45 data input ports function like a data sharing device by allowing a single data channel input to connect to the DBU-2328_C using RTS to CTS handshake protocols or Port-A only may be forced active. This ensures the user always has an input datalink ready. Only input data Port-A or Port-B is allowed by the internal logic to establish connection while the second input port is in active standby. If the RTS signal drops from Port-A, then Port-B RTS is ready to connect and will receive the CTS signal back allowing connection to the unit. When Port A or Port B is connected, the asynchronous data is transmitted by the attached DTE device into the unit's internal logic. The input data is then replicated and broadcast out the RS-232 data Ports 1 - 8 at the same time. Users may also purchase the complementary USB-232 Converter that has an RJ-45 connector pinned out to connect to the DBU-2328_C RJ-45 ports with a standard CAT-6 cable at distances up to 150 feet at 9.6kbps.

The front panel of the unit has LED's illuminating for active power, Port-A or Port-B connection status with active RTS, TXD and CTS signal status. Additional LED's indicate the status of the front panel Port-A & Port-B switches as enabled and the RS-232 test mode HELLO broadcast signal Red LED when enabled on the rear panel push button switch.

The HELLO data stream is a test mode only feature for assisting broadcast data cabling during product installation and test. The test feature is enabled via a recessed rear panel push button switch and when enabled a red LED will flash on the rear panel and the front panel to alert the user that the HELLO test pattern feature is running. To disable, simply push the recessed switch and when the red LED stops flashing the HELLO command stops and the user data on PORT-A or PORT-B may be utilized. The installer of the DBU-2328_C may connect a laptop PC with Putty or a similar program to visually see the HELLO Async data pattern to confirm cabling is correct trouble shooting cabling issues. The async data pattern is 9.6k async 8, N, 1.

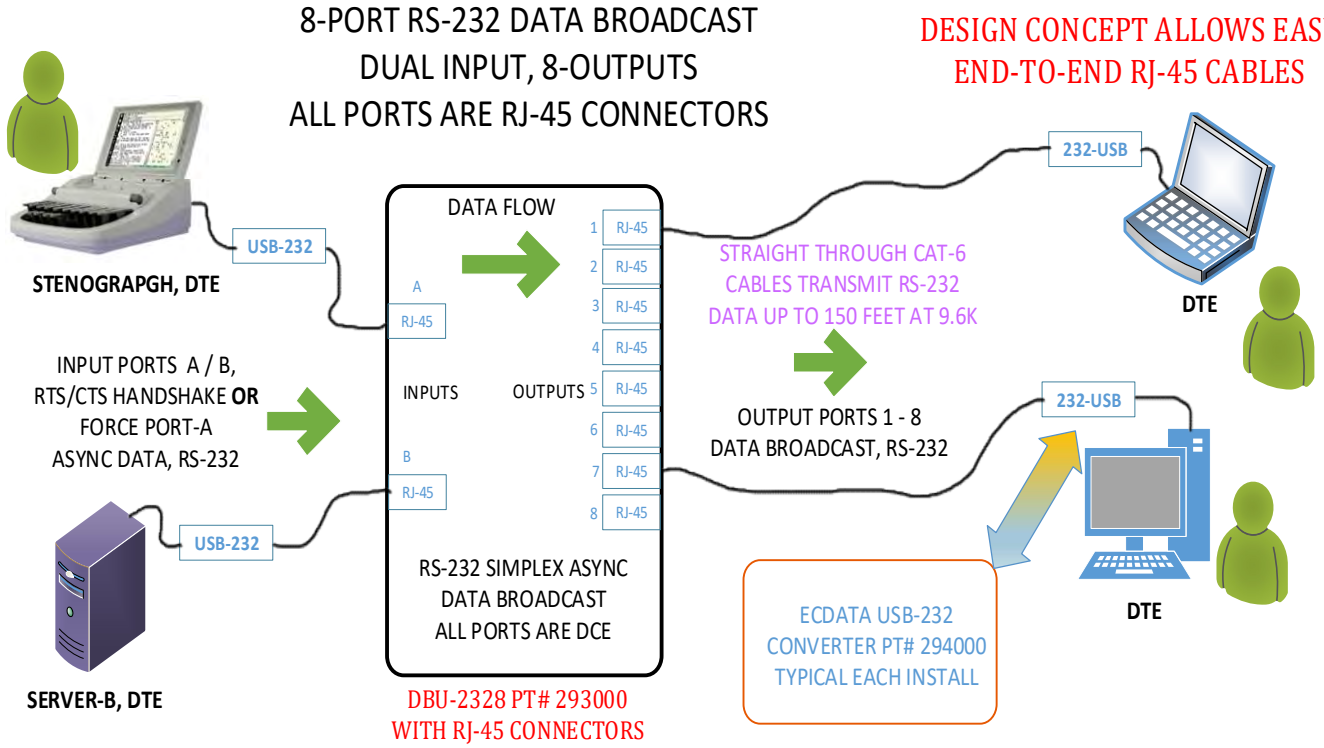


Figure 1 - Typical Application

CHAPTER 2 - PRODUCT FUNCTIONS OVERVIEW

The DBU-2328_C operates on 110/220VAC selectable power. The unit's data ports are RS-232 and are all configured as DCE interfaces. Simplex Async Data only is supported, any character length such as 10 bit data or 8, N, 1. The unit has two user data input ports marked PORT-A and PORT-B. These two ports must be capable of RTS/CTS handshaking or RTS & DTR / CTS handshaking. RTS from the selected input Port-A or Port-B is passed to broadcast ports 1-8 as CTS (pin 5). Optionally, CTS to the broadcast ports may be forced using S1 dip switch.

INPUT PORT-A and PORT-B PINOUTS

RJ-45 FEMALE CONNECTORS	
PIN NUMBER	**PIN NAME**
1	Data Set Ready(DSR) – ***Forced High***
2	Data Terminal Ready (DTR)
3	Request To Send (RTS)
4	Receive Data(RXD)- ***Forced High***
5	Transmit Data (TXD)
6	Clear To Send (CTS)
7	Ground (GND)
8	Data Carrier Detect(DCD) - ***Forced High***

OUTPUT PORTs 1 – 8 PINOUTS

RJ-45 FEMALE CONNECTORS	
PIN NUMBER	**PIN NAME**
1	Data Set Ready(DSR) – ***Forced High***
2	Data Terminal Ready (DTR) – ***No Connect***
3	Request To Send (RTS) – ***No Connect***
4	Receive Data(RXD)
5	Transmit Data (TXD) – ***No Connect***
6	Clear To Send (CTS)
7	Ground (GND)
8	Data Carrier Detect(DCD) - ***Forced High***

2.1 FRONT AND REAR PANEL INDICATORS

FRONT PANEL LED'S DESCRIBED FROM LEFT TO RIGHT

LED 1 AC MAINS POWER ILLUMINATED WHEN AC MAINS POWER IS APPLIED
LED 2 PORT-A ACTIVE ILLUMINATED WHEN PORT-A IS THE SELECTED INPUT PORT
LED 3 RTS IN FROM PORT-A ILLUMINATED WHEN RTS FROM PORT-A IS ACTIVATED
LED 4 PORT-B ACTIVE ILLUMINATED WHEN PORT-B IS THE SELECTED INPUT PORT
LED 5 RTS IN FROM PORT-B ILLUMINATED WHEN RTS FROM PORT-B IS ACTIVATED
LED 6 DATA OUT PORTS 1-8 ILLUMINATED WHEN DATA IS SENT TO OUTPUT PORTS 1-8
LED 7 CONTROL OUT(CTS) ILLUMINATED WHEN (CTS PIN 5) IS SENT TO PORTS 1-8
LED 8 PORT-A ENABLE ILLUMINATED WHEN PORT-A IS ENABLED FROM THE SWITCH
LED 9 PORT-B ENABLE ILLUMINATED WHEN PORT-B IS ENABLED FROM THE SWITCH
LED 10 MESSAGE OUT ILLUMINATED WHEN "HELLO" DATA HAS BEEN ENABLED TO PORTS 1-8

REAR PANEL LED

LED 11 MESSAGE OUT ILLUMINATED WHEN "HELLO" DATA HAS BEEN ENABLED TO PORTS 1-8

2.2 FRONT PANEL SWITCHES

Port-A and Port-B input data ports are enabled or disabled with the push button switches. A ***green*** LED is illuminated when the port is ***enabled***. During normal use, both Port-A and Port-B should be enabled.

2.3 REAR PANEL CONNECTORS AND FUSES

Located on the 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 containing 110 or 220VAC fuses. RS-232 RJ-45 connectors for data connection. A recessed Test Pattern switch and red LED. ***The test pattern LED will flash red when the test pattern is ENABLED***.

2.4 EQUIPMENT GROUNDING

Jumper J20 located on the PCB provides for grounding interconnection in those systems requiring a connection between Pin #1 (frame ground) and Pin # 8 (signal ground). Please reference the PCB for further strapping details. Factory default is ***NO CONNECT***.

2.5 3-PIN JUMPER OPTIONS

Located on the PCB at several user options for configuration. **Jumper JP1 & JP2** positions 1-2 allow RTS to CTS handshaking on input Port-A & Port-B. If the users system requires RTS/DTR to receive CTS back, move JP1 & JP2 to position 2-3 on the header.
Jumper J6 allows enable or disable of input Port-A. The default is enabled positions 1-2. To disabled Port-A completely, move the jumper to positions 2-3.

2.6 DIP SWITCH SETTINGS AND FACTORY DEFAULT

The factory default positions on the dip switch marked S1 on the PCB are all set to OFF. This enables 50ms for RTS to CTS delay to ensure asynchronous character recognition of all devices.

DIP Switch PCB marked "S1" definitions for DBU-2328_C

Dip Switch Position S1 Settings		
Position 1	Position 2	Function
OFF	**OFF**	**50ms of RTS to CTS Delay ****
OFF	ON	25ms of RTS to CTS Delay
ON	OFF	10ms of RTS to CTS Delay
ON	ON	5ms of RTS to CTS Delay
		** Factory Default
Position 3	Position 4	Function
OFF	OFF	RTS from input port passed to Port 1-8 as CTS (pin 5)
ON	OFF	CTS is forced to Ports 1-8

2.7 TEST MODE – HELLO DATA MESSAGE

Press in to enable the HELLO broadcast message to Ports 1-8. The message is async, 8,N,1 async format. The user can read the message on a laptop PC via a RS-232 serial port using a free download called PUTTY or similar serial program. Ensure that PUTTY is set for 9600bps, 8,N,1 data format. The message should be received as HELLO with no character issues to debug your cabling. The HELLO message is sent every 200ms continuously. When completed with testing, depress the rear panel switch and the front and rear panel LED will stop flashing.

CHAPTER 3 - INSTALLATION

3.1 VOLTAGE SELECTION

CAUTION: DISCONNECT POWER BEFORE SERVICING PRODUCT:
It is very important to check that the unit is set to the correct operating voltage 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 of the product you will find an IEC Power receptacle. This receptacle contains a fuse drawer. Two (2) fuses are in this compartment.
FUSES for 110VAC, 0.160ma value, MFR: Shurter, Inc. PT# 034.3109
FUSES for 220VAC, 0.080ma value, MFR: Shurter, Inc. PT# 034.3106

3.3 POWER CONNECTION

Before connecting the DBU-2328_C to an AC power source the top cover should be installed with the supplied #6-32 screws. AC power is supplied to the DBU-2328_C via the supplied power cord terminated by a grounded 3-prong plug. Select an appropriate location accessible to and within four to six feet of an AC outlet. The AC Power source MUST be grounded.

3.4 INTERNAL DIP SWITCH AND PIN-HEADER SETTINGS

Disconnect the power cord to set the dip switch S1 and 3-Pin header jumper settings if changes are required.

3.5 CONNECTING DATA CABLES AND SENDING DATA

Connect your two DTE data sources into the DBU-2328_C ports marked ***MASTER INPOUT PORT-A*** and ***PORT-B***. The RS-232 Input Port is a DCE interface and a straight through data cable should be connected to the attached DTE device, normally a server. Ensure the front panel switches ***Port-A*** and ***Port-B*** are pushed in and the two accompanied ***green LED's*** are illuminated verifying ***ENABLED***.

The units output broadcast ***Ports 1-8*** are configured as a DCE interface, and you should connect a straight thru RS-232 data cable to your DTE equipment to receive the input broadcast data. CTS should always be high to the attached DTE.

After connecting the user input data, the user input DTE equipment should be activated to allow RTS to CTS handshaking for RS-232 Async data transfer. The first input port to ***raise the RTS signal*** will be given access to the DBU-2328_C and the front panel LED will **illuminate RTS and Port-A** or ***Port-B*** indicating input port connection. The user input data will be sent out Ports 1-8. The front panel LED's for ***RXD and CTS*** should now be illuminated. ***NOTE:*** It is possible for both of the RTS LED's to be illuminated, however only one of the two input ports will indicate Port-A or Port-B ***as active***. If RTS is illuminated on the standby port, this indicates RTS is high and the port is ready to connect when the current active port drops RTS.

3.6 HANDSHAKE METHODS

The product supports two handshake methods:

1) **RTS to CTS *(Factory default*, *PCB 3-Pin headers Marked JP1 & JP2 are in the 1-2 Position***) – This method allows the users DTE devices attached to Port-A and Port-A to gain access to the product when the user DTE raises the RTS signal and the DBU-2328_C will return CTS. Which then connects the DTE and the user data is received on Pin 2 as RXD of the RJ-45 input

port A or B. The data is then replicated by the internal PCB design logic and send out Ports 1-8 as TXD on Pin 3 of the RJ-45 connectors. (This is the most common handshake method)

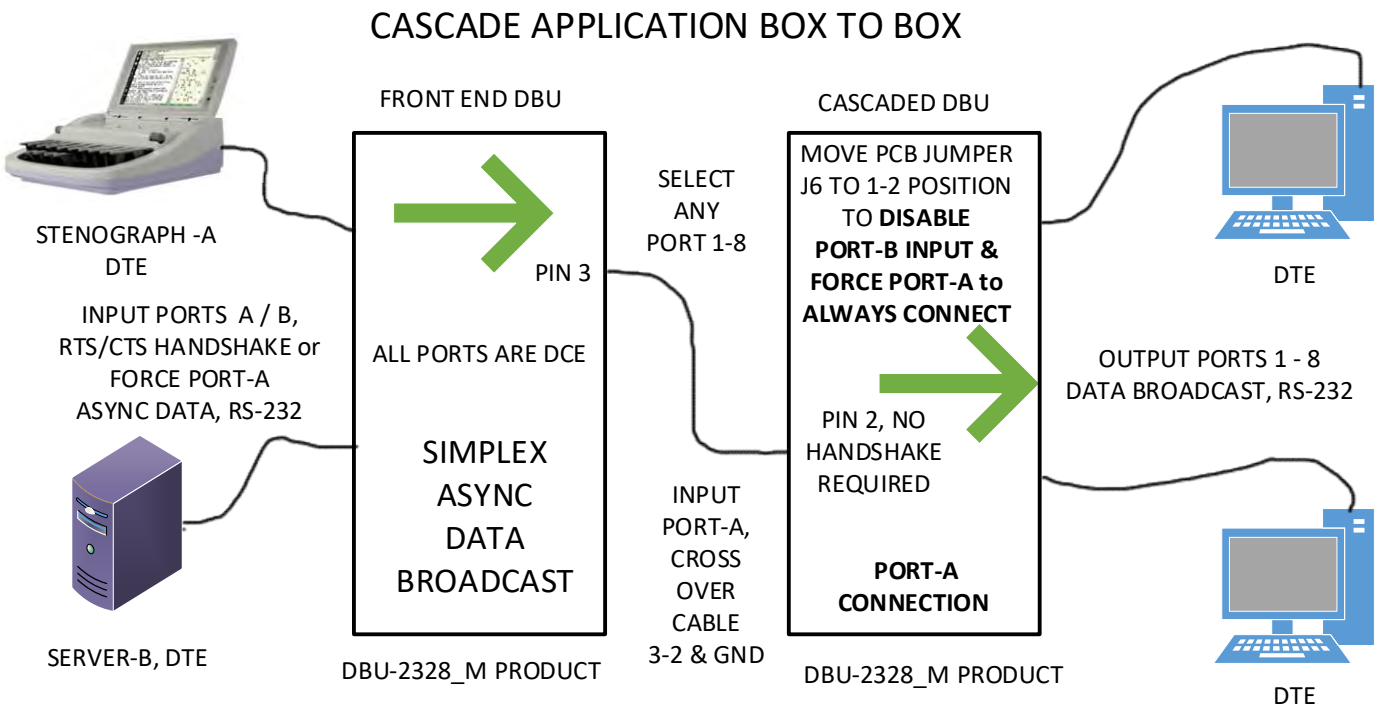
2) **RTS/DTR to CTS *(PCB 3-Pin headers Marked JP1 & JP2 are moved to the 2-3 Position*)** – This method allows the user DTE devices attached to Port-A and Port-A to gain access to the product when the users DTE raises the ***RTS & DTR*** signal and the DBU-2328_C will return CTS. Which then connects the DTE and the user data is received on Pin 2 as RXD of the RJ-45 input port A or B. The data is then replicated by the internal PCB design logic and send out Ports 1-8 as TXD on Pin 3 of the RJ-45 connectors. (RTS/DTR to CTS could be required on some user systems)
3) **NO HANDSHAKE** – Move the PCB jumper J6 to the 1-2 Position and connect your DTE device to INPUT PORT-A. Simply send data without any handshake required.

3.7 RTS TO CTS DELAY OPTION

The product supports ***RTS to CTS delays*** via the internal Dip Switch located at ***S1 on the PCB***. The settings are ***5, 10, 25 & 50ms delays***. Meaning, when the users DTE attached to Port-A or Port-B raises RTS, the unit will respond back with CTS 50ms later. This will allow sufficient time for the users ASYNC DATA character pattern to be recognized by the attached DTE device and system synchronization to take place.

3.8 CASCADING

The product supports cascading by using any of the output broadcast Ports 1 – 8 and the input PORT-A into the cascaded unit(see diagram below). This requires that the user change a 3-Pin jumper located at ***J6 to position 1-2***, which ***disables PORT-B input completely and will force PORT-A to be enabled all the time without any handshake required***. The user should also ***disable the front panel PORT-B push button switch***. A ***Cross-Over cable*** will also be required to reverse ***PINS 2-3 OF THE FRONT END DBU*** to the INPUT PORT-A of the cascade unit.



CHAPTER 4 – TROUBLE SHOOTING ISSUES

PROBLEM: Front panel PWR or power LED is not illuminated – ***(FIRST, DISCONNECT THE POWER CORD)***
ANSWER: verify that the rear panel 110/220VAC switch is set to your operating voltage. If correct and still NO POWER, remove the power entry fuse drawer and verify the fuses are good by setting a multimeter to CONTINUITY MODE and checking the fuses end to end on the meter for continuity. Fuse info below.
The IEC Power receptacle contains a fuse drawer. Two (2) fuses are in this compartment.
FUSES for 110VAC, 0.160ma value, MFR: Shurter, Inc. PT# 034.3109
FUSES for 220VAC, 0.080ma value, MFR: Shurter, Inc. PT# 034.3106

PROBLEM: Port-A or Port-B RTS is illuminated but PORT-A or PORT-B LED is not illuminated –
ANSWER: verify your cable pinouts support RTS and CTS and that the cables from your DTE device to the DBU-2328_C are straight through cables. Verify also that your hand shake only

PROBLEM: Either Port A/B RTS and PORT A/B are illuminated, the DATA LED is flashing, but you have no data on Ports 1-8 to your end DTE devices.
ANSWER: The output data is on ***PIN-3 of the RJ-45 Ports 1-8***, verify you have connection to that pin along with ground on PIN-7. REFERENCE the pinout charts for connection on PAGE 4 of this user manual. Additionally, your DTE device may require RTS/CTS handshake, so that may need to be in your cables. The unit will supply CTS high to your DTE device as long as the pin is in your cable. Try a fully pinned RJ-45 cable – straight through – no cross over.
Additionally, you can debug your cables by pressing the rear panel ***TEST PATT*** switch – this will send a async ***HELLO*** message every 200ms out ports 1-8 and you can connect a laptop PC with PUTTY terminal running at 9.6k and 8,N,1 protocol and you should see the HELLO message when cabled correctly. When finished, ***depress the TEST PATT switch*** and PORT-A/B input data are ready to access the unit.

Problem: I want to cascade another DBU-2328_C unit behind the first, but the cascade unit does not show Port-A active nor RTS active.
Answer: disconnect power, remove the top cover. Locate **J6 on the PCB**, move the jumper to ***PINS 1-2***, this will force ***PORT-A active with PORT-A RTS LED active*** on the front panel. Disable the cascade units Port-B front panel switch. ***Use a cross-over cable from the original unit, any output Port 1-8 to the cascade unit INPUT PORT-A.***

5.0 – TECHNICAL SPECIFICATIONS

Application
8-Port Data Broadcast with Dual Input Data Ports that allow a single port connection using RTS/CTS handshaking or no handshaking

Capacity
One or Two Input Ports
Eight Output Ports
All ports are DCE Interfaces

Interface
EIA RS-232 with Surge Protection

Data Rates
Up to 19.2Kbps

Data Format
Asynchronous - data transparent at all data rates
Any character length

Handshake Method for Input Ports A/B
RTS to CTS or RTS/DTR to CTS or Force Port-A

RS-232 Port Connections
RJ-45 female connectors

RTS to CTS Delay Options
5, 10, 25 & 50ms (Dip Switch Selectable)

Cascade Box to Box Support
Yes – J6 Jumper on PCB to 1-2 position

Front Panel Indicators
Power(PWR), Active Input as Port-A & RTS and Port-B & RTS, output ports 1-8 as RXD & CTS when Port-A /B are connected with RTS/CTS handshake, Input Ports A/B switch enable LED's, Test Patt LED.

Power Source
100-120Vac, 0.16A or 200-240Vac, 0.08A, 50-60Hz, external 110/220 volt select switch, IEC Power Inlet, (2) 5mm Fuses

Power Draw
Less than 3 watts total

MTBF
557,600 Hours
Benign Ground, Controlled, Telcordia Issue 1

Approvals – EMI / Safety / Environmental
EMI Approvals
FCC 47CFR, Part 15, Subpart B for conducted emissions from a Class A
FCC 47CFR, Part 15, Subpart B for radiated emissions from a Class A

Safety Approvals
UL 62368-1

Environmental
Operating Temperature: 50º to 160º F (10º to 60º C)
Operational Alt.: 0 to 2000 Meters above sea level
Operational Relative Humidity: 10% to 80%
Non-Operational Temperature: -30 degC to 70 degC
Non-Operational Alt.: 0 to 50,000 feet above sea level

Dimensions
Height ..... 1.75 inches (4.44 cm)
Width ..... 17.00 inches (43.18 cm)
Depth ..... 9.00 inches (22.86 cm)

Weight
5.0 pounds (2.267 Kg) in the box

Warranty
Three Years, Return to Factory

ORDERING INFORMATION
Part Number: 293000
Model: DBU-2328_C
Description: 2-Port Data Sharer with 8-Port RS-232 Data Broadcast Ports, 1U Rackmount Chassis

OPTIONAL COMPLEMENTARY PRODUCTS
Part Number: 294000
Model: USB-232 w/RJ-45

Part Number: 293009
Model: Loopback Plug, RS-232 w/RJ-45

INCLUDED WITH EACH UNIT:
1) Operations Manual
2) U.S.A. Grounded Power Cord, Part # 713015
3) 1U Rackmount ears, PT# 702037
4) 0.080ma Fuse, Qty (2) Part # 714001