SLC® Series 5 Carrier System

AUA178( ) (RT) C-POTS Channel Unit—
5SC1WX0 (AUA178)
5SC4CCC (AUA178B)

Features/Functions

- Conforms to appropriate industry standards
- Adaptive balance to enhance V.34 modem performance (AUA178B)
- Extended range to 1400 ohms (AUA178B)
- Automatic level compensation (ALC)
- 600 ohms impedance
- Supports *CLASS** services
- On-hook transmission (OHT)
- Faceplate test access to tip and ring for both channels
- Faceplate BUSY LEDs
- Enhanced inventory
- No option switches
- UL† recognized

* Service mark of Bell Communications Research, Inc.

† Registered trademark of Underwriters Laboratories Inc.

Description

This data sheet describes the AUA178( ) (RT) C-POTS channel unit (CU) (COMCODE 107184806, AUA178; and 107744153, AUA178B) and is intended for the end-user of the unit.

The AUA178( ) channel unit is designed for 2-wire, loop-start POTS service. The unit provides two channels of service and is normally installed at the remote terminal (RT). The AUA178( ) CU can also be hosted by a *SLC*-2000 Access System. The CU is equipped with automatic level compensation (ALC) which

adds loss when connected to shorter loops. This feature optimizes the loss level for ranges of metallic extensions up to 900 ohms. If a digital loop carrier (DLC) system or channel is replacing long metallic loops, the ALC feature minimizes the loss contrast experienced on cutover. The AUA178( ) furnishes a current feed interface to the customer loop and provides a fast forward disconnect feature (repeats the central office's (CO) open battery interval toward customer premises equipment (CPE), up to a maximum of 1.5 seconds if the central office interval is greater than or equal to 50 ms). The AUA178( ) unit features ALC on-hook as well as off-hook.

The AUA178B channel unit differs from the AUA178 CU in that the AUA178B has an extended range of 1400 ohms and uses an adaptive balance network that provides improved balance for a wide range of loop terminations. The adaptive balance feature will frequently increase the connect rate and/or throughput performance of a pair of high speed modems, such as those with maximum connect rate of 28.8 kb/s or 33.6 kb/s, used to access the Internet.

The channel unit stores a plug-in inventory record in non-volatile memory available for reading by an inventory compatible host (e.g., *SLC*-2000 Access System). The inventory record includes 10-character *COMMON LANGUAGE** *CLEI*, COMCODE, ECI, Function, Loss, and ID codes.

Relative to other POTS channel units, the AUA178( ) unit has the following feature changes.

- Structural impedance of 600 ohms + 2.16 μF.
- Off-hook ALC loss profile of 2 dB reducing to 0 dB.
- On-hook ALC loss profile of 5.5 dB reducing to 3.5 dB.

Figure 1 shows the faceplate diagram for the AUA178( ) C-POTS CU. Table 1 shows the AUA178( ) CU's on-hook transmission compatibility. Table 2 lists the salient AUA178( ) CU's electrical and transmission specifications. Table 3 lists the environmental specifications and Table 4 lists the power drain of the AUA178( ) CU. Table 5 lists the edge connections for the AUA178( ) (RT) C-POTS CU.

* *COMMON LANGUAGE* is a registered trademark and *CLEI*, *CLLI*, *CLCI*, and *CLFI* are trademarks of Bell Communications Research, Inc.

Compatibility

The AUA178( ) channel unit is supported by all *SLC* Series Carrier System feature packages and by all RT releases of the *SLC*-2000 Access System. The far-end termination can be any of the following units (where the *SPOTS*® units are limited to loop start service):

- AUA32 *SPOTS*® channel unit
- AUA39( ) *SPOTS* channel unit
- AUA31 POTS channel unit
- AUA38( ) POTS channel unit
- *SLC* 96 WP10( ) POTS channel unit
- *SLC* 96 WP36( ) *SPOTS* channel unit
- *SLC* -2000 *SPQ*®300 quad POTS channel unit
- *SLC* -2000 *SPQ*340 quad *SPOTS* channel unit
- *5ESS*® switch digital carrier line unit (DCLU)
- *5ESS* switch integrated digital carrier unit (IDCU)

Specifications

Table 1 gives the on-hook transmission capabilities for the AUA178( ) C-POTS CU.

Table 1. AUA178( ) C-POTS CU — On-hook Transmission Capability

ON-HOOK TRANSMISSION CAPABILITIES			
CO Termination	**Signaling**	**Direction**	**OHT Services CND, MWI, MR**
WP10	LS	COT→RT	✔*
WP10B	LS	COT→RT	✔ *
WP10C	LS	COT→RT	✔*
AUA38( )	LS	COT↔RT	✔
WP10D	LS	COT↔RT	✔
WP36	LS /GS	COT→RT	✔*
AUA39	LS†/GS	COT↔RT	✔ ‡
AUA39B	LS /GS	COT↔RT	✔
INTEGRATED:§			
POTS CU mode	LS	DCLU↔RT	✔

Legend:

CND — Calling name/number delivery (CND). Individual calling line identification (ICLID) feature of CND transmits number, using frequency shift keying (FSK), during silent ringing interval.

MWI — Visual message waiting indication(MWI). Central office (CO) switch transmits FSK to turn on indicator during idle state.

MR — Meter reading.

LS — Loop start (LS) signaling.

GS — Ground start (GS) signaling.

* Meter must present off-hook termination when responding to poll.

† When an AUA39 CU is connected to the floating battery feed of a *5ESS* Switch, either the RANGEX or GNDREF *5ESS* Switch option should be set, to provide the necessary low resistance tip/ground interface when the switch sends the CND message. The RANGEX option is preferred. The AUA39B CU does not require these switch options:

RANGEX=Y [up to Release 5E9(2)] or RANGEX=EXT [Release 5E9(2) or later]

GNDREF=Y

‡ CND only.

§ Digital carrier line unit (DCLU) or integrated digital carrier unit (IDCU) interface feature of *5ESS* Switch, or other switch with digital loop interface compliant with Bellcore TR-TSY-000008. (Compatibility for MWI on ground start circuits is not covered by TR8.)

Table 2 gives the salient electrical and transmission specifications for the AUA178( ) channel unit. The parameters are off-hook unless specified otherwise. Table 3 lists the environmental specifications.

Table 2. Salient AUA178( ) Electrical and Transmission Specifications *

Parameter	Value
Loop resistance (excluding telset):	0-900 ohms; 0-1400 ohms, AUA178B
Loop current:	20 mA to 30 mA
1 kHz VF loss between CO and network interface (NIF) at customer location, customer premises equipment (CPE) off-hook: AUA178 AUA178B	 2 dB to 6.5 dB 2 dB up to maximum-length-cable loss
Nominal 1 kHz VF loss, between CUs; loss vs. tip-to-ring resistance off-hook: 0-540 ohms (AUA178( )) 780 ohms to maximum (AUA178) 840 ohms to maximum (AUA178B)	 2 dB 0 dB 0 dB
Nominal 1 kHz VF loss, vs. tip-to-ring resistance, CPE on-hook: between COT and RT CUs AUA178( ) only	 4 dB to 7.5 dB off-hook loss + 3.5 dB*
Return loss at COT, AUA178. Reference Z = 900 ohms + 2.16 µF. AUA178 terminated with all three TR-57 CSA test loops. DC resistance of loop terminations < 430 ohms.	ERL > 14 dB, SRL > 10 dB
Return loss at COT, AUA178B. Reference Z = 900 ohms + 2.16 µF. AUA178B terminated with all nine TR-57 test loops. DC resistance of loop terminations < 430 ohms.	ERL > 15 dB, SRL > 11 dB
Return loss at RT, AUA38B or AUA38C at the COT. Reference Z = 600 ohms + 2.16 µF. DC resistance at RT: on-hook, and off-hook < 430 ohms.	ERL > 18 dB, SRL > 10 dB
Return loss at RT, AUA38 only at COT. Reference Z = 600 ohms + 2.16 µF. DC resistance at RT: on-hook, and off-hook < 430 ohms.	ERL > 18 dB, SRL > 10 dB, off-hook ERL > 11 dB, SRL > 7 dB, on-hook
Frequency response (loss relative to 1004 Hz, end to end)	Frequency range 300-3000 Hz; -0.5 dB to +1.0 dB 3200 Hz: -0.5 dB to +1.5 dB

Parameter	Value
Frequency response (loss relative to 1004 Hz, end to end)	Frequency range 300-3000 Hz; -0.5 dB to +1.0 dB 3200 Hz: -0.5 dB to +1.5 dB
Overload at the COT and RT	≤ 0.5 dB increased loss at + 3 dBm0
Single frequency distortion with input of: 0 - 12 kHz, 0 dBm0 1004 - 1020 Hz, 0 dBm0	 < -28 dBm0† < -40 dBm0‡
Signal-to-distortion with input of: 0 dBm0 to -30 dBm0 -30 dBm0 to -40 dBm0 -40 dBm0 to -45 dBm0	 > 33 dB > 27 dB > 22 dB
System generated tones 0 < f < 16 kHz	< -50 dBm0
Structural impedance (hybrid impedance, output impedance)	600 ohms + 2.16 µF
Minimum longitudinal balance (measured by IEEE Method 455-1976): Frequency 200 Hz to 1000 Hz 3000 Hz	 Longitudinal Balance ≥ 58 dB ≥ 53 dB
Idle channel noise, end-to-end	≤ 20 dBrnC
60 Hz Rejection (loss relative to 1004 Hz)	> 20 dB
Cross talk (0 dBm0 input, 200 Hz to 3400 Hz)	-65 dBm0
Impulse noise at a threshold of 47 dBrnC0 for 15 minutes	≤ 15 counts
Data pulse distortion, peak-to-average ratio (P/AR), end to end	 > 90
Gain Tracking§ (relative to gain at 0 dBm0) -37 dBm0 to +3 dBm0 -50 dBm0 to -37 dBm0 -55 dBm0 to -50 dBm0	 ± 0.5 dB max. (± 0.25 dB avg.) ± 1.5 dB max. (± 0.5 dB avg.) ± 3.0 dB max. (± 1.5 dB avg.)

* When the AUA178( ) is first installed with the telset on-hook, its nominal loss is 4 dB.

† At any other frequency, 0 to 12 kHz.

‡ At any other frequency, 0 to 4 kHz.

§ At 1004 Hz, off-hook.

* Note: End-to-end performance specified with AUA178( ) terminated with 600 ohms + 2.16 µF, and with AUA38( ) at COT, terminated with 900 ohms + 2.16 µF, except as noted.

Table 3. Environmental Specifications

A. Temperature Range (Ambient) 1. Operating, per TR-NWT-000057*: in Lucent Technologies cabinet mounted RT, outside ambient temperatures of -40° F with no solar load to +115° F with maximum solar load and maximum power dissipation. Lucent Technologies cabinets are designed to assure that the components within do not exceed their rated temperatures for the above conditions. 2. Storage, per TR-NWT-000057: ambient temperatures of -40° to 140° F.
B. Relative Humidity 1. Operating, per TR-NWT-000057. For outside ambient temperature 84° F or less, relative humidity of 5% to 95%. For ambient temperatures above 84° F, the relative humidity is limited to that corresponding to a specific humidity of 0.024 pounds of water per pound of dry air. 2. Storage, per TR-NWT-000057: ambient temperatures 84° F or less, 10% to 95%. For ambient temperatures above 84° F, the relative humidity is limited to that corresponding to a specific humidity of 0.024 pounds of water per pound of dry air.

* Bellcore Technical Reference TR-NWT-000057, Issue 2, January 1993, and all Revisions and Supplements, "*Functional Criteria For Digital Loop Carrier Systems*," Bell Communications Research

Table 4. Power drain for AUA178( ) POTS CU

Condition	Value
All channels idle	0.72 W
Each added channel active (T/R resistance 600 ohms): AUA178 AUA178B	 1.30 W 1.45 W
Each added channel ringing	12 mW

Installation and Testing

There are no switches to set on this unit. Procedures for testing the unit are given in AT&T 363-205-402, *SLC Series 5 Carrier System Channel Unit Installation and testing*.

The AUA178( ) CU is compatible with mechanized loop testing (MLT) and the pair gain test controller (PGTC) and the extended test controller (XTC) test systems.

The faceplate jack provides convenient test access to the tip (T) and ring (R) of both odd (O) and even (E) channels.

Faceplate Features

The AUA178B (RT) C-POTS current feed channel unit faceplate is shown in Figure 1. The faceplate jack provides convenient test access to the tip and ring through a channel unit faceplate test cord, part number CiPT-5, available from CI Network Products; (708-806-6300). The following LED indicators are located on the faceplate:

ODD BUSY (Red LED): The ODD channel is busy when lit.

EVEN BUSY (Red LED): The EVEN channel is busy when lit.

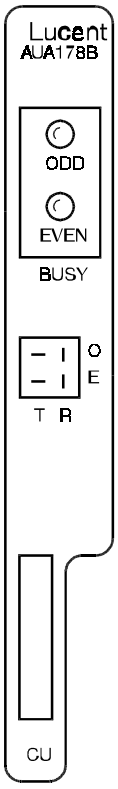

Figure 1. AUA178B Faceplate Diagram

Table 5. Edge Connections For AUA178( ) (RT) C-POTS Channel Unit

Finger	Function
1	Frame Ground
2	Ringing Ground
13, 17, 20, 21	Circuit Ground
22, 23, 25, 50	+5 Volts dc
26	-48 Volts dc
27	-20 Hz Ringing
29	T1 (Tip Even)
30	R1 (Ring Even)
31	T (Tip Odd)
32	R (Ring Odd)
49	-5 Volts DC

References

The following documents provide additional information about the use of this channel unit in the *SLC Series 5 Carrier System* and the *SLC*-2000 Access System:

AT&T 363-205-010 *SLC Series 5 Carrier System Applications and Planning Guide*

AT&T 363-205-402 *SLC Series 5 Carrier System Channel Unit Installation and Testing*

AT&T 363-208-000 *SLC*-2000 *Access System Application, Planning, and Ordering Guide*

Technical Assistance

Follow local procedures for obtaining technical assistance. Lucent Technologies also provides in-hours or emergency out-of-hours help for the *SLC* Series 5 Carrier System and the *SLC*-2000 Access System. Call the Lucent Technologies Regional Technical Assistance Center at 1-800-225-RTAC.

Ordering Information

Additional copies of this document (363-005-314) are available from the Customer Information Center — call 1-888-582-3688.

Comments

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