HiGain ETSI

Addendum

UTU-801 List 3 and UTU-804 List 3 ISDN Primary Rate Access (PRA) 2-Pair Application Mode

Overview

This document describes the system configuration and signaling specific to the ISDN PRA 2-Pair Application Mode in the PairGain HiGain ETSI Universal Termination Units, model UTU-801 List 3 and model UTU-804 List 3. These units are designed expressly for interconnection with the Lucent Technologies AnyMedia® Access System, which serves as the LTU.

Table 1 lists the part numbers and application interfaces for the List 3 UTUs covered in this addendum.

Table 1. *Part Numbers and Application Interfaces*

Model	Part Number	Interface
UTU-801	150-1420-31L	G.703
UTU-804	150-1420-34L	G.703/Nx64k

With the exception of their ISDN 2-pair application mode, the List 3 UTUs are functionally identical to other UTUs with the same interface (G.703 and/or Nx64k).

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THE POWER BEHIND DSL ACCESS

Section Number: 700-801-203-01
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Supporting Documentation

Information that supports the installation and configuration of the List 3 Utes is provided in the following documents:

- HDSL Line and Desktop Units Quick Installation Guide, Section 700-801-900-0x (included with List 3 UTUs)
- ERE-811 Single-Slot Remote Enclosure Technical Practice, Section 700-811-102-0x (included with enclosure)

The UTU-801 List 3 and UTU-804 List 3 are to be installed only in the ERE-811 List 3 Single-Slot Remote Enclosure. Installing these units in any other enclosure, shelf, or chassis will cause erroneous operation.

Die UTU-801 List 3 und die UTU-804 List 3 sollten nur in der ERE-811 List 3 Single-Slot Remote Enclosure verendet werden. Anderweitige Verwendung hat fehlerhalte Funktion zur Folge.

Detailed information about PairGain HiGain ETSI HDSL systems is provided in the following document:

- HDSL Line and Desktop Units Technical Practice, Section 700-804-100-0x (can be viewed or printed from the PairGain Web site)

SYSTEM CONFIGURATION

1 Install and power up the UTU as instructed in the supporting documentation.

2 Connect a maintenance terminal to the UTU craft port.

3 Log on to the UTU Console screen (Figure 1).

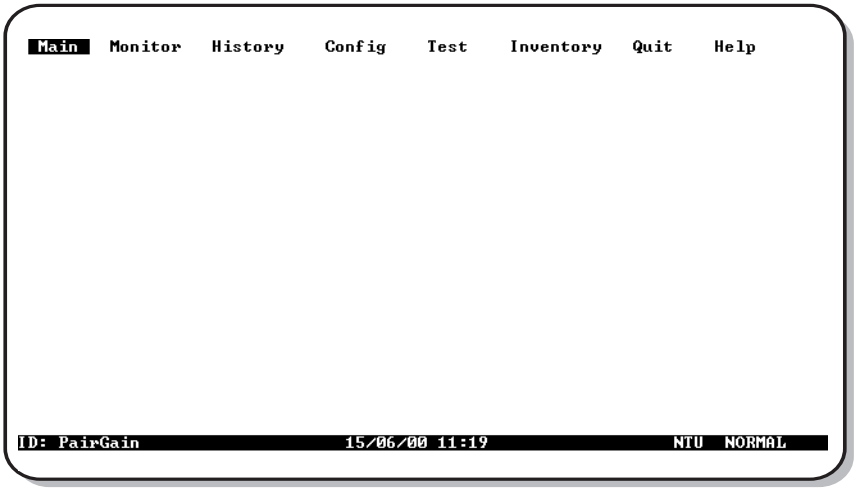

Figure 1. *Console Screen*

4 Press **C** to access the UTU Config menu (Figure 2).

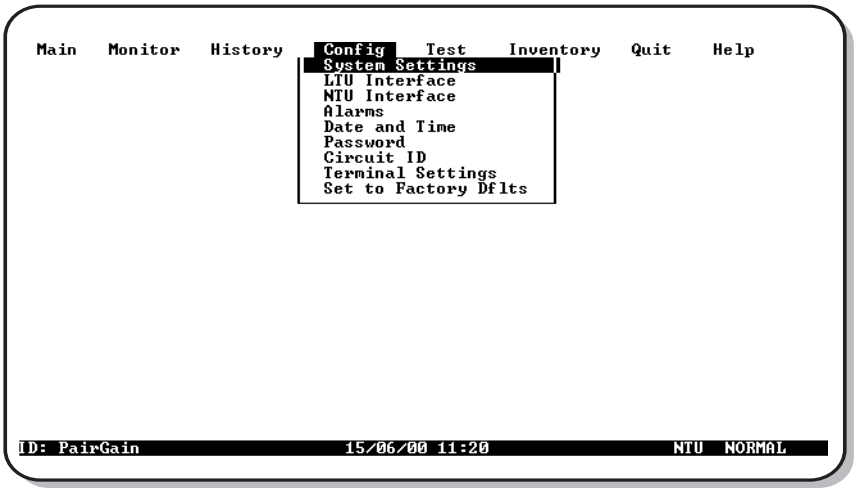

Figure 2. *Config Menu*

5 Set the following Config menu options as instructed in the supporting documentation:

- Terminal Settings
- Date and Time
- Password
- Circuit ID
- Alarms

6 Press S to access the Config System Settings menu (Figure 3).

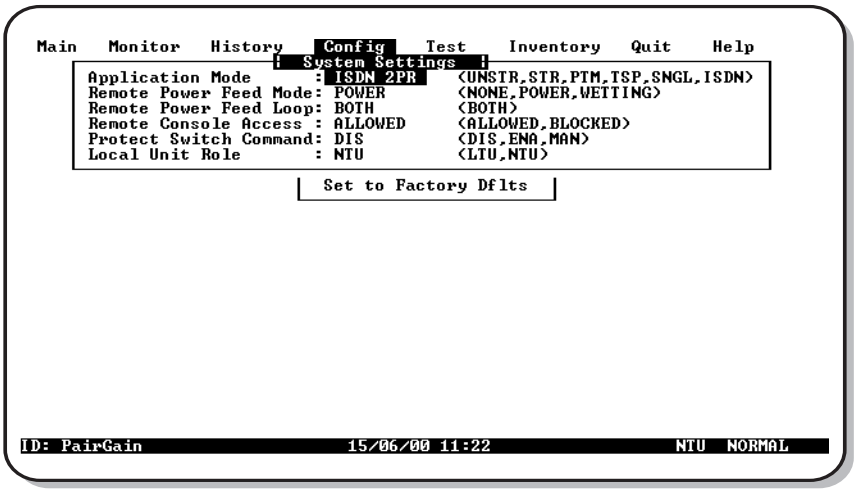

Figure 3. *Config System Settings Menu*

7 Press the ↑ and ↓ keys to highlight the current Application Mode setting.

8 Press the SPACEBAR to select the **ISDN 2PR** application mode.

9 Press ENTER to apply the selection.

10 Configure the remaining System Settings options as required.

The Local Unit Role must be set for NTU.

11 Press ESC to return to the UTU Config menu.

12 Press N to access the Config NTU Interface Menu (Figure 4).

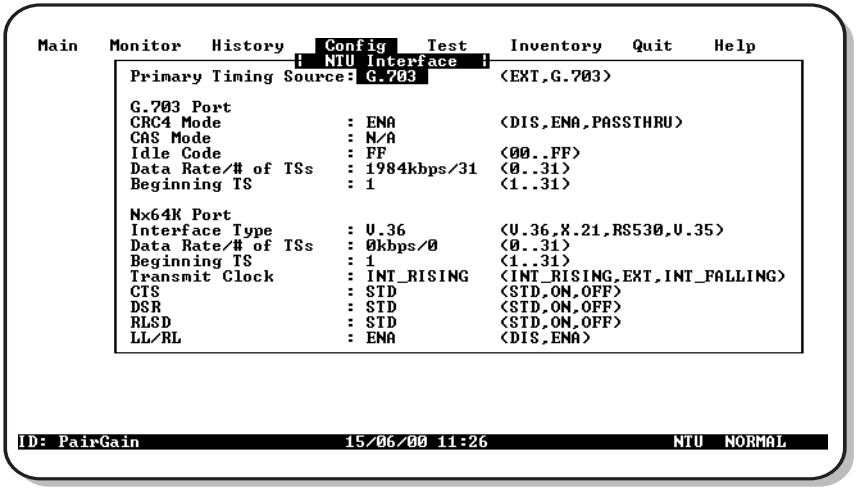

Figure 4. *Config NTU Interface Menu (menu for UTU-804 shown)*

13 Verify the following settings for the G.703 port:

- Primary Timing Source: G.703
- CRC4 Mode: ENA
- Idle Code: FF
- Data Rate/# of TSs: 1984kbps/31
- Beginning TS: 1

14 Press ESC (two times) and M to access the Main status screen (Figure 5).

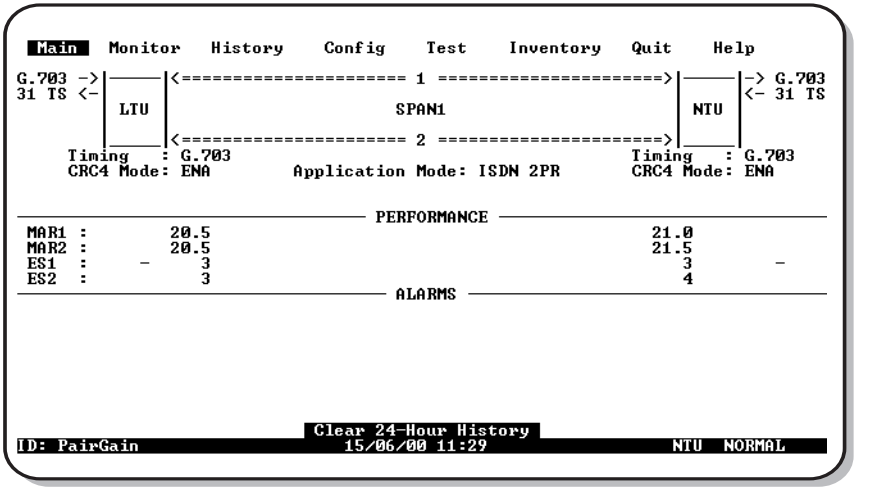

Figure 5. *Main Status Screen*

15 Verify that system performance is within tolerance and the loop is free of alarms.

TESTING

Press T to access the Test menu (Figure 6). Use this menu and its loopbacks graphic display to run loopback and BER tests.

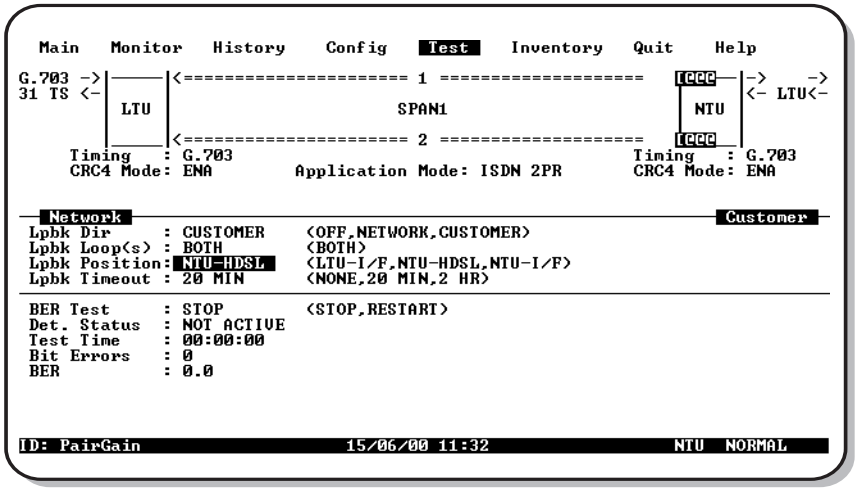

Figure 6. *Test Menu and Loopbacks Graphic Display*

Loopbacks remain active until the loopback timeout elapses or the configuration changes.

In the Test menu graphic display, the loopback location is indicated by the "@@]" characters (shown in reverse video). The loopback status is indicated as follows:

- **Blinking @@] characters = active loopback**
- **Steady @@] characters = disabled loopback**

BASIC NTU FUNCTIONS

Table 2 describes the basic functions of the List 3 UTUs when operating as NTUs in the IDSN PRA 2-pair application mode.

Table 2. *Basic NTU Functions - IDSN PRA 2-Pair Application Mode*

Function	Description
F1	The NTU regenerates CRC-4 towards the network based on the received 2 Mbps bitstream from the Terminal Equipment (TE).
F2	The NTU generates Frame Alignment Signal (FAS) towards the network.
F3	The NTU indicates CRC-4 errors in the network 2 Mbps bitstream (over HDSL) by setting the E-bit back to the network.
F4	The NTU regenerates CRC-4 towards the TE based on the received 2 Mbps bit stream received from HDSL.
F5	The NTU generates FAS towards the TE.
F6	The NTU indicates CRC-4 errors from the TE G.703 interface by setting the E-bit back to the TE.
F7	The NTU passes Sa4, Sa7, and Sa8 bits transparently in both directions unless a LOS/LOF condition exists at the G.703 input of the NTU. In this case, Sa4, Sa7, and Sa8 bits shall be set to '1' towards the network.
F8	The NTU passes Sa5 and Sa6 bits transparently to the TE.
F9	The NTU passes the A-bit transparently toward the network, except for FE-G.
F10	The NTU passes the A-bit transparently to the TE, if it is set to '1.' The NTU shall set the A-bit to '1' towards the TE during a LOS/LOF/AIS condition at the NTU G.703 input.

ISDN PRA SIGNALING

European Telecommunications Standard ETS 300 233 defines the Function Elements (FEs) required for operation and maintenance of the access digital section of an ISDN PRA between the user-network interface at the T reference point and the local exchange (LE) at the V3 reference point.

FEs are the signals maintained, generated, and exchanged at the V3 reference point between the access digital section (DS) and the exchange termination (ET). Table 3 describes these FEs as implemented in the UTU-801 List 3 and UTU-804 List 3 ISDN 2-pair application mode.

Table 3. *ISDN PRA Functional Elements (FEs)*

Description	FE	DS ← →ET	A Bit	Sa5 Bit	Sa6 Bit	LTU Functionality	NTU Functionality
Normal operation of the PRA Digital Section (DS)	A	→	X	1	00xx	Transparent	A-bit transparent to Local Exchange (LE), generate Sa5, Sa6 to the LE
Normal operation of the Exchange Termination (ET)	B	←	X	0	0000	Transparent	Transparent
Unintentional loopback initiated at Line Termination (LT)	C1	→	X	0	Xxxx	Loopback E1 towards ET, generate Sa5 (implemented in OEM). Regenerate CRC. The entire E1 stream is passed transparently towards NTU.	Entire E1 stream is passed transparently towards Terminal Equipment (TE)
Unintentional loopback initiated at Network Termination 1 (NT1)	C2	→	X	0	xxxx	Transparent	Loopback E1 towards ET, generate Sa5. Regenerate CRC. Entire E1 stream is passed transparently towards TE.
LOS/LFA at TE (FC2) [(a)]	D	→	1	1	00xx	Transparent	A-bit transparent to LE, generate Sa5, Sa6 to LE
LOS at V3 reference point of LT only (FC3) [(a)]	E1	→	1	1	1110	Generate Auxiliary Pattern (AUXP) towards NTU (implemented in AnyMedia)	A-bit transparent to LE, generate Sa5, Sa6 to LE, generate AIS towards TE
LOS at line side of NT1 due to the presence of an out-of-sync state for both loops of the HDSL framer (FC3)	E2	→	1	1	1110	FE-L [(b)] occurs and supersedes FE-E2.	Generate AIS towards TE when FE-L occurs

(Continued)

Table 3. ISDN PRA Functional Elements (FEs) (Cont.)

Description	FE	DS ← →ET	A Bit	Sa5 Bit	Sa6 Bit	LTU Functionality	NTU Functionality
LFA at line side of NT1 and both loops of the HDSL framer are in-sync (FC3)	E3	→	1	1	1110	Transparent	A-bit transparent to LE, generate Sa5, Sa6 to the LE, generate AIS towards TE
LOS at line side of NT1 due to the presence of an out-of-sync state for only one loop of the HDSL framer (FC3)	E4	→	1	1	1110	OEM is transparent and AnyMedia generates AUXP in both directions	Generate AIS towards TE
LOS/LFA at V3 (V3') reference point of ET (FCL)	F	←	1	0	0000	Transparent	Transparent
LOS/LFA at T reference point of NT1 (FC4) [(a)]	G	→	0	1	1100	Transparent	Generate A-Bit, Sa5, Sa6 to LE
FC3 (FE-E1) [(b)] and FC4 simultaneously	H1	→	0	1	1110	Generate AUXP towards NTU (implemented in AnyMedia)	Generate A-Bit, Sa5, Sa6 to LE, generate AIS towards TE
FC3 (FE-E2) and FC4 simultaneously	H2	→	0	1	1110	FE-L occurs and supersedes FE-H2	FE-L occurs and supersedes FE-H2
FC3 (FE-E3) and FC4 simultaneously	H3	→	0	1	1110	Transparent	Generate A-Bit, Sa5, Sa6 to the LE, generate AIS towards TE
FC3 (FE-E4) and FC4 simultaneously	H4	→	0	1	1110	OEM is transparent and AnyMedia generates AUXP in both directions	Generate AIS towards TE
Loss of power at NT1	I	‡	0	1	1000	Transparent	A-bit transparent to LE, generate Sa5 and Sa6 toward LE

Table 3. *ISDN PRA Functional Elements (FEs) (Cont.)*

Description	FE	DS ← →ET	A Bit	Sa5 Bit	Sa6 Bit	LTU Functionality	NTU Functionality
Loss of power at NT1 and LOS/LFA at TE simultaneously	K	→	1	1	1000	Transparent	A-bit transparent to LE, generate Sa5 and Sa6 toward LE
LOS at line side of LT due to an out-of-sync state for both loops of the HDSL framer (FC1) [(a)]	L	→			AUXP	Generate AUXP to LE (implemented in Anymedia)	Generate AIS towards TE
Reception of AIS at V3 reference point of LT (Reaction to FCDL or FCET)	M	→	1	1	1111	Transparent	Generate AIS towards TE, A-bit transparent to LE, generate Sa5, Sa6 to LE
Reception of AIS at V3 reference point of LT and FC4 simultaneously	N	→	0	1	1111	Transparent	Generate AIS towards TE, generate A-Bit, Sa5, Sa6 to LE
Defect FCET in the ET or FCDLd in the digital link between V3'and V3.	O	←			AIS	Transparent	Generate AIS towards TE.
Defect FCDLu between the reference points V3 and V3'	P	→			AIS	Transparent	A-bit transparent to LE, generate Sa5, Sa6 to LE
Loopback 1 command	Q	←	1	0	1111	Transparent (OEM module recognizes loopback command and passes entire payload transparently towards NTU)	Transparent (OEM module passes entire payload transparently towards NTU)

(Continued)

Table 3. *ISDN PRA Functional Elements (FEs) (Cont.)*

Description	FE	DS ← →ET	A Bit	Sa5 Bit	Sa6 Bit	LTU Functionality	NTU Functionality
Loopback 2 command	R	←	1	0	1010	Transparent (OEM module passes entire payload transparently towards NTU)	Transparent (OEM module passes entire payload transparently towards NTU)
Loopback acknowledge for loopback 1 command	S1	→	X	0	xxxx	Loopback E1 towards ET (including Sa5)	Transparent
Loopback acknowledge for loopback 2 command	S2	→	X	0	xxxx	Transparent	Loopback E1 towards ET (including Sa5)
Loopback release command	T	←	X	0	0000	Release Loopback 1	Release Loopback 2
CRC error report from NT1 line side	U	→	X	1	xxxx	Transparent	Set E-Bit towards LE
CRC error information from ET	V	←	X	0	0000	Transparent	E-bit is not monitored and is overwritten at NT1
CRC error reported from TE	W	→	X	1	0001	Transparent	Monitor E-bit from TE, A-bit transparent to LE, generate Sa5, Sa6 to LE
CRC error detected at T reference Point of NT1	X	→	X	1	0010	Transparent	A-bit transparent to LE, generate Sa5, Sa6 to LE
Simultaneous occurrence of FE-W [b] and FE-X	Y	→	X	1	0011	Transparent	A-bit transparent to LE, generate Sa5, Sa6 to LE

(a) (FC*n)* through (FC*xxx*) = Failure conditions as defined in ETS 300 011 and ETS 300 233.
(b) FE-A through FE-X = Functional Elements A through X.