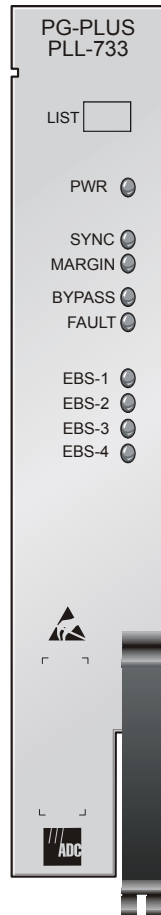


# PG-PLUS

## TECHNICAL PRACTICE



### 4 EBS

## CENTRAL OFFICE LINE UNIT

Model	List	CLEI Code
PLL-733	1	S9L1AF0A~~

---

**Revision History of This Practice**

---

<b>Revision</b>	<b>Release Date</b>	<b>Revisions Made</b>
01	December 18, 1998	Initial Release
02	January 28, 2002	Release to rebrand document to comply with ADC standards
03	January 6, 2003	Updated Product Support Information

---

**©Copyright 2003 ADC DSL Systems, Inc. All Rights Reserved.**

*ADC is a registered trademark of ADC Telecommunications, Inc. PG-Plus is a registered trademark of ADC DSL Systems, Inc. No right, license, or interest to such trademarks is granted hereunder, and you agree that you shall assert no such right, license, or interest with respect to such trademarks. Other product names mentioned in this document are used for identification purposes only and may be trademarks or registered trademarks of their respective companies.*

*Information contained in this document is company private to ADC DSL Systems, Inc., and shall not be modified, used, copied, reproduced or disclosed in whole or in part without the written consent of ADC.*

*Contents herein are current as of the date of publication. ADC reserves the right to change specifications at any time without notice. Information furnished by ADC is believed to be accurate and reliable. In no event shall ADC be liable for any damages resulting from the loss of data, loss of use, or loss of profits and ADC further disclaims any and all liability for indirect, incidental, special, consequential or other similar damages. This disclaimer of liability applies to all products, publications and services during and after the warranty period.*

## USING THIS PRACTICE

Three types of messages, identified by icons, appear in the text.



**Notes indicate information about special circumstances.**



**Cautions indicate the possibility of equipment damage or the possibility of personal injury.**



**Electrostatic Discharge (ESD) susceptibility symbols indicate that a device or assembly is susceptible to damage from electrostatic discharge. You must wear an antistatic wrist strap connected to the appropriate ground connection prior to performing installation procedures. You must also observe normal ESD precautions when handling electronic equipment. Do not hold electronic plugs by their edges. Do not touch components or circuitry.**

## INSPECTING YOUR 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 [“Returns” on page 38](#). If you must store the equipment for a prolonged period, store the equipment in its original container.



# TABLE OF CONTENTS

<b>Product Overview</b>	<b>1</b>
Description .....	1
Specifications .....	2
Power Consumption and Heat Dissipation .....	3
Maximum Heat Dissipation .....	3
Thermal Loading Limitations .....	3
Maximum Power Consumption .....	4
Maximum Current Drain .....	4
Monitoring, History and Diagnostics .....	4
Performance Parameters .....	4
Alarms .....	5
Alarm Types .....	5
History .....	5
LED Descriptions .....	6
<b>Installation and Test</b>	<b>7</b>
Required Tools and Test Equipment .....	7
Installing the COLU .....	7
Initialization Sequence .....	7
Subscriber Drop Tests .....	8
<b>Administration</b>	<b>9</b>
Conventions Used in This Document .....	9
Logging On .....	9
Logging Off .....	10
PAU or PMU Main Screen .....	10
COLU Main Menu .....	12
Navigational Methods .....	12
Menu Bar Selections .....	13
COLU Summary Screen .....	14
Performance Submenu .....	15
HDSL Summary Screen .....	16
HDSL 24-Hour History Screen .....	17
HDSL 7-day History Screen .....	18
Signal History Screen .....	19
Alarms Submenu .....	20
System History Screen .....	21
HDSL History Screen .....	22

---

Configuration Submenu.....	23
System Options Screen .....	24
System Alarm Types Screen .....	25
Channel Options Screen.....	26
HDSL Alarm Thresholds Screen .....	27
HDSL Alarm Types Screen .....	28
Set Factory Defaults Screen.....	29
Test Submenu .....	30
Information Submenu .....	31
Inventory Screen .....	32
Event Log Screen.....	33
Help Screen .....	34
<b>Fault Isolation</b> .....	<b>35</b>
COLU Fault Indicators.....	35
RT Status Indicators .....	36
Subscriber Reported Faults.....	37
<b>Product Support</b> .....	<b>38</b>
Technical Support.....	38
Limited Warranty .....	38
Returns.....	38
FCC Class A Compliance.....	40
Modifications.....	40
<b>Acronyms</b> .....	<b>41</b>

## LIST OF FIGURES

1. Typical EBS Application.....	1
2. Front Panel LEDs .....	6
3. Status Window.....	36
4. Troubleshooting Flowchart .....	37





## LIST OF TABLES

1. Power Consumption and Heat Dissipation.....	3
2. LED Descriptions .....	6
3. Menu Bar Selections.....	13
4. System Status.....	14
5. System Options Configuration Fields .....	24
6. Alarm Report Settings .....	25
7. Configuration Fields .....	25
8. HDSL Alarm Threshold Fields .....	27
9. Alarm Types Defaults.....	28



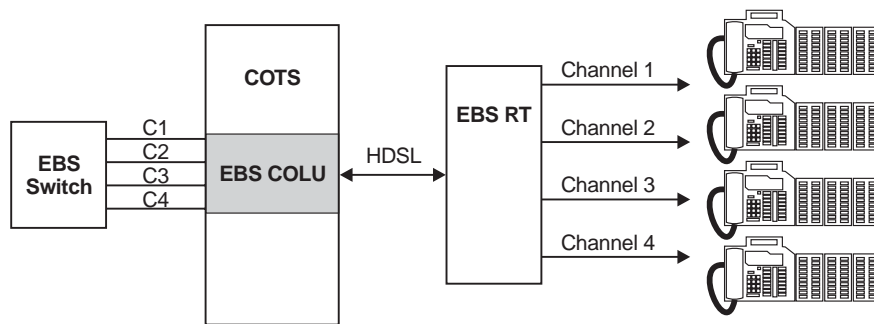
# PRODUCT OVERVIEW

This practice describes the ADC® PG-Plus® PLL-733 List 1, a COLU that provides interfaces for four EBS interfaces between an RT and the subscribers. An EBS COLU supports one RT, which supports 4 EBS sets with up to three add-ons each (see [Figure 1](#)).

## DESCRIPTION

A PG-Plus application provides bidirectional transport of multiple DS0 over a single, unconditioned wire pair using HDSL technology. Using existing cable, PG-Plus provides for higher bandwidth needs of residential and business customers by providing four EBS on a single HDSL twisted-pair wire. A minimally configured PG-Plus application consists of:

- COTS
- COLU
- RT



**Figure 1.** Typical EBS Application

The COLU uses ADC's HDSL technology to provide digital transmission without the need for repeaters, loop conditioning, or pair selection. The COLU can be installed in the PCS-718 19-inch or the PCS-719 23-inch COTS. The COLU operates in the standalone mode with no other COTS circuit cards required. Advanced features such as performance monitoring, alarm reporting, and testing require the addition of the PAU or the PMU. Line power is provided to the RT by the COLU.

The COLU performs the interface functions between the EBS circuits of the CO switching system by mapping one EBS line onto one DS0 for transmission to the RT on the HDSL pair. To obtain maximum reach, the HDSL line to the RT is operated at the minimum rate to support the payload.

Because of the loop lengths supported by the EBS COLU, it does not support metallic fallback.

## SPECIFICATIONS

PG-Plus offers extended reach beyond traditional DAML using proven HDSL technology. The application specifications are detailed in the following sections.

### System

Resistive Signature Tip to Ground 162 K; Ring to Ground 453 K

### Power Supply

Input Voltage -42 Vdc to -56 Vdc

### HDSL Line

Output Voltage  $\pm 140$  Vdc maximum; A2 compliant per GR-1089

Output Power 27 W maximum

HDSL Line Code 2B1Q

HDSL Line Rate 130.6 K symbols/sec; 261.3 K b/sec

HDSL Reach 15.0 kft, 26 AWG; 21.7 kft, 24 AWG; 31.2 kft, 22 AWG; 49.7 kft, 19 AWG

Maximum Attenuation 45.9 dB at 65 kHz

### EBS

Analog Impedance 900  $\Omega$

8 KHz Detection Level  $\geq 50$  mV<sub>pp</sub>

8 KHz Transmission Level 200 mV<sub>pp</sub>

Current Draw when set present at RT 16 mA typical

Switch to COLU wiring 100  $\Omega$  dc; with up to 4 db of loss at 8 kHz

Voice Transmission Loss (each direction) 4 dB  $\pm 2$  dB

MLT Test Request Voltage +116 Vdc applied to Tip

### Environment

Operating Temperature -40° F to +150° F; -40° C to +65° C

Operating Humidity 5% to 95% noncondensing

Altitude -200 ft to 13,000 ft; -60 m to 4,000 m

Vibration NEBS

ESD Per GR-1089-CORE

Power Cross and Lightning Surge Per GR-1089-CORE

Human Safety UL 1950

Emissions Radiation and Immunity Per GR-1089-CORE for class A equipment

### Connector

50 gold-plated card edge fingers

### Dimensions

Height 5.5 in. (14.0 cm.)

Width 1.1 in. (2.8 cm.)

Depth 10.25 in. (26.0 cm.)

Weight 1.0 lbs. (0.5 kg.)

## POWER CONSUMPTION AND HEAT DISSIPATION

The three most important power demands of an COLU on the COTS input power are its maximum power consumption, heat dissipation, and current drain. Table 1 lists the power consumption and heat dissipation for the COLU on a per slot and COTS basis.



**The worst case conditions under which these parameters are measured include a 15,000 ft., 26 AWG loop, a fully loaded COTS, and a -42 Vdc COTS battery voltage, and 4 EBS phones Active. Loop current sink at the COTS is assumed to be 16 mA.**

*Table 1. Power Consumption and Heat Dissipation*

Power	COLU Slot	COTS	
		19-inch	23-inch
<b>Maximum Heat Dissipation</b>			
HDSL Line Power Off	2.1 W	25.2 W	33.6 W
HDSL Line Power On	7.5 W	90.0 W	119.9 W
<b>Maximum Power Consumption</b>			
HDSL Line Power Off	2.1 W	25.2 W	33.6 W
HDSL Line Power On	12.3W	148.2 W	197.6 W
<b>Maximum Current Drain</b>			
HDSL Line Power Off	50.0 mA	0.6 A	0.8 A
HDSL Line Power On	293 mA	3.53 A	4.70 A

### Maximum Heat Dissipation

The maximum heat dissipation measures the power converted into heat that is built up within the COLU. It contributes to the total heat generated in the space around the COLU. This conversion factor is used to determine the maximum number of fully loaded COTS per bay that will not exceed the maximum allowable power dissipation density in Watts per square foot.

In CO locations, the maximum heat dissipation for open-faced, natural convection-cooled mountings is limited to 134.7 W per square foot per Section 4.1.4 of the NEBS standard *GR-63-CORE*. The footprint of a standard 16 slot, 23-inch COTS is 7.042 square foot. The maximum bay dissipation is therefore limited to 948.5 W. At 119.9 W per COTS, the number of fully loaded COTS is limited to eight per bay with a heat baffle between every COTS.



**This is a worst case situation in that it assumes the entire CO is subjected to the maximum power density. Conditions other than the worst case ones presented in this practice would permit increasing the number of COTS per bay without jeopardizing the CO thermal integrity. Consider also that, due to the chimney effect, it is recommended to install one heat-dissipating baffle between every COTS. Otherwise, the rated operating temperature of the COLUs may be exceeded.**

### Thermal Loading Limitations

The thermal loading limitations imposed when using the COLU in a CEV or other enclosures are determined by applying the COLU power parameters to the manufacturer's requirements for each specific housing.

## Maximum Power Consumption

The maximum power consumption is the total power that the COLU consumes or draws from its -48 Vdc COTS power source. This parameter is needed when the COLU is located remotely from its serving CO. It determines the battery capacity required to maintain an 8-hour standby battery reserve for emergency situations.

## Maximum Current Drain

The maximum current drain is the maximum current drawn from the COTS power supply when the COTS power supply is at its minimum voltage (-42.5 Vdc). This determines the COTS fusing requirements.

# MONITORING, HISTORY AND DIAGNOSTICS

COLUs provide extensive real-time, nondisruptive monitoring of HDSL transmission performance parameters for all units in a circuit. You can select threshold settings for the performance monitoring measurements at the appropriate COLU screen. These settings cause alarms to be activated at the designated threshold setting. The user interface ports performance is also monitored. Monitored parameters include the following:

- HDSL                      Noise margin, pulse attenuation, ES, UAS
- Interface                ES, SES, UAS seconds
- Major Alarm Relay      Form-C relay contacts (NO, NC, C). Fail-safe operation

## Performance Parameters

Based on the monitored parameters, the COLUs derive the following performance parameters:

- MAR                      A measure of the ratio of signal power to noise power, in decibels (dB), at a receiver point. A value of 0 dB means that the predicted transmission BER is equal to  $10^{-7}$ , a value of 6 dB means the predicted transmission BER is equal to  $10^{-10}$ . The Main menu status display of the console continuously updates the margin value. You can set the high and low values of this parameter for the COLU and the RT at the “[HDSL Summary Screen](#)” on page 16 and the severity of the alarm at the “[HDSL Alarm Types Screen](#)” on page 28. You can see the results of these setting at the “[COLU Summary Screen.](#)”
- LOSW                    The COLU has detected an error in one or more bits in six consecutive HDSL SYNC words. Two consecutive SYNC words must be received without error to clear this condition. A LOSW condition generally indicates the loop is down, thus data cannot be transmitted. The COLU uses this parameter to derive UAS performance parameter. You can set the severity of the alarm at the “[HDSL Alarm Types Screen](#)” on page 28. You can see the results of these setting at the “[HDSL Summary Screen](#)” on page 16.
- HDSL ES                An interval of 1 second during which at least one CRC is detected at the incoming HDSL port. You can set the value of this parameter for the COLU and the RT at the “[HDSL Alarm Thresholds Screen](#)” on page 27 and at the “[HDSL Alarm Types Screen](#)” on page 28 set the severity of the alarm. You can see the results of these setting at the “[HDSL Summary Screen](#)” on page 16.
- HDSL UAS              An interval of 1 second during which a loop is down. You can set the value of this parameter for the COLU and the RT at the “[HDSL Alarm Thresholds Screen](#)” on page 27 and at the “[HDSL Alarm Types Screen](#)” on page 28 set the severity of the alarm. You can see the results of these setting at the “[HDSL Summary Screen](#)” on page 16.

## Alarms

The COLU generates alarms for problem conditions on the HDSL transmission facility and at the application interface.

- MAR
- ES
- UAS
- LOSW
- PFO
- PFS
- PGF
- MISMATCH
- NORLUSW
- MISPWRA
- MISPWRB
- BKUPMEMP

## Alarm Types

Alarms can be individually set to the following values:

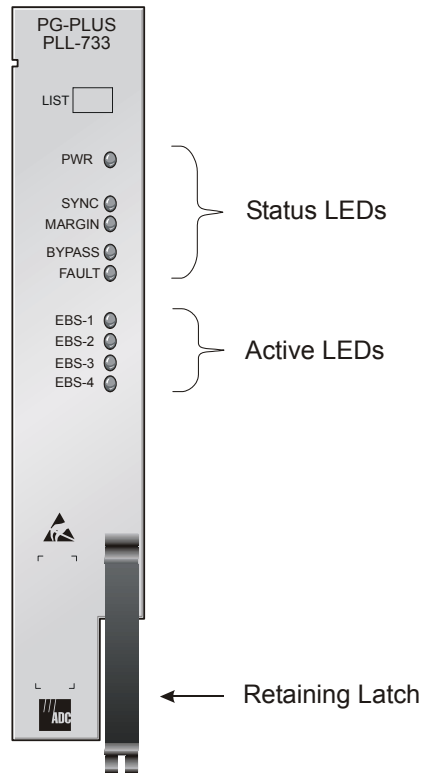
- MN
- MJ
- CR
- NA
- NR

## History

Current cumulative counts of the past 24 hours and historical data in the form of 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.

- HDSL Interface reports 24-Hour and 7-Day for ES and UAS
- Alarm reports contain time stamp of first and last occurrence, number of occurrences for all enabled alarms.

## LED DESCRIPTIONS



**Figure 2.** Front Panel LEDs

Table 2 describes the COLU front-panel LEDs in which  $n$  equals the EBS line. For further details, refer to “Initialization Sequence” on page 7 and the “COLU Fault Indicators” on page 35.

**Table 2.** LED Descriptions

Label	Color	Status	Description
<b>PWR</b>	Green	On	HDSL line feed is normal
		1 Hz Flash	Problem with the COLU power supply or the HDSL line feed is open
		Off	COLU is not receiving power or the fuse is blown
<b>SYNC</b>	Green	On	HDSL line is in synchronization between the COLU and RT
		Flash	HDSL line is attempting to synchronize with the RT
		Off	Active RT is not detected
<b>MAR</b>	Yellow	On	COLU HDSL margin is below a preset level
		1 Hz Flash	RT margin is below preset level
		Off	HDSL margin is above a preset level
<b>Test</b>	Yellow	1 Hz Flash	SDT is occurring, Activity LED 1 Hz flashes
		Off	No tests active
<b>Fault</b>	Red	On	Fault in the COLU
		1 Hz Flash	Active alarm at COLU or RT or both
		Off	No faults are detected at the COLU or RT
<b>EBS<math>n</math> Activity</b>	Green	On	Channel is off-hook or Active
		8 Hz Flash	Channel is ringing
		1 Hz Flash	Channel is in SDT
		Off	Channel is on-hook



# INSTALLATION AND TEST

The following sections describe the tools and procedure for installing and testing the COLU.

## REQUIRED TOOLS AND TEST EQUIPMENT

No tools are required to install the COLU. For testing, the following tools may be utilized:

- EBS Telephone
- No. 2 flat-head screwdriver
- Optional, PSU-795, COTS Continuity Test Card, 150-1695-01 List 1

## INSTALLING THE COLU

You can install the COLU in any slot except the three positions labeled COMMON, MUX 1, and MUX 2.

- 1 Open the retaining latch on the front of the COLU.
- 2 Insert the COLU into the card guides in a vacant slot in the COTS that corresponds to the location of the wiring from the CO switch. Refer to the cabling tables provided in the COTS documentation for slot and Telco cabling assignment.
- 3 Engage the retaining latch to hold the card in place.

## INITIALIZATION SEQUENCE

After inserting the COLU into the appropriate slot in the COTS, the following events should occur in the order listed below:

- All the LEDs go On briefly and then go Off with the exception of the PWR and Fault LEDs, which start 1 Hz Flash.
- After about 5 seconds, the COLU applies power and goes into Start-Up mode. If an RT is present and no power feed shorts, opens, or ground faults are detected, the PWR LED is On green. HDSL Start-Up is initiated.
- As the COLU continues with power-up mode (if an RT is present), the PWR LED is On solid and the SYNC LED Flashes, indicating the HDSL line is attempting to acquire synchronization. When synchronization is complete, the SYNC LED is On.
- The Margin LED is On yellow indicating the COLU signal-to-noise ratio is equal or below the selected signal-to-noise ratio threshold on the COLU. The Margin LED flashes if the signal-to-noise ratio of the HDSL line is equal or below the selected signal-to-noise ratio threshold on the RT. The Margin LED is Off when the signal-to-noise ratio of the HDSL line crosses the selected signal-to-noise ratio. This takes approximately 30 seconds to 3 minutes, according to the loop length.
- Test each subscriber line with the test set. Observe the LED indicators for correct activity (where  $n$  equals the EBS line):
  - Off-hook (Active call):  $EBS_n$  LED is On
  - Ringing:  $EBS_n$  LED Flashes at 8 Hz
  - On-hook (no Active call):  $EBS_n$  LED is Off

There are three ways to initialize the HDSL on the EBS COLU, after the RT is installed:

- Wait 5 minutes for a Restart.
- Remove the COLU from the COTS and reinstall.
- Short the HDSL Tip and Ring pair for 3 seconds, remove short and wait 3 seconds.

## **SUBSCRIBER DROP TESTS**

PG-Plus supports testing of a subscriber drop in two ways:

- Initiate a test by applying a test voltage on the Tip at the COLU through an MLT set
- With the VT-100 Terminal connected to the PAU or PMU maintenance port, select the *Subscriber Drop Test* feature from the Test menu. Relays on the RT provide a path for performing a SDT. The results are reported to the PAU or the PMU and presented as TA-909 resistive signatures.

# ADMINISTRATION

Performance monitoring is built into PG-Plus application. You can access the VT-100 port of the PAU or the PMU to review performance measurements that provide an indication of the quality of transmission to the subscriber. You can perform system administration functions, such as alarm checking and clearing, configuration changes, performance monitoring, and testing for the COLU through the screens.

Connect a VT-100 terminal is connected to the RS-232 interface on the front panel of either the PAU or the PMU to access the COLU screens. If the system does not respond, verify the following values are present:

- VT-100 terminal Hardware Flow Control is set to On
- XON/XOFF is enabled
- ASYNC parameters: Data = 8, Parity = None, Start/Stop = 1.

For further information on connecting a terminal and accessing the screens refer to the PAU or the PMU or the PAU or the PMU Technical Practice.

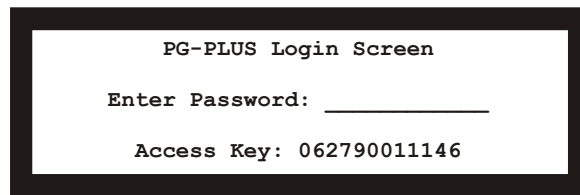
## CONVENTIONS USED IN THIS DOCUMENT

Some screenshots in this document come from a prototype set-up and may appear slightly different from what you see on your Craft interface screen. The basic information and contents should be similar. This document uses the following conventions for menus and shortcuts.

Example	Describes
<i>menu</i>	name of menu item
<i>submenu</i>	name of submenu item
<i>prompts</i>	the place where you answer yes or no or some other response required
<b>error</b>	the name of what's wrong
error text	an explanation of what's wrong
<i>n</i>	a variable, such as POTS unit 1 in a 6 POTS unit

## LOGGING ON

- 1 Press **SPACEBAR** several times to activate the Autobaud feature. Supported baud rates are 1200, 2400, 4800, 9600, and 38400. The Logon Password screen displays.



- 2 Type the default password and press **ENTER** to view the PAU or PMU Main menu bar.

Select the COLU you want to view. The screens presented to the VT-100 terminal are generated by the COLU. For further information on connecting a terminal and accessing the screens refer to the PAU or PMU Technical Practice.



**The factory-default password is password#1. If you establish a different password, you must type the new password at a subsequent log on.**

**Passwords are not case sensitive. The password must use at least 6 and no more than 10 characters, and MUST contain at least 1 alpha, 1 numeric, and 1 special character.**

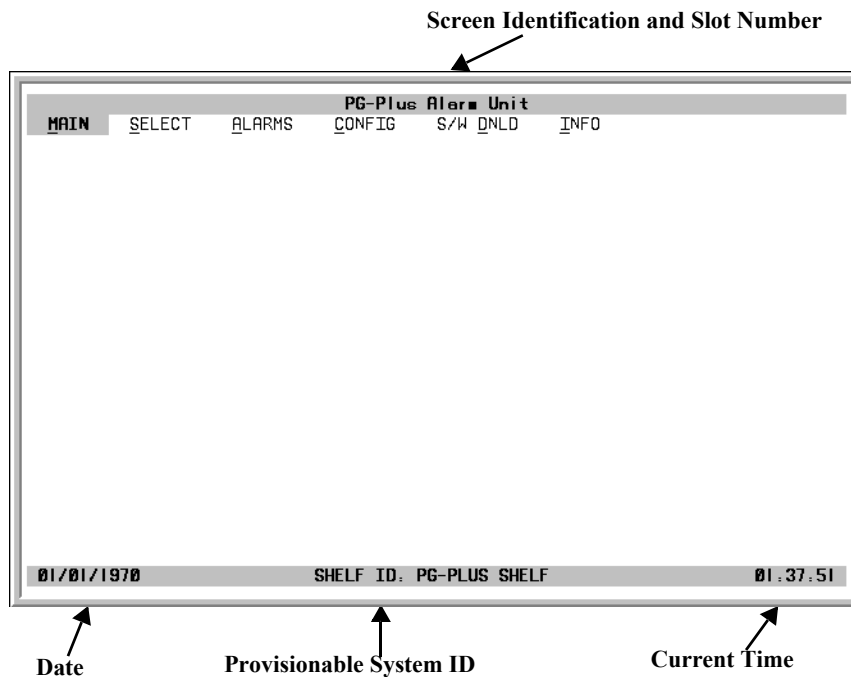
**The factory defaults in this document are standard factory defaults. You may have a customized version of the product, in which case, refer to the PG-Plus Customized Factory Defaults for the values appropriate to the product version you have.**

## LOGGING OFF

If you must leave your VT-100 terminal unattended for any length of time, it is good practice to log out until you are ready to resume work. This prevents unauthorized persons from inadvertently changing any of your operating parameters. Log out by choosing Quit from the menu bar or by disconnecting the cable connecting the console to the COLU.

## PAU OR PMU MAIN SCREEN

The first screen displays with the COTS Main menu bar. The screens are identified by the COTS slot number at the top of each screen. The provisionable System ID string displays at the bottom center, the date displays at the lower left of the screen and the time in military format displays at the lower right of the screen.



- 1 If you want to access a specific COLU but do not know the slot number, press **ENTER** to view the COTS information.
- 2 Note the slot number of the desired COLU. There may be more than one of the COLU type you are installing.

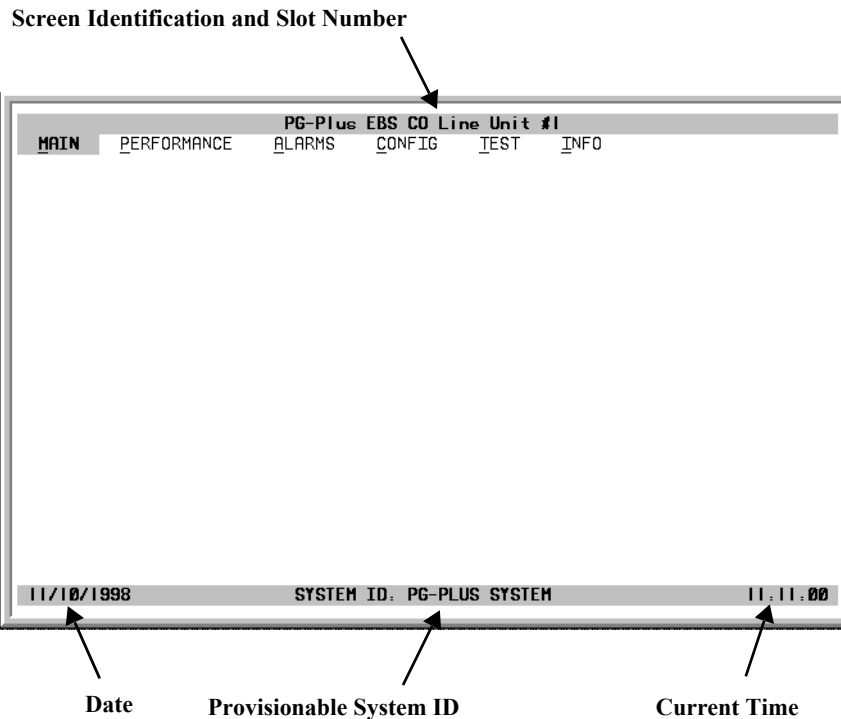
PG-Plus Alarm Unit					
MAIN	SELECT	ALARMS	CONFIG	S/W DNLD	INFO
<b>Shelf Summary</b>					
SLOT			SHELF UNIT TYPES		
PMX1	NOT EQUIPPED	5	NOT EQUIPPED	11	NOT EQUIPPED
PMX2	NOT EQUIPPED	6	NOT EQUIPPED	12	NOT EQUIPPED
1	DUAL 2-POTS	7	NOT EQUIPPED		
2	NOT EQUIPPED	8	NOT EQUIPPED		
3	NOT EQUIPPED	9	NOT EQUIPPED		
4	6 POTS	10	NOT EQUIPPED		
----- SHELF CURRENT ALARMS -----					
PAU PMX1 PMX2 1 2 3 4 5 6 7 8 9 10 11 12					
CRITICAL :					
MAJOR :					
MINOR :					
[ * = ACTIVE ALARM ]					
01/01/1970		SHELF ID: PG-PLUS SHELF		01:39:19	

- 3 Press **ESC** to return to the Main menu bar.
- 4 Scroll to the *Select* option and press **ENTER** to access the submenu.
- 5 Scroll to the slot number noted above and press **ENTER**.

PG-Plus Alarm Unit					
MAIN	SELECT	ALARMS	CONFIG	S/W DNLD	INFO
	PMX 1				
	PMX 2				
	COLU 1				
	COLU 2				
	COLU 3				
	COLU 4				
	COLU 5				
	COLU 6				
	COLU 7				
	COLU 8				
	COLU 9				
	COLU 10				
	COLU 11				
	COLU 12				
01/01/1970		SHELF ID: PG-PLUS SHELF		03:51:35	

## COLU MAIN MENU

When you select the COLU from the PAU or the PMU Select menu option, the COLU Main menu displays. You can perform any of the functions listed in [Table 3](#) from this screen.



### Navigational Methods

Use the following keyboard keys to navigate through the menus and screens:

- A - Z** keys      Selects and executes an underlined or highlighted menu item.
- ←**                      Moves left across Main menu. Moves the cursor to the left.
- Moves right across Main menu. Moves the cursor to the right.
- ↑**                      Moves up the submenu selection. Moves the cursor up the screen items.
- ↓**                      Moves down the submenu selection. Moves the cursor down the screen items.
- CTRL + R**            Returns to the PAU or PMU Main screen. ADC banner appears briefly, then the Main menu bar displays.
- SPACEBAR**        No effect. At COLU screen cycles through choices.
- ESC**                    Exits the current screen and returns to the previous screen. Changes made at the current screen are discarded. Press **ESC** in a text field to cancel the text entry and restore the old value.
- ENTER**                Moves to submenu or screen selected. At the screen, it submits all selection changes on the current screen and makes them effective in the system.

## Menu Bar Selections

Table 3 describes the menus and submenus selectable from the COLU menu bar.

**Table 3. Menu Bar Selections**

<b>Select the underlined alpha character:</b>	<b>To View or Change:</b>
<b><u>M</u>ain</b>	Circuit configuration. Performance summary information. Alarm summary information.
<b><u>P</u>erformance</b>	HDSL Summary and reset the minimum and maximum margin counts. Date and time of the last reset of the minimum and maximum margin counts. Information about the HDSL span, 24-hours of performance history including ES, UAS and validity of counts. History screens. 7-day history plus current day's accumulated performance information including ES, UAS and validity of counts. EBS signal history on any of the 4 EBS units, and clear the Trace buffer.
<b><u>A</u>larms</b>	HDSL History screen detailing the number of times each alarm occurred, time and date of first and last occurrence, the provisioned notification type, and current status. Alarm history
<b><u>C</u>onfig</b>	Options such as SDT, HDSL Periodic Power Up, and System ID. Alarm types of all System alarms Threshold crossing values for the 24-hour ES count and low margin dB. HDSL and DSL line power alarms. EBS signaling transmit level at the RT. Operating parameters reset to factory defaults.
<b><u>T</u>est</b>	Test subscriber drop. Results which include hazardous voltages, foreign voltages, resistive faults, and EBS CPE termination status.
<b><u>I</u>nf</b>	Registration information to track product manufacturing, configuration, and revision state. Event log Summary of navigational methods

## COLU Summary Screen

This screen details the performance condition of the COLU and RT.

- 1 Select *Main* from the menu bar and press **ENTER** to view the COLU Summary screen.

The screenshot shows the COLU Summary Screen with the following content:

```

PG-Plus EBS CO Line Unit #1
MAIN PERFORMANCE ALARMS CONFIG TEST INFO
Channel Set
Status Present
IDLE YES EBS1 -- COLU HDSL Status RLU -- EBS1
IDLE YES EBS2 -- NORMAL -- EBS2
IDLE YES EBS3 -- ----- EBS3
IDLE YES EBS4 -- HDSL SPAN EBS4
-----
PERFORMANCE
HDSL Margin (dB) : 20 21
HDSL ES (24 Hr.) : 0 0
-----
ALARMS
SYSTEM : NONE
HDSL : NONE
-----
11/10/1998 SYSTEM ID: PG-PLUS SYSTEM 11:11:42
    
```

Annotations on the right side of the screenshot:

- Status indicators for the HDSL span and the EBS interfaces (points to the top section of the screen)
- HDSL performance summary in terms of margin and ES count (points to the PERFORMANCE section)
- Status of current HDSL and System alarms (points to the ALARMS section)

- 2 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.
- 3 Refer to the Performance and Alarms screens for a detailed description of data displayed in these areas.

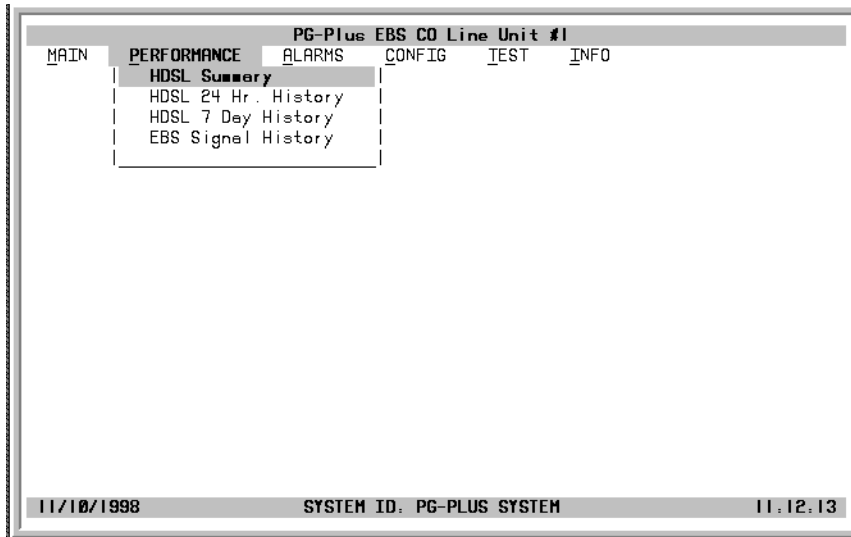
**Table 4. System Status**

System Status	Description
<b>Channel Status</b>	
Open	No CO battery detected.
Idle	CO battery detected and there is no Active call at RT
Ringing	Line is ringing
Busy	Line has an Active call at RT
Test	Line is under SDT
<b>Set Present</b>	
Yes	EBS CPE is present.
No	EBS CPE is not present, or wired backwards (Tip and Ring reversed).
<b>HDSL Line Status</b>	
Restart Pending	HDSL link is down, waiting to restart.
Start-up	System in start-up mode where the HDSL link is acquiring synchronization.
Normal	System running normal where the HDSL link is synchronized and speech and signaling data are flowing between the COLU and the RT.



# PERFORMANCE SUBMENU

The Performance submenu provides access to the COLU performance screens.



## HDSL Summary Screen

This screen depicts an HDSL performance summary in terms of the margin and ES count. Use the available options to reset the minimum and maximum margin counts.

- 1 Select *Performance* and press **ENTER** to view the submenu.
- 2 Scroll to the *HDSL Summary* option and press **ENTER** to view the screen. The date and time of the last reset of the minimum and maximum margin values displays at the bottom of the screen.

PG-Plus EBS CO Line Unit #1					
MAIN	PERFORMANCE	ALARMS	CONFIG	TEST	INFO
<b>HDSL Summary</b>					
			<u>COLU</u>	<u>RLU</u>	
Current Margin (dB)	:		20	21	
Minimum Margin (dB)	:		19	20	
Maximum Margin (dB)	:		21	21	
Errored Seconds (24 Hr.)(ES)	:		0	0	
Unavailable Seconds (24 Hr.)(UAS)	:		0	0	
Insertion Loss (dB)	:		0	0	
HDSL Tip/Ring Reversal (YES/NO)	:		NO		
RESET MIN/MAX MARGIN COUNTS (Y)?					
MIN/MAX MARGIN COUNTS LAST RESET: 11/10/1998 11:09:51					
11/10/1998		SYSTEM ID. PG-PLUS SYSTEM		11.12.47	

Insertion Loss is the measurement of the amount of signal loss between the COLU and the RT.

- 3 You can reset the values for the minimum and maximum margins for the COLU or RLU. To reset these values, highlight the appropriate field and type in the desired numerical value. When you have completed the changes, type **Y** at the *Reset MIN/MAX Margin Counts* prompt to reset the values.

If the MAR value falls below or exceeds the value set here, then alarms are registered according to the value level selected at the “[HDSL Alarm Types Screen](#),” and displayed at the “[COLU Summary Screen](#).”

- 4 If you chose to reset the counts, type **Y** at the confirmation prompt.
- 5 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## HDSL 24-Hour History Screen

This screen shows twenty-four hours of HDSL performance history. The performance history data displayed includes ES and UAS values for the COLU and the RT.

- 1 Select *Performance* from the menu bar and press **ENTER** to view the submenu.
- 2 Scroll to the *HDSL 24 Hr. History* option and press **ENTER** to view the screen.

PG-Plus EBS CO Line Unit #1					
MAIN	PERFORMANCE	ALARMS	CONFIG	TEST	INFO
HDSL 24 Hr. History					
Time	COLU		RLU		
	ES	UAS	ES	UAS	
11:00	0-ADJ	0-ADJ	0-ADJ	0-ADJ	
10:45	0-UNA	0-UNA	0-UNA	0-UNA	
10:30	0-UNA	0-UNA	0-UNA	0-UNA	
10:15	0-UNA	0-UNA	0-UNA	0-UNA	
10:00	0-UNA	0-UNA	0-UNA	0-UNA	
09:45	0-UNA	0-UNA	0-UNA	0-UNA	
09:30	0-UNA	0-UNA	0-UNA	0-UNA	
09:15	0-UNA	0-UNA	0-UNA	0-UNA	
09:00	0-UNA	0-UNA	0-UNA	0-UNA	
08:45	0-UNA	0-UNA	0-UNA	0-UNA	

COM = Complete, PAR = Partial, ADJ = Adjusted, UNA = Unavailable

11/10/1998      SYSTEM ID: PG-PLUS SYSTEM      11.13.49

In the Time field, the current 15-minute interval information shows the real-time updates. For example, the time interval marked 4:00 contains the information for 4:00 am to 4:15 am.

The COLU derives the COLU and RT performance parameters, which have the valid field values of:

- Unavailable: The system has not run long enough to fill this register.
- Partial: Data is being collected for this register.
- Complete: Data is saved in the history register for the complete interval.
- Adjusted: The time or date has been changed on the system during the interval.

- 3 Highlight either of the paging buttons and press **ENTER** to scroll through all ninety-six 15-minute intervals.
- 4 Highlight the Clear History button and press **ENTER** to clear the history.



**If there is an active alarm associated with the current 15-minute performance history information, this alarm becomes inactive when the 24-hour performance history is cleared.**

- 5 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## HDSL 7-day History Screen

Shows seven days of performance history plus the current day's accumulated performance information. The information displayed includes ES counts, UAS counts, and the validity of the values.

- 1 Select *Performance* from the menu bar and press **ENTER** to view the submenu.
- 2 Scroll to the *HDSL 7 Day History* option, then press **ENTER** to view the screen.

PG-Plus EBS CO Line Unit #1					
MAIN	PERFORMANCE	ALARMS	CONFIG	TEST	INFO
HDSL 7 Day History					
COLU			RLU		
Date	ES	UAS	ES	UAS	
11/10	0-ADJ	0-ADJ	0-ADJ	0-ADJ	
11/09	0-UNA	0-UNA	0-UNA	0-UNA	
11/08	0-UNA	0-UNA	0-UNA	0-UNA	
11/07	0-UNA	0-UNA	0-UNA	0-UNA	
11/06	0-UNA	0-UNA	0-UNA	0-UNA	
11/05	0-UNA	0-UNA	0-UNA	0-UNA	
11/04	0-UNA	0-UNA	0-UNA	0-UNA	
11/03	0-UNA	0-UNA	0-UNA	0-UNA	

COM = Complete, PAR = Partial, ADJ = Adjusted, UNA = Unavailable

CLEAR HDSL 7 DAY HISTORY (Y)?

11/10/1998      SYSTEM ID. PG-PLUS SYSTEM      11.14.30

The current day performance information shows real-time updates. At midnight of every day, the current day performance information is moved into the previous day slot and the current day performance information is cleared.

The COLU derives the performance parameters for both the COLU and the selected RT with the valid field values of Unavailable, Partial, Complete, and Adjusted.

- 3 At the *Clear HDSL 7 day History* prompt, type **Y** to clear the 7-day history information.



**Clearing the 7-day performance history does not clear the current day performance information. The current day performance information may only be cleared through the HDSL 24-hour performance history screen.**

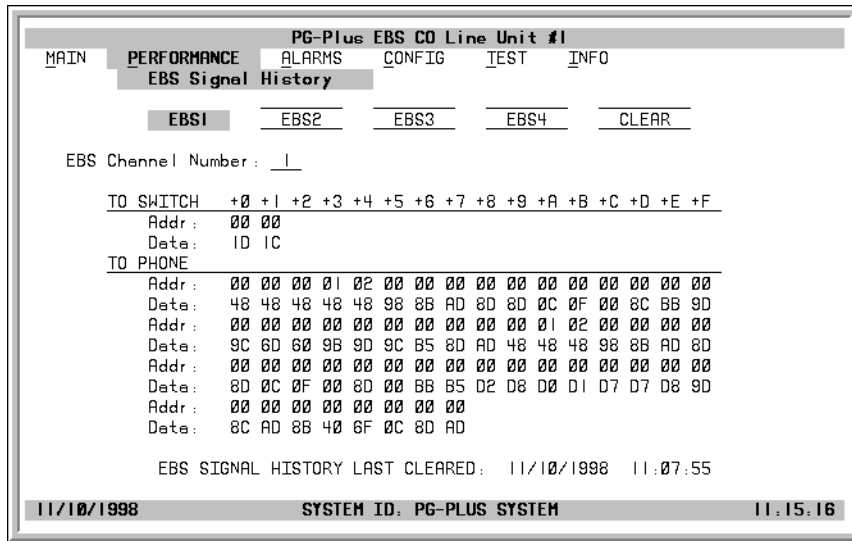
**If there is an active alarm associated with the current 24-hour performance history information, this alarm becomes inactive when the 24-hour performance history is cleared.**

- 4 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## Signal History Screen

This screen displays the trace of the EBS signaling messages sent from the EBS switch to the EBS phone and vice versa.

- 1 Select *Performance* from the menu bar and press **ENTER** to view the submenu.
- 2 Scroll to the *EBS Signal History* option and press **ENTER** to view the channel selection.
- 3 Select a channel to view, for example EBS Channel 1, by highlighting the desired channel and pressing **ENTER**. For example, EBS1.



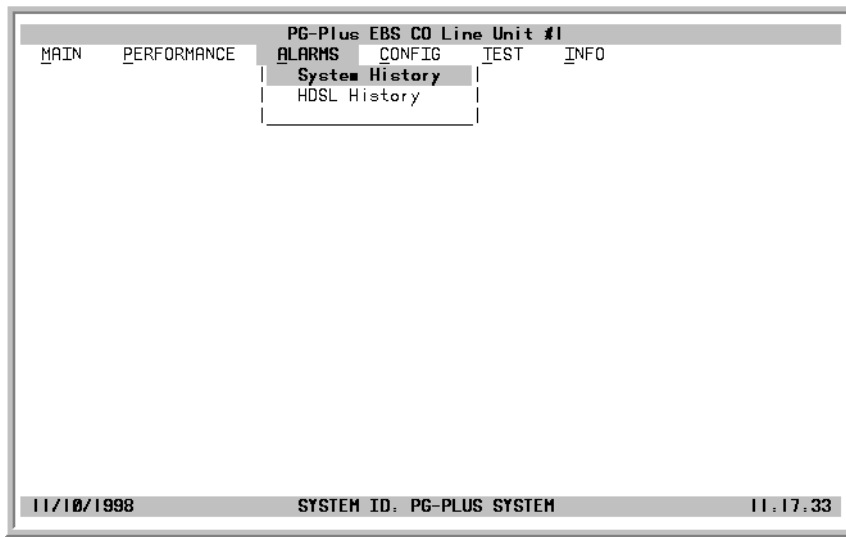
When you press **ENTER** the EBS Channel Number field changes to 1. The screen shows hexadecimal address and message codes sent as part of EBS signaling protocol between the EBS switch and the EBS phone. The exact definition of the message codes can be found in the document "Electronic Business Service Access Interface Specification," (Nortel document NIS S106-2).

- 4 To clear EBS1 Signal History, with 1 displaying in the EBS Channel Number field, scroll to the Clear button and press **ENTER**. The Time and Date field at the bottom of the screen is updated, and the signal history is cleared.
- 5 Press **ESC** to move up a menu level, or **CTRL+R** to return to the PAU/PMU Main menu.

## ALARMS SUBMENU

The COLU detects and reports HDSL, EBS, and System related alarmed events to the PAU or the PMU (if present). Select *Alarms* at the menu bar and press **ENTER** to view the submenu.

All alarms in the PG-Plus application are suppressed when initially installed and powered up. Any alarms that are generated during this process are marked as Suppressed. When the HDSL is synchronized and the COLU and RT margin has cleared; any outstanding alarms that have been marked Suppressed are marked Active and reported to the PAU or the PMU, based upon their provisioned types.



## System History Screen

Shows the system alarm history. Abbreviations for active alarms are listed. If no alarms are present, the status word OK displays.

- 1 Select *Alarms* from the menu bar and press **ENTER** to view the submenu.
- 2 Scroll to the *System History* option and press **ENTER** to view the screen. The current information shows real-time updates.

PG-Plus EBS CO Line Unit #1						
MAIN	PERFORMANCE	ALARMS	CONFIG	TEST	INFO	
System History						
ALARMS		TYPE	CURRENT	COUNT	FIRST	LAST
Power A Missing	(MISPAWA)	NA	OK	0	--/-- --:--	--/-- --:--
Power B Missing	(MISPAWB)	NA	OK	0	--/-- --:--	--/-- --:--
COLU-RLU Mismatch	(MISMATCH)	MN	OK	0	--/-- --:--	--/-- --:--
No RLU S/W	(NORLUSW)	MN	OK	0	--/-- --:--	--/-- --:--
EEPROM FAILURE	(BKUPMEMP)	MN	OK	0	--/-- --:--	--/-- --:--
CLEAR SYSTEM ALARM HISTORY (Y)? █						
SYSTEM ALARM HISTORY LAST CLEARED: --/--/---- --:--:--						
11/10/1998		SYSTEM ID: PG-PLUS SYSTEM			11.18.29	

- 3 To clear the history information, type **Y** at the Clear System Alarm History prompt. Clearing the system alarm history does not clear the current alarms.
- 4 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## HDSL History Screen

The HDSL history maintained on the COLU contains a count of the number of times each alarm occurred, the time and date of the first and last occurrence, the provisioned notification type, and the current status. If no alarms are present, the status word OK displays.

- 1 Select *Alarms* from the menu and press **ENTER** to view the submenu.
- 2 Scroll to the *HDSL History* option and press **ENTER** to view the screen.

PG-Plus EBS CO Line Unit #1						
MAIN		PERFORMANCE	ALARMS	CONFIG	TEST	INFO
HDSL History						
ALARMS	TYPE	CURRENT	COUNT	FIRST	LAST	
COLU HDSL LOSW	MN	OK	1	01/01 00:00	01/01 00:00	
COLU HDSL ES 15 MIN THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
COLU HDSL ES 24HR THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
COLU HDSL UAS 15 MIN THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
COLU HDSL UAS 24HR THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
COLU HDSL LOW MARGIN	MN	OK	0	--/-- --:--	--/-- --:--	
COLU POWER FEED OPEN	MN	OK	0	--/-- --:--	--/-- --:--	
COLU POWER FEED SHORT	MN	OK	0	--/-- --:--	--/-- --:--	
COLU POWER GROUND FAULT	MN	OK	0	--/-- --:--	--/-- --:--	
RLU HDSL LOSW	MN	OK	1	01/01 00:00	01/01 00:00	
RLU HDSL ES 15 MIN THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
RLU HDSL ES 24HR THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
RLU HDSL UAS 15 MIN THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
RLU HDSL UAS 24HR THRESH	MN	OK	0	--/-- --:--	--/-- --:--	
RLU HDSL LOW MARGIN	MN	OK	0	--/-- --:--	--/-- --:--	
CLEAR HDSL ALARM HISTORY (Y)?						
HDSL ALARM HISTORY LAST CLEARED: --/--/-----						
11/10/1998		SYSTEM ID. PG-PLUS SYSTEM			11.19.02	

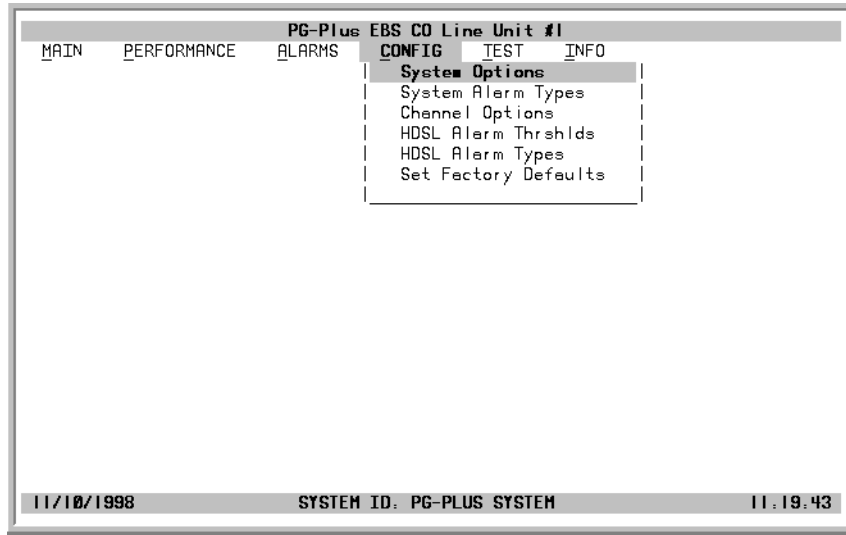
At this screen you see the results of the alarms types set at the Configuration “HDSL Alarm Types Screen” on page 28.

- 3 Type **Y** at the Clear HDSL Alarm History? prompt to clear the information. Clearing the alarm history clears the RT and the COLU alarm history. If there is an active alarm, then the count is set to 1 and the value in the Last date and time field is set to the First date and time field.
- 4 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.



## CONFIGURATION SUBMENU

Provides access to the COLU system provisioning screens, SDT compatibility, channel options, and alarm capabilities.



## System Options Screen

System Options screen allows the provisioning of options such as SDT compatibility, HDSL Periodic Power Up, and a System ID.

- 1 Select *CONFIG* from the menu and press **ENTER** to view the submenu.
- 2 Scroll to the *System Options* line and press **ENTER** to view the screen.

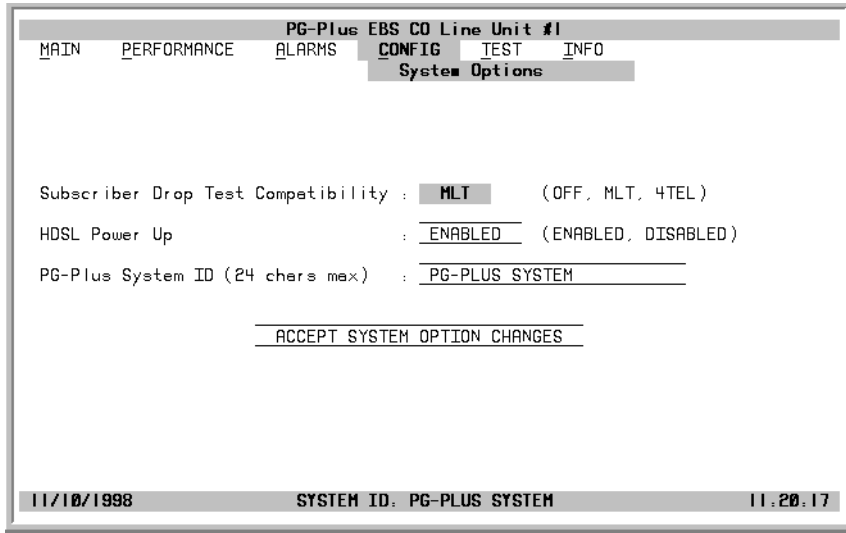


Table 5 shows the configurable system options and the factory default values.

- 3 Highlight the desired field and press **SPACEBAR** to toggle to the desired value, or use a directional key to move to the next option.
- 4 Press **TAB** to move to the Accept System Option Changes button, and press **ENTER** to accept the changes.
- 5 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

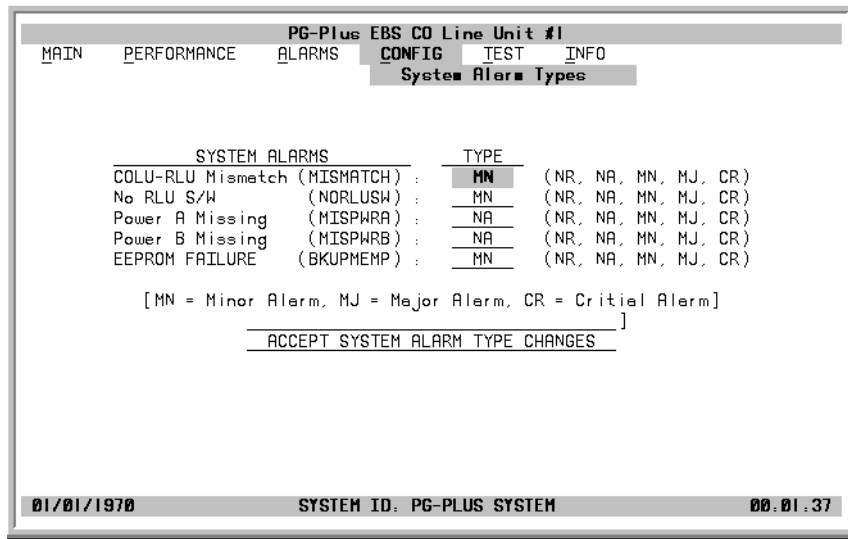
**Table 5.** System Options Configuration Fields

System Options	Description	Default
SDT Compatibility	Specifies whether the PG-Plus initiates and operates with mlt or 4TEL loop test systems. Select the test type according to the loop testing system in use. Possible values include Off, mlt, and 4TEL. Craft initiated SDTs work in any selection.	mlt
HDSL Periodic Power Up	Enabled, PG-Plus attempts to power up the HDSL line every 5 minutes or anytime the HDSL pair is shorted for 3 seconds and then opened. Disabled inhibits the power-up sequence under any circumstances and the system remains unpowered.	Enabled
System ID	Configurable identification string for the system, visible at the bottom of the every COLU screen. This string can be up to 24 characters. There are no special rules for changing the System ID. Any printable character, including space, is valid. The System ID makes it easy for you to know which COLU screens are displayed.	PG-Plus System

## System Alarm Types Screen

Allows the provisioning of the alarm types of all system alarms. These fields can be set to the values shown in Table 6, with defaults shown in Table 7.

- 1 Select *CONFIG* from the menu and press **ENTER** to view the submenu.
- 2 Scroll to the *System Alarm Types* option and press **ENTER** to view the screen.



If the MAR value goes above or below the value set at the “HDSL Summary Screen,” then alarms are registered by the criticality selected here, the results of which are displayed at the “System History Screen.”

- 3 Highlight the desired option and press **SPACEBAR** to toggle to the desired value. Continue until you have made all desired changes.
- 4 When you finish, move to the Accept System Alarm Types Changes button and press **ENTER**.
- 5 Press **ESC** to move up a menu level, or **CTRL +R** to return to the PAU/PMU Main menu.

**Table 6. Alarm Report Settings**

Settings	PAU/PMU Reports	Fault LED Affected	Main Summary Listing	History Updated
CR/MJ/MN	Yes	Yes	Yes	Yes
NA	No	No	No	No
NR	No	Yes	Yes	Yes

**Table 7. Configuration Fields**

Alarm	Description	Default
MISMATCH	Incompatible COLU and RT are installed. For example, a 4 EBS COLU is connected to a 4 POTS RT.	MN
NORLUSW	RT has no application software and is awaiting software download.	MN
MISPWRA	COLU detected a missing A -48 Vdc power source. If power is verified at the COLU, then the COLU must be replaced, because it has a blown fuse.	NA
MISPWRB	COLU detected a missing B -48 Vdc power source. If power is verified at the COLU, then the COLU must be replaced, because it has a blown fuse.	NA
BKUPMEMP	A write to Serial EEPROM failed.	MN

## Channel Options Screen

Allows the provisioning of the EBS signaling transmit level at the RT. Possible selections are Low or High. The default is Low transmit level.

- 1 Select *CONFIG* from the menu and press **ENTER** to view the submenu.
- 2 Scroll to the *Channel Options* line and press **ENTER** to view the screen.

The screenshot shows a terminal window with the following content:

```
PG-Plus EBS CO Line Unit #1
MAIN PERFORMANCE ALARMS CONFIG TEST INFO
Channel Options

Channel 1 RLU Transmit Level: LOW (Low, High)
Channel 2 RLU Transmit Level: LOW (Low, High)
Channel 3 RLU Transmit Level: LOW (Low, High)
Channel 4 RLU Transmit Level: LOW (Low, High)

ACCEPT CHANNEL OPTION CHANGES

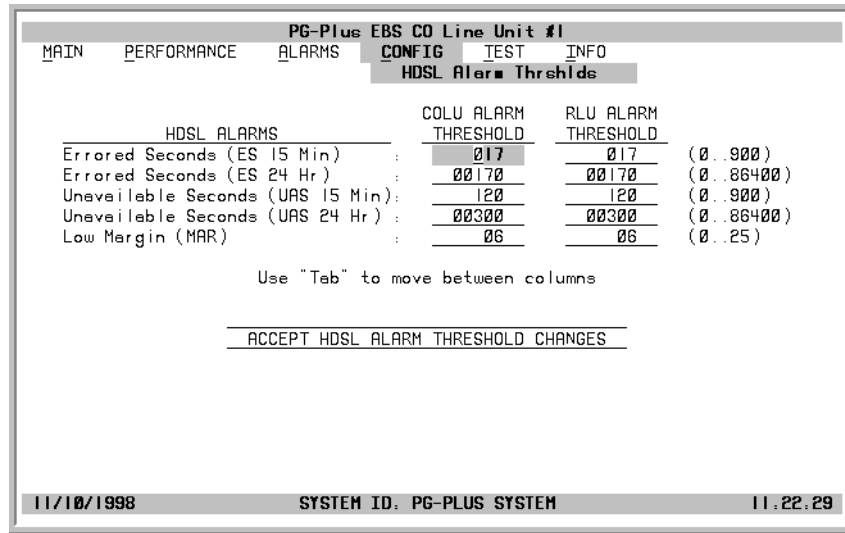
11/10/1998 SYSTEM ID: PG-PLUS SYSTEM 11:21:55
```

- 3 Highlight the Channel 1 RLU Transmit Level line, press **SPACEBAR** to toggle to the desired value. Move to the next option. Continue until you have made all the desired changes.
- 4 Move to the Accept Channel Option Changes button, and press **ENTER** to accept the changes.
- 5 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## HDSL Alarm Thresholds Screen

At this screen you can provision the threshold crossing values for the 24-hour ES count and the low margin dB. [Table 8](#) lists the fields of the HDSL Alarm Thresholds and the default factory values.

- 1 Select *CONFIG* from the menu bar and press **ENTER** to view the submenu.
- 2 Scroll to the *HDSL Alarm Thrshlds* line and press **ENTER** to view the screen.



- 3 Highlight the desired field, press **SPACEBAR** to toggle to the correct value for that field, then move to the next option. Continue until you have made all desired changes.
- 4 Move to the Accept System Option Changes button and press **ENTER** to accept the changes.
- 5 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

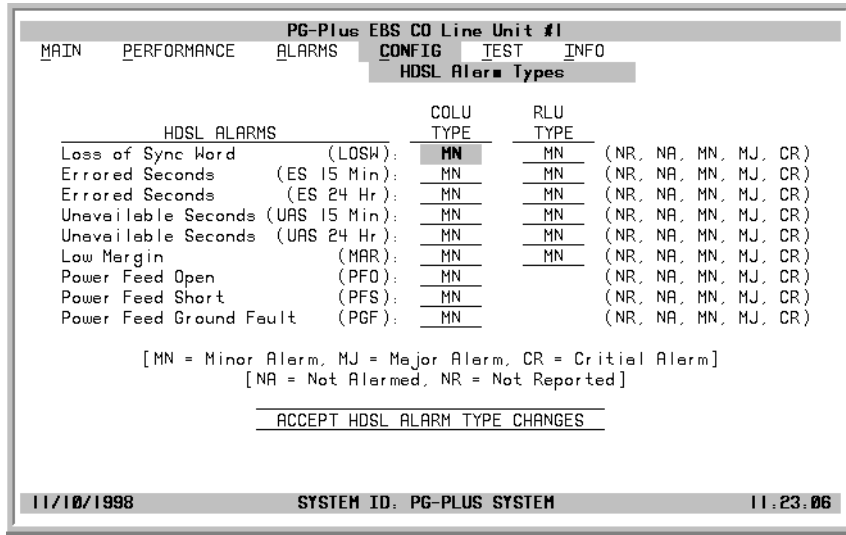
**Table 8.** HDSL Alarm Threshold Fields

Alarms	Description	Defaults
ES-15	Alarm is set active if the current 15-minute HDSL ES count reaches or exceeds this threshold.	17
ES -24	Alarm is set active if ES counts become equal to or greater than this threshold.	170
UAS-15	Alarm is set active if the current count reaches or exceeds this threshold.	120
UAS-24	Alarm is set active if the current counts become equal to or greater than this threshold.	300
MAR	Alarm is set active if margin drops equal to or less than this threshold.	6

## HDSL Alarm Types Screen

Allows the provisioning of the alarm types for all HDSL Alarms. All HDSL Alarms Types can be set to values shown in Table 6. The default factory settings are shown in Table 9.

- 1 Select *CONFIG* from the menu and press **ENTER** to view the submenu.
- 2 Scroll to the *HDSL Alarm Types* option and press **ENTER** to view the screen.



You can view the results of these settings from the “HDSL History Screen” on page 22.

- 3 At the LOSW field in the COLU Type column, press **TAB** to toggle to the desired value. Move to the RLU Type column to make any desired changes. Continue until you have made all the desired changes.
- 4 Move to the Accept HDSL Alarm Type Changes button, and press **ENTER** to accept the changes.
- 5 Press **ESC** to move up a menu level, or **CTRL+R** to return to the PAU/PMU Main menu.

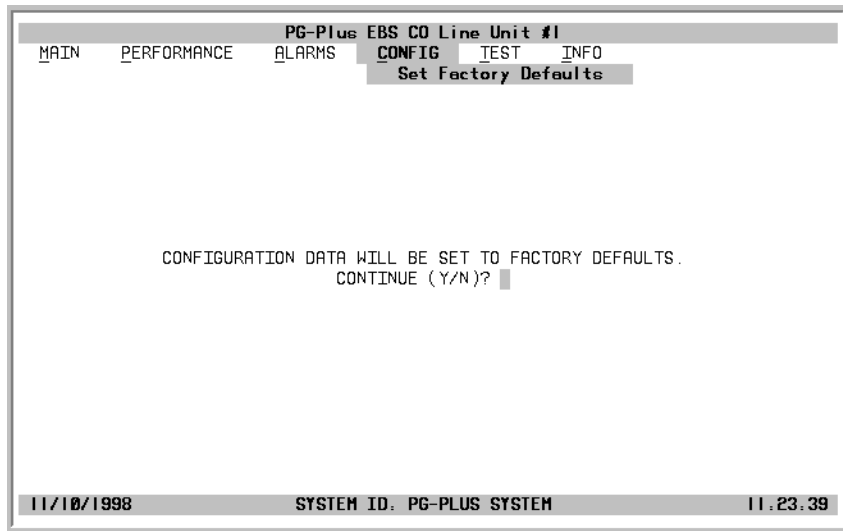
**Table 9. Alarm Types Defaults**

Alarm	Description	Default
LOSW	COLU cannot receive data over the given HDSL loop. COLU and RT cannot synchronize and are out of service.	MN
ES-15	Number exceeded the threshold to give advance warning that HDSL performance is deteriorating.	MN
ES-24	Number exceeded the threshold to give advance warning that HDSL performance is deteriorating.	MN
UAS-15	Number exceeded the threshold to give advance warning that HDSL performance is deteriorating.	MN
UAS-24	Number exceeded the threshold to give advance warning that HDSL performance is deteriorating.	MN
MAR	HDSL noise margin of the loop has fallen below the threshold. HDSL margin reaches or drops below the current threshold value.	MN
PFO	COLU cannot power the RT due to an open circuit. Undercurrent condition detected by the RT exists for the HDSL pair (<10 mA). A possible cause is that there is no RT at the other end of the circuit. No user intervention is required.	MN
PFS	COLU cannot power the RT due to a short circuit. An excessive current condition as detected by the COLU exists for HDSL pair (>150 mA). Indicates an overcurrent condition due to wire shorting or an RT failure. COLU turns off power feeding to HDSL loop in response to a PFO or PFS condition. No user intervention is required.	MN
PGF	COLU cannot power the RT due to a ground fault.	MN

## Set Factory Defaults Screen

Sets all configuration data back to factory default values.

- 1 Select *CONFIG* from the menu and press **ENTER** to view the submenu.
- 2 Scroll to *Set Factory Defaults* line and press **ENTER** to display the defaults option.

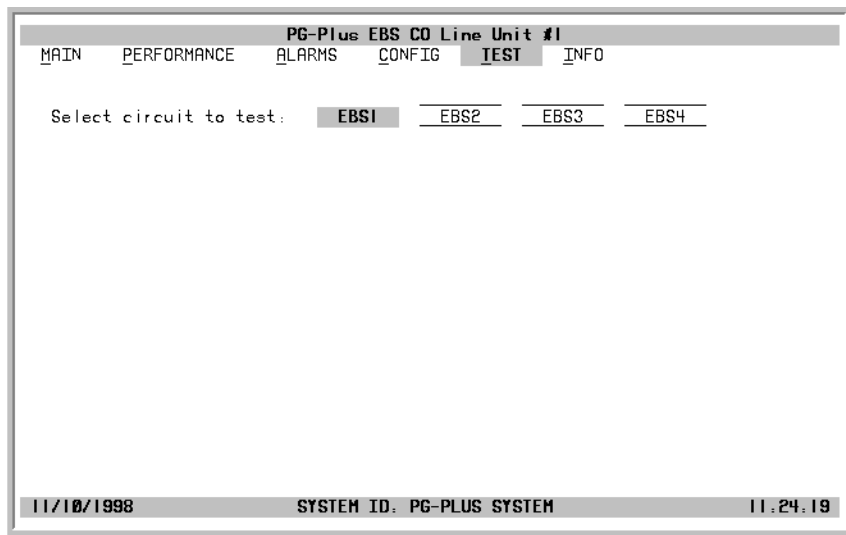


- 3 Type **Y** at the Continue? prompt to reset the system to the factory default values, or **N** to maintain the current configuration defaults.
- 4 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## TEST SUBMENU

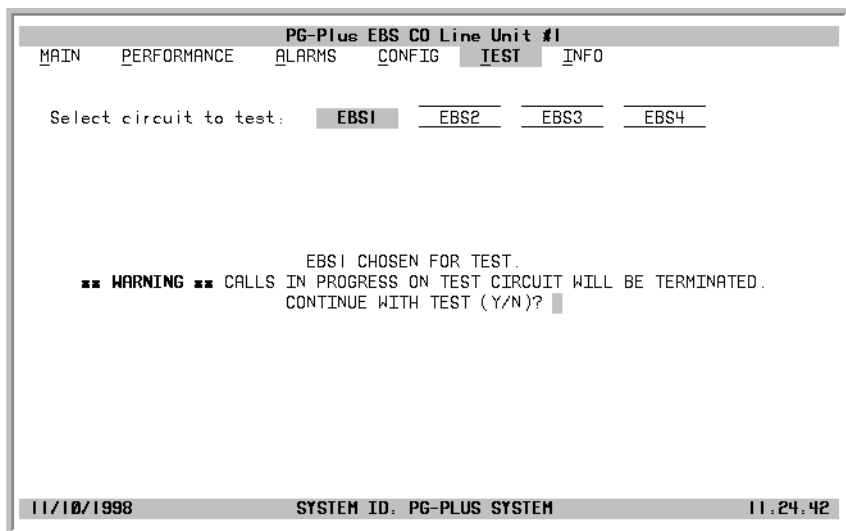
Testing of a subscriber drop is supported in two ways. A test can be initiated by applying a test voltage between the Tip and Ring at the COLU through an mlt test set or by selecting it from the menu item through the VT-100 terminal connected to the PAU or PMU RS-232 port. The relays in the RT provide a path for performing an SDT.

- 1 Select *TEST* from the menu and press **ENTER** to view the test options.
- 2 Use the **TAB** key to move to the desired circuit to test and press **ENTER**.



Confirmation and warning messages display when a channel is selected for the test.

- 3 To continue with the test, type **Y**, or type **N** to halt the test.



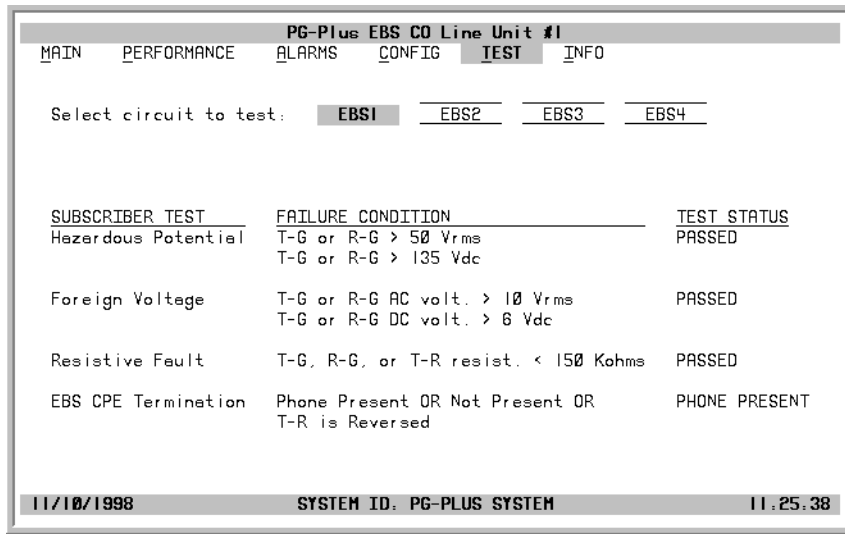
A *Test In Progress* message displays on the screen throughout the test.



**Performing a SDT on one of the EBS channel interrupts service on the line under test. The remaining lines on the PG-Plus system remains in service.**



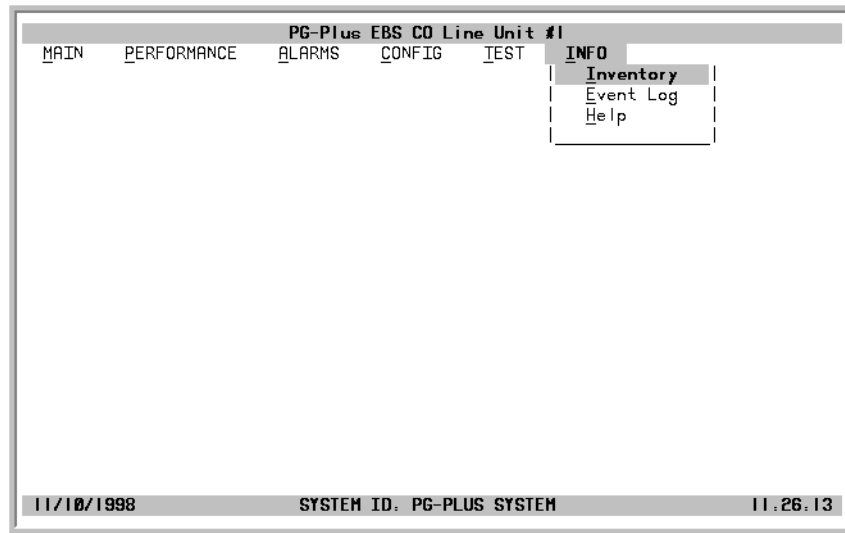
When the tests are complete, the Drop Tests Results screen displays. The results contains Subscriber Test, Failure Condition, and Test Status. Tests are performed in the order of display. If a test fails, the remaining tests are not performed (as per TR-909). It takes approximately 7 to 8 seconds for all tests to complete.



- 4 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## INFORMATION SUBMENU

- 1 Select *INFO* from the menu and press **ENTER** to view the submenu.



- 2 Select either *Inventory*, *Event Log*, or *Help* to view the associated screen.
- 3 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

### Inventory Screen

Displays all the critical information about the COLU and RT. Press **ESC** to move up a menu level, or **CTRL+R** to return to the PAU/PMU Main menu.

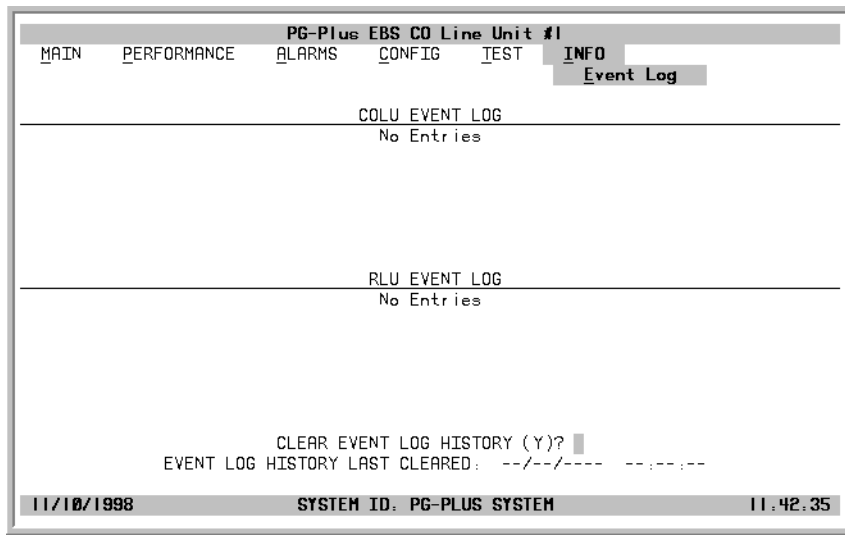
PG-Plus EBS CO Line Unit #1					
MAIN	PERFORMANCE	ALARMS	CONFIG	TEST	INFO
Inventory					
			COLU	RLU	
Model Number	:	PLL-733		PRL-783	
List Number	:	01		1B	
CLEI	:	S9L IAF0AAA		S9R IAAAAA	
Serial Number	:	012598296537		013480128495	
H/W Part Number	:	150-1633-01		150-1683-21	
H/W Revision	:	E39		E35	
FPGA Type	:	FPGA-20		FPGA-15	
FPGA Version	:	3		2	
EBSIC Type	:	FPGA-18		FPGA-18	
EBSIC Version	:	5		5	
Boot S/W Program Type	:	COLU UDLC EBS BOOT		RLU UDLC EBS BOOT	
Boot S/W Version	:	R1.0		R1.0	
App S/W Program Type	:	COLU UDLC EBS		RLU UDLC EBS	
App S/W Version	:	R1.0		R1.0	

11/10/1998      SYSTEM ID: PG-PLUS SYSTEM      11:42:04

## Event Log Screen

The Event Log screen provides information events that occurred but that are not Alarmed events. The two Events logged are as follows:

- **MEMVER** A provisioning database conversion occurred when a software download occurred. MEMVER is informational only. Event is cleared if you reseal the COLU, however it is not required. No customer action is required.
- **MEMCHK** The provisioning factory defaults were restored due to a corrupted database. MEMCHK is informational only. To clear the MEMCHK alarm, at the CONFIG submenu option *Set Factory Defaults*, type Y at the Accept the Set Factory Defaults prompt. No customer action is required.



- 1 Type **Y** at the Clear Event Log History? prompt to clear the information. The date and time the Event Log History was last cleared displays.
- 2 Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

## Help Screen

Provides information on using the PAU or the PMU screens and menus. The Help screen also lists the ADC Customer Support and Bulletin Board telephone numbers.

Press **ESC** to move up a menu level, or **CTRL + R** to return to the PAU/PMU Main menu.

```

PG-Plus EBS CO Line Unit #1
MAIN PERFORMANCE ALARMS CONFIG TEST INFO
Help

Menu Operating Instructions:

Keypress          Effect on Menu          Effect on Screen
-----
ENTER             Moves to submenu or screen  Confirms changes
LEFT ARROW/CTRL-F Moves LEFT across main menu  Moves the cursor LEFT
RIGHT ARROW/CTRL-G Moves RIGHT across main menu Moves the cursor RIGHT
UP ARROW/CTRL-T   Moves UP a submenu         Moves the cursor UP
DOWN ARROW/CTRL-V Moves DOWN a submenu        Moves the cursor DOWN
SPACE             No effect                  Cycles through choices
ESCAPE           Moves up a menu level       Returns to menus
CTRL-R           Returns to Main Menu         Returns to Main Menu

11/10/1998          SYSTEM ID: PG-PLUS SYSTEM          11:43:11

```

# FAULT ISOLATION

The following sections detail the fault isolation procedures. For sections that indicate a condition such as “distance limitation exceeded”, refer to the section “Specifications” on page 2 for the correct values.

## COLU FAULT INDICATORS

At the CO, you can use the VT-100 interface to initiate a SDT to determine the cause of any of the following problems. The following sections provide procedures for isolating faults indicated by the COLU LEDs.

- No LEDs On**
- processor in the COLU stopped
    - 1 Remove and re-insert the COLU.
    - 2 At the VT-100 Terminal, go to the COLU Main Screen to view the Performance report to verify that no alarms exist. If you cannot view the COLU Main Screen, a communication error exists indicating a faulty COLU.
    - 3 If the LEDs do not illuminate, replace the COLU.
- Fault LED On**
- indicates an existing alarm condition on the COLU
    - 1 At the VT-100 Terminal, go to the COLU Main Screen to view the Performance report to determine the cause of the alarm. Correct the condition, if possible. If you cannot view the COLU Main Screen, a communication error exists.
    - 2 Remove and re-insert the COLU.
    - 3 If the communication error still exists, replace the COLU.
- Margin LED On**
- distance limitation exceeded
  - fault in HDSL line.
  - faulty COLU
    - 1 At the VT-100 Terminal, go to the COLU Main Screen to view the Performance report to verify that no alarms exist.
    - 2 Initial installation, check engineering records for distance between COTS and RT.
    - 3 If existing installation, measure loss of HDSL line to ensure maximum attenuation value has not been exceeded.
    - 4 Replace COLU and/or the RT.
- MARGIN LED Flashing**
- distance limitation exceeded
  - fault in HDSL line
  - faulty RT
    - 1 Initial installation, check engineering records for distance between COTS and RT.
    - 2 If existing installation, measure loss of HDSL line to ensure maximum attenuation value has not been exceeded.
    - 3 Replace COLU and/or the RT.

- SYNC LED Off**
  - HDSL line has lost synchronization
  - distance limitation may have been exceeded
  - COLU is faulty
    - 1 Initial installation, check engineering records for distance between COTS and RT.
    - 2 If existing installation, measure loss of HDSL line to ensure that the maximum attenuation value has not been exceeded.
    - 3 Replace COLU and/or the RT.
  
- PWR LED Off**
  - no input power
  - on-board fuse is blown on COLU
    - 1 Ground fault condition exists.
    - 2 Check input power at COTS backplane with COLU removed.
    - 3 If power is present at COTS backplane, replace the COLU.
  
- PWR LED Flashing**
  - HDSL line open
  - an overload exists
    - 1 Check line continuity and resistance.
    - 2 COLU power supply or RT may be faulty.

## RT STATUS INDICATORS

You can view the LED status through the window of the RT metal enclosure. These LEDs indicate different system states. The top portion of the label is a guide to the meaning of the Status LEDs (see Figure 3).

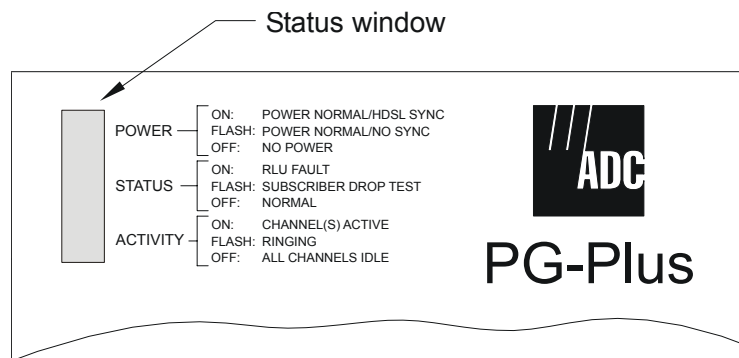


Figure 3. Status Window

If the PWR LED is Off, perform the following operations:

- 1 Verify that the RT and its corresponding COLU are installed on the same pair.
- 2 Verify that the corresponding COLU is installed and turned up, and the HDSL Periodical Power Up option is Enabled.
- 3 Verify that the signal loss on the pair is no more than 41 dB at 130 kHz.
- 4 Check for a short placed on the HDSL Tip and Ring conductors, and remove if necessary.
- 5 Check for HDSL cable fault, and replace if necessary.
- 6 Replace the RT.
- 7 Replace the corresponding COLU.

# SUBSCRIBER REPORTED FAULTS

At the CO, you can use the VT-100 terminal to log onto the COLU and to initiate a SDT to determine the cause of any of the following problems.

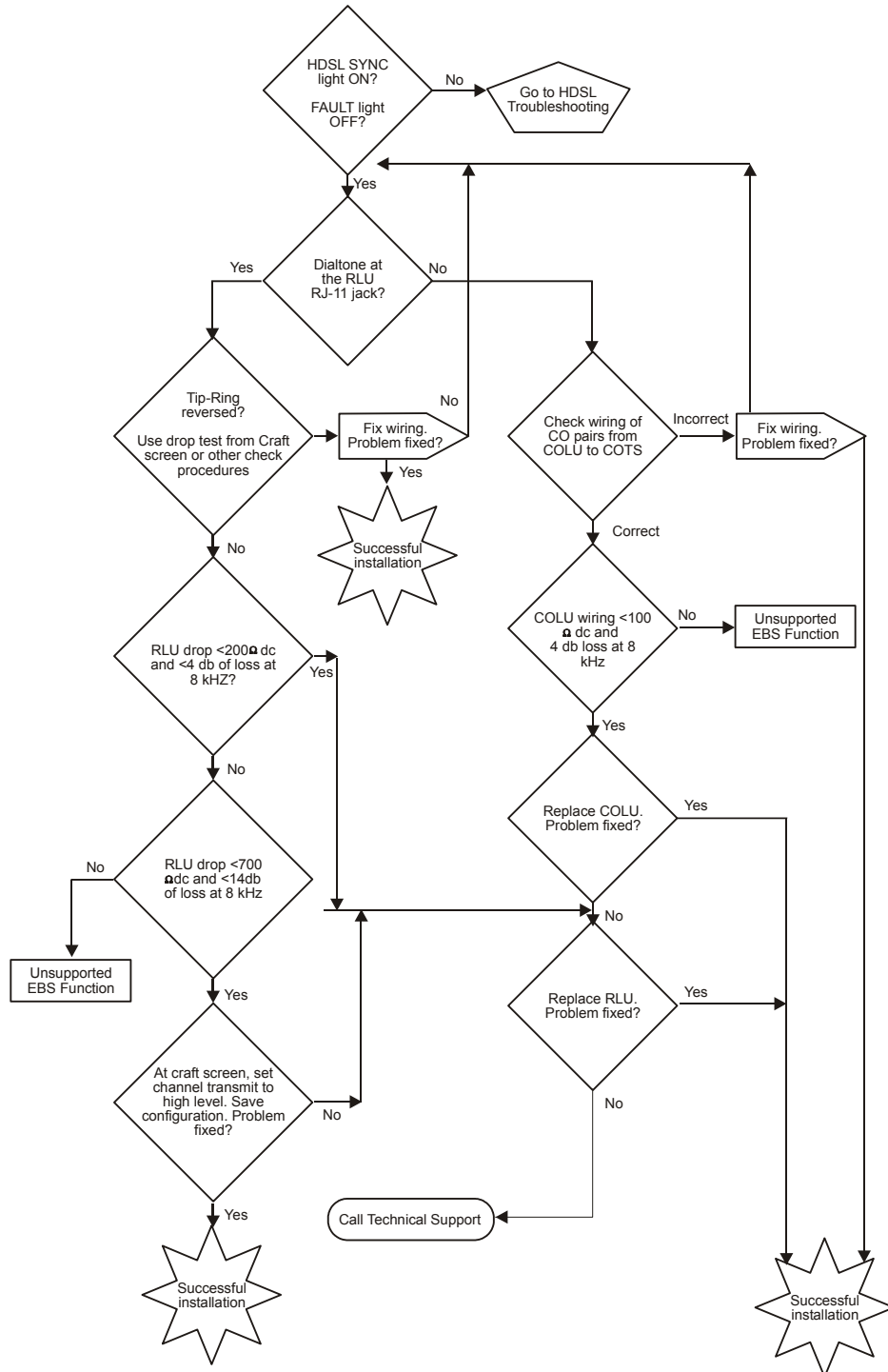


Figure 4. Troubleshooting Flowchart

# 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](mailto:wsd_support@adc.com)

Knowledge Base: [http://adc.com/Knowledge\\_Base/index.jsp](http://adc.com/Knowledge_Base/index.jsp)

Web: [www.adc.com](http://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](mailto: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.
  - The shipping address to which ADC should return the repaired equipment.
  - The original purchase order number.
  - A 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.
  - The 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 another 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 user 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.

# ACRONYMS

<b>2B1Q</b>	2 Binary, 1 Quaternary
<b>4TEL</b>	Type of mechanized subscriber loop drop test.
<b>AWG</b>	American Wire Gauge
<b>BKUPMEMP</b>	Backup Memory Failure
<b>BER</b>	Bit Error Ratio
<b>CEV</b>	Controlled Environmental Vault
<b>CO</b>	Telco Central Office
<b>COLU</b>	Central Office Line Unit
<b>COTS</b>	Central Office Terminal Shelf
<b>CPE</b>	Customer Premises Equipment
<b>CR</b>	Critical
<b>DS0</b>	Single channel with 64 kbps of data
<b>EBS</b>	Electronic Business Service
<b>ES</b>	Errored Seconds
<b>HDSL</b>	High-bit-rate Digital Subscriber Line
<b>LED</b>	Light Emitting Diode
<b>LOSW</b>	HDSL Loss of SYNC Word
<b>mA</b>	milli-Amps
<b>mV<sub>pp</sub></b>	milli-Volts peak-to-peak
<b>MAR</b>	HDSL Line Margin
<b>MISPWRA</b>	Power A Missing
<b>MISPWRB</b>	Power B Missing
<b>MJ</b>	Major
<b>mlt</b>	mechanized loop testing
<b>MN</b>	Minor
<b>NA</b>	Not Alarmed
<b>NORLUSW</b>	NO RT Software
<b>NR</b>	Not Reported
<b>PAU</b>	PG-Plus Alarm Unit
<b>PFO</b>	Power Feed Open
<b>PFS</b>	Power Feed Short
<b>PGF</b>	Power Feed Ground Fault
<b>PMU</b>	PG-Plus Management Unit
<b>POTS</b>	Plain Old Telephone Service
<b>RLU</b>	Remote Line Unit
<b>RMA</b>	Return Materials Authorization
<b>RT</b>	Remote Terminal
<b>SDT</b>	Subscriber Drop Test
<b>SES</b>	Severely Errored Seconds
<b>SES</b>	Severely Errored Seconds
<b>SYNC</b>	Synchronization
<b>UAS</b>	Unavailable Seconds Counts

---

**World Headquarters:**

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

**For Technical Assistance:**

800.366.3891



1251791

---