SLC®-2000 Access System

SPQ®400( ) (RT) POTS Channel Unit—
SAC1AAA (*SPQ*400)
SAC1AUA (*SPQ*400B)

Features/Functions

- Conforms to appropriate industry standards
- Automatic level compensation (ALC)
- Supports *CLASS** services
- Unique keying to prevent erroneous insertion in shelf
- Faceplate test access to tip and ring for four channels
- Faceplate BUSY LEDs
- On-hook transmission (OHT)
- Enhanced inventory
- No option switches

* Service mark of Bell Communications Research, Inc.

Description

This data sheet describes the *SPQ*400( ) (RT) POTS channel unit (CU) (COMCODE 1060731821, *SPQ*400; 107719809, *SPQ*400B) and is intended for the end-user of the unit.

The *SPQ*400( ) channel unit is designed for 2-wire, loop-start POTS service. The unit provides four channels of service and is normally installed at the remote terminal (RT). 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 *SPQ*400( ) 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 *SPQ*400 unit features ALC on-hook as well as off-hook.

This data sheet is being reissued to describe the *SPQ*400B channel unit and to correct the on-hook loss specification in the data sheet for the *SPQ*400 unit.

The *SPQ*400B channel unit exhibits an off-hook loss profile with less maximum loss (4.25 dB versus 6 dB) than the loss profile of the *SPQ*400 CU. The nominal on-hook loss of the *SPQ*400B CU is fixed at 4.25 dB. The loop range of the *SPQ*400B CU is increased from 900 to 1200 ohms. The *SPQ*400B is backward compatible with the *SPQ*400 CU for all applications.

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.

Figure 1 shows the faceplate diagram for the *SPQ*400( ) POTS CU. Table 1 shows the *SPQ*400( ) CU's on-hook transmission compatibility. Table 2 lists the salient *SPQ*400( ) CU's electrical and transmission specifications. Table 3 lists the environmental specifications and Table 4 lists the power drain of the *SPQ*400( ) CU. Table 5 lists the edge connections for the *SPQ*400( ) (RT) POTS CU.

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

Compatibility

The *SPQ*400( ) channel unit is supported by all current and planned releases of the *SLC*-2000 Access System. The far-end termination can be any of the following units:

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

Specifications

Table 1 gives the on-hook transmission capabilities for the *SPQ*400( ) POTS CU.

Table 1. *SPQ*400( ) POTS CU — On-hook Transmission Capability

ON-HOOK TRANSMISSION CAPABILITIES			
CO Termination	**Signaling**	**Direction**	**OHT Services CND, MWI, MR**
*SPQ*300	LS	COT↔RT	✔
WP10	LS	COT→RT	✔*
WP10B	LS	COT→RT	✔ *
WP10C	LS	COT→RT	✔*
AUA38( )	LS	COT↔RT	✔
WP10D	LS	COT↔RT	✔
*SPQ*340	LS	COT↔RT	✔
WP36	LS	COT→RT	✔*
AUA39	LS†	COT↔RT	✔ ‡
AUA39B	LS	COT↔RT	✔
INTEGRATED:§	LS	IDCU↔RT	✔
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.

* 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 *SPQ*400( ) channel unit. The parameters are off-hook unless specified otherwise. For complete transmission specifications consult Chapter 4 of AT&T 363-208-000, *SLC*-2000 *Access System Applications, and Planning Guide*. Table 3 lists the environment specifications.

Table 2. *SPQ*400( ) CU Electrical and Transmission Specifications *

Parameter	Value	
	Normal Power	On Low Battery
Loop Range (excluding 430 ohm telset):	*SPQ*400: 0 - 900 Ω *SPQ*400B: 0 - 1450 Ω	*SPQ*400: 0 - 900 Ω *SPQ*400B: 0 - 1200 Ω
Long Loop Current	≥ 20 mA	≥ 18 mA
Short Loop Current	28 mA	28 mA
1 kHz VF loss between CO and network interface (NIF) at customer location, customer premises equipment (CPE) off-hook:	4 dB to 8 dB	
Nominal 1 kHz VF loss, *SPQ*400( ) only: 0 ohm tip-to-ring 900 ohm loop resistance	*SPQ*400 6 dB 1.4 dB	*SPQ*400B 4.25 dB 1.4 dB
Nominal 1 kHz VF loss between CO and network interface (NIF) at customer location, customer premises equipment (CPE) on-hook:	*SPQ*400 9 dB to 13 dB	*SPQ*400B 5.5 dB to 12.5 dB
Nominal 1 kHz VF loss, on-hook, *SPQ*400( ) only:	*SPQ*400 5 dB to 9.5 dB	*SPQ*400B 4.25 dB
Return loss at RT (reference Z of 900 ohms + 2.16 µF) (COT terminated in 900 ohms + 2.16 µF)	ERL > 18 dB, SRL > 10 dB	
Return loss at COT (reference Z of 900 ohms + 2.16 µF) (RT terminated in 900 ohms + 2.16 µF)	ERL > 18 dB, SRL > 10 dB	
Input/output impedance (Structural impedance, hybrid impedance)	900 ohm + 2.16 µF	
Minimum longitudinal balance at the RT*	200-1000 Hz; ≥ 58 dB 3000 Hz; ≥ 53 dB	
Idle channel noise, end-to-end	≤ 20 dBrnc	
Frequency response (loss relative to 1004 Hz): End to end *SPQ*400( ) only	Frequency range 300-3000 Hz; -0.5 dB to +1.0 dB 3200 Hz: -0.5 dB to +1.5 dB 300-3000 Hz; -0.25 dB to +0.5 dB 3200 Hz: -0.25 dB to +0.75 dB	

Parameter	Value
60 Hz rejection: End to end *SPQ*400( ) only, transmit	 > 20 dB > 20 dB
Crosstalk (0 dBm0 input, 200 to 3400 Hz)	≤ - 65 dBm0
Impulse noise at a threshold of 47 dBrnC0 for 15 min.	≤ 15 counts
Data pulse distortion (P/AR): End to end *SPQ*400( ) only	 > 90 ≥ 94
Single frequency distortion with input of: 0 - 12 kHz, 0 dBm0 1004 - 1020 kHz, 0 dBm0	 < - 28 dBm0 at 0 Hz to 12 kHz < - 40 dBm0 at 0 Hz to 4 kHz
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
Gain Tracking at 1004 Hz, relative to 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.)
Intermodulation distortion (4-tone method, -13 dBm0 input)	 A - B (R2) product > 43 dB 2A - B (R3) product > 44 dB

* Measured by IEEE Method 455-1976

* Note: Off hook unless specified. End-to-end performance with a *SPQ*300 CU at the COT.

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 *SPQ*400( ) POTS CU (Per Channel)

Condition	Value
All channels idle *SPQ*400 *SPQ*400B	 0.37 W 0.29 W
Each added channel active (T/R resistance 600 ohms): *SPQ*400 *SPQ*400B	 1.70 W* 1.70 W*
Each added channel ringing *SPQ*400 *SPQ*400B	 162 mW - 64 mW†

* 470 mW is delivered to T-R load (600 ohms)

† *SPQ*400B power drain decreases by 64 mW per channel when ringing.

Installation and Testing

There are no switches to set on this unit. Procedures for testing the unit are given in 363-208-001, *SLC* -2000 *Access System User/Service Manual*.

The *SPQ*400( ) CU is compatible with mechanized loop testing (MLT) and the pair gain test controller (PGTC) and the extended test controller (XTC) test systems.

Faceplate Features

The *SPQ*400( ) quad (RT) POTS current feed channel unit faceplate is shown in Figure 2. The faceplate jack provides convenient test access to the tip and ring through a channel unit faceplate test cord, part number CiPT-5 which is available from CI Network Products; (708-806-6300). The following LED indicators are located on the faceplate:

BUSY A (Red LED): The A channel (channel 1) is busy when lit.

BUSY B (Red LED): The B channel (channel 2) is busy when lit.

BUSY C (Red LED): The C channel (channel 3) is busy when lit.

BUSY D (Red LED): The D channel (channel 4) is busy when lit.

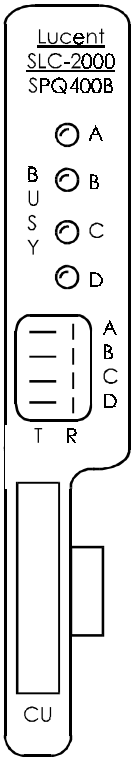

Figure 1. *SPQ*400B Faceplate Diagram

Table 5. Edge Connections For *SPQ*400( ) (RT) POTS Channel Unit

Finger	Function
1	Frame Ground
2	Ringing Ground
3	T2 (3rd channel)
4	R2 (3rd channel)
5	T3 (4th channel)
6	R3 (4th channel)
17, 19, 20, 21	Circuit Ground
22, 23, 25, 50	+ 5 Volts DC
26	- 48 Volts DC (RT only)
27	- RNG (20 Hz)
29	T1 (2nd channel)
30	R1 (2nd channel)
31	T (1st channel)
32	R (1st channel)
49	- 5 Volts DC

References

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

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

AT&T 363-208-001 *SLC*-2000 *Access System User/Service Manual*

AT&T 363-208-003 *SLC*-2000 *Access System Command and Message Manual*

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 (363-005-368) are available from the Customer Information Center — call 1-888-582-3688.

Comments

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