SLC® -2000 Access System

SPQ®454 4-Wire E&M Special Services Channel Unit — SAC1BG0

Features/Functions

- E&M and pulse link repeater (PLR) signaling
- Four-wire PBX tie trunk applications
- Faceplate test access to tip and ring pairs
- BUSY LED on faceplate
- Enhanced inventory read-out
- Conforms to appropriate industry standards.

Description

This data sheet describes the *SPQ*454 4-Wire E&M channel unit (CU) (COM-CODE 107226748) which is intended for use in private branch exchange (PBX) tie trunks and other special service circuits requiring an E&M signaling interface. The *SPQ*454 CU is used in a *SLC*®-2000 Access System equipped with Release 3.2 (or later) in a central office terminal (COT) or remote terminal (RT), but not in a multi-services distant terminal (MSDT). (The AUA54( ) *SLC*® Series 5 System E&M channel unit is used in an MSDT.) The *SPQ*454 can interface with other transmission equipment, a PBX, or a tie trunk equipped CO-Centrex. The channel unit must be co-located with the terminating equipment because its interface circuits are not protected against the outside plant environment. The *SPQ*454 CU can be connected to a distant D-bank via an integrated network access facility (INA-Facility) arrangement.

The *SPQ*454 CU includes capability for plug-in inventory. The unit stores in its nonvolatile memory an inventory record that includes its 10-character CLEI* code, readable by the system controller.

Functions

The *SPQ*454 CU provides one channel of service, which can function in one of two modes, 4E&M or pulse link repeater (PLR). Each of these modes can be configured with single leads connecting the signaling circuits of the interfacing equipment (Type I) or with pairs of leads looped to avoid using a noisy building structure for the return path (Type II).

4E&M: The 4E&M function provides an E&M signaling interface. The unit converts the DC signal on the M lead from the PBX into a signal carried by the digital network. A similar signal from the digital facility is converted into the DC signal sent to the equipment over the E lead. See Figures 5-11 and 5-16 of TR-NWT-000057 Issue 2 for E&M Type I and Type II signaling lead connections.

PLR: The PLR function provides the E&M with inverted polarity signaling interface. The unit converts the DC signal on the E lead from the interfacing equipment into a signal carried by the digital facility. Similar signals from the digital facility are converted into the DC signal sent to the equipment over the M lead. See Figures 5-19 and 5-20 of TR-NWT-000057 Issue 2 for Type I and Type II signaling connections in the PLR mode.

Transmission Treatment and Signaling

Since cable connecting the *SPQ*454 CU is strictly intrabuilding, transmission treatment consists of attenuation control over a wide range (see Table 3). Full transmission is enabled whether the circuit is idle or busy. The signaling range for Type I is 250 ohms and for Type II is 500 ohms. These ranges translate to 3 kft of 26 gauge cable. In all cases the signaling range may be limited by the interface equipment.

Options

The *SPQ*454 CU has options (Table 1) that must be set before service can be provided. All options for the CU are set by entering commands into the *SLC*-

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2000 craft interface terminal (CIT) which then transmits the settings to the system controller where they are stored in nonvolatile memory. The controller then writes the settings into memory registers on the CU immediately, or when a CU is later installed or replaced. The procedures for setting options with the CIT are described in AT&T 363-208-001, *SLC-2000 Access System User/Service Manual.*

Tables 2 and 3 list the transmission and signaling options and the associated ranges for the *SPQ*454 CU. Use the guidelines for the AUA54 provided in AT&T 915-710-116 *SLC Series 5 Channel Unit Application and Prescription Setting* , to select options for the *SPQ*454 unit.

Facility Failure

When the system controller notifies the channel unit that a facility failure has occurred, the *SPQ*454 CU carries out the following actions:

- Adopts an idle condition for 2.5 seconds, then goes to a busy condition
- After 2.5 seconds and for the duration of the failure, conditions the signaling leads for busy, sends idle signaling to the far end, disables transmission in the receive direction, and disables the test relay.

Remote Test Access

Local or remote test access to the *SPQ*454 CU is available when the unit's test relay is operated. This access includes full splitting access to the transmission leads and splitting access toward the digital facility on the primary signaling leads (E,M).

Table 1. *SPQ*454 Channel Unit Options.

Options For Each *SPQ*®454 Channel Unit Function		
	CU Function	
Option	4E&M	PLR
Function Code	X	X
Transmit Attenuator	X	X
Receive Attenuator	X	X

Table 2. *SPQ*454 Channel Unit Function Codes.

SPQ®454 Channel Unit Function Codes		
Function Code	CU Function	Signaling Mode
EM4C	4E&M	E&M signaling Type I
EM4H	4E&M	E&M signaling Type II
PLR1	PLR	PLR signaling Type I*
PLR2	PLR	PLR signaling Type II*

* PLR signaling (the complement of E&M signaling) permits the back-to-back connection of two carriers with E&M signaling.

Table 3. Range of Settings For *SPQ*454 Channel Unit Options

Range of Settings For *SPQ*®454 Channel Unit Options (Note)	
Option	**Range**
Transmit attenuator	0 dB to 16.5 dB in steps of 0.1 dB
Receive attenuator	0 dB to 16.5 dB in steps of 0.1 dB

NOTE:
The transmit and receive impedances of the unit are fixed at 600 ohms.

Compatibility

The *SPQ*454 CU is end-to-end compatible with the AUA41( ) 4-wire CU for PBX tie trunk applications. The *SPQ*454 can also be used in the local CO back-to-back with a D-bank 4E&M or PLR channel unit in applications where signaling is two-state, such as a direct-inward-dial PBX trunk from a foreign CO.

Further compatibility and application information can be found in AT&T 915-710-116, where:

a. AUA41 is to be read AUA41( )
b. AUA42 is to be read AUA42( )/SPQ442
c. AUA43 is to be read AUA43( )/SPQ443
d. AUA44 is to be read AUA44( )/SPQ444
e. AUA54 is to be read AUA54( )/SPQ454
f. *SLC*® Series 5 is to be read *SLC*® Series 5/*SLC*-2000.

This document in several places refers to compatibility of channel units located beyond a digital connectivity unit (DCU). The *SLC*-2000 System does not support DCUs, but the document can nevertheless be applied if references to DCU-equipped terminals in the text are replaced by a digital switch, digital cross-connect equipment, or an INA facility used to connect a *SLC*-2000 RT to a D4-type terminal.

Specifications

The *SPQ*454 CU conforms to the appropriate criteria of ANSI*, Bellcore, FCC, GTE, and UL** standards.

For a list of transmission specifications of the *SPQ*454, consult AT&T 363-205-010, *SLC Series 5 Carrier System Application and Planning Guide,* referring to the AUA54.

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Faceplate Features

The *SPQ*454 channel unit faceplate is shown in Figure 1. The *SPQ*454 faceplate has one faceplate jack and one red BUSY LED indicator.

The faceplate test jack provides bridging test access to both tip/ring pairs (T/R, T1/R1) through the ITT RTG16L2H15A channel unit faceplate test cord (COMCODE 405755208). Tip and ring leads provide VF input to the CU; tip1 and ring1 leads connect to the CU output.

BUSY (Red LED): The BUSY LED is lit whenever a busy condition exists on the signaling leads.

In response to an LED TEST command in a *SLC*-2000 Access System, the BUSY LED will be lit. On power-up, the LED will be lit for 2 seconds.

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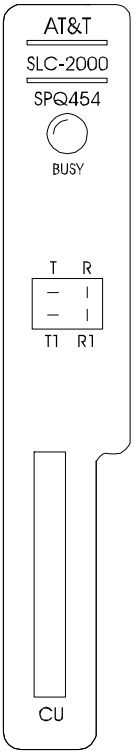

Edge Connections	
Finger	Function
1	Frame Gnd
2	Ringing Gnd
11	SB
12	M
13	E
17, 20, 21	Circuit Gnd
22, 23, 25, 50	+5 Volts DC
26	-48 V DC Battery
29	T1
30	R1
31	T
32	R
37	SG
49	-5 Volts DC

Figure 1. ***SPQ* 454 Faceplate and Edge Connections**.

References

The following documents provide additional information about the *SLC*-2000 Access System and the *SLC* Series 5 Carrier System:

AT&T 363-205-010	*SLC Series 5 Carrier System Application and Planning Guide*
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 915-710-115	*SLC Series 5 Carrier System Application Engineering*
AT&T 915-710-116	*SLC Series 5 Carrier System Channel Unit Application and Prescription Setting.*

Bellcore's technical reference for digital loop carrier systems, TR-NWT-000057, Issue 2, January 1993, is one of several telephone company sponsored documents that offer criteria by which to judge such systems.

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 and the *SLC*-2000 Access System. Call the AT&T Regional Technical Assistance Center at 1-800-225-RTAC.

Ordering Information

Additional copies of this document (AT&T 363-005-386) are available from the Customer Information Center — call 1-800-432-6600.

Comments

Comments about this document can be directed to:

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