Atrie
WireSpan 4000 IDSL
MODEM
User's Manual

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Version 1.3

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1. Introduction

The WireSpan 4000 IDSL uses 2B1Q line coding to allow reliable and cost-effective full-duplex transmission at speed up to 128 Kbps and Voice port over one pair of existing copper subscriber lines. It provides data and voice services simultaneously. Adaptive equalization and echo cancellation ensures consistent performance, even over poor quality lines. It has a comprehensive V.54 loop test function allowing easy optimal speed calibration and troubleshooting without the need for a cable tester. The stand-Alone unit is easy to use and configure through a menu-driven LCD control panel. The Rack unit is easy to use and configure through DIP switch and push button. The WireSpan 4000 IDSL satisfies the requirements of a variety of high-speed data communication applications.

2. Features and Specification

◆ **WireSpan 4000 IDSL Stand-Alone Unit**
- Menu-driven 2 x 16 LCD control panel for easy configuration and diagnostics.
- Configuration and set-up verification of remote unit.
- Comprehensive error reporting with external alarm trigger.
- Built-in 511 pattern generation/detection and V.54 remote digital loopback.
- Data Rate:
  Synchronous : 4.8k, 9.6k, 19.2k, 38.4k, 48k, 56k, 64k, 72k, 112k, 128 kbps.
  Asynchronous : 4.8k, 9.6k, 19.2k, 38.4kbps
- Line Operation: Full duplex over 2-wire subscriber line up to 5.5km (18 kft @ 0.4mm cable), complying to ANSI T1.601, ITU-T G.961 specification.
- Transmission: Synchronous, 2B1Q line coding with adaptive echo-cancellation and equalization.
- Transmit Level: 13.7 dBm
- Line Impedance: 135 ohms balance
- Voice and data service simultaneously.
- Provide FXO interface at Central side and FXS interface at remote side.(Option)
- Voice interface meet ITU-T G.712 transmission requirements
- Wide choice of DTE port, V.24, V.35, G.703 and X.21
- Programmable flow control: CTS, RTS and Anti-Streaming delay time.

◆ **WireSpan 4000 IDSL Rack Unit**
- Data Rate:
  Synchronous:4.8k,9.6k,19.2k,38.4k,56k,64k,72k,112k,128kbps.
  Asynchronous:4.8kbps,9.6kbps,19.2kbps,38.4kbps.
- Line Operation:Full duplex over 2-wrie subscriber line up to 5.5km(26AWG cable)
- Support the V.110 rate adaption.
- Line Rate : 160 Kbps
- Base on ISDN U-interface.
- Fully Compliant with ANSI T1.601-1992 specification.
- Transmit Level : 13.7 dBm.
- Line Impedance : 135 Ohms.
- Line Interface:RJ-45/Teminal Block.
- Line interface circuitry protects against lightning and power surges.

- DTE Interface:V.35,RS-232D/V.28,G.703.
- Diagnostics Testing : LL, RL, DL, DTE Loopback, BERT build in 511.
- Input Voltage:AC90~260 Volts/47~63Hz,or -36 to –72 Vdc Single or Daul power(option).
- Power Consumption : 5W(Max.)/Per
- 10 LEDs Indicators : SYN,TST,TD,RD,CD,RTS,CTS,DTR,DSR,PWR.
- Rack Size :1. 16 port (16 pieces)per Rack with Power Module in 19'' Rack Shelf./482mm(L)×8.3''/210mm(W)×175mm(H)
- Operating : 1.Temperature:0 to 45ºC (Operating);
- 2.Relative Humidity : 0 to 80% non-condensing.
- Clock Source Select : Internal, External, Loop.

Management : Lacal Configuration, Remote Configuration., SNMP, Console(Option)

3. Installation

3.1 WireSpan 4000 IDSL wiring

Once you unpacking the WireSpan 4000 IDSL unit, the following accessories are included.

AC Power Cord	1 pcs(Stand-Alone Only)
Connection box	1 pcs(Stand-Alone Only)
RJ-11 Cable	1 pcs
Voice Module	1 pcs (option for Stand-Alone)

Follows the steps and figure3.1 to install the Stand-Alone unit. follows the steps and figure3.2 to install the Rack unit. The pin definition of the following each connector, Please refer to section 3 descriptions.

Step 1: Install DTE cable to the external equipment properly. WireSpan 4000 IDSL provides V.35 , V.24 , and G.703 data ports.

Step 2: Install RJ-11(Stand-Alone)/RJ-45(Rack-Unit) cable to the other end of WireSpan 4000 IDSL.

Step 3 (Only for Stand-Alone) :Install Voice Module (option) from rear panel and push to the seat properly. Please unscrew the voice module cover firstly. Make sure the FXO module is installed in the Central Site (local carrier company or switches), the FXS is in the remote site (to the telephone set or PBX).

Step 4: Make sure the power switch is turned OFF and install AC power cord (auto-range from AC 90V to 260V) with Stand-Alone or AC/DC power card(-36Vdc to –72Vdc) in Rack-Unit .
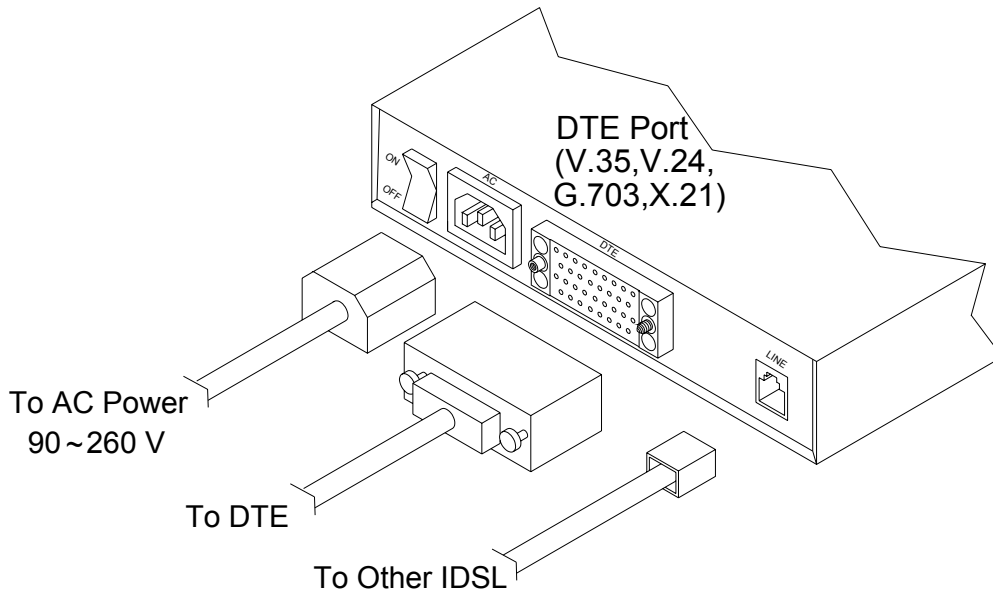
Step 5: Turn ON power switch and enjoy it.

DTE Port
(V.35,V.24,
G.703,X.21)

ON
OFF
AC
DTE
LINE

To AC Power
90~260 V

To DTE

To Other IDSL

Figure 3.1- Wiring WireSpan 4000(V.35) Stand-Alone Unit

CH15   CH14   CH13   CH12   CH11   CH10

CH-0
87654321   10 BASE T   ON

CH15   CH13   CH11

OFF

I   II   III
1LA   L1A   L1A
2LB   L1B   L1B
3PA   L2A   none
4PB   L2B   none
5TXA   G703TXA
6TXB   G703TXB
7RXA   G703RXA
8RXB   G703RXB

FG

DC-48V GND

CH15   CH14   CH13   CH12   CH11

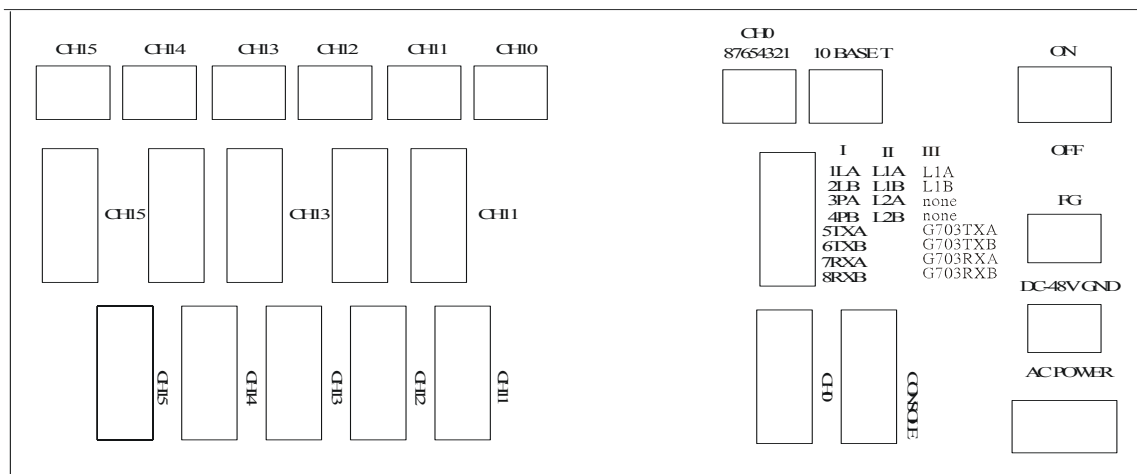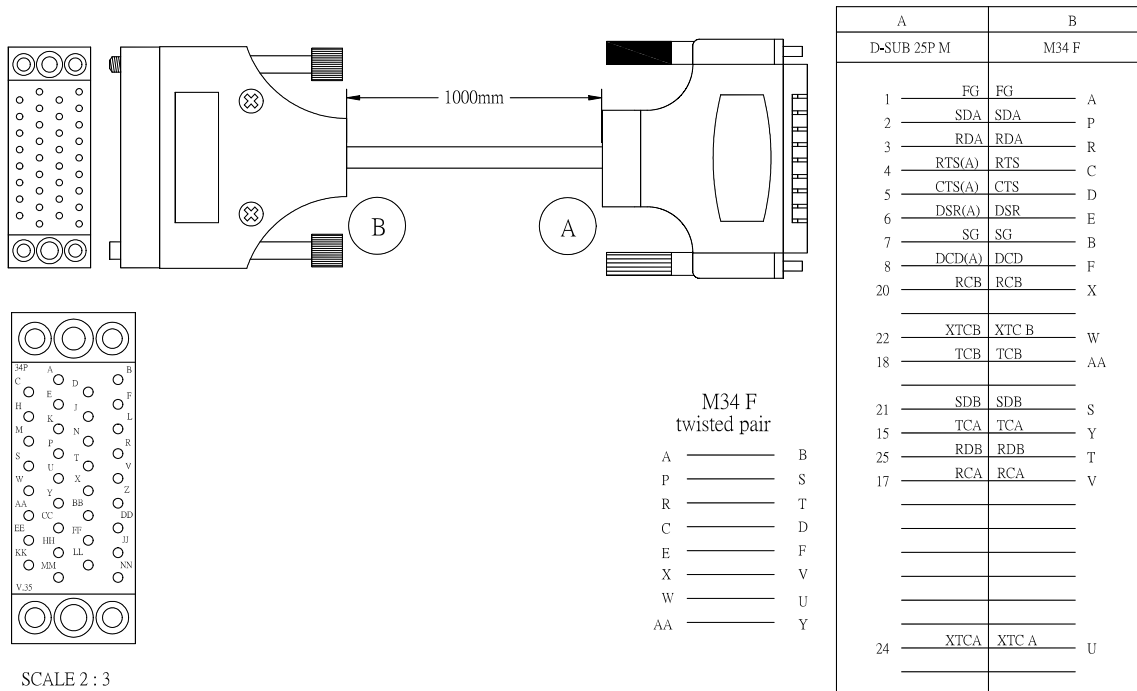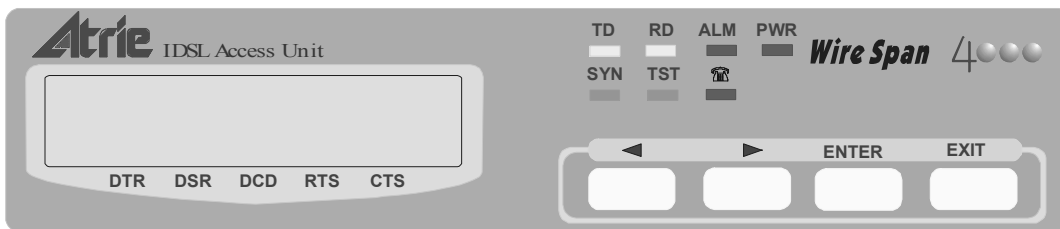CH-0   CONSOLE

AC POWER

Figrue 3.2 WireSpan 4000 Rack Back pane

CH 0~15   DB25 (Female) DTE Connecter.You can to use Standard DB25-DB25 or DB25-M34
                 Change-Cable(Only ATRIE defined) to connect V.24/V.35 Interface
FG/SG   F ground/Signal ground
DC-48V GND   - 48 Vdc input
AC POWER   90~260 Vac input
L1A/L1B(III)   Line interface to Others WireSpan 4000 (Non-polarity)
G703TxA/B   Only for WireSpan 4000 Rack-Unit is G.703 Interface Co-direction
                 unit .
                 "Attention" The RJ45/Terminal Block is to be linked together. It's
                 suggest to use 8P/2C RJ45 cable to connect other WireSpan 4000
                 When use G.703 interface to connect other DCE Device.
10 BASE T   SNMP Ethernet connecter
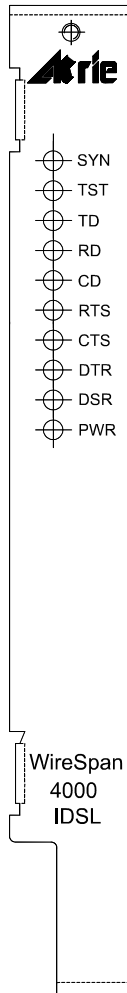**CONSOLE**   Reserve function

◆ **Dedicated V.35 Change-Cable Definition (Only WireSpan 4000 IDSL Rack System by used)**

1000mm

B   A

SCALE 2 : 3

M34 F
twisted pair

A	B
D-SUB 25P M	M34 F

1	FG	FG	A
2	SDA	SDA	P
3	RDA	RDA	R
4	RTS(A)	RTS	C
5	CTS(A)	CTS	D
6	DSR(A)	DSR	E
7	SG	SG	B
8	DCD(A)	DCD	F
20	RCB	RCB	X
22	XTCB	XTC B	W
18	TCB	TCB	AA
21	SDB	SDB	S
15	TCA	TCA	Y
25	RDB	RDB	T
17	RCA	RCA	V
24	XTCA	XTC A	U

M34 F twisted pair:

A ——— B
P ——— S
R ——— T
C ——— D
E ——— F
X ——— V
W ——— U
AA ——— Y

3.2   WireSpan 4000 IDSL Stand-Alone Front Panel Operation

Atrie IDSL Access Unit

TD   RD   ALM   PWR
SYN   TST   ☎

Wire Span 4●●●

◄   ►   ENTER   EXIT

DTR   DSR   DCD   RTS   CTS

✓ 2 x 16 characters LCD
  Display the Command Menu of Modem Status, Alarm messages and Configuration.
✓ Push buttons:
  ◄ ►   Scroll through available options
  ENTER   Choose current option
  EXIT   Go back to previous menu
✓ LED displays:
  PWR   Lights when power is ON.
  SYN   Sync indicators. Blinks until DSL pair is synchronized.
  TST   Loop Test indicator
  ALM   Error detect.
  RD   Receive data indicator
  TD   Transmit data indicator
  ☎   Voice Port Status indicator:
                  ON/ Off-Hook, OFF/ On-Hook or No voice port, Flashing/Ring

LED displays:

SYN	Sync nicators. Blinks until DSL pair issynchronized.
TST	Loop Test indicator
TD	Transmit data indicator
RD	Receive data indicator
CD	Data Carrier Detect
RTS	Request To Send
CTS	Clear To Send
DTR	Data Terminal Ready
DSR	Data Set Ready
PWR	Lights when power is ON.

SYN
TST
TD
RD
CD
RTS
CTS
DTR
DSR
PWR

WireSpan
4000
IDSL

4. Command Menu Tree of WireSpan 4000 IDSL

Local & Remote Configuration

> **Password Control**
>> Enable , Disable
>
> **Enter Password**
> **Data Rate**
>> Sync Mode, Async Mode
>
> **Flow Control Signal**
>> CTS, DSR, DCD, Anti-Streaming
>
> **Timer**
>> RTS→CTS On Delay, DCD Off Delay, Anti-Streaming
>
> **Clock Source**
>> Internal, External, Received
>
> **Voice Control**
>> Select A/U Law, FXO/FXS control
>
> **Reset**
> **Default Setting**
> **Save Changes(for local configure only)**
> **Send Configure (for remote configure only)**

View Local & Remote Configuration

> **Data Rate**

Port Type
Clock
Timer
Test Time
Flow Control Signal(for remote configure only)

Diagnostics

LL Test
RL Test
RAL Test
LL + 511 Test
RL + 511 Test
RAL + 511 Test
DL + 511 Test
DL Test
511 Test Pattern
Test Time
     Test Time = infinite
     Test Time = 5 min. to 255 min.

5. Configure the WireSpan 4000 IDSL

The Modem has been configured at the factory with the following default settings.

PARAMETERS	DEFAULT
Data rate	64 kbps
CTS	Always On
DSR	Always On
DCD	Always On
Anti-Streaming	Off
RTS to CTS Delay	50 ms
DCD Off Delay	0 ms
Anti-Streaming timer	30 seconds
Clock Source	Internal
Error Seconds Threshold	60 seconds
Remote Configuration	Enabled

5.1 Show Setup

This screen can be viewed from the current Modem Setup with the following parameters.

Data Rate, Port Type, Clock Source, Anti-Stream On/Off, Anti-Stream Time, Test Time, RTS → CTS Delay Time, DCD Off Delay Time, CTS/DSR/DCD On and Off status, Voice Port Status

5.2 Show I/F Signal (remote device only)

If the remote modem are being configured, this command will show the existing interface control signal status, CTS, RTS, DCD, DSR and DTR. The ✷ indicate signal is ON.

```
CTS ✷   RTS ✷   DCD ✷
DSR ✷   DTR ✷    OK
```

Or Rack-Unit CTS,RTS,DCD,DSR,DTR LEDs is ON

5.3 Change Setup

5.3.1 Data Rate

Sync and Async data rate are provided :
Synchronous : 4.8k, 9.6k, 19.2k, 38.4k, 48k, 56k, 64k, 72k, 112k, 128 kbps.
Asynchronous : 4.8k, 9.6k, 19.2k, 38.4kbps

5.3.2   Control Signal

a) CTS: Follow remote DCD, Follow local RTS and Always ON.
b) DSR: Follow remote DTR, Follow local DTR and Always ON.
c) DCD: Follow remote RTS, Always ON or Follow By Sync (Once the DSL line is
        synchronized, the DCD is turned ON automatically).
d) Anti-Streaming: Switch ON, Switch OFF
        Anti-Streaming is a method of preventing domination by any one modem during
        half-duplex operation by forcing CTS off if RTS remains on over a given amount
        of time (Anti-Streaming Time).

5.3.3   Timer

a) RTS $\rightarrow$ CTS ON Delay Time: from 0 to 255ms (increment by 5 ms)
        This feature provides a given delayed time to turn CTS on after RTS is ON.
b) DCD OFF Delay Time: from 0 to 255ms (increment by 5 ms)
        DCD ON signal continues for a given period of time after the loss of line signal
        (DCD is OFF).
c) Anti-Streaming Time: from 0 to 255 seconds (increment by 5 seconds)

5.3.4   Clock Source

a) Internal: Central Site Modem select internal free-running clock as a master clock.
b) External: Central Site Modem follow external DTE clock as a master clock.
c) Received: Remote Site Modem extracted clock from received line signal.

5.3.5   Error Seconds Threshold

The WireSpan 4000 IDSL samples the number of CRC error per 60, 300 and 900 seconds
simultaneously, known as Error Seconds. Each of these Error Seconds has a minimum
and maximum level. When the Error Seconds goes over the maximum threshold, the
modem triggers the alarm. When the Error Seconds falls below the minimum level it will
automatically cut-off the alarm.

a) ES60s : Provide minimum (00) to maximum (060) error seconds setting per 60
        seconds period.
b) ES300s : Provide minimum (00) to maximum (300) error seconds setting per 300
        seconds period.
c) ES900s : Provide minimum (00) to maximum (300) error seconds setting per 900
        seconds period.

5.3.6   Remote Configuration

In order to prevent unauthorized person to change configuration, WireSpan 4000 IDSL provides a facility to enable or disable configuration from remote modem.
 a) Unit Enable : Enable configuration to the remote modem
 b) Unit Disable : Disable configuration to the remote modem

5.3.7   Follow Profile

This feature allows the current modem Setup to be a Data Port Profile. The LCD will display "Set Data Port as Profile".

5.3.8   Set Unit Default

This command setup the current modem with predefined default parameters. Total is 6 default parameters option. List below table:

Default Number	Clock Source	Data rate
1.	Internal	64K
2.	Internal	128K
3.	External	64K
4.	External	128K
5.	Received	64K
6.	Received	128K

*Control Signal is non-changed(Factory default value)

5.3.9   Voice Control (Only changeable by Stand-Alone Unit)

The WireSpan 4000 IDSL provides FXO or FXS voice port on the modem card. If the voice port is installed and enabled, the data rate is restricted under 64 kbps data rate automatically. The FXO port is connected to the Central Office (CO or PSTN, Switches), the FXS is connected to the regular telephone set or private PBX/Key Telephone system. WireSpan 4000 IDSL detect FXO/FXS voice module automatically and can be enabled or disabled by CM unit. The voice is transmitted with 64 kbps PCM code, A or u-Law.

 a) FXO/FXS Enable/Disable : Enable or Disable voice module.
 b) A/u-Law : Configure voice with A-Law or u-Law 64 kbps PCM code.

5.4   Reset Device

Select this command will reset the current Modem module. The Modem module re-start according to the pre-defined setting.

5.5   Save Setup

After finished configuration, tthe following SAVE information. NOTE: All Change Setup have to be saved in order to save to non-volatile RAM. After reset or power off the modem, the Change setup parameters can be resumed.

6. Diagnostic of WireSpan 4000 IDSL

The WireSpan 4000 IDSL has 8 sets of V.54 loop tests. It also has an internal 511 Bit Error Rate Test (BERT) pattern generator. These loop tests allow you to check the reliability of the installation, to calibrate for optimum performance or, in case of problems, to do troubleshooting. The different loop tests are described in the following table. To activate these functions, please follow the following Command Menu Tree.
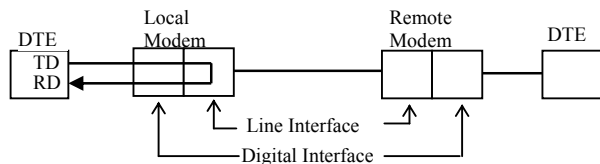
Local Device or Remote Device → Device Management → Diagnostic
The test interval of each test is defined by Test Time at the following command. If the test need to be stopped immediately, press ► and ◄ key and then **OK** key to stop the test command.
The following V.54 looptest with 511 test pattern will indicate the Error Bits (show **ErrBits = ……**)on the LCD display immediately. Press ► and ◄ key and then **OK** key to stop the test command.
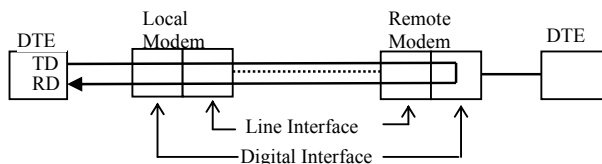
6.1 LL Test : Local Loopback Test

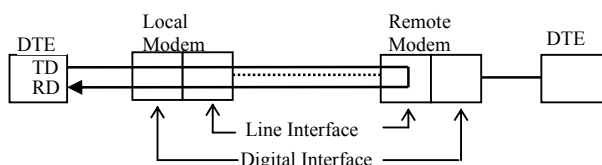Test from the local DTE up to the line interface of the local unit.

6.2 RL Test : Remote Loopback Test

Test from the local DTE up to the Digital interface of the Remote unit.
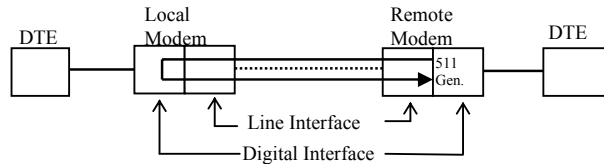The WireSpan 4000 IDSL Pair has to be in Sync mode.

6.3 RAL Test : Remote Analog Loopback Test

Test from the local DTE up to the line interface of the Remote unit.
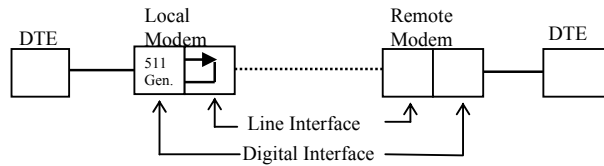The WireSpan 4000 IDSL Pair has to be in Sync mode.

6.4   DL+511 Test : Digital Loopback with 511 Test Pattern

Testing using 511 BERT pattern generated from the remote unit up to the digital interface of the local unit. The WireSpan 4000 IDSL Pair has to be in Sync mode
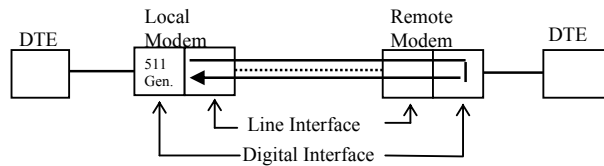

6.5   LL+511 Test : Local Loopback with 511 Test Pattern

Test using 511 BERT pattern generated from the local unit up to the line interface of the local unit.
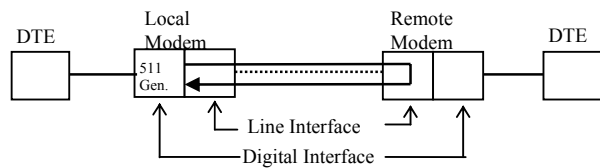

6.6   RL+511 Test : Remote Loopback with 511 Test Pattern

Test using 511 BERT pattern generated from the local unit up to the digital interface of the remote unit.The WireSpan 4000 IDSL Pair has to be in Sync mode.
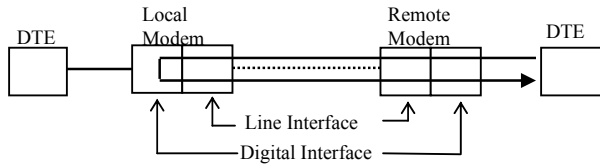

6.7   RAL+511 Test : Remote Analog Loopback with 511 Test Pattern

Test using 511 BERT pattern generated from the local unit up to the digital interface of the remote unit. The WireSpan 4000 IDSL Pair has to be in Sync mode.

6.8 DL Test : Digital Loopback

Testing using 511 BERT pattern generated from the remote unit up to the digital interface of the local unit. The WireSpan 4000 IDSL Pair has to be in Sync mode

6.9 511 Test Pattern

The WireSpan 4000 IDSL generates a 511 test pattern between both local and remote sides to verify the data transmission are working well. To perform this feature, both sides have to enter "511 Test Pattern" mode. Press ◄ and ► key on the local front panel under this mode to send an error bit to remote modem. Press one key to generate one error bit.

```
TP_511 running
ErrBits = 0
```

```
TP_511 running
ErrBits = 2
```

Press ◄ and ► key on the
local Modem.

Generate error bits on the
remote Modem.

6.10   Test Time

a) Time = infinite : Setup test time infinite until manual stop.
b) Time = 005 min to 255 min : Setup test time duration from 5 minutes up to 255 minutes. (increment by 5 minutes)

7. Setup Copy Configuration(Only for Rack Mount)

In order to provide a faster method for setting up several modems. You can use copy configuration menu and choose one of Rack mount to copy setup to another rack mount. This function is effective when ROM version on Rack Mount is the same.