PG-Flex*Plus*

8 ADSL
Remote Line Unit
Technical Practice

Model	List	CLEI Code
ARL-942	1	VARHVGPG~~

REVISION HISTORY

Revision	Release Date	Revisions Made
01	November 7, 2002	Initial Release
02	January 6, 2003	Updated Product Support Information

USING THIS TECHNICAL PRACTICE

The following style conventions and terminology are used throughout this guide.

Element	Meaning
Bold font	Text that you must input exactly as shown (e.g., type **1** for card 1), menu buttons (e.g., **ACCEPT SHELF OPTIONS**) or menu screen options (e.g., **ALARMS** screen) that you must select
Italic font	Variables that you must determine before inputting the correct value (e.g., *Password*)
Monospace font	References to screen prompts (e.g., `Invalid Password...Try Again:.`)

Reader Alert	Meaning
	Alerts you to supplementary information
	Alerts you to supplementary information that is essential to the completion of a task
	Alerts you to possible equipment damage from electrostatic discharge
	Alerts you to possible data loss, service-affecting procedures, or other similar type problems
	Alerts you that failure to take or avoid a specific action might result in hardware damage or loss of service
	Alerts you that failure to take or avoid a specific action might result in personal harm

INSPECTINGYOUR SHIPMENT

Upon receipt of the equipment:

- Unpack each container and visually inspect the contents for signs of damage. If the equipment has been damaged in transit, immediately report the extent of damage to the transportation company and to ADC. Order replacement equipment, if necessary.
- Check the packing list to ensure complete and accurate shipment of each listed item. If the shipment is short or irregular, contact ADC as described in Product Support on page 101. If you must store the equipment for a prolonged period, store the equipment in its original container.

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OVERVIEW

The PG-Flex^{PlusTM} ARL-942, L1 Asynchronous Transfer Mode (ATM) Remote Line Unit is an integral component of the Edge Access Network System. The ARL-942 is installed in the ARX-965 24-Channel Edge Remote Access Multiplexer (RAM) Remote Terminal Enclosure for Edge RAM applications. The Edge RAM extends Asynchronous Digital Subscriber Line (ADSL) services beyond the normal ADSL range by using Single-pair High-bit-rate Digital Subscriber Line (SHDSL) transport between the Central Office Terminal Shelf (COTS) and the RAM, then provides ADSL drops to the subscriber (Figure 1 on page 2). POTS splitters are used with the RAM to combine Plain Old Telephone Service (POTS) and ADSL on the same copper pair toward the subscriber.

DESCRIPTION

The Edge Remote Acess Mulitplexer (RAM) extends ADSL services beyond the normal ADSL range by using SHDSL transport between the COTS and the RAM, then provides ADSL drops to the subscriber (Figure 1). POTS Splitters are used with the RAM to combine POTS and ADSL on the same copper pair toward the subscriber.

Each line-powered ARL-942 RAM module accepts one SHDSL circuit and supports eight ADSL circuits. The RAM is line-powered via the SHDSL pair. Each system COTS supports up to 11 RAMs and can serve up to 256 ADSL subscribers.

ATM data is transported between the COTS and the ATM switch or DSLAM over a DS3 or multiple DS1 circuits. Equipment protection is provided through the ASU-945, which splits the DS3 signal between the two AMX-944 ATM/TDM Mulitplex Units. The AMX-943 ATM/TDM Multiplexer Unit can be used in place of the AMX-944s. When using the AMX-943, the ASU-935 should not be used. DS1's are wired directly to the COT Shelf backplane. Refer to the appropriate technical practice (AMX-944 or AMX-943) for more information.

The SHDSL circuits support ATM data from the ALU-935 Dual SHDSL Line Unit to the ARL-942 Line Unit. Analog POTS circuits are terminated on the ARX-965 and are provided over copper pair or DLC systems from the CO switch and are combined with the ADSL circuits originating from the ARL-942 in the ASU-940 POTS Splitter. The ASU-940 must be installed in the ARX-965 to provide ADSL and POTS services to the subscriber.

The Management Unit (MU) (PMU-712/AMU-912) provides shelf management, performance monitoring, alarm and test interface functions. The AMU-912 supports Simple Network Management Protocol (SNMP); however, the PMU-712 does not support it.

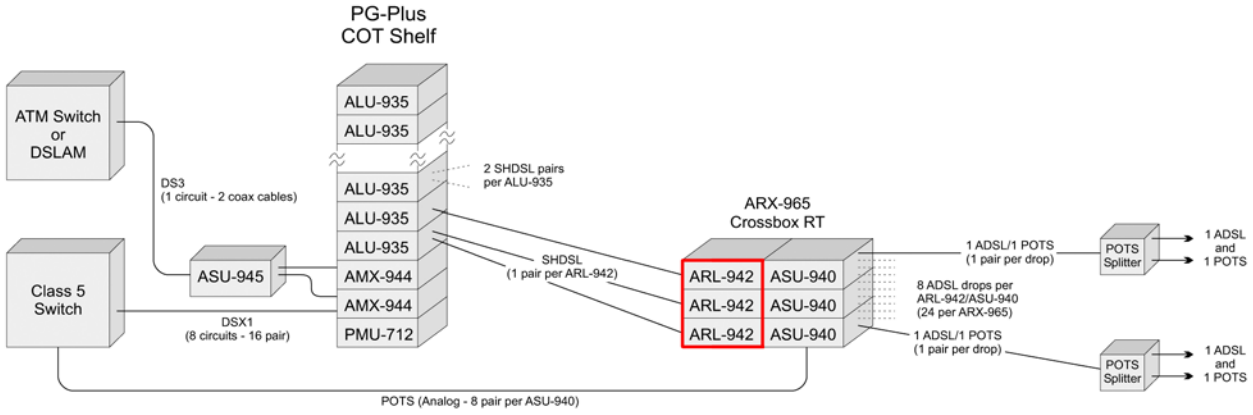


Figure 1. Edge RAM Architecture

Figure 2 shows the ARX-965 RT and the location of the ARL-942s and other cards in the RT Enclosure. The RT supports three ARL-942s, three ASU-940s and a AFU-960 Fan Unit. The AFU-960 is included with the RT and must be installed to ensure adequate cooling of the ARL-942s.

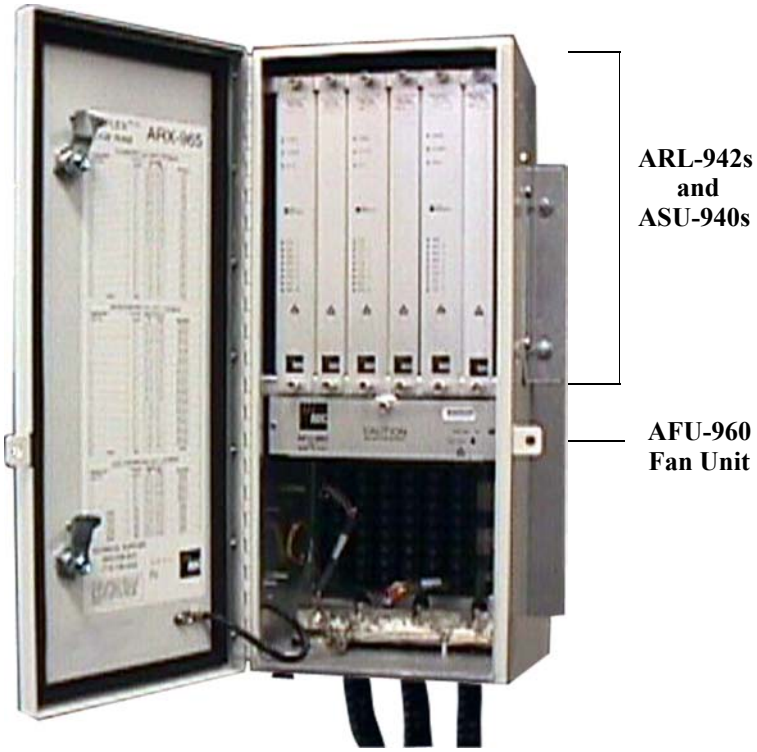


Figure 2. ARX-965 RT Enclosure

SPECIFICATIONS

Table 1 lists the specifications for the ARL-942.

Table 1. Specifications

Category	Item	Value
Electrical	Input Voltage	180 Vdc to 270 Vdc (± 130 Vdc)
	Input Power	Less than 12 W
G.SHDSL Performance	Line Rate	576 Kbps to 2056 Kbps (dependent on length)
	Line Reach	0 Kft to 12.5 Kft
ADSL Performance	Line Rate	32 Kbps to 8160 Kbps
	Line Reach	Up to 13,000 ft
Environmental	Elevation	-200 ft. to 13,000 ft -60 m to 4,000 m
	Temperature	-40° F to +150° F -40° C to +65° C
	Humidity	5% to 95% (non-condensing)
Compliance	NEBS	SR-3580 Level 3
	ESD	Per GR-1089-CORE
	Power Cross and Lightning Surge	Per GR-1089-CORE
	Human Safety	UL-1950 for Restricted Access
	Emissions Radiation and Immunity	GR-1089-CORE for Class A equipment
Physical	Height	10.5 in. (26.7 cm.)
	Width	2.0 in. (5.08 cm.)
	Depth	7.8 in. (19.8 cm.)
	Weight	1.0 lbs. (0.5 kg.)

POWER

Table 2 lists the power metrics of the ARL-942.

Table 2. Power Requirements

Category	Measurement
ARL-942 Input Power	8.2 W (no ADSL active)
	9.5 W (8 ADSL active)
	11 W (8 ADSL active with fan card running)
Power increase from 0 to 8	1.299 W

Performance Monitoring and Alarm History

An ARL-942 provides extensive real-time, nondisruptive monitoring of SHDSL transmission performance parameters. User selectable threshold settings for many of the performance monitoring measurements can be adjusted in the ARL-942 screen. These settings cause alarms to be activated at the designated setting. ADSL performance is monitored and some threshold settings can also be adjusted. The ART reports the raw ADSL statistics to the ARL-942 which accumulates and displays the information. Monitored parameters include the following:

- SHDSL- Rate, Noise Margin, Insertion Loss, Errored Second (ES), Unavailable Seconds (UAS)
- ADSL - Coding Type, Noise Margin, Rate, Attenuation, Interleave Delay, ES, Severely Errored Seconds (SES), UAS

Alarms

An ARL-942 generates the listed alarms for fault conditions on the SHDSL transmission facility and at the application interface.

All SHDSL alarms are suppressed when unit is initially installed and powered up. When the SHDSL circuit is synchronized and the ARL-942 and RT margins have cleared, any outstanding alarms that had been suppressed are made active and reported to the Management Unit (based upon their provisioned types).

ADSL alarms are suppressed until the ADSL line synchronizes for the first time.

During alarm suppression, alarms are not reported to the Management Unit for generating user alarms. Only the alarm history is generated for ARL-942 screens that are in alarm.

Alarm Types

Any alarm may be set to the following severities:

- Critical - CR
- Major - MJ
- Minor - MN
- Not Alarmed - NA
- Not Reported - NR

An alarm type set to NA will accumulate history counts and send an SNMP trap message, but will not be passed to the management unit for further alarm processing. However, *Current* Status will show ACTIVE. An alarm set to NR will not be reported by the system.

History

Current cumulative counts of the past 24 hours and historical data in the form of a 24-hour history (in 15-minute increments) and a 7-day history (in 24-hour increments) are available to assist you in identifying problem sources.

- SHDSL Interface: 24-Hour (15-minute intervals) and 7-Day (24-hour intervals) for ES and UAS
- Alarm: Time stamp of first and last occurrence, number of occurrences for all enabled alarms
- ADSL: 15 minute and 3-Day for ES, SES and UAS

FRONT PANEL

Figure 3 shows the ARL-942 front panel and Table 3 on page 8 describes the front panel LEDs.

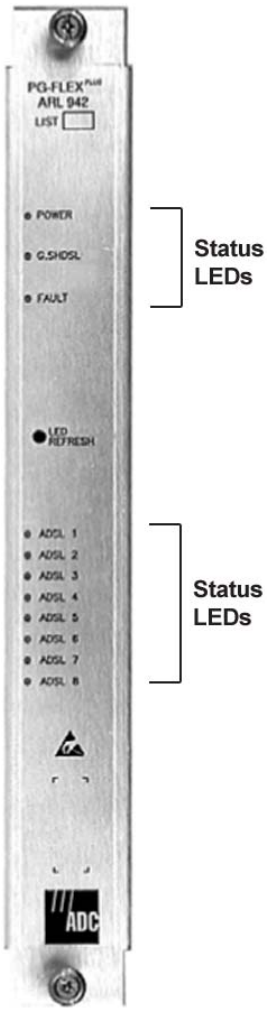


Figure 3. ARL-942 Front Panel

Table 3. ARL-942 Front Panel LEDs

LED	Color	State	Description
PWR	Green	On	ARL-942 is receiving power from the ALU-935
		Off	ARL-942 is not receiving power from the ALU-935
SHDSL	Green	On	SHDSL is in sync between the ARL-942 and the ALU-935
		Flashing (Fast)	SHDSL is in sync between the ARL-942 and the ALU-935, but the margin is below the threshold
		Flashing (Slow)	SHDSL is attempting to sync
		Off	SHDSL does not detect a signal from the ALU-935
FAULT	Red	On	An internal fault has been detected in the ARL-942
		Off	No internal fault has been detected in the ARL-942
ADSL # (# = 1 – 8)	Green	On	ADSL is in sync
		Flashing (Fast)	ADSL is in sync between the ARL-942 and the ALU-935 and the margin is below the threshold
		Flashing (Slow)	ADSL is idle or attempting to sync
		Off	LEDs are in power save mode. Press LED REFRESH to see status.

INSTALLATION AND TEST

Always treat the SHDSL pair as if it were live with high voltage present. Use caution when installing a SHDSL pair because voltages up to 270 Vdc may be present.

STATIC SENSITIVE DEVICE – DO NOT HANDLE ANY MATERIAL WITHOUT FIRST TAKING PROPER STATIC CONTROL PRECAUTIONS.

REQUIRED TOOLS AND TEST EQUIPMENT

No tools are required to install the ARL-942.

Install the ARL-942 from left to right leaving a space between each card for the ASU-940 (Figure 2 on page 3). The RT supports three ARL-942s and three ASU-940s. Refer to the cabling tables provided in the COTS documentation for slot and Telco cabling assignment.

INSTALLATION

Install a ARL-942

Step	Action
1	Loosen the thumbscrews on the front of the ARL-942.
2	Insert the ARL-942 into a vacant slot in the shelf that corresponds to the location of the wiring for the service being activated.
3	Tighten the thumbscrews to hold the card in place.

Table 3 on page 8 assumes the ARL-942 is installed and connected to a working SHDSL circuit originating from an ALU-935. The LED REFRESH button on the ARL-942 must be pressed to view the LED status. The ADSL LEDs automatically extinguish after two minutes.

INITIALIZE AND POWER UP THE ARL-942

After installing the ARL-942, the following events occur:

- All LEDs briefly blink on and then off, with the exception of the PWR LED that remains On.
- SHDSL LED blinks until it is fully synchronized (up to a few minutes), then remains On.
- All ADSL LEDs blink (until sync), then stays On for a few minutes, then extinguishes.
- Fault LED does not come On unless a fault is detected (Table 22 on page 98).
- Beyond this time, the LED REFRESH button must be pressed to view the ADSL LED status. These LEDs automatically extinguish after two minutes.

ADMINISTRATION

Refer to the proper Management Unit Technical Practice for detailed Administration instructions.

For example:

1. Provision your PC/Laptop running Windows HyperTerminal or PROCOMM, etc. to the following terminal settings:

8 data bits
1 stop bit
no parity
VT-100 emulation
9600 baud

2. Connect the DB-9 cable between the RS-232 port on the front of the Management Unit and the PC/Laptop serial port.

3. Press **ENTER** several times until the Main Menu appears.

NAVIGATIONAL METHODS

Table 4 shows the keys used to navigate through the menus and screens:

Table 4. Navigational Keystrokes

Keypress	Effect on Menu	Effect on Screen
ENTER	Moves to sub-menu or screen selected	Confirms changes
← or CTRL - F	Moves left across Main Menu	Moves the cursor left
→ or CTRL - G	Moves right across Main Menu	Moves the cursor to the right
↑ or CTRL - T	Moves up the sub-menu selection	Moves the cursor up
↓ or CTRL - V	Moves down the sub-menu selection	Moves the cursor down
TAB	No effect	Moves to the next field
SPACEBAR	No effect	Cycle through the field options
ESC	Moves up a menu level. From the Main Menu, the Logout screen is displayed.	Returns to Main Menu without accepting changes. The banner briefly appears and then the Main Menu bar displays.
CTRL - R	Returns to the Main Menu. The banner briefly appears and then the Main Menu bar displays.	Returns to Main Menu without accepting changes
A - Z keys	Selects an underlined or highlighted menu item	A screen entry is made

Some screens illustrated in this document may be slightly different than what may appear on the craft interface terminal. These differences are related to individual software installations.

CONFIGURATION, MAINTENANCE, AND TESTING

The following sections describe how to navigate the VT-100 screens to configure, check the status of, and maintain the ARL-942 system.

MENUS AND DISPLAY STRUCTURE

Figure 4 shows the menu structure of the terminal management system.

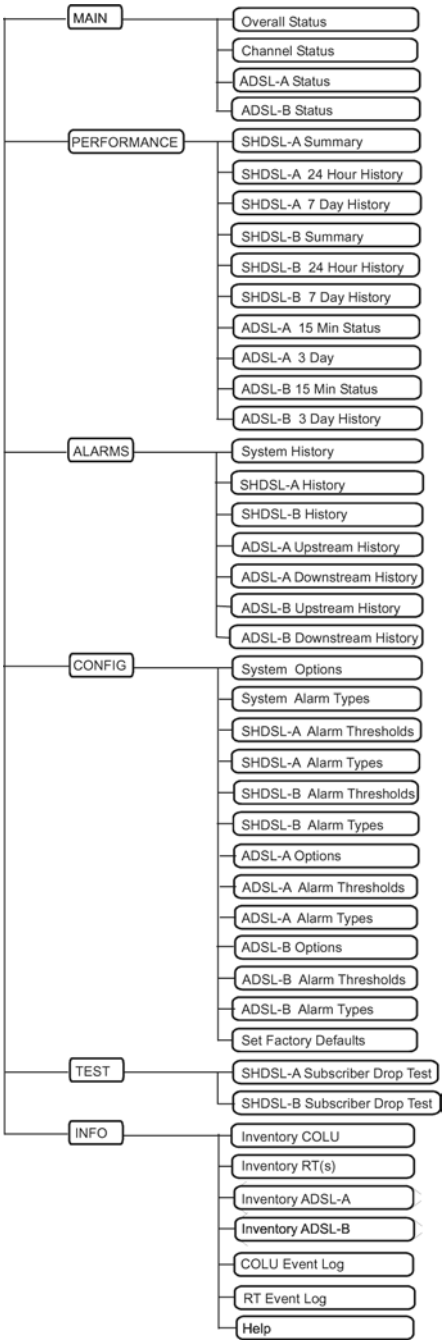


Figure 4. Terminal Menu and Display Structure

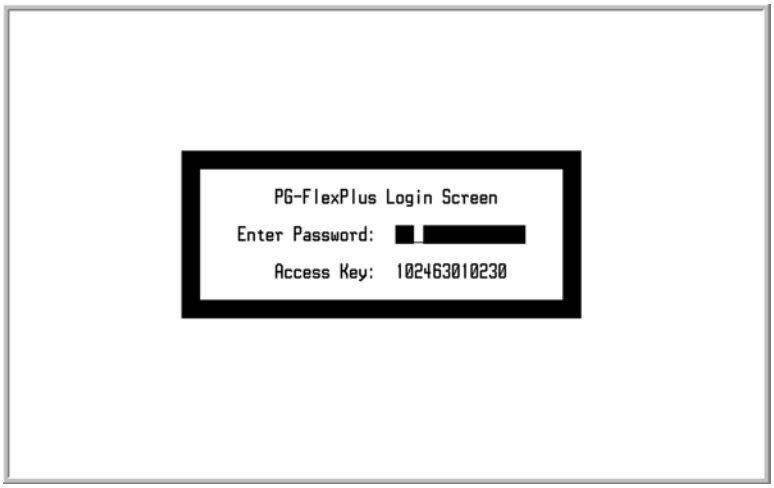
Log On The ARL-942 Through the Management Unit

This screen logs the user into the ARL-942 by going through the Management Unit (PMU-712/AMU-912). The example below shows how to log into the PMU-712.

The factory-default password is **password#1**.

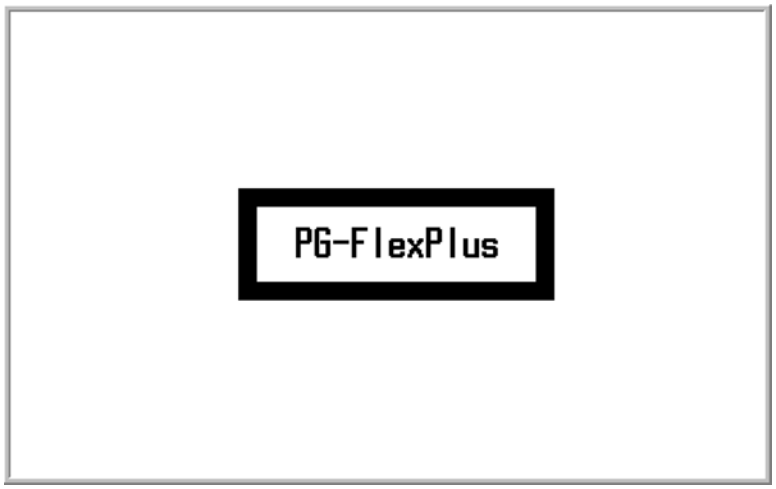
If the password has been changed and the new password is not known, contact ADC Technical Support while at the terminal. Technical Support will provide a temporary password based on the Access Key number displayed on the Logon screen.

Log On The ARL-942 Through the Management Unit

Step	Action
1	After connecting a VT-100 terminal to the PMU-712, press **SPACEBAR** several times to start the autobaud feature. The Login Password screen appears. 
2	If an invalid *Password* is entered, the Login screen is redisplayed with the message `Invalid Password...Try Again:.` 

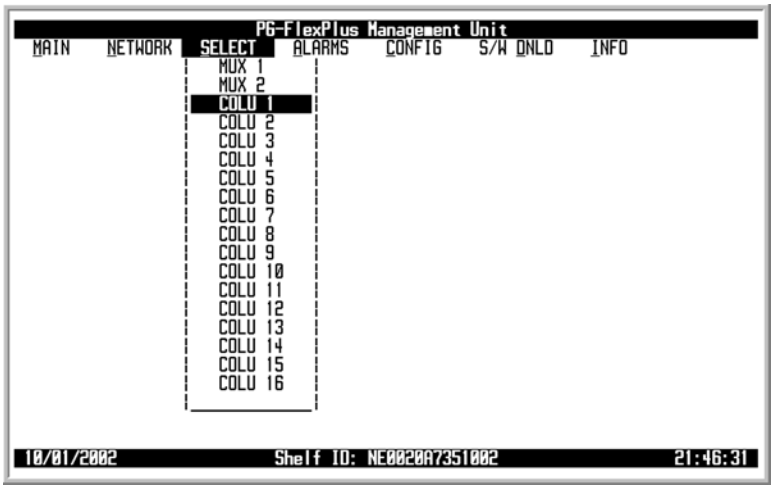
Log On The ARL-942 Through the Management Unit (Continued)

Step	Action
3	Type the *Password*, then press ENTER. After a successful login, the system banner screen appears for a few seconds.

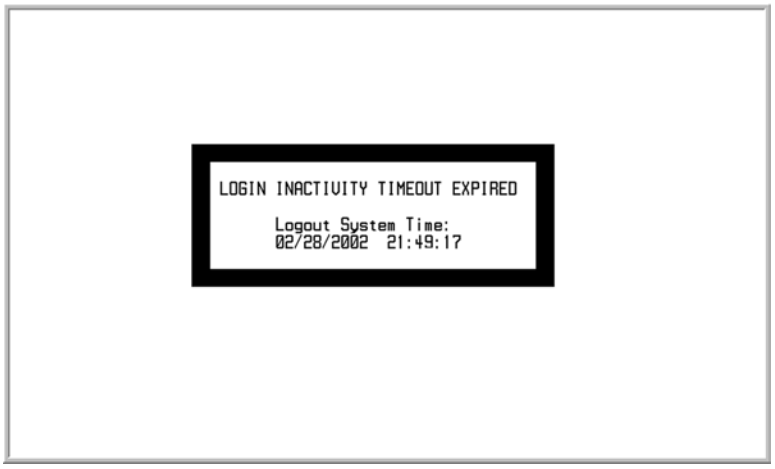
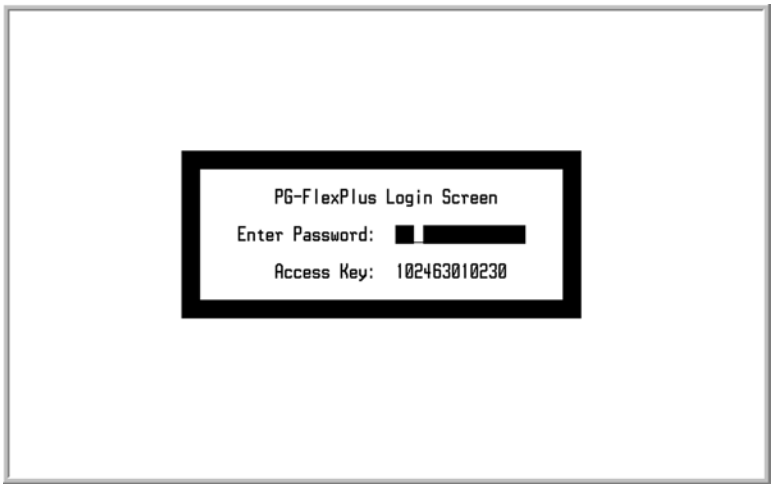


Then, the PMU-712 Main Menu screen appears.

Log On The ARL-942 Through the Management Unit (Continued)

Step	Action
4	At the Main Menu, choose **SELECT**. Press ↓ to choose appropriate *COLU#* (e.g., **COLU 1**).  The ARL-942 Main Menu appears. 

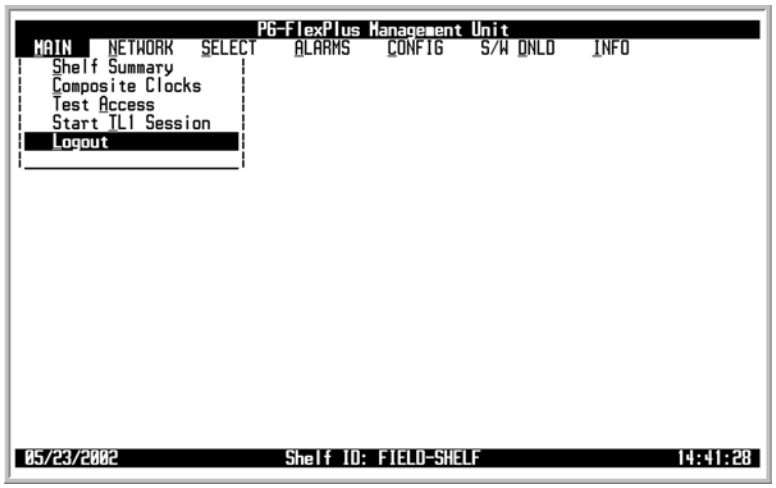
Log On The ARL-942 Through the Management Unit (Continued)

Step	Action
5	After 15 minutes of inactivity, the following menu appears.  Press **ESC**. The Login screen reappears.  Repeat Step 1, Step 3 and Step 4 to log in again.

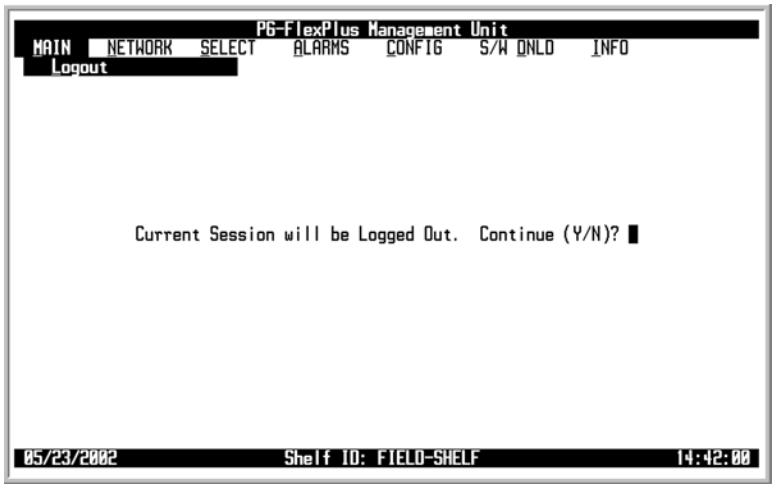
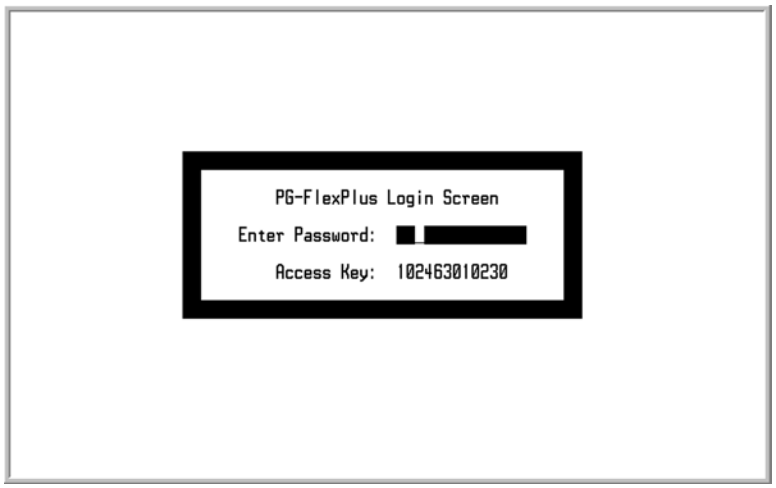
Logout of the ARL-942 through the Management Unit

This screen logs the user out of the ARL-942 by going through the PMU-712/AMU-912. The example below shows how to log out of the PMU-712.

Logout of the ARL-942 through the Management Unit

Step	Action
1	**CAUTION** ***If you must leave your VT-100 terminal unattended for any length of time, log off until you are ready to resume work. This prevents unauthorized persons from inadvertently changing any of your operating parameters and causing a possible loss of service.*** At the ARL-942 Main Menu screen, press **ESC** to return to the PMU-712 Main Menu. The following screen appears. 
2	At the Main Menu screen, select **MAIN**. Press ↓ to choose **Logout**. The following screen appears. 

Logout of the ARL-942 through the Management Unit (Continued)

Step	Action
3	To logout of the system, press Y.  The Login screen appears. 

MAIN MENU OPTION

The Main Menu provides access to a summary of the overall status of the unit and a view of individual unit status. Refer to Table 5 for sub-menu options and descrptions.

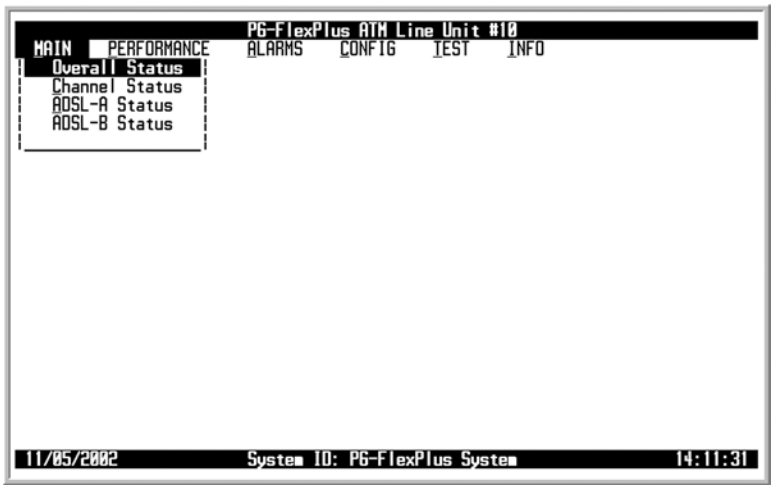


Table 5. Main Menu Options

Sub-Menu Options	Sub-Menu Descriptions	Parameters	Valid Values
Overall Status (See Table 6 on page 21 for Overall Status)	Displays the operational status of the A and B SHDSL links		
Channel Status (See Table 7 on page 23 for Channel Status)	Displays the operational status of the SHDSL links and ADSL/POTS drops		
ADSL-A Status (See Table 8 on page 26 for ADSL Status)	Displays the operational status conditions of the ADSL-A connections for the Edge IAD		
ADSL-B Status (See Table 8 on page 26 for ADSL Status)	Displays the operational status conditions of the ADSL-B connections of the selected ADSL facility for the Edge RAM		

MAIN — Overall Status

This screen displays the operational status of the A and B SHDSL links. Refer to Table 6 on page 21 for Overall Status information.

MAIN — Overall Status

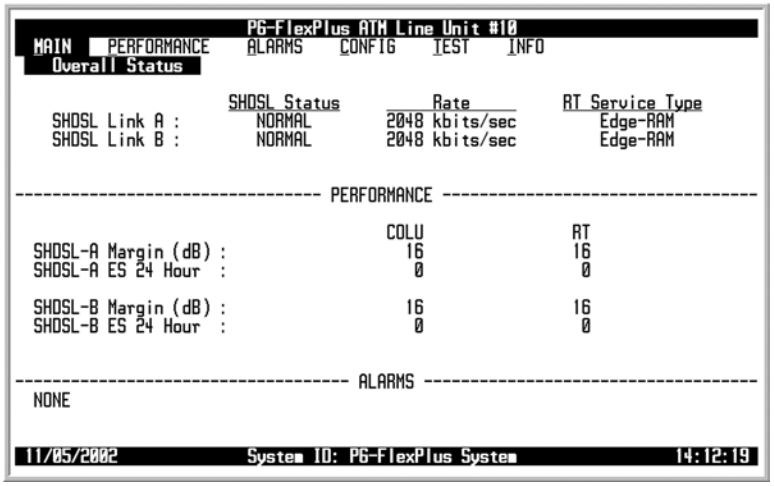
Step	Action
1	At the Main Menu screen, select **MAIN**. Press ↓ to choose **Overall Status**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

Table 6. Overall Status

State	Description
SHDSL Status	
FRAMER SYNC	Part of the SHDSL startup process; chipset is working to sync the SHDSL framer
HANDSHAKE	Part of the SHDSL startup process; chipset is sending and receiving SHDSL capabilities before initiating the rate negotiation
LINK DOWN	RT is not powered and not in sync
NORMAL	Normal operation where the SHDSL link is synchronized between the ARL-942 and the CO
RATE ADAP	Part of the SHDSL startup process; chipset is optimizing performance for maximum data rate
STABILIZING	Part of the SHDSL startup process; remote end is still performing framer sync
STARTUP	Part of the SHDSL startup process; SHDSL link is acquiring synchronization
TRAINING	Part of the SHDSL startup process; chipset is analyzing communication abilities
Performance	
SHDSL-A ES (24 Hr.)	Count of Errored Seconds occurring on SHDSL Link A
SHDSL-A Margin (dB)	Current margin value on SHDLS Link A
SHDSL-B ES (24 Hr.)	Count of Errored Seconds occurring on SHDSL Link B
SHDSL-B Margin (dB)	Current margin value on SHDLS Link B
Alarms	
ADSL-A	ADSL alarm is active on port (1 through 8) of RT-A
ADSL-B	ADSL alarm is active on port (1 through 8) of RT-B
SHDSL-A	Summary of types of Active alarms of RT-A
SHDSL-B	Summary of types of Active alarms of RT-B
System	Summary of types of Active alarms. At least one system is active.

MAIN — Channel Status

This screen displays the operational status of the SHDSL links and ADSL/POTS drops. Refer to Table 7 on page 23 for Channel Status information.

MAIN — Channel Status

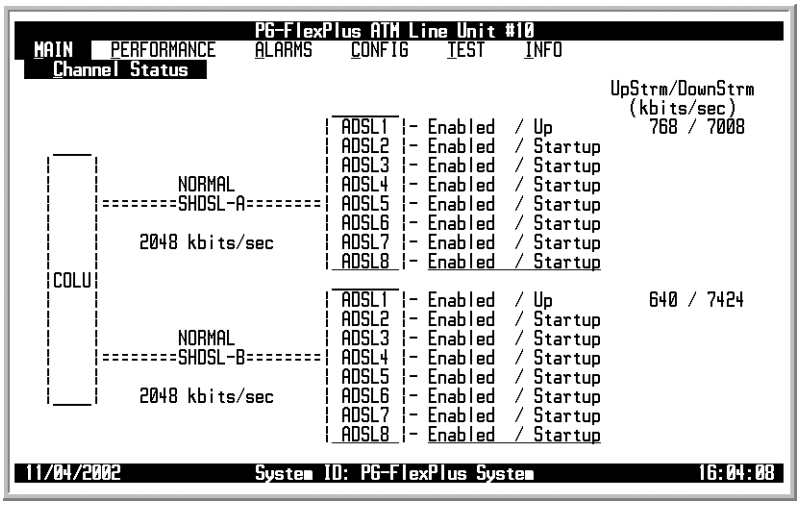
Step	Action
1	At the Main Menu screen, select **MAIN**. Press ↓ to choose **Channel Status**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

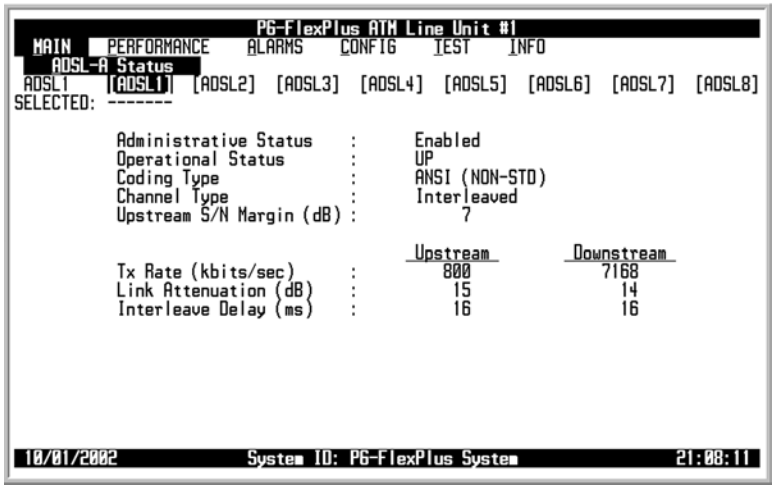
Table 7. Channel Status

State	Description
SHDSL Status	
Refer to Table 6 on page 21.	
Channel Status	
ENABLED - UP	In sync - connected to modem and passing data
ENABLED - STARTUP	Trying to sync with modem
ENABLED - DOWN	Trying to sync with modem, but goes down while restarting
DISABLED - UP	In sync - connected to modem, but no data is passing through
DISABLED - STARTUP	Trying to sync with modem
DISABLED - DOWN	Trying to sync with modem, but goes down while restarting

MAIN — ADSL-A Status

This screen displays the operational status conditions of the ADSL-A connections for the Edge IAD. For documentation purposes, the ADSL-A status screens depict an IAD application. Refer to Table 8 on page 26 for ADSL-A status.

MAIN — ADSL-A Status

Step	Action
1	At the Main Menu screen, select **MAIN**. Press ↓ to choose **ADSL-A Status**. The following screen appears. 
2	Press **ENTER**. The following screen appears.  Select the appropriate ADSL facility (1-8) and press **ENTER** to view the screen.
3	Press **ESC**. The Main Menu screen reappears.

MAIN — ADSL-B Status

This screen displays the operational status conditions of the ADSL-B connections of the selected ADSL facility for the Edge RAM. For documentation purposes, the ADSL-B status screens depict an RAM application. Refer to Table 8 on page 26 for ADSL-B status.

MAIN — ADSL-B Status

Step	Action
1	At the Main Menu screen, select **MAIN**. Press ↓ to choose **ADSL-B Status**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

Table 8. ADSL-A and ADSL-B Status

State	Value	Description
ADSL Status (1-8)		
Administrative Port Status	Disabled, Enabled	Determines whether ADSL port should pass data or not. Data will not pass when port is disabled.
Operational Link Status	UP, DOWN, STARTUP	Indicates ADSL link status between ADSL port and Customer Premise Equipment (CPE) - usually ADSL modem
Coding Type	G.DMT, G.Lite, ANSI, ANSI (non-std.), N/A	Line coding type of the ADSL link. When link status is DOWN, coding type is N/A. When link status is up, coding type is actual type of connection.
Channel Type	Fast, Interleaved	Indicates whether interleave buffers are used on ADSL channels or not (thus indicating ADSL channel type)
Upstream S/N Margin (dB)	1-255	Upstream S/N ratio as determined by the ADSL port. Downstream S/N is determined by the CPE.
Tx Rate (kbits/sec)	32-1024 (Upstream) 32-8160 (Downstream)	Downstream and Upstream Transmit data rate reported by ADSL port
Link Attenuation (dB)	1-255 (Upstream) 1-255 (Downstream)	Measured signal loss between RT and CPE
Interleave Delay (ms)	1-255 (Upstream) 1-255 (Downstream)	Additional transmission delay due to the error correcting code of the ADSL channel

PERFORMANCE MENU OPTIONS

The Performance Menu provides access to SHDSL-A, SHDSL-B, ADSL-A and ADSL-B summary, history, and ADSL-A and ADSL-B status screens. Refer to Table 9 on page 28 for sub-menu options and descriptions, parmeters and valid values.

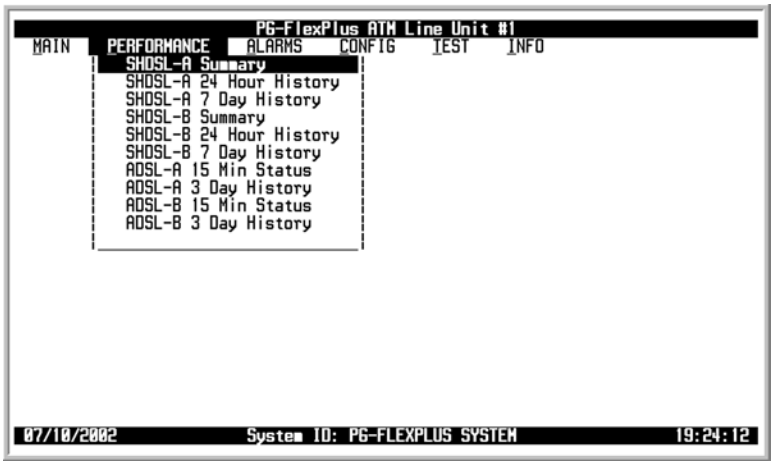


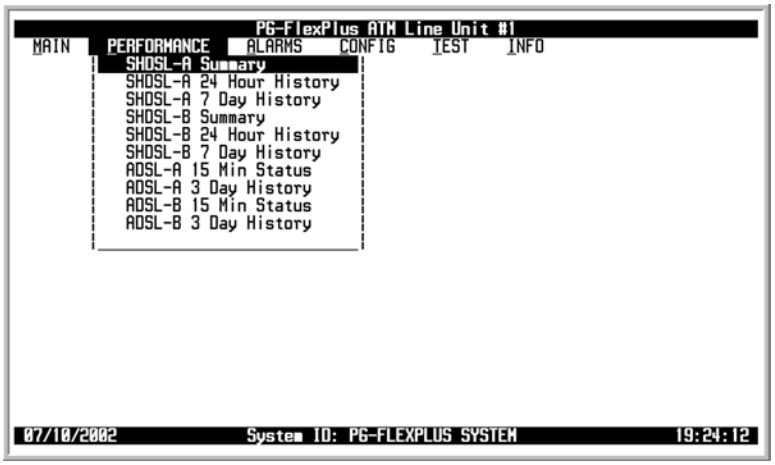
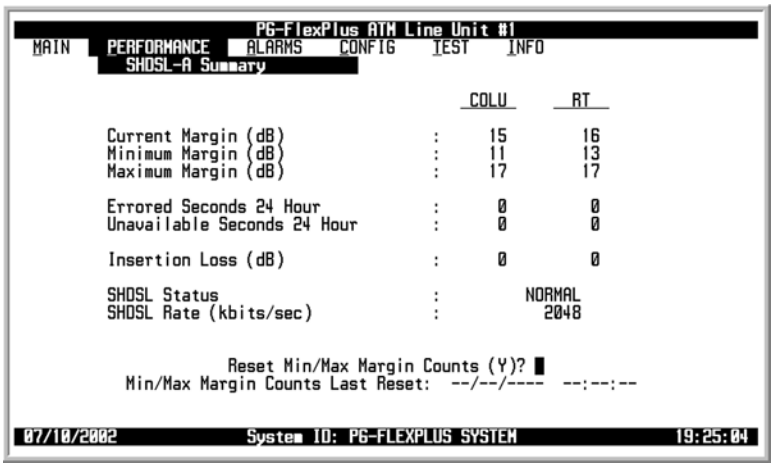
Table 9. Performance Menu Options

Sub-Menu Options	Sub-Menu Descriptions	Parameters	Valid Values
SHDSL-A Summary (See Table 10 on page 31 for SHDSL Summary)	View a summary of the SHDSL-A or SHDSL-B performance in terms of the margin and ES counts	• Reset Min/Max Margins (Y)? • SHDSL Low/High margins will be reset. Continue (Y/N)?	• Y • Y or N
SHDSL-B Summary (See Table 10 on page 31 for SHDSL Summary)			
SHDSL-A 24 Hour History	View the last 24 hours of SHDSL-A or SHDSL-B performance history in 15 minute intervals	• SHDSL 24 Hour History will be cleared. Continue (Y/N)?	• Y or N
SHDSL-B 24 Hour History			
SHDSL-A 7 Day History	View the last 7 days of SHDSL-A or SHDSL-B performance history, plus the current day's accumulated performance history in 24 hour intervals	• Clear SHDSL 7 Day History (Y)? • SHDSL 7 Day History will be cleared. Continue (Y/N)?	• Y • Y or N
SHDSL-B 7 Day History			
ADSL-A 15 Min Status	View the current 15 minute performance statistics of the ADSL-A or ADSL-B link between the RT and Modem	ADSL15 Min Status will be cleared for ADSL*n* (where *n* = 1-8). Continue (Y/N)?	Y or N
ADSL-B 15 Min Status			
ADSL-A 3 Day History	View last 3 days of performance statistics of the ADSL-A or ADSL-B link between the RT and Modem	ADSL 3 Day History will be cleared for ADSL*n* (where *n* = 1-8). Continue (Y/N)?	Y or N
ADSL-B 3 Day History			

PERFORMANCE — SHDSL-A Summary

This screen displays a summary of the SHDSL-A performance in terms of the margin and ES counts. Use the option at the bottom of the screen to reset the minimum and maximum margin values for the selected SHDSL link. Refer to Table 10 on page 31 for SHDSL Summaries.

PERFORMANCE — SHDSL-A Summary

Step	Action
1	At the Main Menu screen, select **PERFORMANCE**. Press ↓ to choose **SHDSL-A Summary**. The following screen appears. 
2	Press **ENTER**. The following screen appears.  The following actions can be taken: a. To clear the minimum and maximum margins, press **Y** and continue with this procedure. b. To exit the SHDSL-A Summary, press **ESC**.

PERFORMANCE — SHDSL-A Summary (Continued)

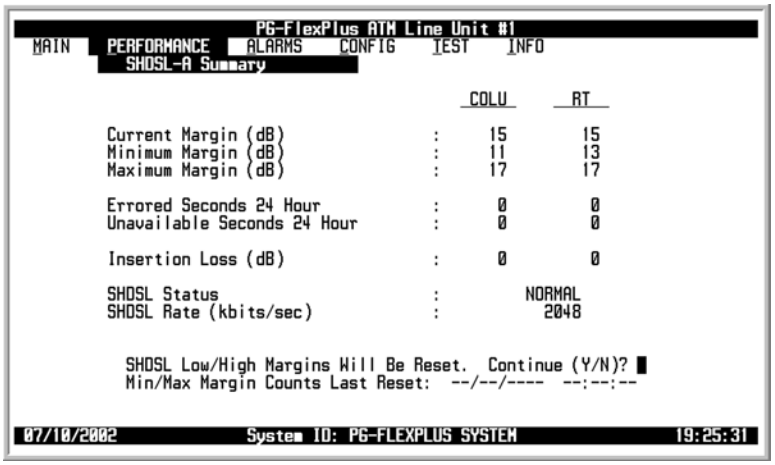
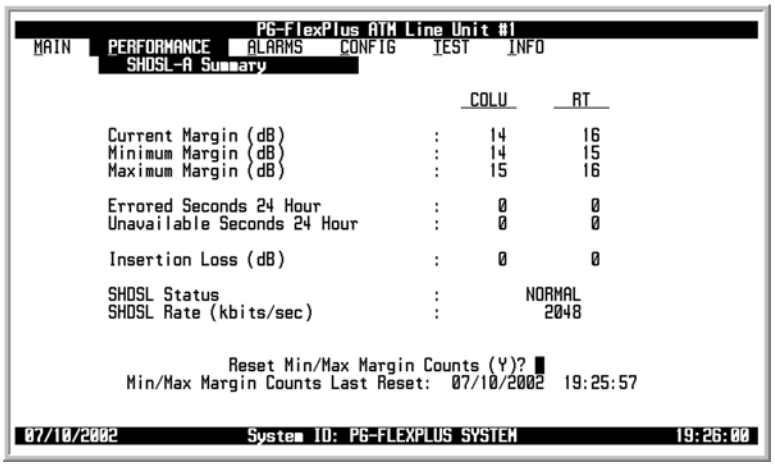
Step	Action
3	The following actions can be taken: a. To verify you want to reset the margins, press **Y**. The following events occur: • minimum and maximum margins are set to the current margins • `Last Cleared` time and date fields are updated   b. To retain the existing minimum and maximum margins, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

Table 10. SHDSL-A and SHDSL-B Summary

State	Description
Current Margin (dB)*	Signal to noise decibel margin
Minimum Margin (dB)*	Minimum decibel value for the SHDSL link
Maximum Margin (dB)*	Maximum decibel value for the SHDSL link
Errored Seconds 24 Hour	SHDSL (ES) counts since the last 24 hour reset
Unavailable Seconds 24 Hour	SHDSL (UAS) counts since the last 24 hour reset
Insertion Loss	Measured signal loss between the COLU and RT
SHDSL Status	Refer to Table 6 on page 21
SHDSL Rate (kbits/sec)	Transmit and receive data rate
* e.g., 0 dB is a predicted BER equal to 10^{-7}; 6 dB is a predicted BER equal to 10^{-10}	

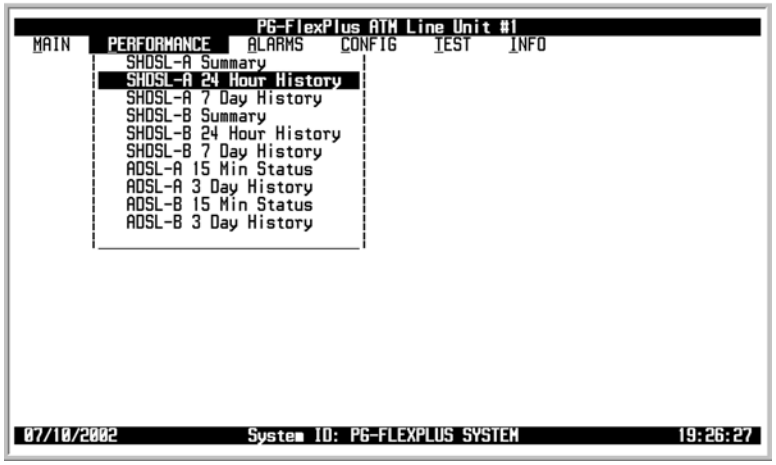
PERFORMANCE — SHDSL-A 24 Hour History

This screen displays the last 24 hours of SHDSL-A performance history in 15 minute intervals. The performance history data displayed includes ES and UAS counts and the status of these counts.

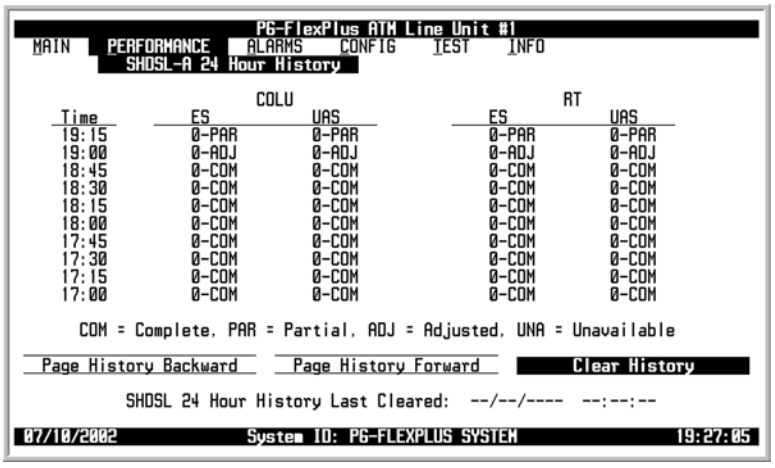
If there is an active 15-minute ES or UAS alarm, this alarm becomes inactive when the 24-hour performance history is cleared and reactivates once the threshold has been crossed.

PERFORMANCE — SHDSL-A 24 Hour History

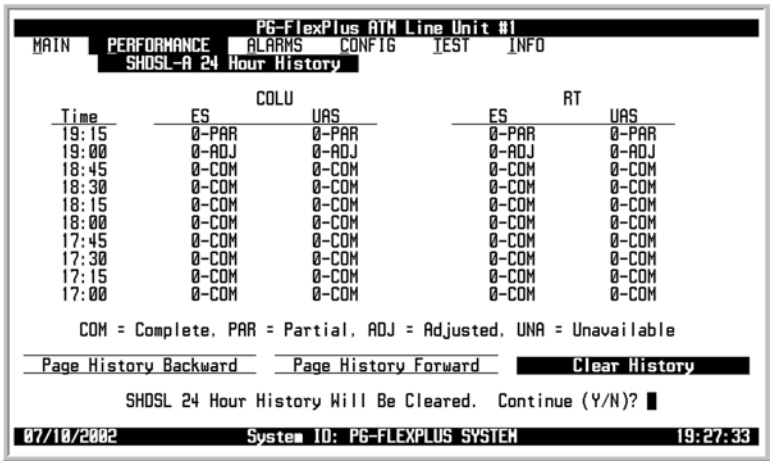
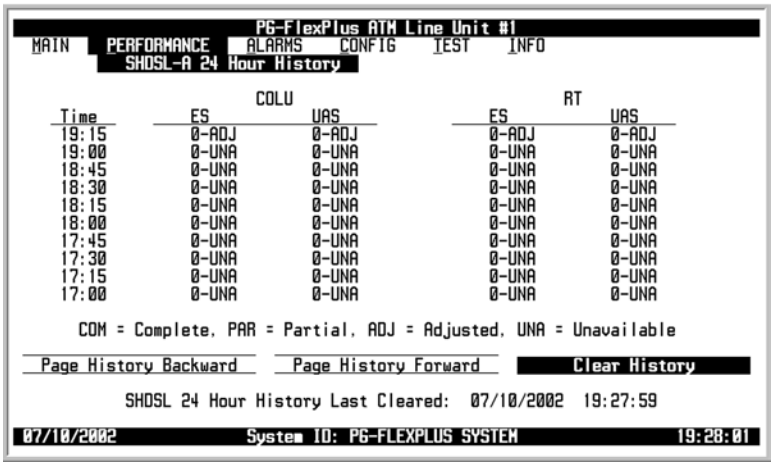
Step	Action
1	At the Main Menu screen, select **PERFORMANCE**. Press ↓ to choose **SHDSL-A 24 Hour History**. The following screen appears.



PERFORMANCE — SHDSL-A 24 Hour History (Continued)

Step	Action
2	Press ENTER. The following screen appears.  Fifteen minute intervals are displayed in the *Time* Field. For example, the time interval marked 19:00 contains information for 19:00 to 19:15. The status of the count is shown as: • ADJ (Adjusted): Time or date has been changed or the history cleared on the system during this interval • COM (Complete): Data is saved in the history register for this interval • PAR (Partial): Data is being collected for this interval • UNA (Unavailable): Data has not been collected for this interval or has been reset during a previous time interval

PERFORMANCE — SHDSL-A 24 Hour History (Continued)

Step	Action
3	The following actions can be taken: a. To scroll through all 15-minute intervals, select the **Page History Forward** or **Page History Backward** button and press **ENTER**. b. To clear the SHDSL 24 Hour History, select the **Clear History** button and press **ENTER**. From the `SHDSL 24 HOUR HISTORY WILL BE CLEARED. CONTINUE (Y/N)?` prompt, the following actions can be taken: • To clear the SHDSL 24 Hour History, press **Y**. The following events occur: 1. counts are set to zero and labeled UNA 2. current interval is labeled as ADJ 3. `Last Cleared` time and date fields are updated   c. To retain the existing minimum and maximum margins, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

PERFORMANCE — SHDSL-A 7 Day History

This screen displays the last seven days of performance history, plus the current day's accumulated performance history in 24-hour intervals. The performance history data information displayed includes ES counts, UAS counts, and the status of the counts.

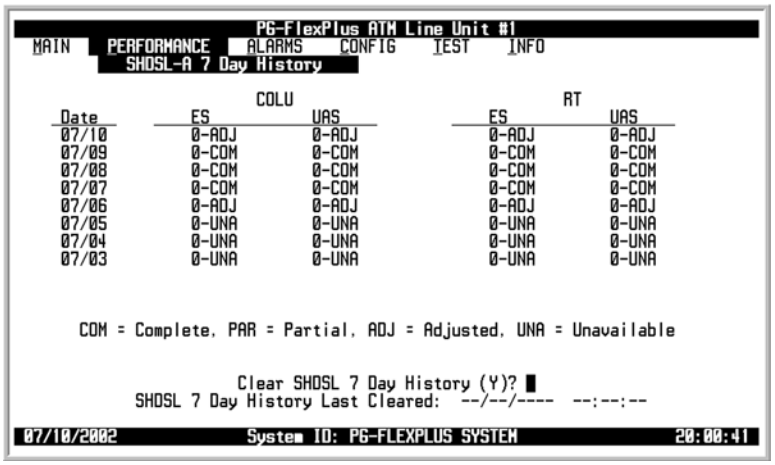
If there is an active 1-day ES or UAS alarm, this alarm becomes inactive when the 24-hour performance history is cleared and reactivates once the threshold has been crossed.

PERFORMANCE — SHDSL-A 7 Day History

Step	Action
1	At the Main Menu screen, select **PERFORMANCE**. Press ↓ to choose **SHDSL-A 7 Day History**. The following screen appears.

PERFORMANCE — SHDSL-A 7 Day History (Continued)

Step	Action
2	Press ENTER. The following screen appears.



The current day performance information shows the performance since the previous midnight. At midnight of every day, the current day performance history is moved to the previous day's history and the current day performance information is cleared. The status of the count is shown as:

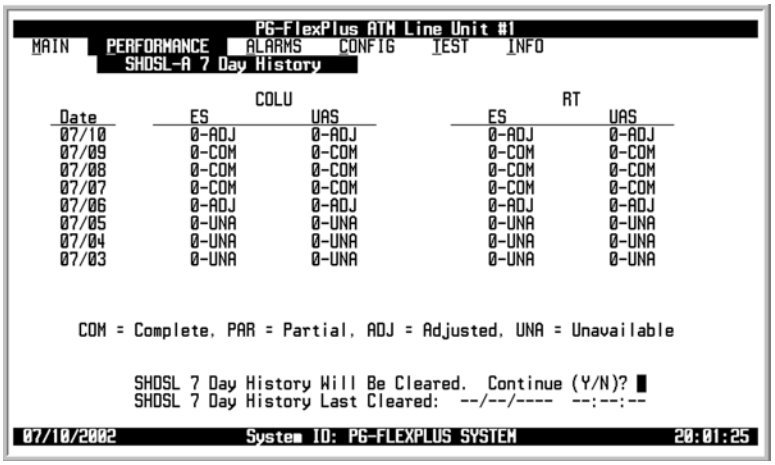
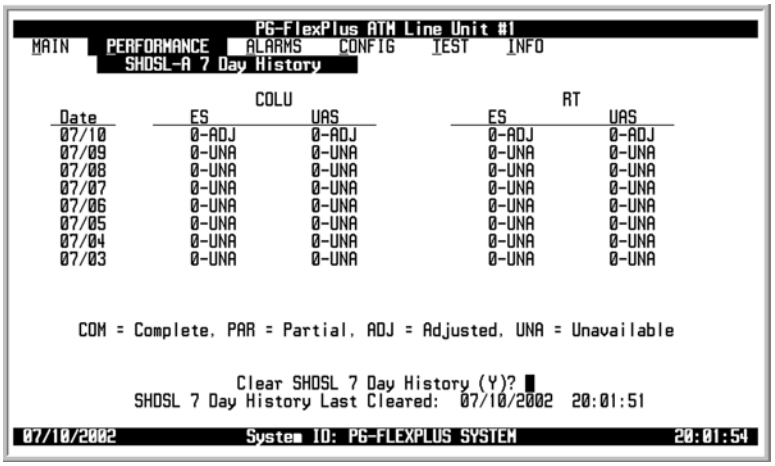
- ADJ (Adjusted): Time or date has been changed or the history cleared on the system during this interval
- COM (Complete): Data is saved in the history register for this interval
- PAR (Partial): Data is being collected for this interval
- UNA (Unavailable): Data has not been collected for this interval or has been reset during a previous time interval

The following actions can be taken:

a. To clear the SHDSL 7 Day History, press Y at the `Clear SHDSL 7 Day History (Y)?` prompt.

b. To retain the existing SHDSL 7 Day History, press N.

PERFORMANCE — SHDSL-A 7 Day History (Continued)

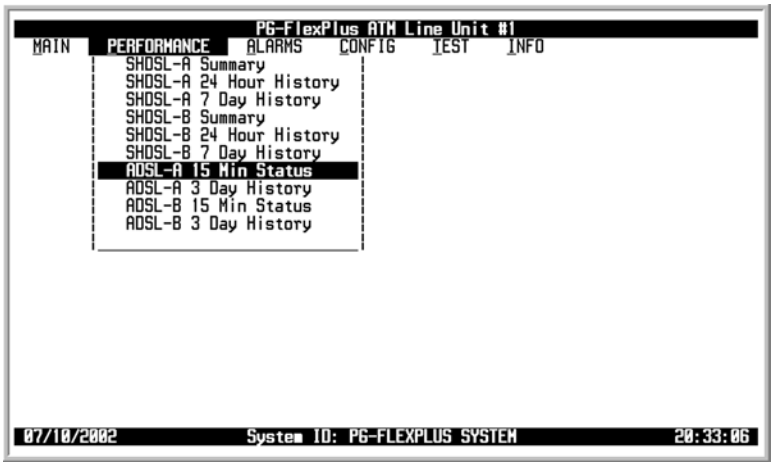
Step	Action
3	The following actions can be taken: a. To verify you want to clear the SHDSL 7 Day History, press **Y** at the `SHDSL 7 Day History will Be Cleared. Continue (Y/N)?` prompt. The following actions can be taken: • The following events occur: 1. counts are set to zero and labeled UNA 2. current interval is labeled as ADJ 3. `Last Cleared` time and date fields are updated   b. To retain the existing HDSL 7 Day History, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

PERFORMANCE — ADSL-A 15 Minute Status

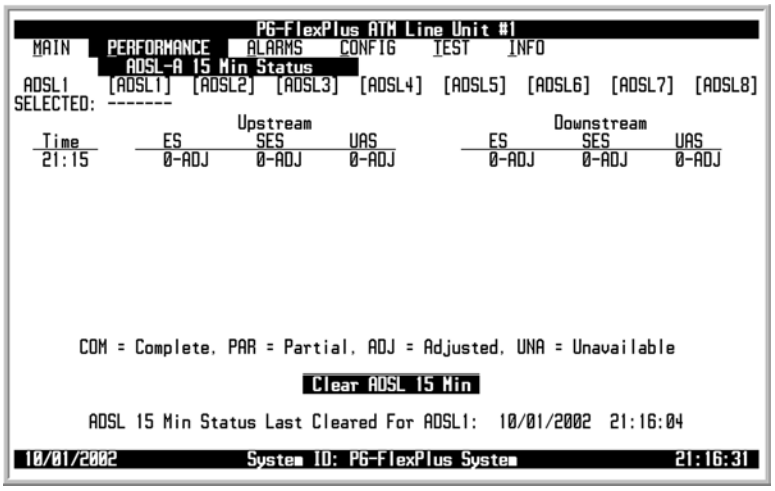
This screen displays the current 15 minute performance statistics of the ADSL link between the RT and Modem. This information includes ES, SES and UAS counts and the validity of the values for the Edge IAD ADSL facility or selected Edge RAM ADSL facility.

If there are active alarms associated with the current ADSL-A 15 minute status information, those alarms become inactive when the ADSL-A 15-Min status performance history is cleared and reactivates once the threshold has been crossed.

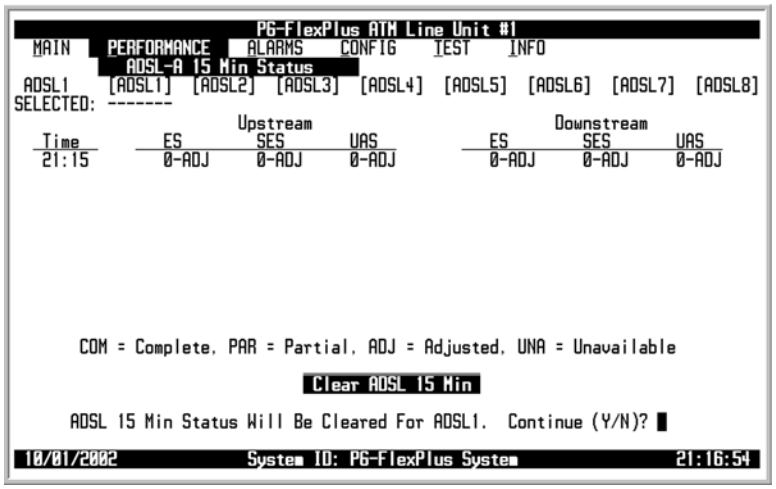
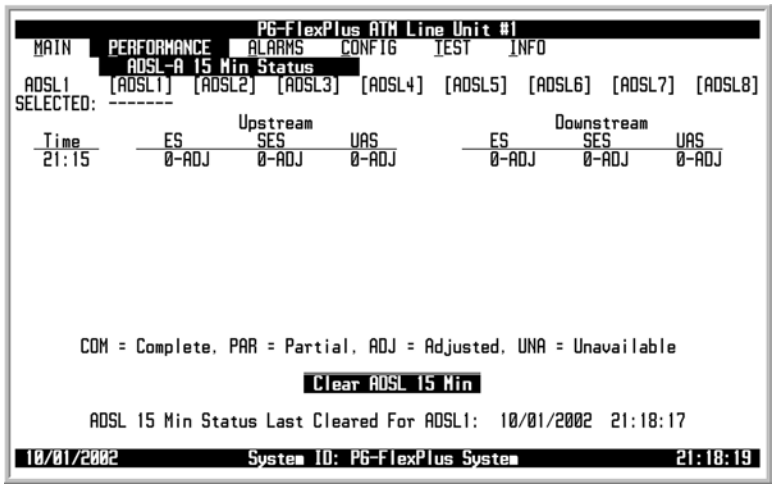
PERFORMANCE — ADSL-A 15 Minute Status

Step	Action
1	At the Main Menu screen, select **PERFORMANCE**. Press ↓ to choose **ADSL-A 15 Min Status**. The following screen appears. 

PERFORMANCE — ADSL-A 15 Minute Status (Continued)

Step	Action
2	Press ENTER. The following screen appears.  The screen displays the current 15 minute performance statistics of the ADSL link between the RT and Modem. The status of the count is as shown: • ADJ (Adjusted): Time or date has been changed or the history cleared on the system during this interval • COM (Complete): Data is saved in the history register for this interval • PAR (Partial): Data is being collected for this interval • UNA (Unavailable): Data has not been collected for this interval or has been reset during a previous time interval The following actions can be taken: a. To clear the ADSL 15 Minute status, select **Clear ADSL 15 Min** button. b. To retain the existing ADSL 15 Min Status, press ESC.

PERFORMANCE — ADSL-A 15 Minute Status (Continued)

Step	Action
3	The following actions can be taken: a. To verify you want to clear the ADSL 15 Min Status, press **Y** at the `ADSL 15 Min Status Will Be Cleared for ADSL1. Continue (Y/N)?` prompt. The following actions can be taken: • The following events occur: 1. counts are set to zero and labeled UNA 2. current interval is labeled as ADJ 3. `Last Cleared` time and date fields are updated   b. To retain the existing ADSL 15 Min Status, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

If there are active alarms associated with the current 24-hour performance history information, those alarms become inactive when the 24-hour performance history is cleared.

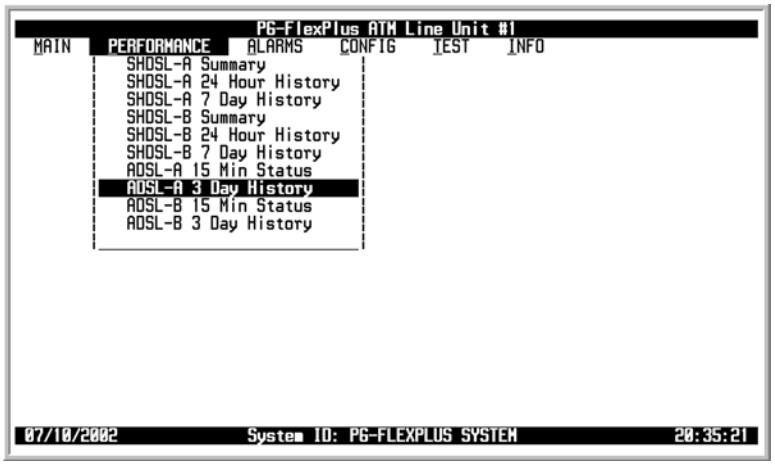
PERFORMANCE — ADSL-A 3 Day History

This screen displays the last 3 days of performance statistics of the ADSL link between the RT and Modem. This information includes ES, SES and UAS counts and the validity of the values for the Edge IAD ADSL facility or selected Edge RAM ADSL facility.

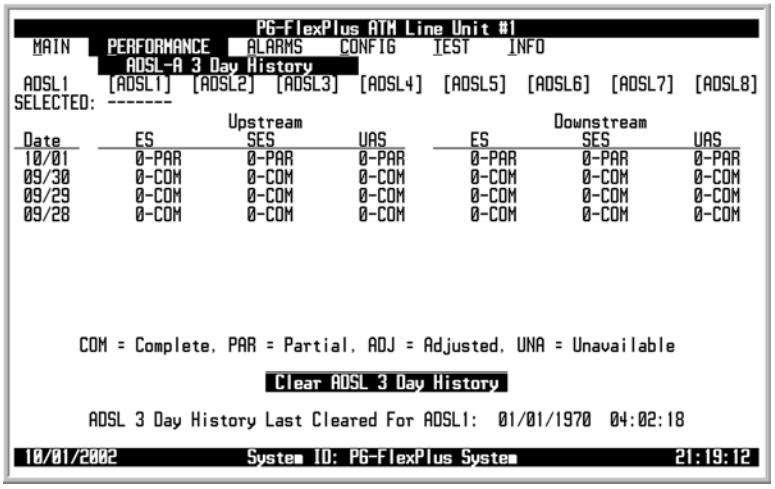
If there are active alarms associated with the current ADSL-A 3 day history information, those alarms become inactive when the ADSL-A 3 day history status performance history is cleared and reactivates once the threshold has been crossed.

PERFORMANCE — ADSL-A 3 Day History

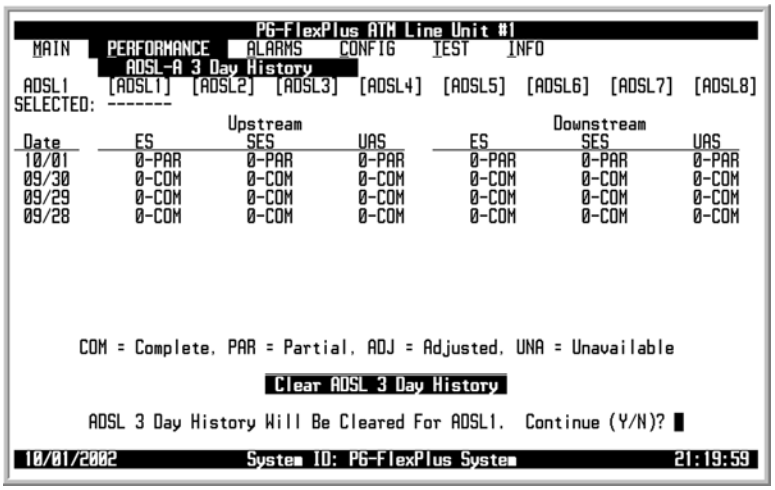
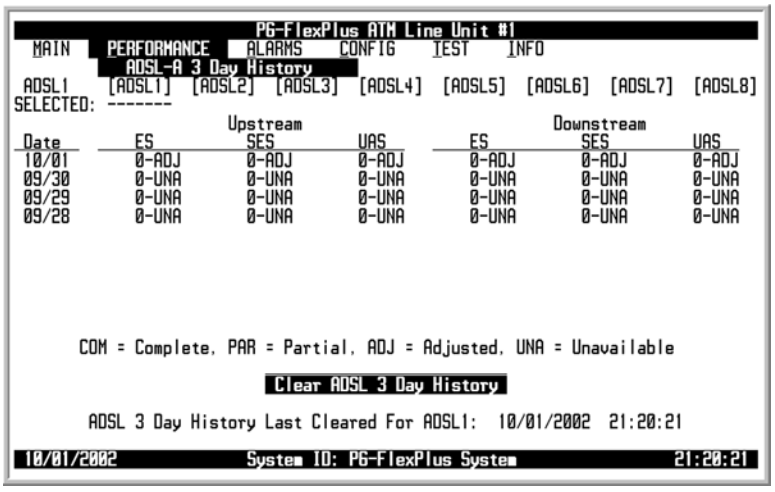
Step	Action
1	At the Main Menu screen, select **PERFORMANCE**. Press ↓ to choose **ADSL-A 3 Day History**. The following screen appears.



PERFORMANCE — ADSL-A 3 Day History (Continued)

Step	Action
2	Press **ENTER**. The following screen appears.  The current day performance information shows the performance since the previous midnight. At midnight of every day, the current day performance history is moved to the previous day's history and the current day performance information is cleared. The status of the count is shown as: • ADJ (Adjusted): Time or date has been changed or the history cleared on the system during this interval • COM (Complete): Data is saved in the history register for this interval • PAR (Partial): Data is being collected for this interval • UNA (Unavailable): Data has not been collected for this interval or has been reset during a previous time interval The following actions can be taken: a. To clear the ADSL 3 Day status, select **Clear ADSL 3 Day History** button. b. To retain the existing ADSL 3 Day History, press **ESC**.

PERFORMANCE — ADSL-A 3 Day History (Continued)

Step	Action
3	The following actions can be taken: a. To verify you want to clear the ADSL 3 Day History, press **Y** at the `ADSL 3 Day History will Be Cleared for ADSL1. Continue (Y/N)?` prompt. The following actions can be taken: • The following events occur: 1. counts are set to zero and labeled UNA 2. current interval is labeled as ADJ 3. `Last Cleared` time and date fields are updated   b. To retain the existing ADSL 3 Day History, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

PERFORMANCE — SHDSL-B Summary

PERFORMANCE — SHDSL-B 24 Hour History

PERFORMANCE — SHDSL-B 7 Day History

PERFORMANCE — ADSL-B 15 Minute Status

PERFORMANCE — ADSL-B 3 Day History

Please refer to PERFORMANCE — SHDSL-A and ADSL-A performance screens since they operate identically.

ALARM MENU OPTIONS

The Alarm Menu reports System, SHDSL, and ADSL related alarmed events. These alarms will be reported to the Management Unit if configured with an alarm severity of critical, major or minor. Refer to Table 11 on page 46 for sub-menu options and descriptions, parameters and valid values.

A description of the Alarm types reported is provided in Table 14 on page 66.

Table 11. Alarm Menu Options

Sub-Menu Options	Sub-Menu Descriptions	Selectable Parameter Options	Valid Values
System History (See Table 15 on page 66 for System Alarms)	View the alarm type, current status, counts and the first and last occurrences	• Clear System Alarm History (Y)? • System Alarm History Will Be Cleared. Continue (Y/N)?	• Y • Y or N
SHDSL-A History (See Table 17 on page 72 for SHDSL Alarm Types)	View the alarm type, current status, counts and the first and last occurrences	• Clear SHDSL Alarm History (Y)? • SHDSL Alarm History Will Be Cleared. Continue (Y/N)?	• Y • Y or N
SHDSL-B History (See Table 17 on page 72 for SHDSL Alarm Types)			
ADSL-A Upstream History (See Table 20 on page 81 for ADSL Alarms)	View the alarm type, current status, counts and the first and last occurrences	ADSL Alarm History Will Be Cleared for ADSL*n* (where *n* = 1-8). Continue (Y/N)?	Y or N
ADSL-B Upstream History See Table 20 on page 81 for ADSL Alarms)			
ADSL-A Downstream History See Table 20 on page 81 for ADSL Alarms)	View the alarm type, current status, counts and the first and last occurrences	ADSL Alarm History Will Be Cleared for ADSL*n* (where *n* = 1-8). Continue (Y/N)?	Y or N
ADSL-B Downstream History See Table 20 on page 81 for ADSL Alarms)			

ALARMS — System History

This screen displays the alarm type, current status, counts and the first and last occurrences. The alarms and default values are defined in Table 15 on page 66.

Under the *Current* alarm column, if the word ACTIVE displays, the alarm is currently active. If the status OK displays, the alarm is not present. If the word SUPPRESSED displays, the alarm is active but suppressed.

Clearing the system alarm history does not clear the current alarms. If there is an active alarm, then the count is set to 1 and the value in the LAST Cleared date and time field is set to the FIRST date and time field.

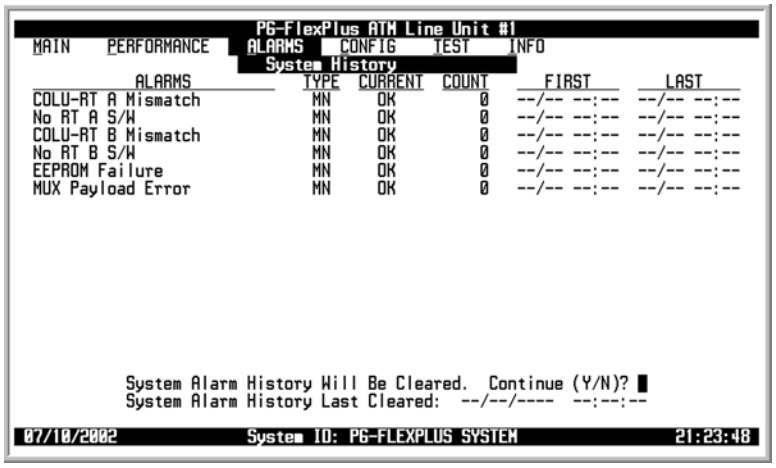
ALARMS — System History

Step	Action
1	At the Main Menu screen, select **ALARMS**. Press ↓ to choose **System History**. The following screen appears. 

ALARMS — System History (Continued)

Step	Action
2	The following actions can be taken: a. To clear the System Alarm History, press **Y** at the `Clear System Alarm History (Y)?` prompt. Press **ENTER**. The following screen appears.  The date and time of the last clearance of the history displays at the bottom of the screen. The current information shows real-time updates. The alarm information displayed indicates: Alarm Types: • CRITICAL — Critical alarm is present • MAJOR — Major alarm is present • MINOR — Minor alarm is present • NOT ALARMED — Condition is active, but has no severity • NOT REPORTED — Condition not reported by system Alarm States: • * — Designates active alarm b. To retain the existing System Alarm History, press **ESC**.

ALARMS — System History (Continued)

Step	Action
3	The following actions can be taken: a. To verify you want to clear the history of all alarms, press **Y** at the `SYSTEM ALARM HISTORY WILL BE CLEARED. CONTINUE (Y/N)?` prompt, the following actions can be taken: The following events occur: • counts are set to zero • `Last Cleared` time and date fields are updated   b. To retain the existing summary of active alarms, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

ALARMS — SHDSL-A History

This screen displays the alarm type, current status, counts and the first and last occurrences. Refer to Table 17 on page 72 for SHDSL Alarms.

Under the *Current* alarm column, if the word ACTIVE displays, the alarm is currently active. If the status OK displays, the alarm is not present. If the word SUPPRESSED displays, the alarm is active but suppressed.

Clearing the system alarm history does not clear the current alarms. If there is an active alarm, then the count is set to 1 and the value in the LAST Cleared date and time field is set to the FIRST date and time field.

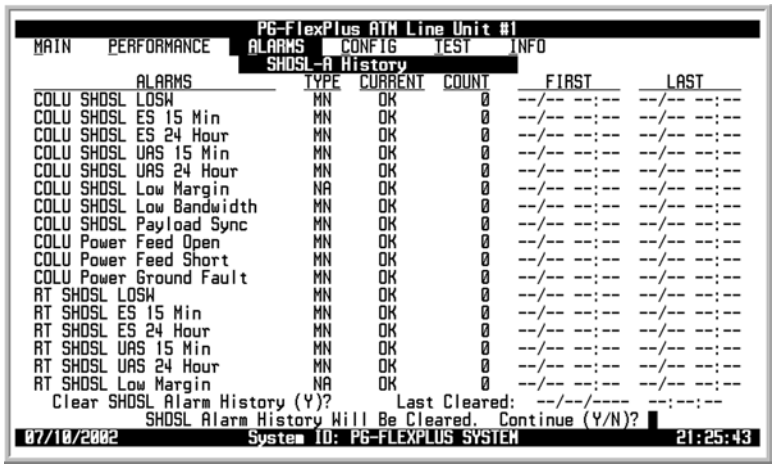
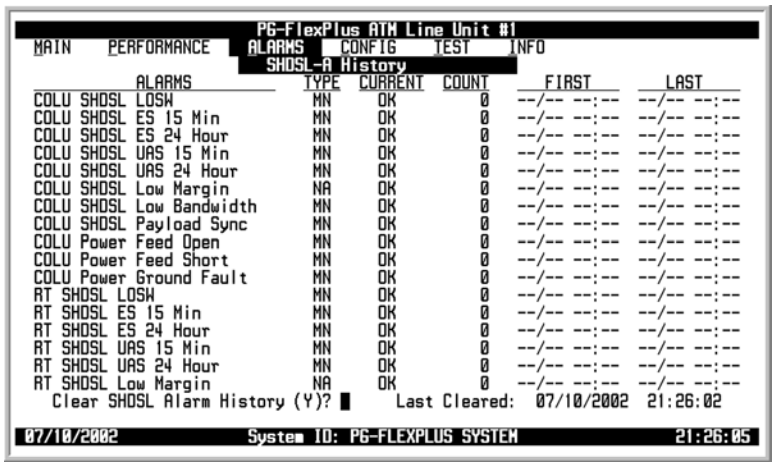
ALARMS — SHDSL-A History

Step	Action
1	At the Main Menu screen, select **ALARMS**. Press ↓ to choose **SHDSL-A History**. The following screen appears. 

ALARMS — SHDSL-A History (Continued)

Step	Action
2	Press **ENTER**. The following screen appears.  The following actions can be taken: a. To clear the SHDSL-A History, press **Y** at the `Clear SHDSL Alarm History (Y)?` prompt. b. To retain the SHDSL-A History, press **ESC**.

ALARMS — SHDSL-A History (Continued)

Step	Action
3	The following actions can be taken: a. To verify you want to clear the SHDSL-A History, press **Y** at the `SHDSL Alarm History Will Be Cleared. Continue (Y/N)?` prompt. The following events occur: 1. counts are set to zero 2. `Last Cleared` time and date fields are updated   b. To retain the existing SHDSL-A history, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

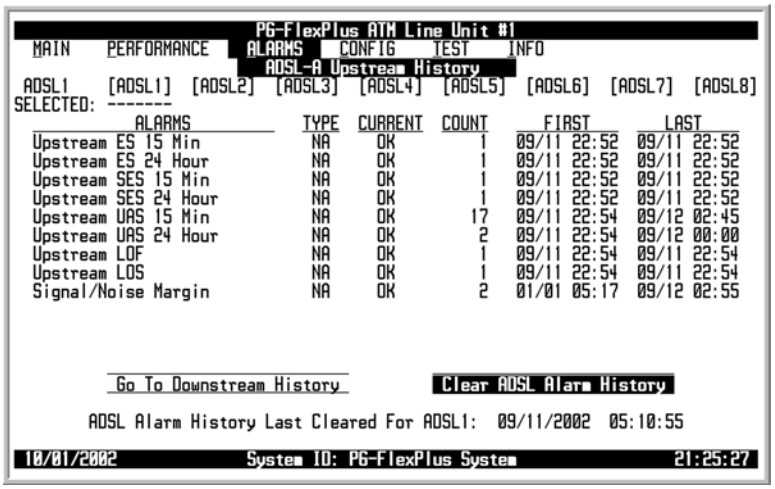
ALARMS — ADSL-A Upstream History

This screen displays the alarm type, current status, counts and the first and last occurrences. Refer to Table 20 on page 81 for ADSL Alarms.

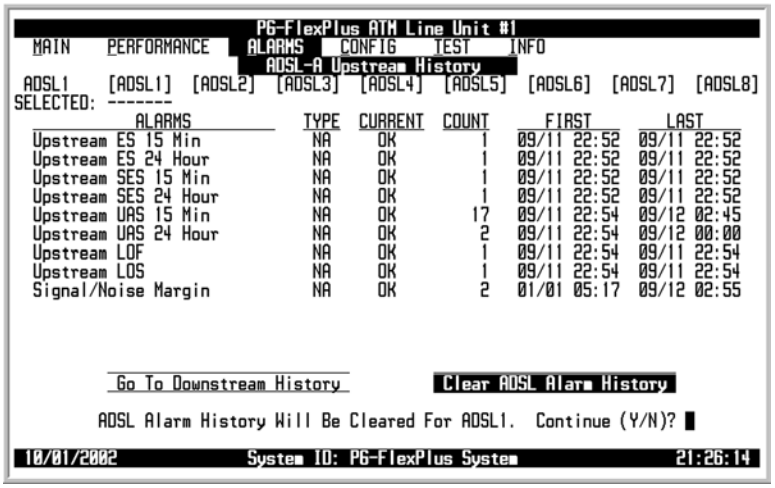
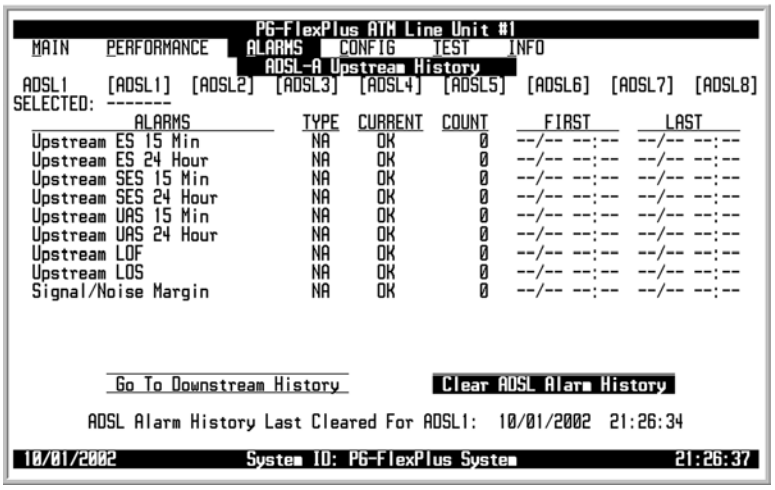
Under the *Current* alarm column, if the word ACTIVE displays, the alarm is currently active. If the status OK displays, the alarm is not present. If the word SUPPRESSED displays, the alarm is active but suppressed.

Clearing the system alarm history does not clear the current alarms. If there is an active alarm, then the count is set to 1 and the value in the LAST Cleared date and time field is set to the FIRST date and time field.

ALARMS — ADSL-A Upstream History

Step	Action
1	At the Main Menu screen, select **ALARMS**. Press ↓ to choose **ADSL-A Upstream History**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 

ALARMS — ADSL-A Upstream History (Continued)

Step	Action
3	The following actions can be taken: a. To view downstream history, select the **Go To Downstream History** button, then press ENTER. b. To clear ADSL alarm history, select the **Clear ADSL Alarm History** button, then press ENTER. From the `ADSL Alarm history Will Be Cleared for ADSL1. Continue (Y/N)?` prompt, the following actions can be taken: • To clear the ADSL-A upstream alarm history, press Y. The following events occur: 1. counts are set to zero 2. `Last Cleared` time and date fields are updated   • To retain the existing ADSL-A upstream alarm history, press N.
4	Press ESC. The Main Menu screen reappears.

ALARMS — ADSL-A Downstream History

This screen displays the alarm type, current status, counts and the first and last occurrences. Refer to Table 20 on page 81 for ADSL Alarms.

Under the *Current* alarm column, if the word ACTIVE displays, the alarm is currently active. If the status OK displays, the alarm is not present. If the word SUPPRESSED displays, the alarm is active but suppressed.

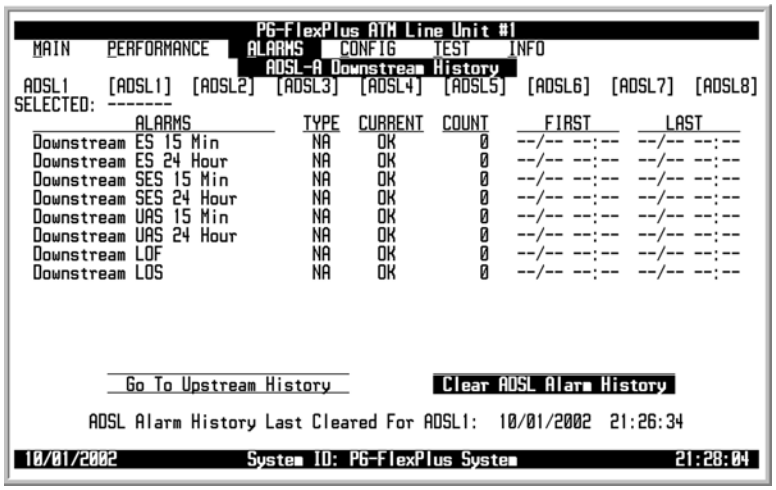
Clearing the system alarm history does not clear the current alarms. If there is an active alarm, then the count is set to 1 and the value in the LAST Cleared date and time field is set to the FIRST date and time field.

ALARMS — ADSL-A Downstream History

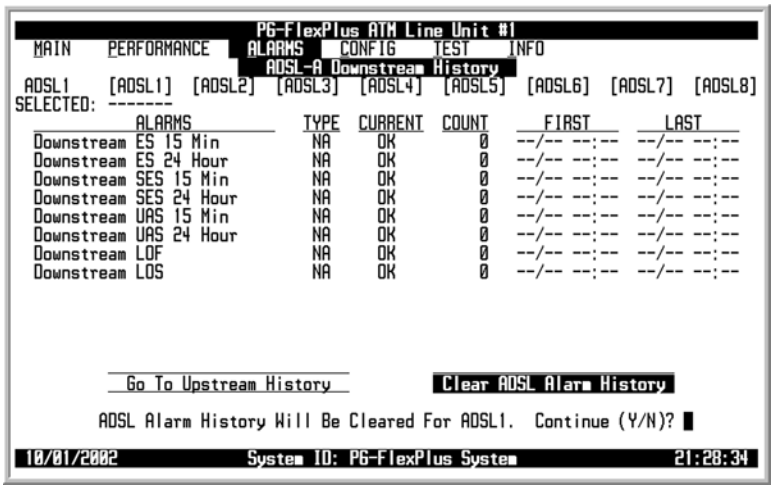
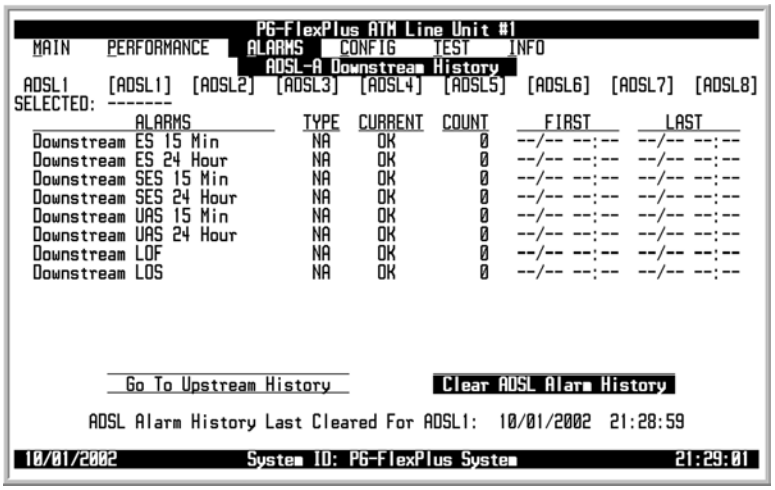
Step	Action
1	At the Main Menu screen, select **ALARMS**. Press ↓ to choose **ADSL-A Downstream History**. The following screen appears.

ALARMS — ADSL-A Downstream History (Continued)

Step	Action
2	Press **ENTER**. The following screen appears.



ALARMS — ADSL-A Downstream History (Continued)

Step	Action
3	The following actions can be taken: a. To view downstream history, select the **Go To Upstream History** button, then press ENTER. b. To clear ADSL alarm history, select the **Clear ADSL Alarm History** button, then press ENTER. From the `ADSL Alarm history Will Be Cleared for ADSL1. Continue (Y/N)?` prompt, the following actions can be taken: • To clear the ADSL-A downstream alarm history, press Y. The following events occur: 1. counts are set to zero 2. `Last Cleared` time and date fields are updated   • To retain the existing ADSL-A downstream alarm history, press N.
4	Press ESC. The Main Menu screen reappears.

ALARMS — SHDSL-B History

ALARMS — ADSL-B Upstream History

ALARMS — ADSL-B Downstream History

Please refer to ALARM — SHDSL-A and ADSL-A alarm screens since they operate identically.

CONFIGURATION MENU OPTIONS

The Configuration Menu provides access to system provisioning and setting all options to factory defaults, etc. Refer to Table 12 for sub-menu options and descriptions, parameters and valid values.

Table 12. Configuration Menu Options

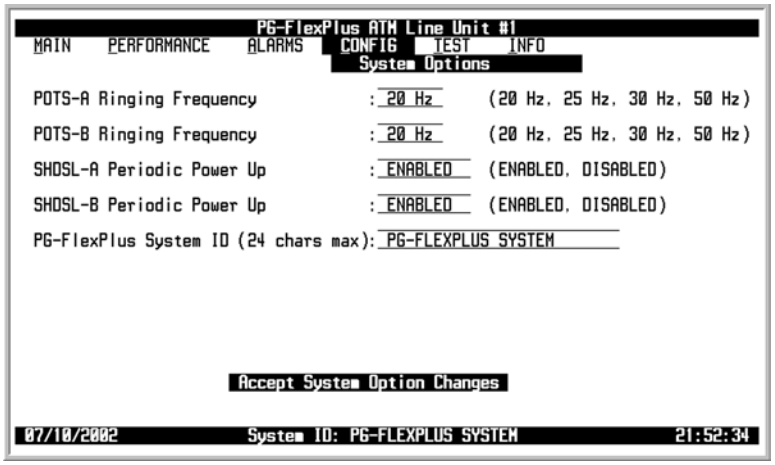
Sub-Menu Options	Sub-Menu Descriptions	Parameters	Valid Values
System Options (See Table 13 on page 63 for System Options)	Set system options	System Options will be changed. Continue (Y/N)?	Y or N
System Alarm Types (See Table 15 on page 66 for System Alarms)	Provision alarm types of all system alarms associated with the SHDSL circuit and ADSL path	System Alarm Types will be Changed. Continue (Y/N)?	Y or N
SHDSL-A Alarm Thresholds (See Table 16 on page 69 for SHDSL Alarm Thresholds)	Provision threshold crossing values for the 15-minute and 24-hour ES, UAS counts and low margin value for SHDSL-A and SHDSL-B ARTs	SHDSL Alarm Thresholds will be Changed. Continue (Y/N)?	Y or N
SHDSL-B Alarm Thresholds (See Table 16 on page 69 for SHDSL Alarm Thresholds)			
SHDSL-A Alarm Types (See Table 17 on page 72 for SHDSL Alarm Types)	Provision alarm types for all SHDSL-A and SHDSL-B alarm severity types	SHDSL Alarm Types will be Changed. Continue (Y/N)?	Y or N
SHDSL-B Alarm Types (See Table 17 on page 72 for SHDSL Alarm Types)			

Sub-Menu Options	Sub-Menu Descriptions	Parameters	Valid Values
ADSL-A Options (See Table 18 on page 75 for ADSL Options)	Provision the ADSL-A and ADSL-B parameters	ADSL Options will be changed for ADSL*n* (where *n* = 1-8). Continue (Y/N)?	Y or N
ADSL-B Options (See Table 18 on page 75 for ADSL Options)			
ADSL-A Alarm Thresholds (See Table 19 on page 78 for ADSL Alarm Thresholds)	Provision threshold crossing values for the 15 minute and 24 hour ES, SES, and UAS counts for the ADSL ARTs	ADSL Alarm Thresholds will be changed for ADSL*n* (where *n* = 1-8). Continue (Y/N)?	Y or N
ADSL-B Alarm Thresholds (See Table 19 on page 78 for ADSL Alarm Thresholds)			
ADSL-A Alarm Types (See Table 20 on page 81 for ADSL Alarm Types)	Provision alarm types for all ADSL-A and ADSL-B alarms for the ADSL ARTs	ADSL Alarm Types will be Changed for ADSL*n* (where *n* = 1-8). Continue (Y/N)?	Y or N
ADSL-B Alarm Types (See Table 20 on page 81 for Channel ADSL Alarm Types)			
Set Factory Defaults	Reset the provisionable items to the original factory settings	• Configuration data will be set to factory defaults Continue (Y/N)? • Configuration data has been set to factory defaults. Press ESC to continue:	• Y or N • ESC

CONFIG — System Options

The System Options screen allows provisioning of Ringing Frequency, SHDSL periodic power up, and System ID. Refer to Table 13 on page 63 for system options.

CONFIG — System Options

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **System Options**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 

CONFIG — System Options (Continued)

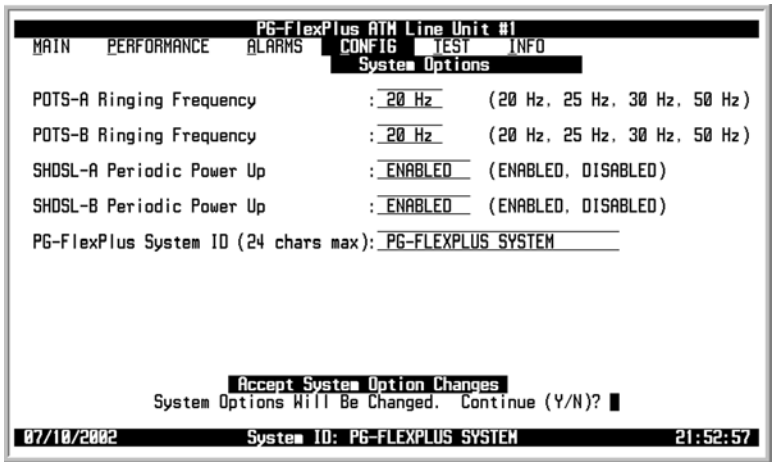
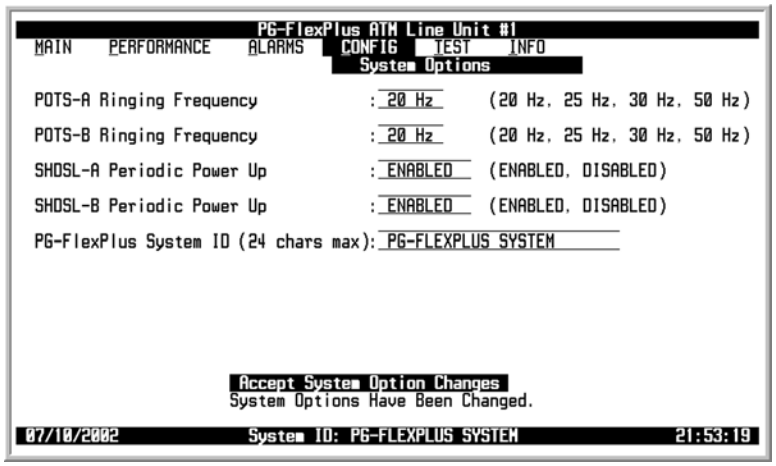
Step	Action
3	The following actions can be taken: a. To change a field value, press SPACEBAR to toggle to the desired value, or press ↓ or ↑ to move to the next option. b. To save the shelf options, select the **Accept System Option Changes** button, then press ENTER. From the `SHELF OPTIONS WILL BE CHANGED. CONTINUE (Y/N)?` prompt, the following actions can be taken: • To save the shelf options, press Y. The following events occur: – all current values are set to desired values   • To retain the existing shelf options on the Shelf Options screen, press N.
4	Press ESC. The Main Menu screen reappears.

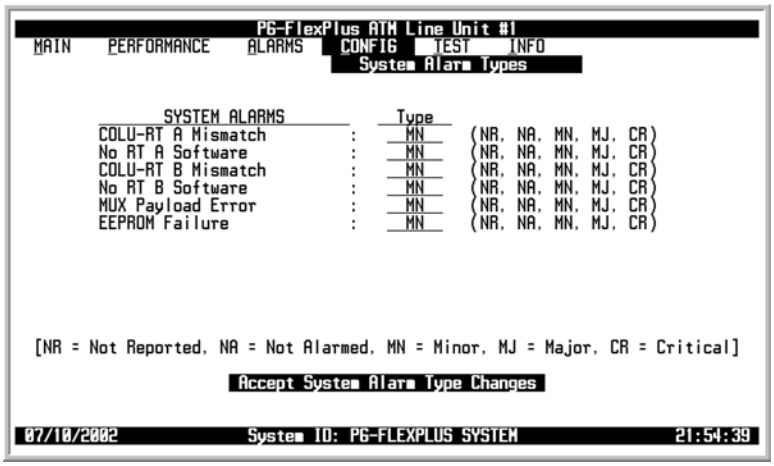
Table 13. System Options

System Options	Value	Description	Default
POTS (A and B) Ringing Frequency	20 Hz, 25 Hz, 30 Hz, 50 Hz	Ringing frequency sent from the RT to the subscriber	20 Hz
SHDSL A Periodic Power Up	Enabled, Disabled	When Enabled, the system periodically attempts to power-up the RT	Enabled
SHDSL B Periodic Power Up			
PG-FlexPlus System ID	Any printable character (including space) is valid	Configurable identification string for system. This string can be up to 24 characters. Because the System ID is visible at every COLU screen, it is easy to know what COLU screens are displayed. There are no special rules for changing the System ID.	PG-FLEXPLUS SYSTEM

CONFIG — System Alarm Type

The System Alarm Types screen allows provisioning of all system alarms associated with the SHDSL circuit and ADSL path. Table 15 on page 66 shows the system alarm type fields, values, descriptions and default settings.

CONFIG — System Alarm Type

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **System Alarm Types**. The following screen appears. 
2	Press ENTER. The following screen appears. 

CONFIG — System Alarm Type (Continued)

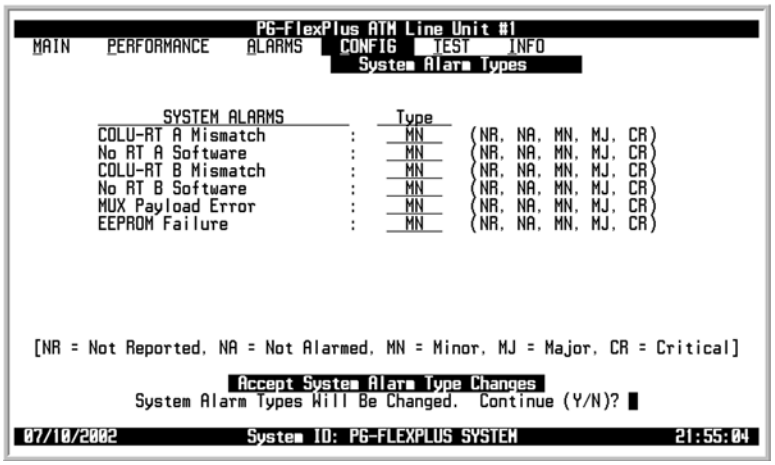
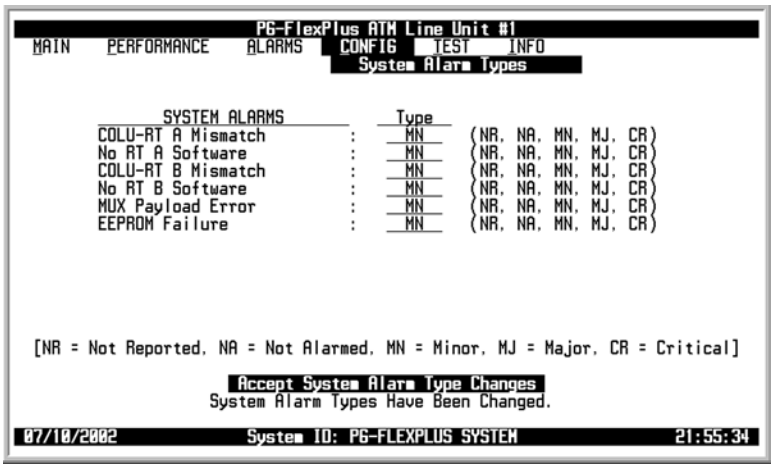
Step	Action
3	The following actions can be taken: a. To change the field value, press **SPACEBAR** to toggle to the desired value, or press ↓ or ↑ to move to the next option. b. To save the system alarm type changes, select the **Accept System Alarm Type Changes** button, then press **ENTER**. From the `System alarm Types Will Be Changed. Continue (Y/N)?` prompt, the following actions can be taken: • To save the system alarm type changes, press **Y**. The following events occur: – all current values are set to desired values   • To retain the existing system alarm types, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

Table 14. Alarm Types Reported

Settings	Reported	Alarm LED Lit	Main Shelf Summary	History Updated	SNMP Trap Message
CR – Critical	Yes	Yes	Yes	Yes	Yes
MJ – Major	Yes	Yes	Yes	Yes	Yes
MN – Minor	Yes	Yes	Yes	Yes	Yes
NA – Not Alarmed	No	No	No	Yes	Yes
NR – Not Reported	No	No	No	No	No

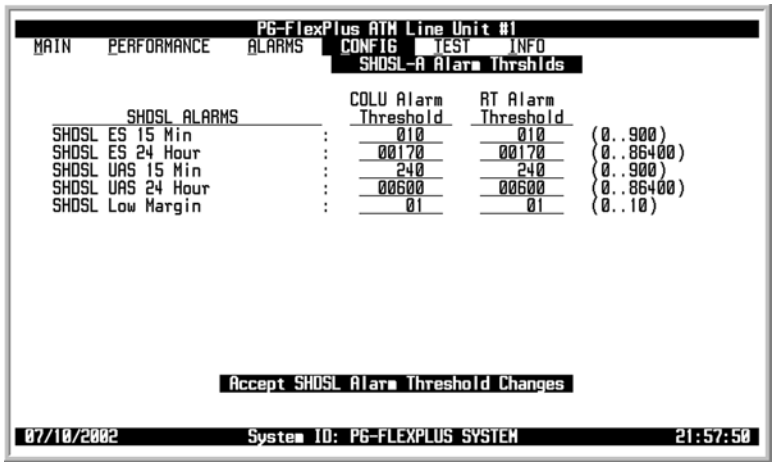
Table 15. System Alarms Types

Alarm	Value	Description	Default
COLU-RT A Mismatch	CR, MJ, MN, NA, NR	Incompatible RT A unit has been installed	MN
No RT A software	CR, MJ, MN, NA, NR	RT A has no application software and is awaiting software download	MN
COLU RT B Mismatch	CR, MJ, MN, NA, NR	Incompatible RT B unit has been installed	MN
No RT B software	CR, MJ, MN, NA, NR	RT B has no application software and is awaiting software download	MN
MUX Payload Error	CR, MJ, MN, NA, NR	Parity error detected between MUX and COLU. An alarm is generated and all circuits are placed in a trunk-conditioned state.	MN
EEPROM Failure	CR, MJ, MN, NA, NR	EEPROM (nonvolatile memory) has failed	MN

CONFIG — SHDSL-A Alarm Thresholds

This screen allows provisioning of all threshold crossing values for the 15 minute and 24-hour ES, UAS counts and low margin value for the SHDSL-A ARTs. Table 16 on page 69 shows the SHDSL-A Alarm Threshold fields, values, descriptions and default settings.

CONFIG — SHDSL-A Alarm Thresholds

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **SHDSL-A Alarm Thresholds**. The following screen appears. 
2	Press ENTER. The following screen appears. 

CONFIG — SHDSL-A Alarm Thresholds (Continued)

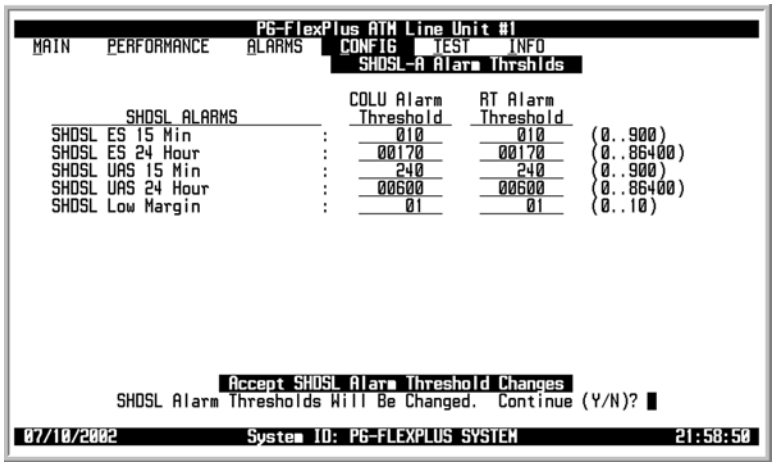
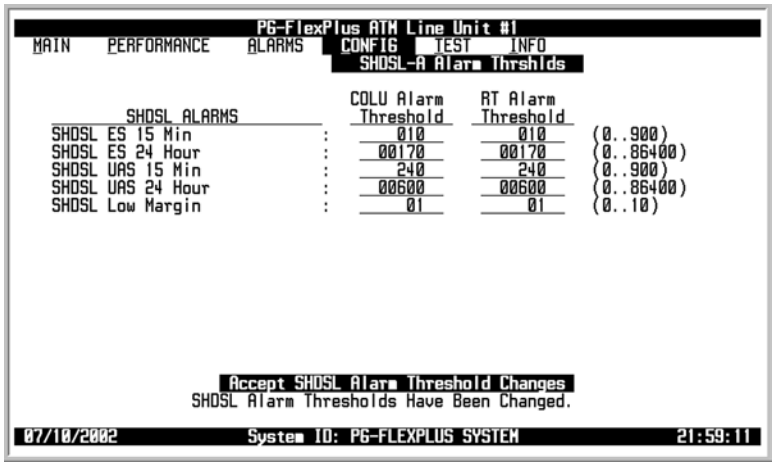
Step	Action
3	The following actions can be taken: a. To change the threshold value, press ↓ or ↑ to go to the appropriate SHDSL Alarm Threshold. Then type the appropriate numbers on the keypad for each field. b. To save the SHDSL Alarm Threshold changes, select the **Accept SHDSL Alarm Threshold Changes** button, then press **ENTER**. From the `SHDSL Alarm Thresholds Will Be Changed. Continue (Y/N)?` prompt, the following actions can be taken: • To save the SHDSL Alarm Threshold changes, press **Y**. The following events occur: – all current values are set to desired values   • To retain the existing SHDSL Alarm Thresholds, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

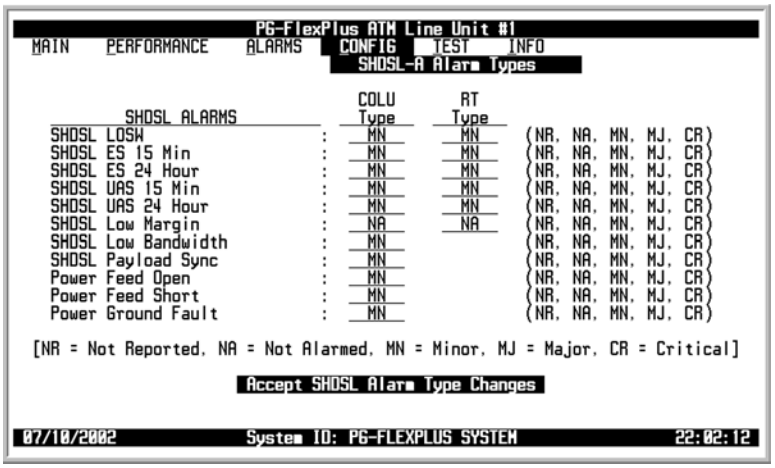
Table 16. SHDSL-A and SHDSL-B Alarm Thresholds

Alarms	Value	Description	COLU Alarm Threshold Default	RT Alarm Threshold Default
SHDSL ES 15 MIN	0 to 900	Threshold value for the SHDSL 15 minute interval ES alarm	10	10
SHDSL ES 24 HOUR	0 to 86,400	Threshold value for the SHDSL 24 hour interval ES alarm	170	170
SHDSL UAS 15 MIN	0 to 900	Threshold value for the SHDSL 15 minute interval UAS alarm	240	240
SHDSL UAS 24 HR	0 to 86,400	Threshold value for the SHDSL 24 hour interval UAS alarm	600	600
SHDSL LOW MARGIN	0 to 10	Threshold value at which alarm is set active if margin drops equal to or less than this number	01	01

CONFIG — SHDSL-A Alarm Types

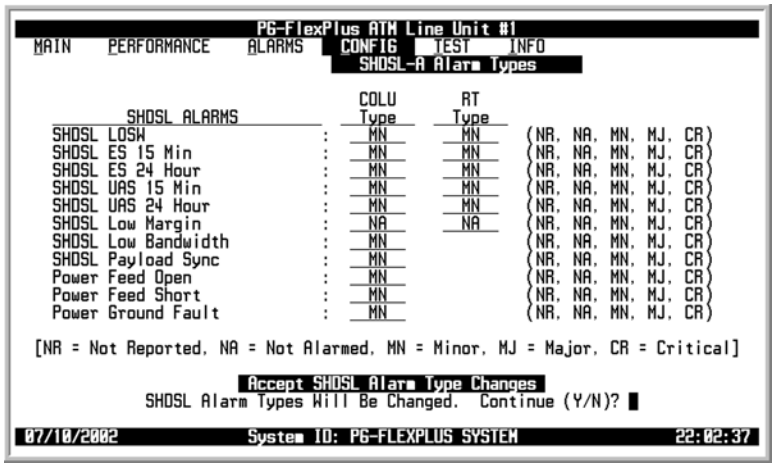
This screen allows provisioning of all SHDSL-A alarm severity types. Table 17 on page 72 lists the SHDSL-A Alarm Type fields, values, descriptions and default settings.

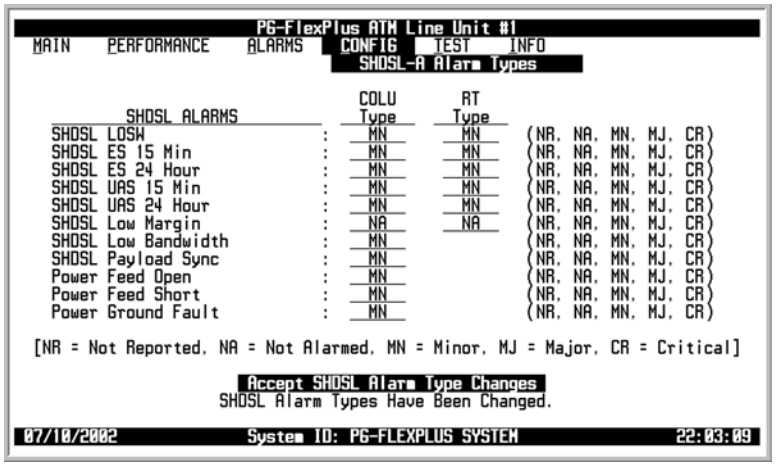
CONFIG — SHDSL-A Alarm Types

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **SHDSL-A Alarm Types**. The following screen appears. 
2	Press ENTER. The following screen appears. 

CONFIG — SHDSL-A Alarm Types (Continued)

Step	Action
3	The following actions can be taken: a. To change the field value, press **SPACEBAR** to toggle to the desired value, or press ↓ or ↑ to move to the next option. b. To save the SHDSL Alarm Type changes, select the **Accept SHDSL Alarm Type Changes** button, then press **ENTER**. From the `SHDSL Alarm Types Will Be Changed. Continue (Y/N)?` prompt, the following actions can be taken: • To save the SHDSL Alarm Types changes, press **Y**. The following events occur: – all current values are set to desired values
4	Press **ESC**. The Main Menu screen reappears.





• To retain the existing SHDSL Alarm Types, press **N**.

Table 17. SHDSL-A and SHDSL-B Alarm Types

SHDSL Alarms	Value	Description	COLU Type Default	RT Type Default
SHDSL LOSW(1)	CR, MJ, MN, NA, NR	SHDSL link has lost synchronization	MN	MN
SHDSL ES 15 Min(2)	CR, MJ, MN, NA, NR	Active if the 15 minute ES count equals or exceeds the threshold in the current 15 minute interval	MN	MN
SHDSL ES 24 Hour(2)	CR, MJ, MN, NA, NR	Active if the count equals or exceeds the threshold in the current 24 hour interval	MN	MN
SHDSL UAS 15 Min(3)	CR, MJ, MN, NA, NR	Active if the count equals or exceeds the threshold in the current 15 minute interval	MN	MN
SHDSL UAS 24 Hour(3)	CR, MJ, MN, NA, NR	Active if the count equals or exceeds the threshold in the current 24 hour interval	MN	MN
SHDSL Low Margin	CR, MJ, MN, NA, NR	Active if the margin equals or drops below the threshold	NA	NA
SHDSL Low Bandwidth	CR, MJ, MN, NA, NR	Active if the SHDSL bandwidth is not sufficient to support the services provided by the RT	MN	
SHDSL Payload Sync	CR, MJ, MN, NA, NR	Active if there is a problem detected in the SHDSL overhead channel	MN	
Power Feed Open	CR, MJ, MN, NA, NR	Open circuit detected on the SHDSL span	MN	
Power Feed Short	CR, MJ, MN, NA, NR	Short circuit detected on the SHDSL span	MN	
Power Ground Fault	CR, MJ, MN, NA, NR	Ground fault condition detected on the SHDSL span	MN	

(1) SHDSL LOSW: A condition that generally indicates the loop is down, thus data cannot be transmitted. The ARL-942 uses this parameter to derive UAS performance statistics.

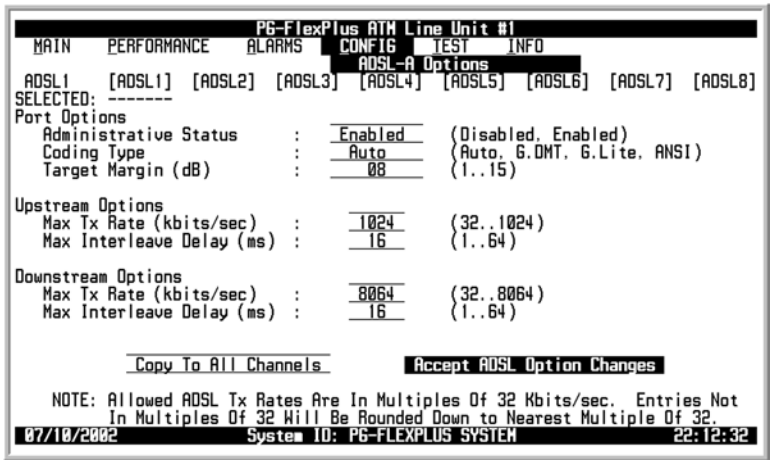
(2) SHDSL ES: Intervals during which at least one CRC is detected at the incoming SHDSL port.

(3) SHDSL UAS: An interval of 1 second during which a loop is down.

CONFIG — ADSL-A Options

This screen allows provisioning of ADSL-A parameters. Table 18 on page 75 lists the ASDL-A Option fields, values, descriptions and default settings.

CONFIG — ADSL-A Options

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **ADSL-A Options**. The following screen appears. 
2	Press **ENTER**. The following screen appears.  Select the appropriate ADSL facility (1-8) and press **ENTER** to view the screen. In IAD Mode, only ADSL1 is available.

CONFIG — ADSL-A Options (Continued)

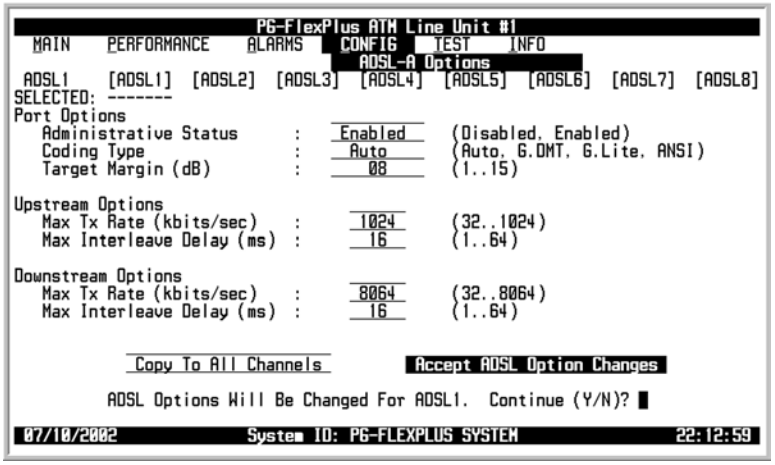
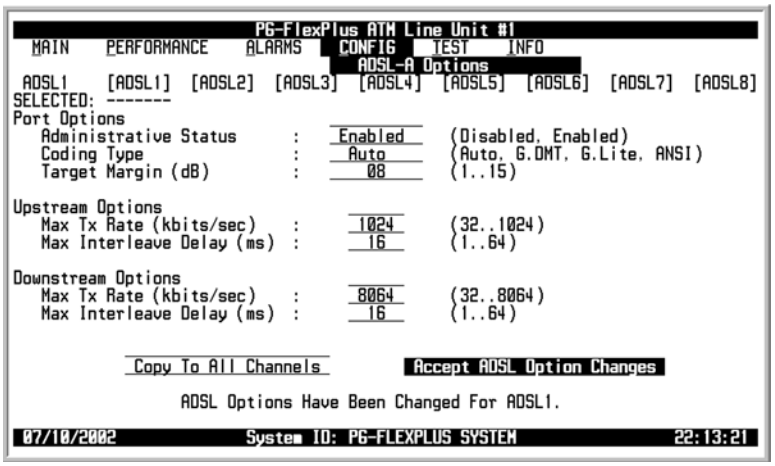
Step	Action
3	The following actions can be taken: a. To change the field value, press **SPACEBAR** to toggle to the desired value, or press ↓ or ↑ to move to the next option. b. To save the ADSL-A Option changes, select the **Accept ADSL Option Changes** button, then press **ENTER**. From the `ADSL Options Will Be Changed. Continue (Y/N)?` prompt, the following actions can be taken: • To save the ADSL-A Option changes, press **Y**. The following events occur: – all current values are set to desired values   • To retain the existing ADSL-A Options, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

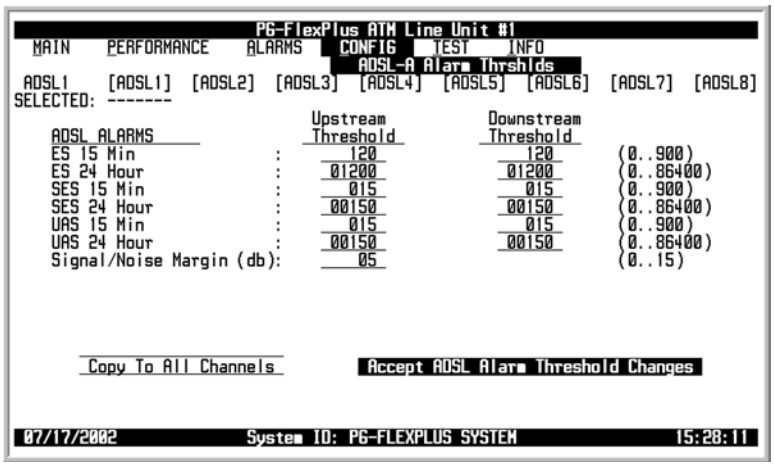
Table 18. ADSL-A and ASDL-B Options

System Options	Value	Description	Default
Port Options			
Administrative Status	Disabled, Enabled	Physical status of DSL port	Enabled
Coding Type	Auto, G.DMT, G.Lite, ANSI	Line coding type	Auto
Target Margin (dB)	1 – 15	Signal to Noise Ratio. 0 dB represents operation at a 10^{-7} bit error rate.	8 dB
***Upstream Options**			
Max Tx Rate (kbits/sec)	32 – 1024	Upstream transmit data rate	1024 kbits/sec
Max Interleave Delay (ms)	1 – 64	Forward error correction transmission delay of the interleaved path	16 ms
***Downstream Options**			
Max Tx Rate (kbits/sec)	32 – 8064	Downstream transmit data rate	8064 kbits/sec
Max Interleave Delay (ms)	1 – 64	Forward error correction transmission delay of the interleaved path	16 ms
*These are the maximum values and will change based on the coding type selected. Transmit and receive rates include payload and overhead.			

CONFIG —ADSL-A Alarm Thresholds

This screen allows the provisioning of ADSL-A alarm thresholds. The fields on this screen are measured hourly and daily. Table 19 on page 78 lists the ADSL-A Alarm Threshold fields, values, descriptions and default settings.

CONFIG —ADSL-A Alarm Thresholds

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **ADSL-A Alarm Thresholds**. The following screen appears. 
2	Press **ENTER**. The following screen appears.  Select the appropriate ADSL facility (1-8) and press **ENTER** to view the screen.

CONFIG —ADSL-A Alarm Thresholds (Continued)

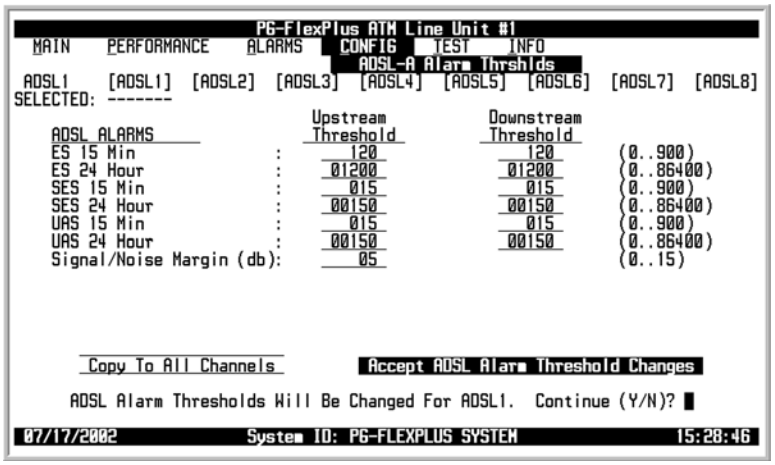
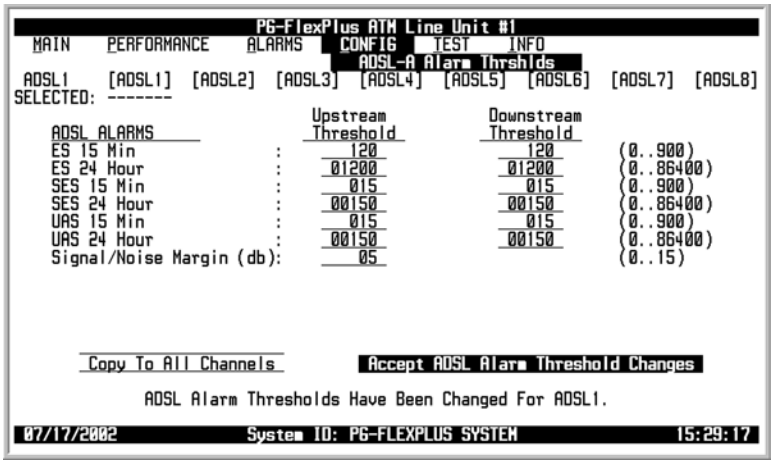
Step	Action
3	The following actions can be taken: a. To change the threshold value, press ↓ or ↑ to go to the appropriate ADSL-A Alarm Threshold. Then type the appropriate numbers on the keypad for each field. b. To save the ADSL-A Alarm Threshold changes, select the **Accept ADSL Alarm Threshold Changes** button, then press ENTER. From the `ADSL Alarm Thresholds Will Be Changed For ADSL1. Continue (Y/N)?` prompt, the following actions can be taken: • To save the ADSL-A Alarm Threshold changes, press Y. The following events occur: – all current values are set to desired values   • To retain the existing ADSL-A Alarm Thresholds, press N.
4	Press ESC. The Main Menu screen reappears.

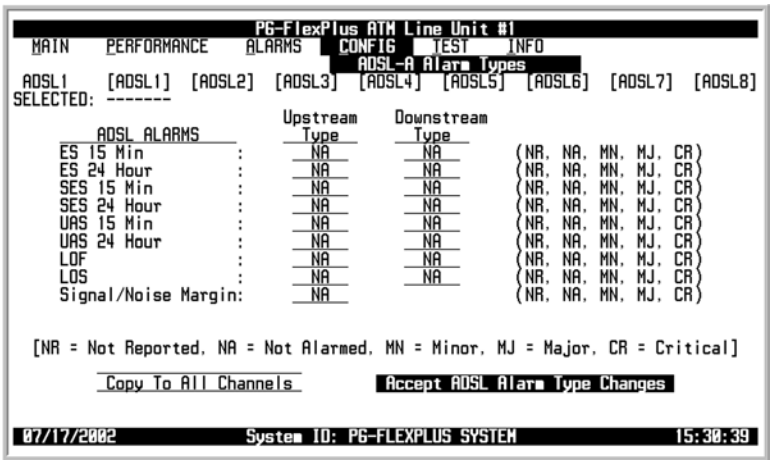
Table 19. ADSL Alarm Thresholds

Alarms	Value	Description	Upstream Threshold Default	Downstream Threshold Default
ES 15 Min	0 – 900	Possible threshold values	120	120
ES 24 Hour	0 – 86,400	Possible threshold values	1200	1200
SES 15 Min	0 – 900	Possible threshold values	15	15
SES 24 Hour	0 – 86,400	Possible threshold values	150	150
UAS 15 Min	0 – 900	Possible threshold values	15	15
UAS 24 Hour	0 – 86,400	Possible threshold values	150	150
Signal/Noise Margin (dB)	0 – 15	Possible threshold values	5	

CONFIG — ADSL-A Alarm Types

This screen allows provisioning for all ADSL-A alarms for the ADSL RTs. Table 20 on page 81 lists the ADSL Alarm Type fields, values, descriptions and default settings.

CONFIG — ADSL-A Alarm Types

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **ADSL-A Alarm Types**. The following screen appears. 
2	Press ENTER. The following screen appears.  Select the appropriate ADSL facility (1-8) and press ENTER to view the screen.

CONFIG — ADSL-A Alarm Types (Continued)

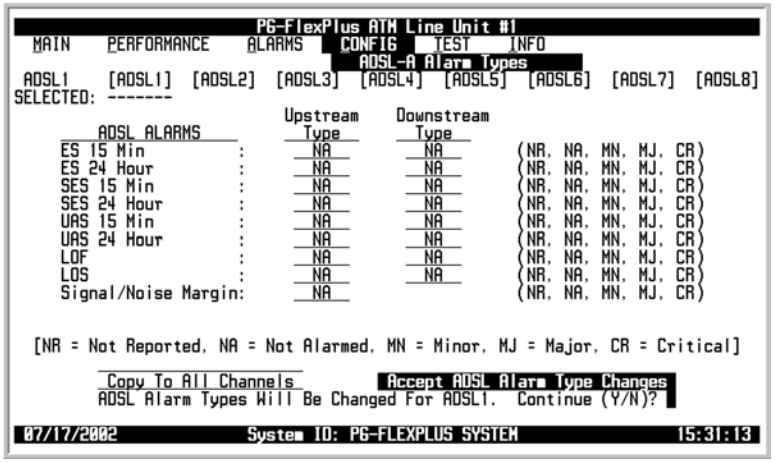
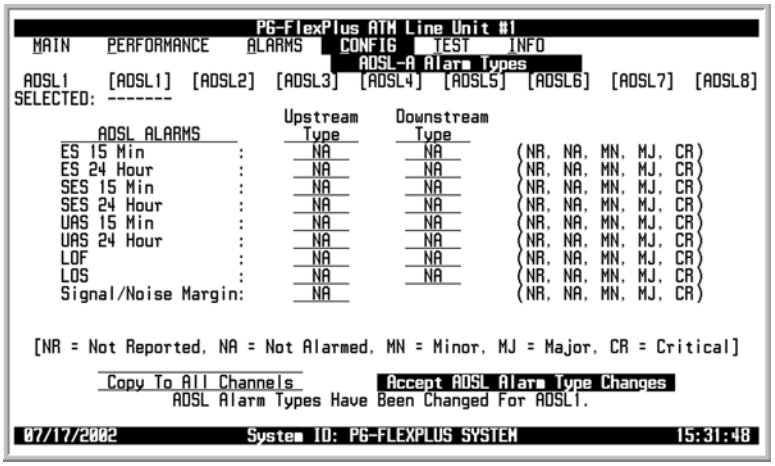
Step	Action
3	The following actions can be taken: a. To change the field value, press **SPACEBAR** to toggle to the desired value, or press ↓ or ↑ to move to the next option. b. To copy values to all channels, select the **Copy to All Channels** button, then press **ENTER**. c. To save the ADSL-A Alarm Type changes, select the **Accept ADSL Alarm Type Changes** button, then press **ENTER**. From the `ADSL Alarm Types Will Be Changed. Continue (Y/N)?` prompt, the following actions can be taken: • To save the ADSL-A Alarm Types changes, press **Y**. The following events occur: – all current values are set to desired values   • To retain the existing ADSL-A Alarm Types, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

Table 20. ADSL-A and ADSL-B Alarm Types

ADSL Alarm	Type	Description	Upstream Type Default	Downstream Type Default
ES 15 Min	CR, MJ, MN, NA, NR	15 minute ES count in the up or downstream direction has exceeded this threshold	NA	NA
ES 24 Hour	CR, MJ, MN, NA, NR	ES 24 Hour count in the up or downstream direction has exceeded this threshold	NA	NA
SES 15 Min	CR, MJ, MN, NA, NR	SES 15 Minute ES count in the up or downstream direction has exceeded this threshold	NA	NA
SES 24 Hour	CR, MJ, MN, NA, NR	SES 24 Hour count in the up or downstream direction has exceeded this threshold	NA	NA
UAS 15 Min	CR, MJ, MN, NA, NR	UAS 15 Minute count in the up or downstream direction has exceeded this threshold	NA	NA
UAS 24 Hour	CR, MJ, MN, NA, NR	UAS 24 Hour count in the up or downstream direction has exceeded this threshold	NA	NA
LOF	CR, MJ, MN, NA, NR	Loss of ADSL Framing	NA	NA
LOS	CR, MJ, MN, NA, NR	Loss of ADSL Signal	NA	NA
Signal/Noise Margin	CR, MJ, MN, NA, NR	Signal/Noise Margin in the upstream direction	NA	

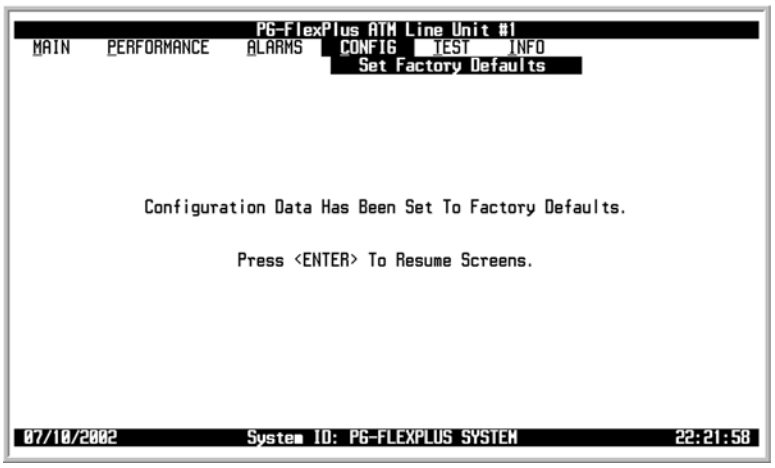
CONFIG — Set Factory Defaults

This screen resets the configuration data back to the original factory default setting.

CONFIG — Set Factory Defaults

Step	Action
1	At the Main Menu screen, select **CONFIG**. Press ↓ to choose **Set Factory Defaults**. The following screen appears. 
2	Press ENTER. The following screen appears.  **CAUTION** ***Setting to Factory Defaults may cause a loss of service.***

CONFIG — Set Factory Defaults (Continued)

Step	Action
3	The following actions can be taken: To reset the system options back to the original factor default settings, press **ENTER**. From the `Configuration Data Will Be Set To Factory Defaults. Continue (Y/N)?` prompt, the following actions can be taken: • To save the Factory Default changes, press **Y**. The following events occur: – all current values are reset to the factory default values  • To retain the existing configuration data, press **N**.
4	Press **ESC**. The Main Menu screen reappears.

CONFIG — SHDSL-B Alarm Thresholds

CONFIG — SHDSL-B Alarm Types

CONFIG — ADSL-B Options

CONFIG — ADSL-B Alarm Thresholds

CONFIG — ADSL-B Alarm Types

Please refer to CONFIG — SHDSL-A and ADSL-A configuration screens since they operate identically.

TEST MENU OPTIONS

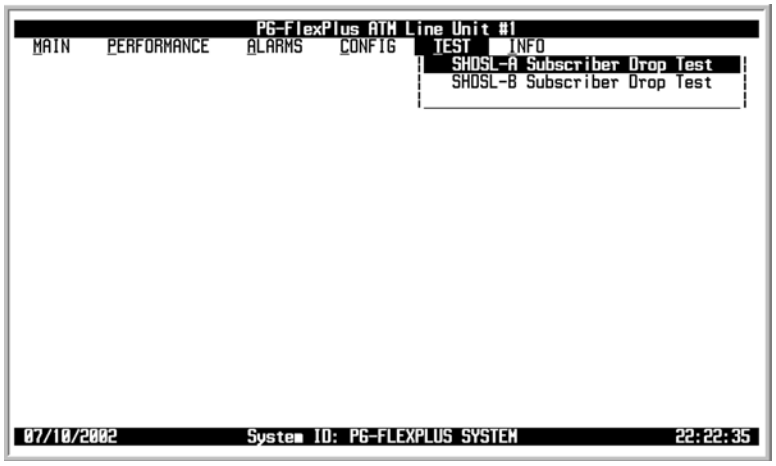
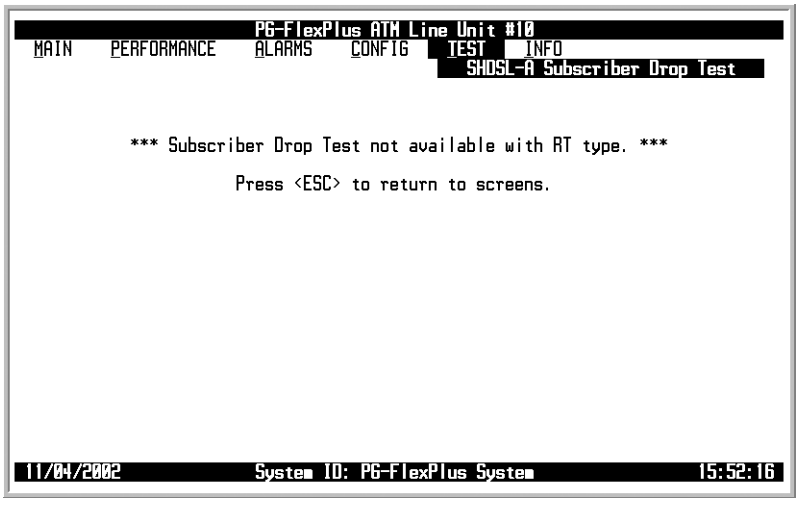
The Test Menu provides access to the SHDSL Subcriber Drop Test Facility.

RAM applications do not have this testing capability.

TEST — SHDSL-A Subscriber Drop Test

Drop tests are not available on the ARL-942.

TEST — SHDSL-A Subscriber Drop Test

Step	Action
1	At the Main Menu screen, select **TEST**. Press ↓ to choose **SHDSL-A Subscriber Drop Test**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

TEST — SHDSL-B Subscriber Drop Test

Please refer to TEST — SHDSL-A test screen since it operates identically.

INFORMATION MENU OPTIONS

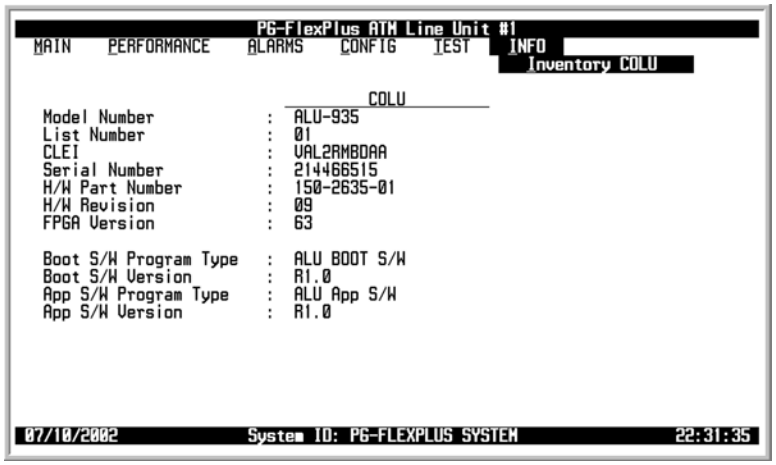
The Information Menu provides technical information about the system. Refer to Table 21 for sub-menu options and descriptions.

Table 21. Information Menu Options

Sub-Menu Options	Sub-Menu Descriptions
Inventory COLU	Displays product identification information, manufacturing data, software and hardware revisions for COLU
Inventory RT(s)	Displays product identification information, manufacturing data, software and hardware revisions for RTs
Inventory ADSL-A	Display manufacturing information on ATU-R and ATU-C units (if coded by manufacturer)
Inventory ADSL-B	Display manufacturing information on ATU-R and ATU-C units (if coded by manufacturer)
COLU Event Log	Displays technical information about the ARL-942
RT Event Log	Displays information on events that occurred for the RT, but are not Alarmed events
Help	Provides information on using the system screens and menus

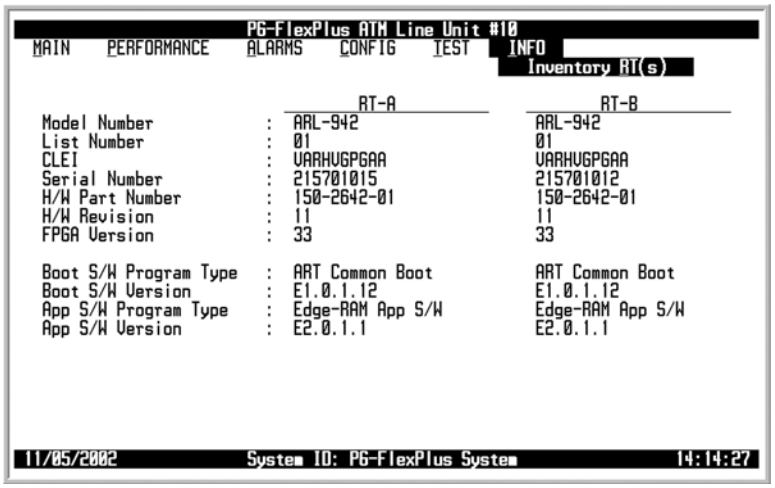
INFO — Inventory COLU

This screen displays product identification information, manufacturing data, software and hardware revisions for COLU.

Step	Action
1	At the Main Menu screen, select **INFO**. Press ↓ to choose **Inventory COLU**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

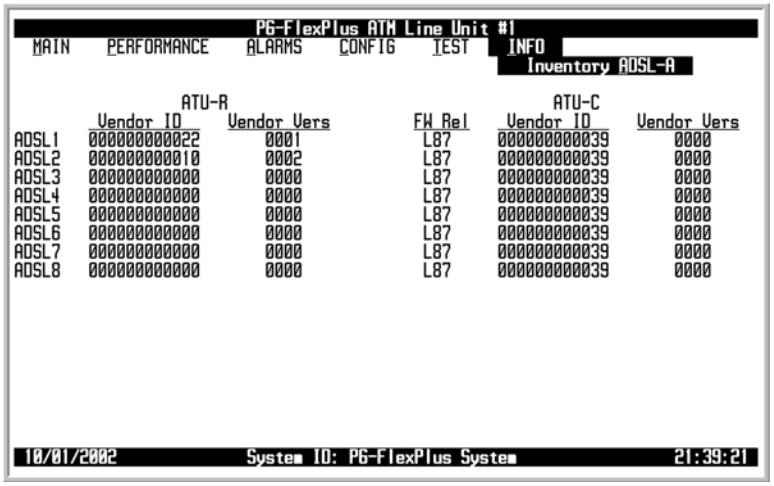
INFO — Inventory RT(s)

This screen displays product identification information, manufacturing data, software and hardware revisions for the RTs.

Step	Action
1	At the Main Menu screen, select **INFO**. Press ↓ to choose **Inventory RT(s)**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

INFO — Inventory ADSL-A

This screen displays manufacturer information on ATU-R and ATU-C units (if coded by manufacturer).

Step	Action
1	At the Main Menu screen, select **INFO**. Press ↓ to choose **Inventory ADSL-A**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

INFO — Inventory ADSL-B

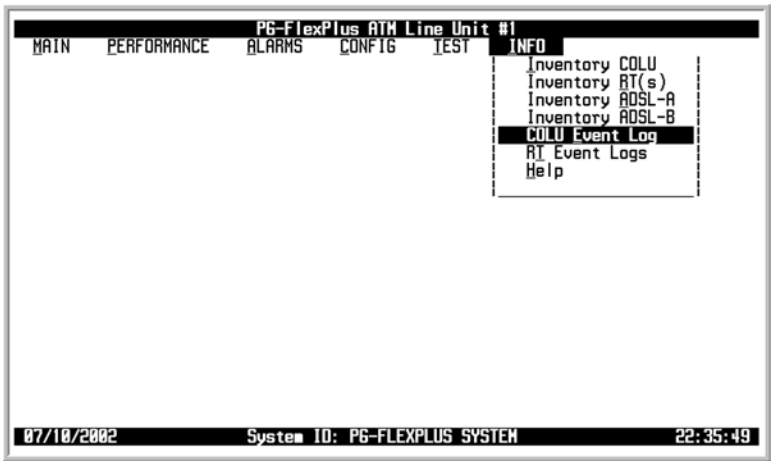
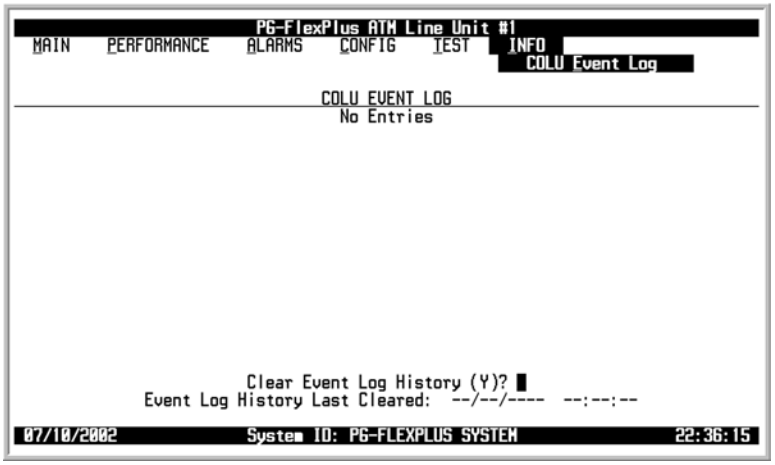
Please refer to INFO —Inventory ADSL-B information screen since it operates identically.

INFO — COLU Event Log

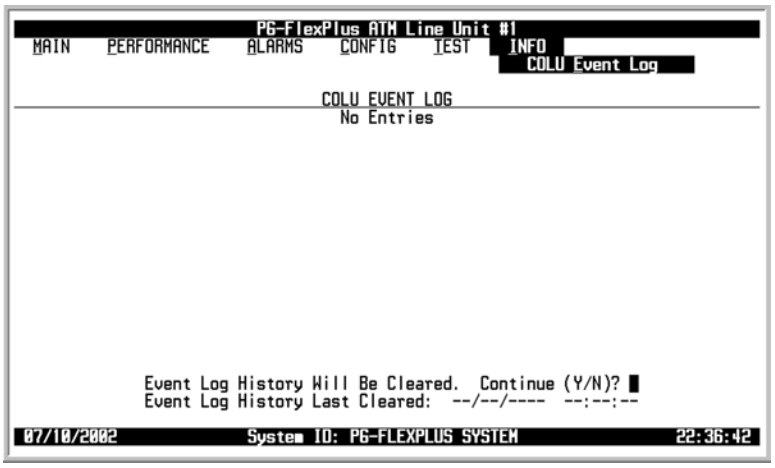
This screen displays information on events that occurred in the ALU-935. The events are alarmed as follows:

- MEMVER: A provisioning database conversion occurred when a software download occurred. MEMVER is information only. This event is cleared if you reset the ALU-935; however, it is not required. No customer action is required.
- MEMCHK: The provisioning factory defaults were restored due to a corrupt database. MEMCHK is information only. To clear the MEMCHK alarm, go CONFIG — Set Factory Defaults and accept the prompt. No customer action is required.

INFO — COLU Event Log

Step	Action
1	At the Main Menu screen, select **INFO**. Press ↓ to choose **COLU Event Log**. The following screen appears. 
2	Press **ENTER**. The following screen appears.  a. To clear the Event Log History, press **Y** at the `Clear Event Log History (Y)?` prompt. b. To retain the existing Event Log History, press **ESC**.

INFO — COLU Event Log (Continued)

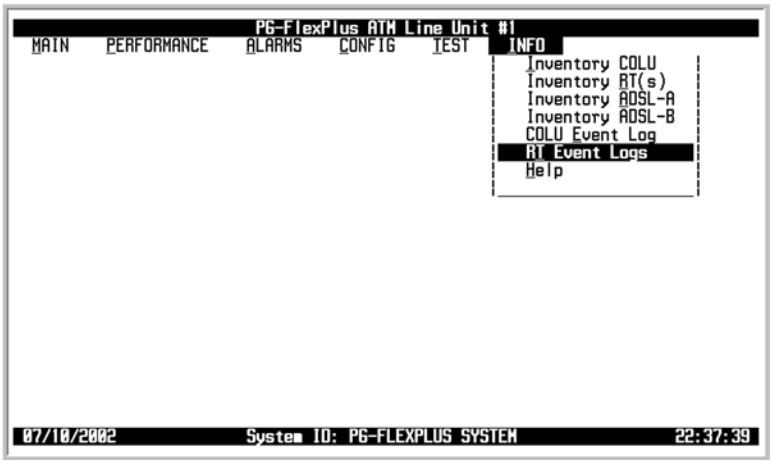
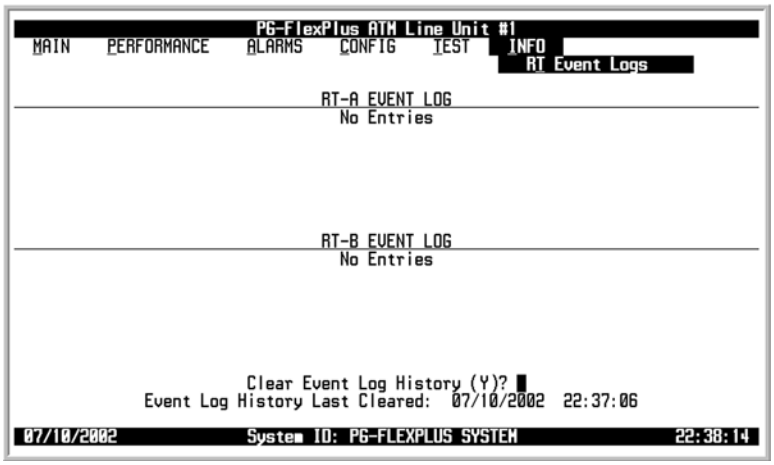
Step	Action
3	The following actions can be taken: a. To confirm that you want to clear the Event Log History, press **Y** at the `Event Log History Will Be Cleared. Continue (Y/N)?` prompt. • The following events occur: – all current values are set to desired values   b. To retain the existing Event Log History, press **N**.

INFO — RT Event Log

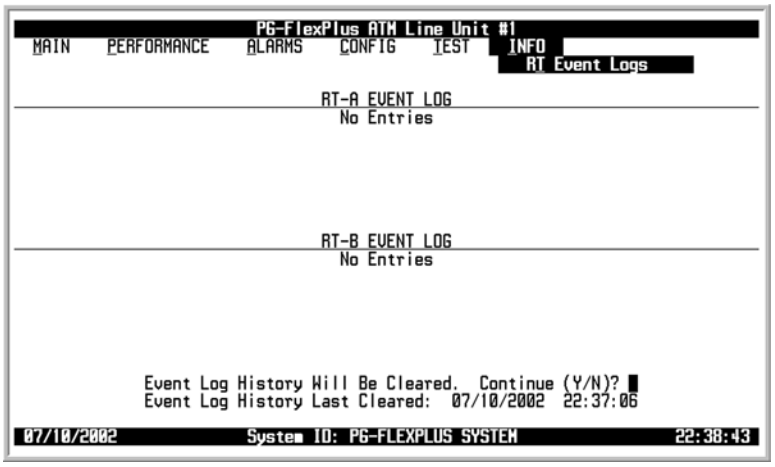
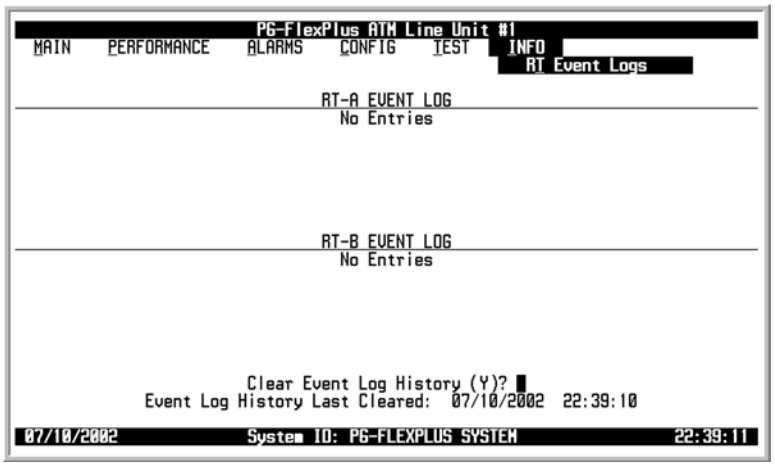
This screen displays information on events that occurred within the RT. The events are alarmed as follows:

- MEMVER: A provisioning database conversion occurred when a software download occurred. MEMVER is information only. This event is cleared if you reset the ARL-942; however, it is not required. No customer action is required.
- MEMCHK: The provisioning factory defaults were restored due to a corrupt database. MEMCHK is information only. To clear the MEMCHK alarm, go CONFIG — Set Factory Defaults and accept the prompt. No customer action is required

INFO — RT Event Log

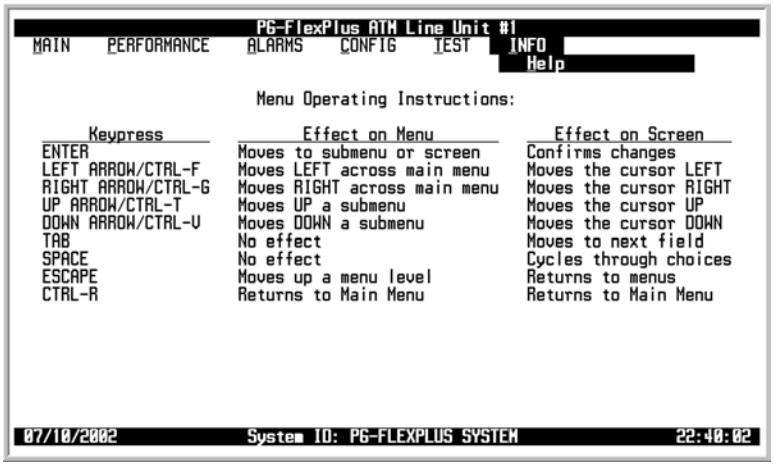
Step	Action
1	At the Main Menu screen, select **INFO**. Press ↓ to choose **RT Event Logs**. The following screen appears. 
2	Press **ENTER**. The following screen appears.  a. To clear the Event Log History, press **Y** at the `Clear Event Log History (Y)?` prompt. b. To retain the existing Event Log History, press **ESC**.

INFO — RT Event Log (Continued)

Step	Action
3	The following actions can be taken: a. To confirm that you want to clear the Event Log History, press **Y** at the `Event Log History Will Be Cleared. Continue (Y/N)?` prompt. • The following events occur: – all current values are set to desired values   b. To retain the existing Event Log History, press **N**.

INFO — Help

This screen provides information on using the system screens and menus.

Step	Action
1	At the Main Menu screen, select **INFO**. Press ↓ to choose **Help**. The following screen appears. 
2	Press **ENTER**. The following screen appears. 
3	Press **ESC**. The Main Menu screen reappears.

TROUBLESHOOTING AND FAULT ISOLATION

Table 22 provides troubleshooting and fault isolation for the ARL-942.

Table 22. ARL-942 Troubleshooting and Fault Isolation

LED	Color	State	Probable Cause	Solution
PWR	Green	On	OK	
		Off	ARL-942 is not receiving power from the ALU-935	Verify the ALU-935 is installed in the COTS and it is operating correctly. Check SHDSL loop faults such as shorts or grounds. Verify loop length is not exceeded.
SHDSL	Green	On	OK	
		Flashing (Fast)	SHDSL is in sync between the ARL-942 and the ALU-935, but the margin is below the threshold	Check the SHDSL loop for faults such as high resistance shorts or grounds or bridged taps. Verify loop length is not exceeded.
		Flashing (Slow)	SHDSL is attempting to sync	Check the SHDSL loop for faults such as high resistance shorts or grounds or bridged taps. Verify loop length is not exceeded.
		Off	SHDSL does not detect a signal from the ALU-935	Check the SHDSL loop for faults such as high resistance shorts or grounds. Verify loop length is not exceeded. Verify the COLU is installed and functioning.
FAULT	Red	On	An internal fault has been detected in the ARL-942	Replace the ARL-942
		Off	OK	
ADSL # (# = 1 – 8)	Green	On	OK	
		Flashing (Fast)	ADSL is in sync between the ARL-942 and the ALU-935 and the margin is below the threshold	Check the ADSL loop for faults such as high resistance shorts or grounds or bridged taps. Verify loop length is not exceeded.
		Flashing (Slow)	ADSL is attempting to sync	Check the ADSL loop for faults such as high resistance shorts or grounds or bridged taps. Verify loop length is not exceeded.
		Off	There is a problem with the ADSL loop, an ADSL modem is not detected, or the LEDs have timed out.	Press the FRESH LED button on the ARL-942. Check the ADSL loop faults such as shorts or grounds. Verify loop length is not exceeded.

ACRONYMS

A

ADSL – Asynchronous Digital Subscriber Line

ATM – Asynchronous Transfer Mode

AWG – American Wire Gauge

C

CO – Central Office

COLU – Central Office Line Unit

COTS – Central Office Terminal Shelf

CPE – Customer Premises Equipment

D

DDL – Derived Data Link

DLC – Digital Loop Carrier

DS0 – Digital Signal Level 0

DS1 – Digital Signal Level 1

DS3 – Digital Signal Level 3

DSL – Digital Subscriber Line

E

ES – Errored Seconds

I

IDLC – Integrated Digital Loop Carrier

L

LED – Light Emitting Diode

M

MLT – Mechanized Loop Testing

MU – Management Unit

MUX – Multiplexer

N

NEBS – Network Equipment Building System

NID – Network Interface Device

P

PMU – Management Unit

POTS – Plain Old Telephone Service

R

RAM – Remote Access Multiplexer

RMA – Return Material Authorization

RT – RemoteTerminal

S

SES – Severely Errored Seconds

SHDSL – Single-pair High-bit-rate Digital Subscriber Line

SNMP – Simple Network Management Protocol

SYNC – Synchronization

T

TDM – Time Divisioned Multiplexer

V

VF –Voice Frequency

PRODUCT SUPPORT

TECHNICAL SUPPORT

Technical Assistance is available 24 hours a day, 7 days a week by the contacting Customer Service Engineering group at:

Telephone:	800.366.3891 The 800 telephone support line is toll-free in the U.S. and Canada.
Email:	wsd_support@adc.com
Knowledge Base:	http://adc.com/Knowledge_Base/index.jsp
Web:	www.adc.com

LIMITED WARRANTY

Product warranty is determined by your service agreement. Refer to the ADC Warranty/Software Handbook for additional information, or contact your sales representative or Customer Service for details.

RETURNS

To return equipment to ADC:

1. Locate the number of the purchase order under which the equipment was purchased. To obtain a return authorization number, you need to provide the original purchase order number to ADC's Return Material Authorization (RMA) Department.
2. Call or write ADC's RMA Department to ask for an RMA number and any additional instructions. Use the telephone number, fax number or email address listed below:
   - Telephone: 800.366.3891
   - Email Address: rma@ADC.com
3. Include the following information, in writing, along with the equipment you are returning:
   - Company name and address
   - Contact name and telephone number
   - Shipping address to which ADC should return the repaired equipment
   - Original purchase order number
   - Description of the equipment that includes the model and part number of each unit being returned, as well as the number of units that you are returning.
   - Reason for the return. For example:
     – The equipment needs an ECO/ECN upgrade.
     – The equipment is defective.

If the equipment is defective, please tell us what you observed just before the equipment malfunctioned. Be as detailed in your description as possible.

If there is any other reason for returning the equipment, please let us know so we can determine how best to help you.

4. Pack the equipment in a shipping carton.

5. Write ADC's address and the RMA Number you received from the RMA Department clearly on the outside of the carton and return to:

   ADC DSL Systems, Inc.
   14352 Franklin Ave.
   Tustin, CA 92780-7013

   Attention: **RMA (Number)**

All shipments are to be returned prepaid. ADC will not accept any collect shipments.

FCC CLASS A COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the use will be required to correct the interference at his own expense.

MODIFICATIONS

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by ADC voids the user's warranty.

All wiring external to the product(s) should follow the provisions of the current edition of the National Electrical Code.

World Headquarters:
ADC Telecommunications, Inc.
12501 Whitewater Drive
Minnetonka, Minnesota USA 55343

For Technical Assistance:
800.366.3891

ISO 9001
DNV
DNV Certification, Inc.
Certificated Firm

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