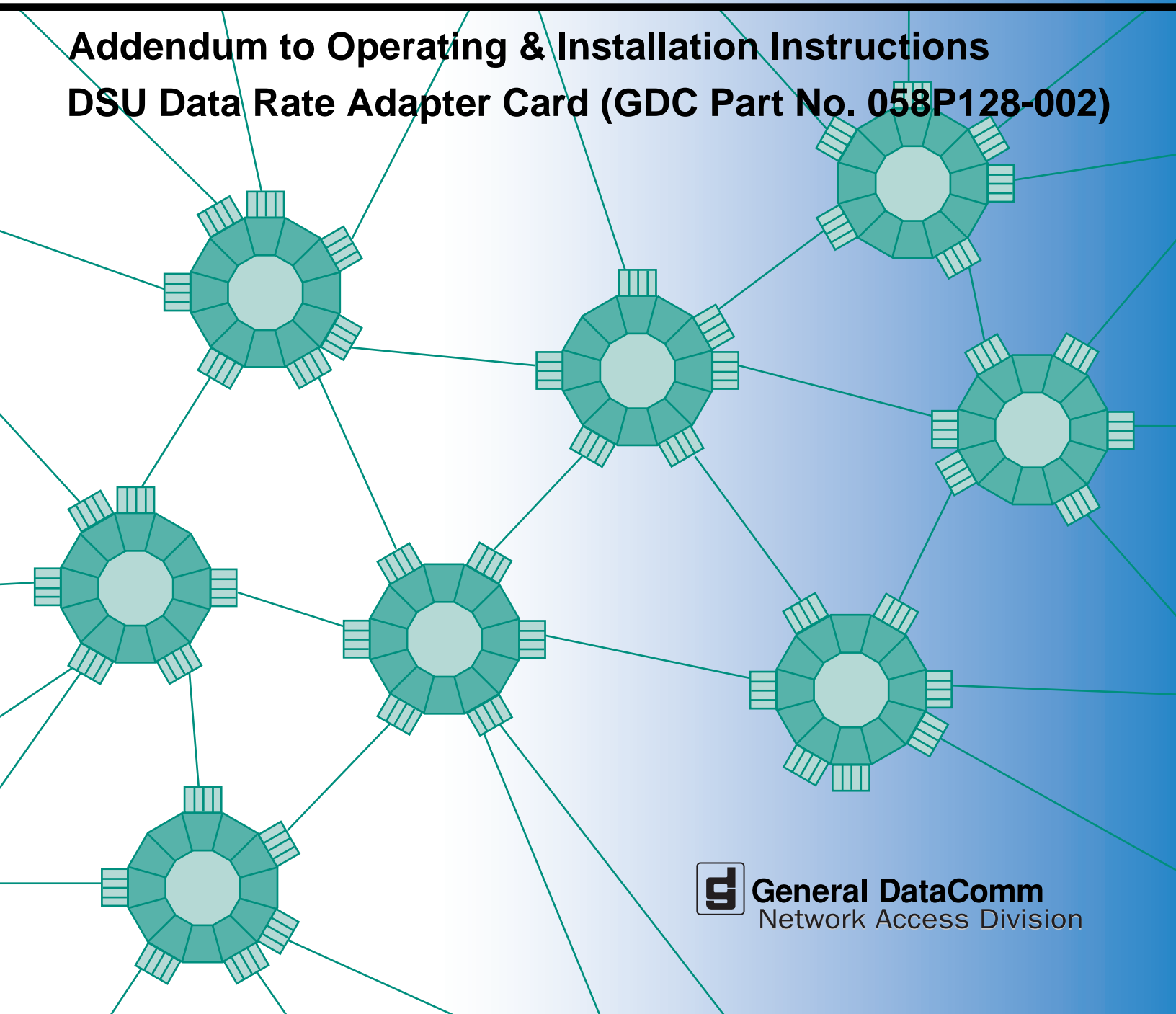


DataComm/NMS/Desktop/SpectraComm® Series Data Service Units

**Addendum to Operating & Installation Instructions
DSU Data Rate Adapter Card (GDC Part No. 058P128-002)**



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Documentation

Revision History

Issue Number	Date	Description of Change
1		Initial Release
2		
3		
4		
5		
6	Feb 2001	Added RTS Signal information
7	June 2001	Correction in asynchronous data rate text

Related Publications

A listing of related user manuals is provided below. In addition to the hardware and software manuals, always read the software System Release Notes supplied with your product.

Publication Name	Publication Number*

* For publications numbers, **REV** is the hardware manual revision (for example, -000, -001, etc.). **VREF** (if listed) is the software revision (for example, -V120 would read: Version 1.2) and corresponds to the most current revision.

Preface

Scope

This manual describes how to install and operate the Data Rate Adapter (DRA). The information contained in this manual has been carefully checked and is believed to be entirely reliable. However, as General DataComm improves the reliability, function, and design of their products, it is possible that information may not be current. Contact General DataComm for updated information on this or other General DataComm products.

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Safety Information

This manual should be read in its entirety and all procedures completely understood before installing or operating the unit. The notes that appear throughout this manual must be read prior to any installation or operating procedure. Examples of notes used in this manual are shown below.

Note *A note provides essential operating information not readily apparent which you should be particularly aware of. A note is typically used as a suggestion.*

Important *Indicates an emphasized note. It is something you should be particularly aware of; something not readily apparent. Important is typically used to prevent equipment damage.*

The CAUTION, WARNING, and DANGER statements that appear throughout this manual are intended to provide critical information for the safety of both the service engineer and operator. These statements also enhance equipment reliability. The following definitions and symbols for CAUTION, WARNING, and DANGER as they are used in this manual comply with ANSI Z535.2, American National Standard for Environmental and Facility Safety Signs, and ANSI Z535.4, Product Safety Signs and Labels, issued by the American National Standards Institute.



CAUTION *Indicates a potentially hazardous situation which, if not avoided, may result in minor to moderate injury. It may also be used to alert against unsafe practices.*



WARNING *indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.*



DANGER *indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.*

Safety Guidelines

Always use the following guidelines when unsafe conditions exist or when potentially hazardous voltages are present:

- Always use caution and common sense.
- Repairs must be performed by qualified service personnel only.
- To reduce the risk of electrical shock, do not operate equipment with the cover removed.
- Never install telephone jacks in a wet location unless the jack is designed for that location.
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface.
- Never install telephone wiring during an electrical storm.

Antistatic Precautions

Electrostatic discharge (ESD) results from the buildup of static electricity and can cause computer components to fail. Electrostatic discharge occurs when a person whose body contains a static buildup touches a computer component. This product may contain static-sensitive devices that are easily damaged. Proper handling, grounding and precautionary ESD measures are essential when installing parts or cards. Keep parts and cards in antistatic packaging when not in use or during transport. If possible, use antistatic floorpads and workbench pads.

When handling components, always use an antistatic wrist strap connected to a grounded equipment frame or chassis. *If a wrist strap is not available, periodically touch an unpainted metal surface on the equipment.* Never use a conductive tool, like a screwdriver or a paper clip, to set switches.

FCC Part 68 Compliance

Connection of data communications equipment to the public telephone network is regulated by FCC Rules and Regulations. This equipment complies with Part 68 of these regulations which require all of the following:

All connections to the telephone network must be made using standard plugs and telephone company provided jacks or equivalent. Connection of this equipment to party lines and coin telephones is prohibited. A label on the component side of the unit's printed circuit board provides the FCC Registration number for the unit. If requested, give this information to the telephone company. To connect the product to the Public Telephone Network, you are required to give the following information to the telephone company:

- FCC Registration Number: TBD
- Facility Interface Codes: 04DU9-BN, 04DU9-DN, 04DU9-1KN, 04DU9-1SN
- Service Order Code: 6.0Y
- Telephone Company jack type: RJ48C

The telephone company may discontinue your service if the unit causes harm to the telephone network. If possible, you will be notified of such an action in advance. If advance notice is not practical, you will be notified as soon as possible and will be advised of your right to file a complaint with the FCC. The telephone company may change its communication facilities, equipment, operations and procedures where reasonably required for operation. If so, the telephone company will notify you in writing. All repairs or modifications to the equipment must be performed by General DataComm. Any other repair or modification by a user voids the FCC registration and the warranty.

Part 15 Compliance

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.

Industry Canada Notification

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operation and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Electromagnetic Compatibility

This Class A digital apparatus complies with Canadian ICES-003.

Avis D'industrie Canada

L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

Avis: L'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

La Compatibilité d'Électro-magnétique

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Deutschland

Überblick Sicherheit

Bitte lesen sie dieses Handbuch komplett durch und stellen sie sicher, daß sie alle Vorschriften verstehen, bevor sie das Gerät installieren oder betreiben. Die Hinweise in diesem Handbuch müssen vor Installation oder Betrieb gelesen werden. Beispiele für Hinweise sehen sie hier.

Hinweis *Ein Hinweis enthält wichtige Informationen zum Betrieb, die nicht auf den ersten Blick ersichtlichsind, und die zu beachten sind. Ein Hinweis dient als Vorschlag.*

Wichtig *Bedeutet einen besonders wichtigen Hinweis. Darauf sollten sie besonders achten, da dies nicht offensichtlich ist. Wichtige Hinweise dienen im Allgemeinen dazu, Schäden am Gerät zu vermeiden.*

Die Hinweise CAUTION (VORSICHT), WARNING (WARNUNG) und DANGER (GEFAHR), welche im Handbuch erscheinen, enthalten entscheidende Informationen für die Sicherheit sowohl des Servicepersonals als auch der Bediener. Diese Hinweise erhöhen die Zuverlässigkeit der Anlage. Die folgenden Definitionen und Symbole für VORSICHT, WARNUNG und GEFAHR, wie sie in diesem Handbuch auftreten, sind gemäß ANSI Z535.2, Amerikanischer Nationaler Standard für Sicherheitszeichen für Umwelt und Anlagen, und ANSI Z535.4, Produkt-Sicherheits-Zeichen und Beschriftungen, ausgegeben vom American National Standards Institute.



VORSICHT *bedeutet eine potentiell gefährliche Situation, die wenn sie nicht vermieden wird, zu leichten oder mittelschweren Verletzungen führen kann.*



WARNUNG *bedeutet eine drohende gefährliche Situation, die wenn sie nicht vermieden wird, zu schweren Verletzungen oder zum Tode führen kann.*



GEFAHR *bedeutet eine drohende gefährliche Situation, die wenn sie nicht vermieden wird, zwangsläufig zu schweren Verletzungen oder zum Tode führt.*

Sicherheitsrichtlinien

Unter normalen Umständen arbeitet die Anlage sicher und zuverlässig in ihrem Netzwerk. Falsche Handhabung oder Installation von Bestandteilen kann zu Ausfällen oder Gefahren für den Bediener führen. Seien sie vorsichtig und beachten sie die allgemeinen Regeln bei der Installation der Netzwerkkabel. Beachten sie die folgenden Hinweise, besonders bei unsicheren Umständen oder potentiell gefährlichen Spannungen:

- Reparaturen dürfen nur von qualifiziertem Servicepersonal ausgeführt werden.
- Zur Vermeidung elektrischer Schläge darf die Anlage nicht mit geöffneter Abdeckung betrieben werden.
- Niemals Netzwerkstecker in feuchter Umgebung installieren, es sei denn der Stecker ist dafür ausgelegt.
- Niemals unisolierte Netzwerkdrähte oder Klemmen berühren, es sei denn das Netzwerk ist am Interface abgeschaltet.
- Niemals Netzwerk bei elektrischem Gewitter verdrahten.

EC Declaration of Conformity

We: General DataComm Limited
Molly Millars Lane
Wokingham, Berkshire RG41 2QF, United Kingdom

On behalf of: General DataComm Inc.
1579 Straits Turnpike
Middlebury, CT 06762-1299, U.S.A.

The products to which this declaration relates are in conformity with the following relevant harmonized standards, the reference numbers of which have been published in the Official Journal of the European Communities.

Electromagnetic Compatibility

EN 55022: 1994

Specification for limits and methods of measurement of radio interference characteristics of information technology equipment.

EN 50082-1: 1992

Generic immunity standard Part 1 Residential, Commercial, and Light Industry.

Safety

EN 60950: 1997 A1 through A11

Low Voltage Directive relating to electrical equipment designed for use within certain voltage limits.

Service Support and Training

VITAL Network Services, a General DataComm company, is committed to providing the service support and training needed to install, manage, and maintain your GDC equipment. VITAL Network Services provides hands-on training courses through **VITAL Network Services Global Technology Training Services**. Courses range from basic data communications, modems and multiplexers, to complex network and ATM systems. Training courses are available at our centers in the US, UK, France, Singapore and Mexico, as well as at a customer's site.

For more information on VITAL Network Services or for technical support assistance, contact VITAL Network Services at:

VITAL Network Services World Headquarters

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Naugatuck, Connecticut 06770 USA

<http://www.vitalnetsvc.com>

Telephones:	Faxes:
1 800 243 1030	1 203 723 5012
1 888 248 4825	1 203 729 7611
1 203 729 2461	

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<p>North American Region Office 6 Rubber Avenue Naugatuck, Connecticut 06770 USA Telephones: 1 800 243 1030 1 888 248 4825 1 203 729 2461 1 800 361 2552 (French Canadian) Training: 1 203 729 2461 Faxes: 1 203 723 5012 1 203 729 7611</p>	<p>Central America, Latin America VITAL Network Services Periferico Sur 4225, Desp. 306 C.P. 14210, Mexico D.F., Mexico Telephone: 52 5 645 2238 Training: 52 5 645 2238 Fax: 52 5 645 5976</p>
<p>Europe, Middle East, Africa VITAL Network Services Molly Millars Close Molly Millars Lane Wokingham, Berkshire RG41 2QF UK Telephone: 44 1189 657200 Training: 44 1189 657240 Fax: 44 1189 657279</p>	<p>Asia Pacific VITAL Network Services 501 Orchard Road 05-05 Wheelock Place, Singapore 238880 Telephone: 65 735 2123 Training: 65 735 2123 Fax: 65 735 6889</p>

Overview

The DSU Data Rate Adapter version -002 is a plug-in piggyback card available as a factory installed option, or as a field-upgrade kit. It is capable of adapting synchronous and asynchronous DTE data transmission at speeds of 19.2 kbps and slower to an aggregate line speed of 56 or 64 kbps. Rate adaptation is provided for point-to-point and multipoint applications.

- Note**
- 1) The previous version -001 of the Data Rate Adapter does not support 5-bit synchronous multipoint, external timing option or dial-backup capabilities.
 - 2) Test voltages +12 V on TIA/EIA-232-F pin 9, and -12 V on TIA/EIA-232-F pin 10 are not supplied on the Business Equipment connector.
 - 3) Use of the Data Rate Adapter might impact the round-trip delays of the network in varying amounts for different data rates. Customers should call VITAL Network Services at 203-729-2461 for technical support.

Adding Data Rate Adapter

The purpose of this addendum is to provide you with instructions to install and operate your data rate adapter piggyback card if it has not already been installed at the factory or described in the DSUs manual. Refer to [Figure A-1](#), and the following text.

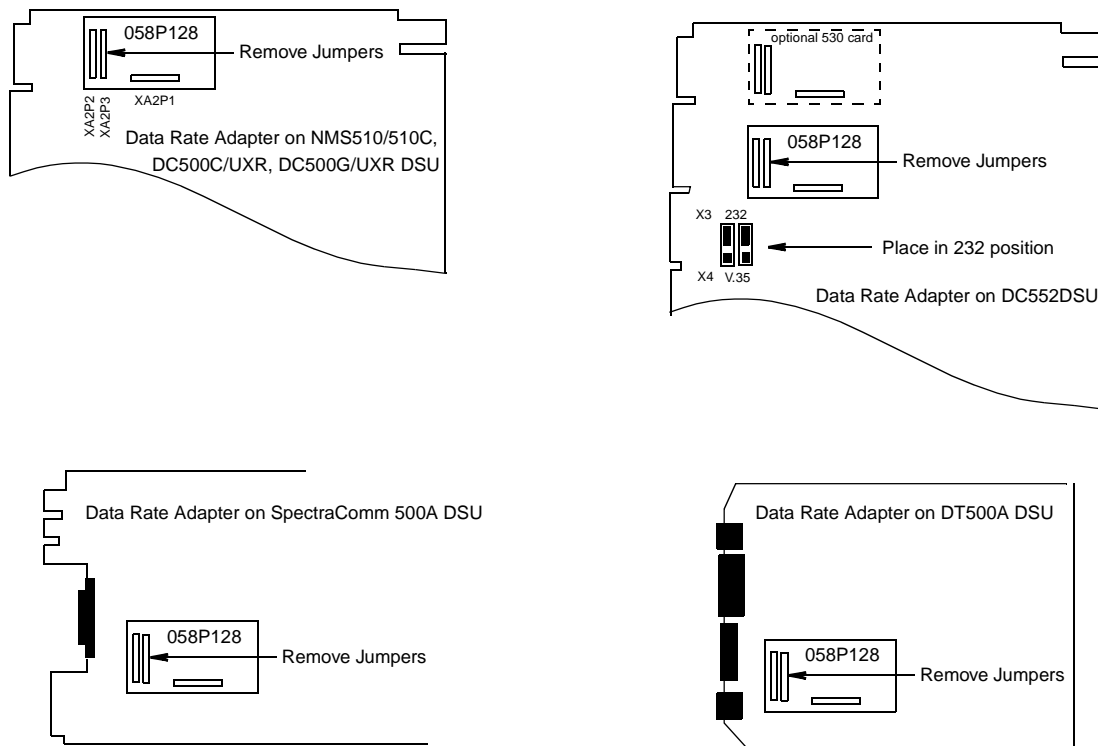


Figure A-1 Location, DSU Data Rate Adapter

The data rate adapter may be added to the following DSUs:

NMS510	510C DC552
NMS510 IFP	DC552A
NMS520	DC552A V1.1
NMS520 IFP	DT500
DC500C/UXR	DT500A
DC500G/UXR	SC (SpectraComm)500A
DC500F/AXR,	DBU-56FW

General

The DSU Data Rate Adapter plugs into the basecard of the above mentioned DSU's, in the space that would normally occupy the optional 530 interface plug-in card. Other placements are described in this addendum or the appropriate DSU manual. On the 552 DSU, only one rate adapter is allowed, and it uses channel B. On the DeskTop 500A, only the rate adapter is supported.

Refer to the accompanying illustrations or those in the DSU manual as needed to help you identify the parts included in the kit. Ensure that you have all needed parts before proceeding. If any parts are missing or broken, contact General DataComm immediately.

Ensure that your DSU is disconnected from service and from the main power source before proceeding with your installation.

Standalone Procedure

Remove the cover from the DSU enclosure as described in the appropriate manual.

Rackmount Procedure

To remove a rackmounted DSU, grasp the front panel with both hands, and pull the DSU straight forward out of the rack.

Component Removal

If your DSU has the optional 530 Interface Card attached to its base card (or in the case of the 552, the upper level card) it must be removed. The 530 card will be attached to the base card with 2 screws; remove the screws, and pull straight up on the card to remove. If it doesn't have a 530 card installed, jumpers will be installed in the connector (see Note below). In any case, the card, or jumpers must be removed before installing the adapter card.

Note

ADDING JUMPER KIT (010K024-001)

The DSU Data Rate Adapter can either be factory installed or added later as a kit. When the Data Rate Adapter is removed, the products will be inoperable without installing the jumpers. A jumper kit 010K024-001 is available and should be used when original jumpers are not available.

Place the four 2X8 jumpers over the two 2X16 connectors used by the optional Data Rate Adapter Card.

Install Adapter Card

You are now ready to install the adapter card on the base card. The new card is installed component side down on the base card to connectors XA2P2, XA2P3, and XA2P1 on the NMS 510 and 510C, DataComm 500C UXR and DataComm 500G UXR DSUs, and to connectors A3P1, A3P2 and A3P3 on the DataComm 552 DSU. (Channel B location ONLY).

Other installations are described in the appropriate DSU manual.

Secure the card with 1 screw from the bottom of its base card. Re-assemble your unit.

Adapter Card Option Settings

The following options are available and located on the 8-position switch S1 or header X1. (Refer to [Figure A-2](#)).

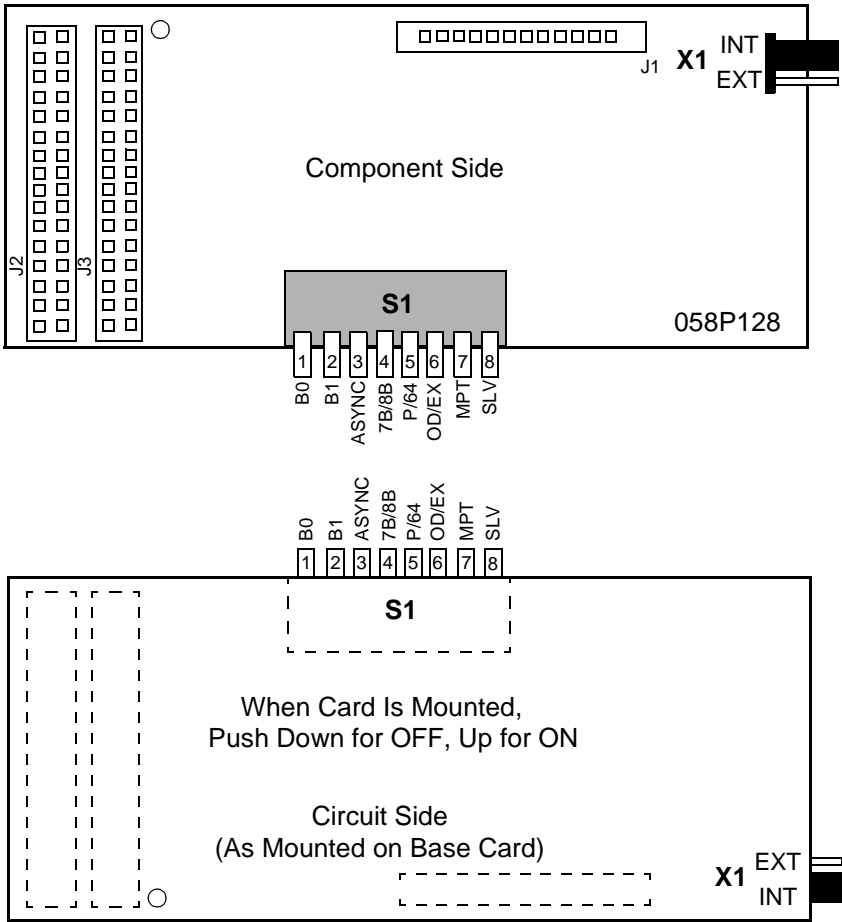


Figure A-2 Option Location, DSU Data Rate Adapter

EXT/INT (X1) - This option provides clock selection for internal (Default) or external timing. (In synchronous mode only).

B0, B1, (S1-1, 2) - In synchronous mode (S1-3 OFF), B0 and B1 select the following synchronous DTE data rates:

B0 (S1-1)	B1 (S1-2)	DTE Data Rate (bps)
OFF	OFF	2400
ON	OFF	4800
OFF	ON	9600
ON	ON	19.2K

In asynchronous mode (S1-3 ON), B0 and B1 select the following asynchronous DTE data rates:

B0 (S1-1)	B1 (S1-2)	DTE Data Rate (bps)
OFF	OFF	1200
ON	OFF	2400
OFF	ON	9600
ON	ON	19.2K

Note When operating in synchronous mode, send data and receive data LED's will be dimly lit when not passing data.

ASYNC (S1-3) - When enabled (S1-3 ON), asynchronous operation is selected. In this mode, S1-4 through S1-6 selects the character format, parity, and parity type as described in the table below. When this feature is disabled (S1-3 OFF), synchronous operation is selected and S1-4 through S1-6 determines network compatibility, aggregate rate and external timing.

7B/8B (S1-4) - For asynchronous operation only. The OFF position selects 8 bits data per character DTE data transmission. The ON position selects 7 bits data per character DTE data transmission.

7B/8B (S1-4) For Asynchronous	7B/8B (S1-4) For Synchronous
OFF = 8 bits data per character DTE data transmission	OFF = 5 bits data per character network data transmission
ON = 7 bits data per character DTE data transmission	ON = 8 bits data per character network data transmission

Note Option is for sync mode 56K/SC Multipoint without clear channel.

5-bit for compatibility with 058P128-001 Rev H- or later and all 058P128-002's. (Maximum 5 consecutive 0's to network)

8-bit for compatibility with 058P128-001 Rev G- or older.

For synchronous multipoint operation only. The OFF position selects 5 bits data per character DTE data transmission. The ON position selects 8-bits data per character DTE data transmission.

P/64 (S1-5) - For asynchronous operation only. The OFF position inhibits transmission of the parity bit. By selecting the ON position, parity transmission is enabled. Refer to the table below:

Asynchronous	Synchronous
OFF = No Parity	OFF = 56 kbps Aggregate Line Rate
ON = Parity Enabled	ON = 64 kbps Aggregate Line Rate

For synchronous operation only. This option provides rate adaptation to the aggregate line rate of 56 kbps (OFF) or 64 kbps (S1-5 ON).

OD/EX (S1-6) - With switch S1-5 ON, in asynchronous operation only, the OFF position of this switch selects even parity. When ON, odd parity is selected. Refer to the table below:

Asynchronous	Synchronous
OFF = Even Parity	OFF = Default or Internal Timing
ON = Odd Parity	ON = External Timing

Note *The X1 EXT/INT header provides the physical clock connection and is optioned according to the selection of S1-6 for synchronous clock sources.*

See application notes for available timing configurations.

For synchronous operation only. With switch S1-6 ON, external DTE timing is selected. The OFF position defaults to internal timing. This switch is used in conjunction with the X1 header to select the timing source.

Note

- 1) *The X1 EXT/INT header option must follow S1-6 selection when in synchronous operation.*
- 2) *DBU-89 operation is for synchronous protocols only.*
- 3) *When operating the NMS 510 with DBU-89, the DBU-89 timing must be optioned the same as the Data Rate Adapter.*
- 4) *For external timing, the DBU-89 dial backup rate must be the same as the DTE rate selected on the Data Rate Adapter (DBU Forced Rate only).*
- 5) *When operating the Data Rate Adapter in an external synchronous point-to-point mode, refer to Figure A-4. The unit with external timing must be optioned as a multipoint master. The internal timing unit is optioned as a multipoint slave.*

Master Options	Slave Options
X1 EXT	X1 INT
SLV (S1-8) OFF	SLV (S1-8) ON
MPT (S1-7) ON	MPT (S1-7) ON
OD/EX (S1-6) ON	OD/EX (S1-6) OFF
7B/8B (S1-4) Selectable	7B/8B (S1-4) Selectable
B0, B1 (S1-1, - 2)	B0, B1 (S1-1, - 2) Set
Set To Ext Clock Rate	To Ext Clock Rate

MPT (S1-7) - For point-to-point applications, the OFF position is required. For multipoint operation, the switch is optioned ON.

SLV (S1-8) - In multipoint applications only, the OFF position options the DSU as the MASTER. When ON, the drop is optioned for SLAVE (Remote).

Basecard Option Settings

In addition to the option settings on the Data Rate Adapter card, the options on the following basecard must be set for proper operation:

DataComm 500C UXR - Front panel switch selection rate 56 kbps (6), TIA/EIA-232-F interface. (X2 through X12 headers)

DataComm 500G UXR DSU - 56 or 64 kbps (S16-8 or S17-1), TIA/EIA-232-F interface. (X2 through X12 headers)

NMS 510/510C - The NETCON operator sets either 56 or 64 kbps from the console; the TIA/EIA-232-F interface option is hard set on the modem's base-card. (X3 through X11 headers)

DataComm 552 DSU - 56 or 64 kbps (S10-1), TIA/EIA-232-F interface (X3, X4 headers). The DataComm 552 DSU does not support the external timing option of the Data Rate Adapter.

DeskTop 500A DSU - 56 or 64 kbps (S16-7 or S16-8), TIA/EIA-232-F interface. (X1 header)

Note *The option settings for data rates mentioned above assume that the purchased line supports that data rate.*

Basecard Timing

The RTS signal must be kept on long enough to clear data from the internal buffer. The length of time varies depending on the data speed and application. If the RTS signal drops too soon, the result is character truncation. In most cases, if the application delays the dropping the RTS signal for 20ms, it should be sufficient time for the Data Rate Adapter to clear the buffered characters.

Another way to insure the integrity of characters in the buffer, is to set the basecard RTS to "Forced On" and configure the network for "Data Mode Idle".

Timing Configuration Diagrams

Refer to [Figure A-3](#) through [Figure A-5](#) for the DSU Data Rate Adapter timing configurations for synchronous multipoint operation. DSU's are optioned for receive timing from the network, and timing sources must be 50 PPM.

Note [Figure A-4](#) is applicable for synchronous point-to-point operation with external timing.

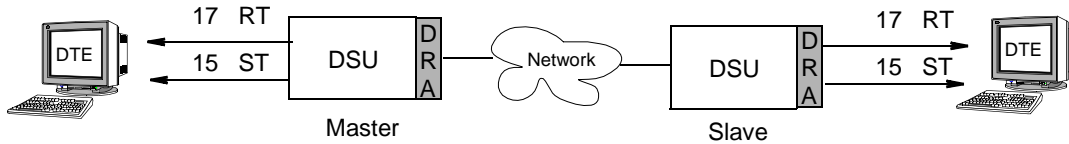


Figure A-3 Master: Internal, Slave: Internal

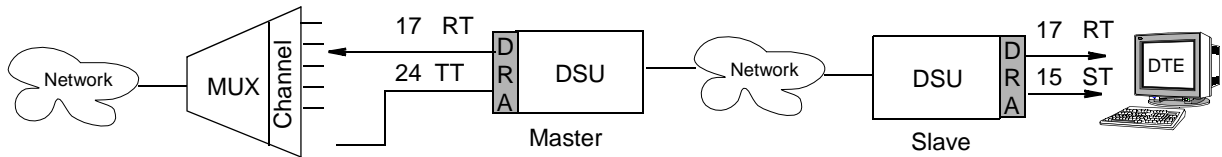


Figure A-4 Master: External, Slave: Internal

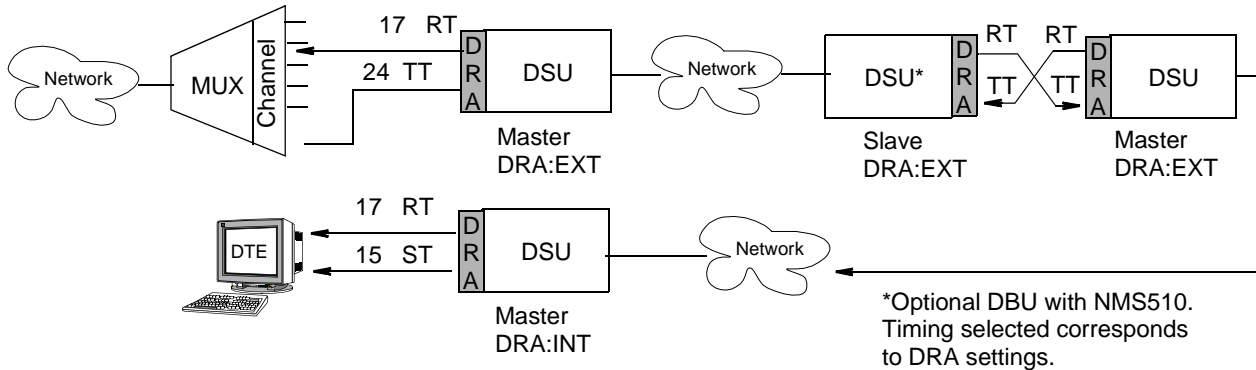


Figure A-5 Two-Layer External Synchronous Multipoint (All DSU's on Receive Timing from Network)

Note *DBU-89 operation is for synchronous protocols only.*

When operating the NMS510 with DBU-89, the DBU-89 timing must be optioned the same as the Data Rate Adapter.

For external timing, the DBU-89 dial backup rate must be the same as the DTE rate selected on the Data Rate Adapter (DBU Forced Rate only).

Technical Characteristics

Refer to Table A-1 for DSU Data Rate Adapter specifications.

Table A-1 Technical Characteristics

Item	Specifications
Format	Serial synchronous and asynchronous binary data.
DSU data rate	56, 64 kbps
DTE data rate	19.2, 9.6, 4.8, 2.4 kbps synchronous. 19.2, 9.6, 2.4, 1.2 kbps asynchronous.
DTE Interface	TIA/EIA-232-F
Operating modes	DDS full duplex point-to-point. DDS full or half duplex multipoint.
Height	0.5 inches (12.70 mm)
Width	1.78 inches (45.21 mm)
Depth	4.30 inches (109.22 mm)

Note *When the piggyback is plugged into the base card, the unit shall meet the environmental, power and quality assurance requirements.*

