SLC ® Series 5 Carrier System

AUA232( ) DSU Dataport — 5SCTCBO

This data sheet describes the AUA232( ) data service unit (DSU) dataport (DP) [COMCODE 107050445 (AUA232)] and is intended for the end-user of the unit. The AUA232( ) DSU dataport is primarily used in an end-link of a digital data system (DDS) private line data service. An end-link is the part of the service between a customer and the local central office. The AUA232( ) DSU may also be used to provide local data service. For DDS applications, the AUA232( ) DSU is always located in the remote terminal (RT). For local data applications, the unit may also be used in the central office terminal (COT) as well as the RT. The AUA232( ) DSU is end-to-end compatible with the AUA34( ) DS0 DP and AUA52( ) OCU DP. The AUA232( ) DSU has the following features:

- Asynchronous and synchronous data operation

- 1.2 (asynchronous only); 2.4, 4.8, 9.6, 19.2, and 56 (synchronous only) kb/s data rates

- Error correction, antistreaming, RTS options

- RS-232 data terminal equipment (DTE) interface

Figure 1 is a functional block diagram of an AUA232( ) DSU, and Figure 2 shows the faceplate and switch locations.

The AUA232( ) DSU DP is a line unit for the AT&T *SLC* ® Series 5 Carrier System that combines the function of an OCU-DP and a DSU/CSU. The DSU DP allows a DTE device access to the DDS network at rates up to 56 kb/s. It responds to network loopback commands received from the network for fault isolation and verification of T1 circuits. It has test capability for local use and a status LED for test/loopback information. Error correction is optional for all service rates. Asynchronous data operation is supported up to 19.2 k baud. Synchronous data operation is supported up to 56 kb/s.

The DSU DP provides a DDS interface towards the *network* and an 8-wire RS-232 interface towards the customer. The unit provides a single channel. This line unit provides a direct connection for DTE to the digital bit stream.

This DSU DP is primarily for use in the *SLC* Series 5 Carrier System. The AUA232( ) contains numerous options which are selected using switches on the circuit pack.

⟹ **NOTE:**
    There is no CIU access to the AUA232.

The DSU DP supports two basic modes of operation, either synchronous or asynchronous. The mode is a switch settable option. The DTE rates (loop side) are also selected by switches on the circuit pack. The network (line side) service rate is automatically set according to the DTE rate selected. (See Table 1.)

The AUA232( ) supports synchronous DTE bit rates of 56000, 19200, 9600, 4800, and 2400. When optioned for synchronous operation, the line side DDS network rate will default to the selected DTE rate. The byte stuffing and data formats for the various network service rates are specified in Bellcore TA-TSY-000077 and Integrated Network INC CMB 100.

In the asynchronous mode, DTE rates of 19200, 9600, 4800, 2400, and 1200 are provided for at either 10 or 11 bits per character (BPC). The unit defaults to the equivalent line side DDS rate towards the network. Since the 1200 rate is not a DDS rate, the unit will default to the 2400 bps rate towards the network. Table 1 indicates the default DDS rates used for the selected DTE rates. The 56 kb/s rate is not a valid rate in the asynchronous mode.

Table 1. DTE Rates and Associated DDS Rates

DTE Selected Rate		Default DDS Rate
SYNC	ASYNC	NETWORK
X	1.2 kb/s	2,400 bps
2.4 kb/s	2.4 kb/s	2,400 bps
4.8 kb/s	4.8 kb/s	4,800 bps
9.6 kb/s	9.6 kb/s	9,600 bps
19.2 kb/s	19.2 kb/s	19,200 bps
56 kb/s	X	56,000 bps

In the asynchronous mode, the async character format is switch selectable on the circuit pack. Start and stop bits are carried through the network. The legal character composition in this mode is summarized in Table 2.

Table 2. Asynchronous Character Format

BPC	Character Format
10	1 start, 8 data, no parity, 1 stop
10	1 start, 7 data, 1 parity, 1 stop
10	1 start, 7 data, no parity, 2 stop
11	1 start, 8 data, 1 parity, 1 stop
11	1 start, 8 data, no parity, 2 stop
11	1 start, 7 data, 1 parity, 2 stop

The circuit pack has the flexibility to operate in either a switched or constant carrier mode. If the unit is set for constant carrier operation, the data present on the transmit data line is transmitted to the network regardless of the state of the RTS control lead. If the unit is set for switched carrier operation, the RTS lead must be asserted by the DTE prior to transmitting any data to the network. If the unit is in the switched carrier mode of operation and the RTS lead is inactive from the DTE, the unit will send control mode idle (CMI) to the network. Switched RTS operation is controlled by a switch on the unit and is applicable in either synchronous or asynchronous operation.

In either synchronous or asynchronous operation, the unit contains an antistreaming feature. The feature invokes an antistreaming timer of 100 seconds. This prevents data streaming from a defective or locked up DTE in multipoint data applications. If the RTS lead is active for more than the timer value, then the unit suspends DTE data transmission to the network and sends CMI. The antistreaming function is enabled or disabled by a switch on the circuit pack. The switched RTS operation must also be enabled for the antistreaming feature to operate.

Error correction is optional for all rates. For DDS rates up to and including 9.6 kb/s, the majority voting scheme is used. For rates 19.2 kb/s through 56 kb/s, the BCH (8,16) parity byte error correction scheme is used. The 19.2 kb/s rate requires only one time slot as the parity bytes can be inserted into the data channel while the 56 kb/s data rate requires that both PCM timeslots associated with the line unit be used; the odd-numbered slot is used for data and the even-numbered slot is used for the parity byte.

$\Rightarrow$ **NOTE:**
Enhanced FPB Mode 2 does not support 56 kb/s with error correction.

The customer interface to the DSU DP is an RS-232 interface that conforms to EIA-232-D specifications. The DSU DP complies with all electrical characteristics of the interchange signals as stated in EIA-RS-232-D.

➡ **NOTE:**
> The 56 kb/s rate is supported by the RS-232 interface. However, this data rate is not covered by the EIA-232-D specification. RS-232 interfaces are only specified to rates below 20 kb/s.

The unit interfaces to the DTE using an 8-pin RJ-48s modular jack located on the faceplate or using the tip and ring metallic interface on the backplane. A strap option (J4) is provided on the circuit pack to enable access of the 8 wires using the tip and ring backplane interface. The pinout is described in Table 3.

Table 3. DTE Connector Assignment

RJ-48s Pin #	Description	RS-232-D Circuit	Series 5 Reference	Series 5 Backplane Pin #
1	ST	DB	E	3
2	Tx	BA	T	31
3	Rx	BB	R	32
4	RTS	CA	T1	29
5	CTS	CB	R1	30
6	DSR	CC	M	5
7	GND	AB	SG	4
8	DCD	CF	SB	6

➡ **NOTE:**
> The RT (receive timing) lead is not supported in the 8-wire interface. In the synchronous mode, the SD (send timing) is coincident with the RT lead. Therefore, the two leads may be strapped together at the customer's terminal interface. The unit does not support timing from the DTE.

➡ **NOTE:**
> To gain access to the 8-wire backplane interface, the channel bank must contain the E&M cabling option.

The AUA232( ) DSU DP can be used in any channel unit slot of a *SLC* Series 5 Carrier COT or RT and can be used in combination with any mix of the other *SLC* Series 5 Carrier System channel units. The user must select the correct location option (COT/RT) on the AUA232 prior to inserting the unit into the channel bank. If required, all 48 channel unit slots in a bank can be equipped with AUA232( ) DSU DPs. The presence of BRITE CUs (AUA90, AUA92, AUA93) imposes certain placement restrictions on other CUs. For details see AT&T 363-205-010, *SLC Series 5 Carrier System, Application and Planning Guide*.

The AUA232( ) DSU DP is compatible with the following feature packages:

- All FPB offerings (Mode 1 and Mode 2).
- All FPC offerings
- All INA-RT modes

⇒ **NOTE:**
Enhanced FPB Mode 2 does not support 56 kb/s with error correction.

⇒ **NOTE:**
The AUA232( ) DSU DP has the following integrated network access-remote terminal (INA-RT) restrictions:

- Mode III (SGL)

    — Dataport operating at 56 kb/s *without* error correction may be assigned to any slot.

    — Dataport operating at 56 kb/s *with* error correction may be assigned to any slot except slot 12 in each digroup (the slot to the immediate right of the dataport CU must remain empty).

- Mode III (DBL)

    — Any dual-channel CU may be assigned to any slot except slot 12 of a digroup. The slot to the immediate right of the equipped slot must remain empty.

    — Dataport operating at 56 kb/s *without* error correction may be assigned to any slot.

    — Dataport operating at 56 kb/s *with* error correction may be assigned to any slot (the slot to the immediate right of the dataport CU must remain empty).

The AUA232( ) DSU DP is end-to-end compatible with another AUA232, or the AUA52B (5SC1430) or AUA52 (5SCU480) office channel unit (AT&T Data Sheet 363-005-111) or the AUA34 (5SCU380) or AUA34B (5SC1330) digital signal zero dataport channel unit (AT&T Data Sheet 363-005-104), or D4 dataport channel units in a *SLC* 96 COT or D4 channel bank.

For all applications of the AUA232( ) DSU DP, the *SLC* Series 5 Carrier System must be synchronized to a DDS-type composite clock. The interface to the clock is the AUA3 office timing unit (OTU) (5SCS604), which is used in the COT. An OTU is not required in the RT since the RT is loop-timed to the COT.

User selectable options are provisioned using DIP switches on the circuit pack. The options are listed in Table 4. The functions of the options are described throughout this document. See Figure 2 for option switch location.

⇒ **NOTE:**
The front panel will flash red if conflicting options are selected.

Table 4. User Selectable Options on Circuit Pack Dip Switches

Position		Feature
NORM	EC	Selects error correction
COT	RT	Selects location
NORM	ANTI-ST	Selects anti-streaming timer (when RTS EN selected)
RTS DIS	RTS EN	Selects switched carrier mode (RTS EN)
OFF	56 k	Selects rate
OFF	19.2 k	Selects rate
OFF	9.6 k	Selects rate
OFF	4.8 k	Selects rate
OFF	2.4 k	Selects rate
OFF	1.2 k	Selects rate
10 BPC	11 BPC	Selects async character size
ASYNC	SYNC	Selects the DTE mode

The front panel of the circuit pack contains a pushbutton switch for test activation from the local end. A tricolor LED is provided on the front panel to display test results and loopback status. Once the switch is pressed, the unit will suspend data transmission to the DTE (DCD, CTS, and RxD marked) and perform a DSU loopback test on the far-end unit (another AUA232, D4 DSU DP, or CSU/DSU). The DSU loopback test sends an alternating loopback code and a 511 test pattern toward the far end. The unit will perform a BERT test while in this mode. The LED on the front panel is used to indicate the status of the test; it will be red to indicate that the 511 pattern contains errors; it will be green to indicate that the pattern is error free; or it will be yellow if an error was previously detected but the pattern is presently error-free. Pressing the switch while the unit is in test will deactivate the test and resume normal operation. While the unit is in the normal operational mode, the LED indicator will be OFF.

The unit will inspect the incoming network data for the presence of loopback request bytes from the far-end unit. If an OCU, DSU, or CSU loopback request sequence is received, data transmission to the DTE is suspended and the unit is placed into the loopback state. To indicate that the unit is in a loopback mode, the LED will flash yellow. Once the loopback termination signal is received, the unit will resume normal data transmission.

The DSU DP monitors the incoming network data for the following alternating loopback commands: channel loopback, OCU loopback, and DSU loopback as defined by TA-TSY-000077. On detection of the OCU or DSU loopback, the unit will mark all data and control leads to the DTE and loop received data back to the network. On the detection of a channel loopback (CSU loopback), the unit will mark DSR to the DTE but will loop data transmitted from the DTE back to the DTE in addition to looping the incoming network data back to the network. When the loopback control codes are no longer detected, the unit will resume normal data transmission.

The DSU DP also monitors incoming network data for latching loopback
sequences. The unit will respond to latching DSU, OCU, and CSU loopbacks as
defined by TA-TSY-000077. Once a latching loopback has been established,
the unit will remain in the loopback condition until the proper termination
sequence is received from the network. DTE control lines react the same as for
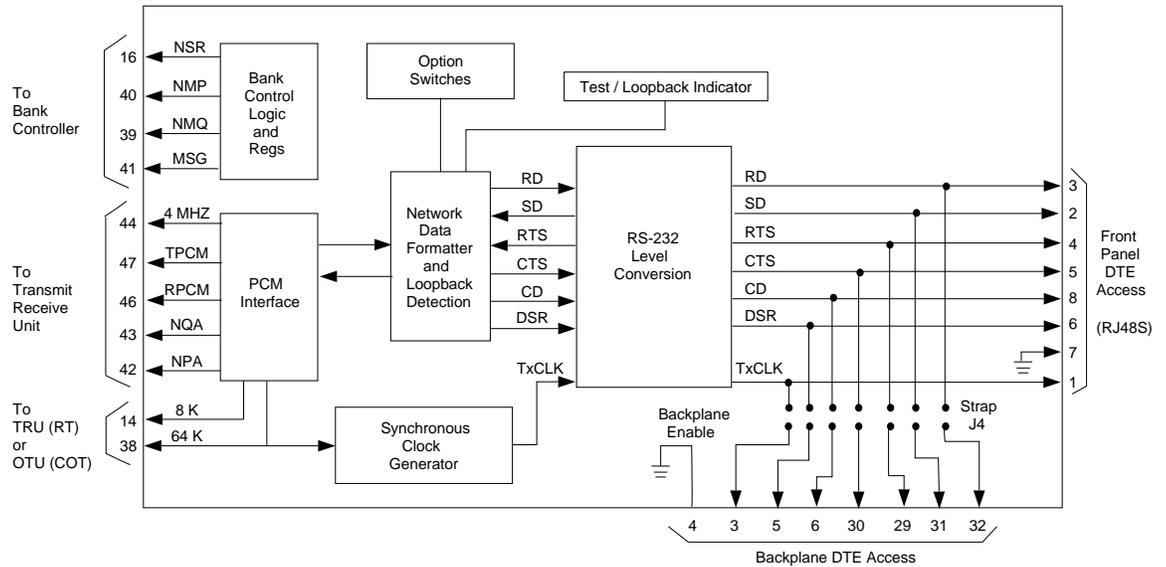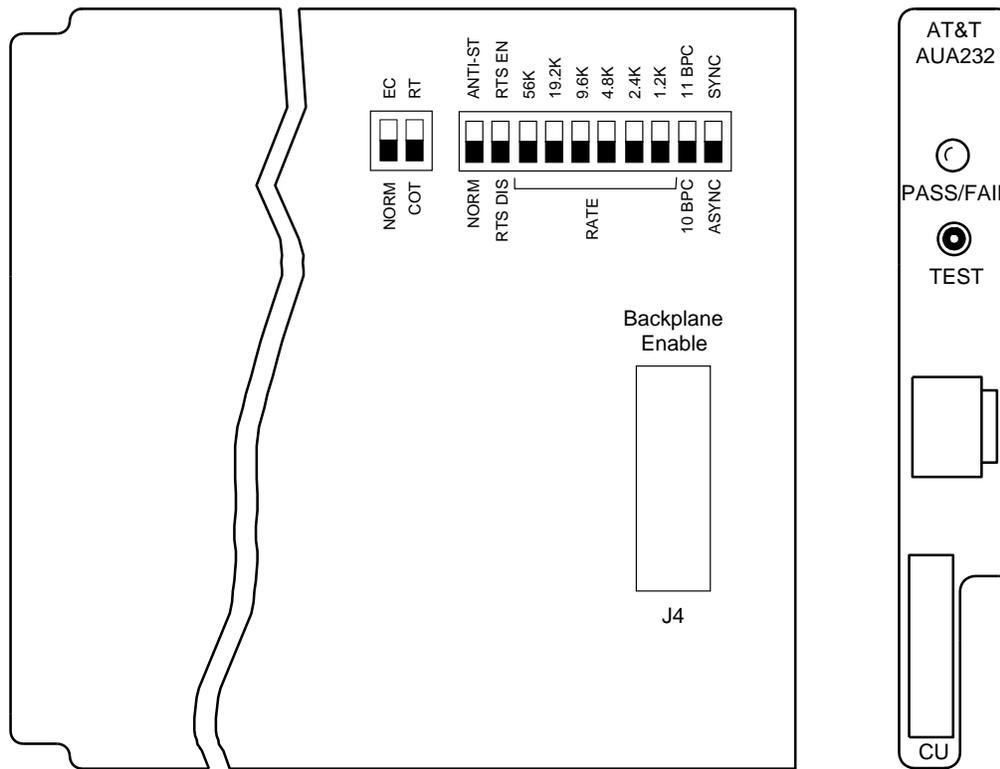alternating loopbacks.

Figure 1. AUA232 Block Diagram

Figure 2. AUA232 Faceplate and Switch Location

Technical Assistance

Follow local procedures for obtaining technical assistance. AT&T also provides in-hours or emergency out-of-hours help for the *SLC* Series 5 Carrier System. Call the AT&T Regional Technical Assistance Center at **1-800-225-RTAC**.

Ordering Information

Additional copies of this document (AT&T 363-005-312) are available from the Customer Information Center — call 1-800-432-6600.

Comments

Comments about this document can be directed to:

AT&T Network Systems Customer Education and Training
Documentation Services
2400 Reynolda Road
Winston-Salem, NC   27106-4606

Copyright Information