USER MANUAL

I-DSL128

Single / Port Leased Line Modem

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CTC Union Technologies Co., Ltd.
Far Eastern Vienna Technology Center (Neihu Technology Park)
8F, No. 60, Zhouzi St.
Neihu, Taipei, 114
Taiwan
Phone: +886-2-2659-1021
FAX: +886-2-2799-1355

I-DSL128
Single/Port Leased Line Modem.

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I-DSL128

This document is the first official release manual. Please check CTC Union's website for any updated manual or contact us by E-mail at info@ctcu.com. Please address any comments for improving this manual or to point out omissions or errors to marketing@ctcu.com. Thank you.

2 Introduction to the *I-DSL128*

The ***I-DSL128*** is a stand-alone data circuit-terminating equipment (DCE) unit that connects data terminal equipment (DTE) to the digital data network (DDN). The ***I-DSL128*** utilizes 2B1Q line coding and echo cancellation technique for full duplex operation at synchronous 64Kbps or 128Kbps transmission rate over 2-wire unconditioned twisted pair.

The ***I-DSL128*** family consists of the following:

- Single DTE port

The ***I-DSL128*** family provides the type of DTE interfaces as following:

- V.35
- EIA-530
- V.36/RS-449

1.1 General Overview

The ***I-DSL128*** is a stand-alone leased line modem with the following features:

- Support for 64Kbps of bandwidth for high speed data applications
- One DTE port
- One LCD panel and four push buttons
- Ability to display and configure local and remote system parameters
- Three system clock sources:
  - Loop timing
  - Internal timing
  - External timing: From DTE interface
- Four loopback functions:
  - Local loopback
  - Digital loopback
  - CSU loopback
  - DSU loopback
- Built-in 2047 BERT pattern generator and receiver for each DTE port
- AC or DC power input (depending on model)

1.2 Applications for *I-DSL128*

The following sections show you the possible applications for the ***I-DSL128***.

- The ***I-DSL128*** delivers dedicated digital access to remote users when they are connected to a central office over a PCM, Advance D4 Channel Bank (AD4), Digital Loop Carrier (DLC) system or U loop ISDN repeater (Figure 1).

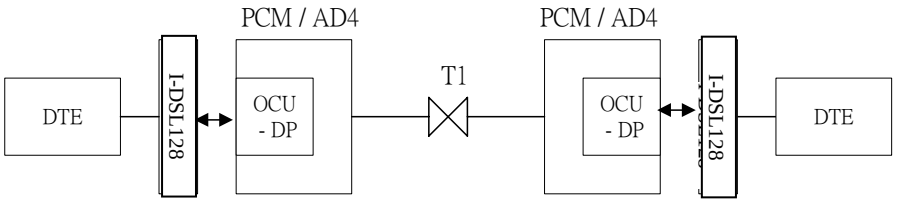

Figure 1 ***I-DSL128*** connects with multiplexer system

- The ***I-DSL128*** can serve as a 64Kbps limited distance modem for leased line application (Figure 2).

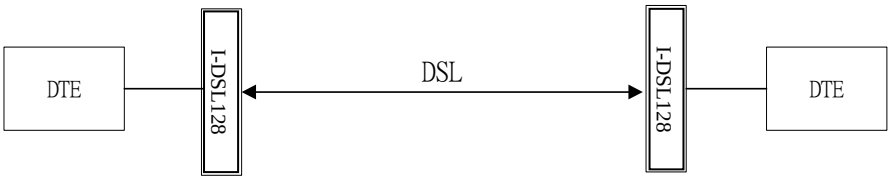

Figure 2 ***I-DSL128*** leased line application

1.3 Hardware Overview

Figure 3 Overview of the ***I-DSL128***

1.3.1 Front Panel

The ***I-DSL128's*** front panel (Figure 4) consists of the following:

- LCD module
- LED module
- Push button module

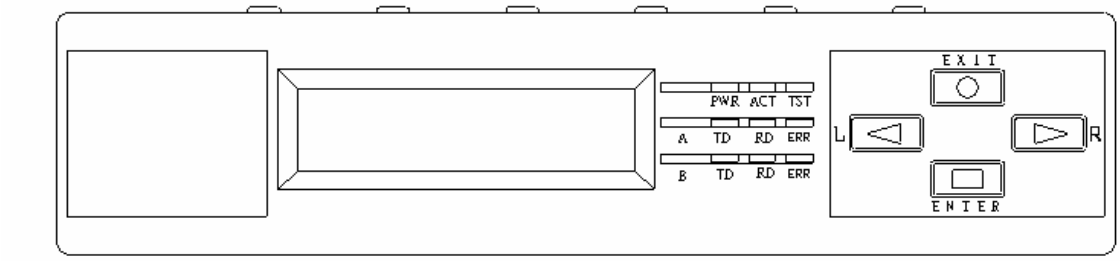

Figure 4 ***I-DSL128*** front panel

1.3.1.1 LCD Display

LCD	Function	Note
	Show status and setups	1. English display 2. Backlight 3. 16 X 2 character display

Table 1 Function of the LCD

1.3.1.2 LED Indictors for *I-DSL128*

LED's	Function	Color	Status	Note
Power	Power Indicator	Green	On	Power normal
Error	Bit error detection	Red	Off	Port G64KC 2047 BERT closed or no error detection
Sync	DSL Indicator	Green	Off	System and remote unsynchronized
			On	System and remote synchronized
			Blink	System detect DSL side CRC error (NEBE)
BERT	Bit Error Rate Test	Red	Off	No 2047 BERT test
			On	2047 BERT test
Loop	Testing indicator	Yellow	Off	System functioning normally
			On	System in testing mode
TX	Data transmitting	Green	Off	No data transmission from DTE to port G64KC
			On	Data transmission from DTE to port G64KC
RX	Data receiving	Green	Off	No data transmission from port G64KC to DTE
			On	Data transmission from port DTE-A to DTE

Table 2 Function of the LED indictors

1.3.1.3 Push Buttons

Button	Function
Esc	Exit
Left Arrow	Left
Right Arrow	Right
Enter	Enter / Confirm

Table 3 Function of the LCD push button

1.3.2 Rear Panel

The ***I-DSL128***'s rear panel (Figure 5) consists of the following:

- DTE Interface
- DSL Interface
- Power Interface

Figure 5 The ***I-DSL128*** rear panel

Each interface has the following functions**:**

Label	Function
POWER	Power switch
AC-IN	Power inlet：input voltage 90~264VAC / 10VA.
DSL	2B1Q Line interface port
DTE-A	Co-directional interface port

Table 4 Function of the rear panel

1.3.3 DTE Interface

The ***I-DSL128*** family provides a single DTE interface as follows:

- G.703 Co-Directional (G64KC)

The DTE interface of the ***I-DSL128*** is fixed at 64Kbps.

1.3.4 DSL Interface

1.3.4.1 DSL Characteristics

- Line coding: 2B1Q
- Type: Full duplex with adaptive echo cancellation
- Impedance: 135Ω
- Physical line type: Unconditioned twisted pair, 19-26AWG
- Conforms to ANSI T1.601-1992

1.3.4.2 DSL Connector

The ***I-DSL128's*** DSL interface provides a 2-wire RJ45 for ISDN basic rate U-interface**.**

1.3.4.3 DSL Protection

There are surge protectors, current limiters and fuses for the primary protection and zener diodes and a diode bridge for secondary protection. The ***I-DSL128*** conforms to FCC Part 68 Type A & B.

1.3.4.4 Sealing Current

- NT mode: The ***I-DSL128*** provides a closed loop for sealing current. The loop resistance is about 334Ω.
- LT mode: The ***I-DSL128*** emulates a constant current source. It outputs a DC current of less than 20mA with a voltage of -42V~-56VDC. The ***I-DSL128*** can protect itself when the DSL loop shorts or when it connects with another current source.

1.4 Factory Default Setup for the *I-DSL128*

The ***I-DSL128*** is supplied with a default setup, which is used when it is first started up. The default configuration is as follows:

System Parameters	Default Setup
	DTE port (G64KC)
LT/NT	NT
DATA RATE	64K
CLOCK SOURCE	Loop

Table 5 System Default Setup

2 Installation

The following shows the rear panel of the ***I-DSL128*** and the connection diagram.

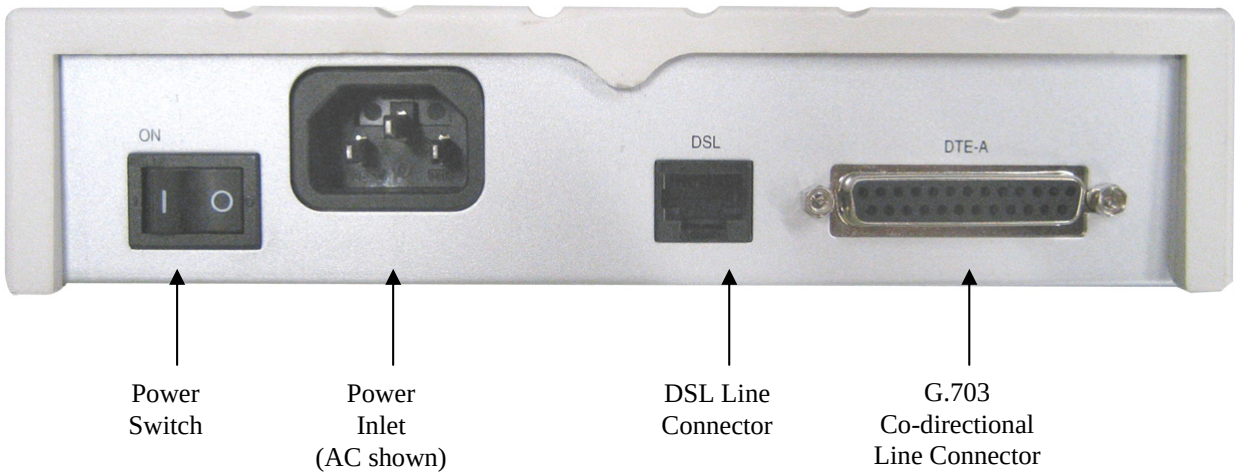

Figure 6 ***I-DSL128*** back panel connections

To install the ***I-DSL128***, proceed as follows:

Step 1 Connecting the ***I-DSL128*** to the DSL (U interface)
Connect the DSL port labeled **Line** on the rear panel to the remote site.

Step 2 Connecting the G64KC (to other co-directional equipment)
Connect the DTE port labeled **Data** on the rear panel to the co-directional equipment using twisted pair cable.

Step 3 Connecting the Power Adaptor to your ***I-DSL128***
Connect the power to the port labeled **AC 90~264VAC** on the rear panel of your ***I-DSL128***.

Step 4 Turning on the power
Turn on the power switch labeled **POWER** on the rear panel of your ***I-DSL128***. The PWR LED lights up to indicate the power is normal. All the LED's on the front panel (except for the PWR LED) will blink for five seconds. The LCD will show the following:

```
** I-DSL128 **
==========
```

After blinking for five seconds, the LED's will turn off, and the I-DSL128 will begin a self-test. The local system tries to synchronize with the remote site.

After the initial setup, you can modify the configuration by using the LCD and the four push buttons (Left arrow, Right arrow, Esc, Enter) on the front panel.

3 Configuration

You can change the ***I-DSL128's*** configuration from the local site only. You can change any of these 5 settings:

(1) LT/NT
(2) DATA RATE: time slot
(3) CLOCK SOURCE
(4) RESTART DEVICE
(5) LOAD DEFAULT SETTING

Note 1: Item (3) only shows up in the LT mode.

While setting up the items (1)~(2), the LCD will indicate current system settings by a "->" sign. If the user needs to change the settings, just use **(**Left arrow) or **(**Right arrow) to move the cursor (blinking) to the preferred option, then press (Enter) to confirm the operation. After this, the "->" sign will point to the new setting and indicate the device configuration has been change successfully.

The user may press (Esc) to leave any operating screen. If there are any settings changed before you leave the current screen, the system will remind user to save the changes. The screen displays this message:

```
* SAVE SETUP *
NO   YES
```

If you choose YES, the settings will be saved in system.
If you choose NO or press (Esc), the settings will not be saved in system.

3.1 LT/NT

Step 1 Enter "DEVICE CONFIGURATION" screen, then press (Enter)

DEVICE CONFIGURATION

Step 2 Use (Left arrow) or (Right arrow) to choose "CHANGE SETUP", then press (Enter) .

CHANGE SETUP

Step 3 Use (Left arrow) or (Right arrow) to choose "LT/NT" screen, then press (Enter) .

CHANGE SETUP LT/NT

Step 4 Use (Left arrow) or (Right arrow) to choose "LT" or "NT", then press (Enter) .

* LT/NT * LT NT

Step 5 The LCD will show one of the following messages to indicate successful completion.

* LT/NT * LT MODE
* LT/NT * NT MODE

3.2 Data Rate

Step 1 Enter "DEVICE CONFIGURATION" screen, then press (Enter)

DEVICE CONFIGURATION

Step 2 Use (Left arrow) or (Right arrow) to choose "CHANGE SETUP", then press (Enter) .

CHANGE SETUP

Step 3 Use (Left arrow) or (Right arrow) to choose "DATA RATE", then press (Enter) .

CHANGE SETUP DATA RATE

note: G.703 64K co-directional must have fixed data rate of 64Kbps. The timeslot may be selected as either B1 or B2 channel and must match on both local and remote units.

Step 4 Use (Left arrow) or (Right arrow) to choose the G64kC time slot (B1 or B2), then press (Enter) .

* G64KC* 64K (B1)	* G64KC * 64K (B2)
* G64KC * OFF	

3.3 Clock Mode

The ***I-DSL128*** provides three options for system clock sources:

- Loop timing
- Internal timing
- External timing: From Data interface (G64KC)

Note 1: Clock mode can only be configured when the system in the LT mode.
Note 2: When the system in the LT mode, it can be configured only as internal or external timing.(G64KC)
Note 3: When the system in the NT mode, loop timing is fixed.

Step 1 Enter "DEVICE CONFIGURATION" screen, then press (Enter)

DEVICE CONFIGURATION

Step 2 Use **(**Left arrow) or **(**Right arrow) to choose "CHANGE SETUP", then press (Enter) .

CHANGE SETUP

Step 3 Use **(**Left arrow) or **(**Right arrow) to choose "CLOCK SOURCE" screen, then press (Enter) .

CHANGE SETUP CLOCK SOURCE

Step 4 Use **(**Left arrow) or **(**Right arrow) to choose "INT" for internal timing or G64KC for external timing, then press (Enter) .

* CLOCK SOURCE * INT G64KC

Step 5 The LCD will show one of the following messages to indicate successful completion.

* CLOCK SOURCE * INTERNAL

* CLOCK SOURCE * FROM G64KC

3.4 Restart Device

Step 1 Enter "DEVICE CONFIGURATION" screen, then press (Enter)

DEVICE CONFIGURATION

Step 2 Use (Left arrow) or (Right arrow) to choose "RESTART DEVICE", then press (Enter) .

RESTART DEVICE

Step 3 Use (Left arrow) or (Right arrow) to choose "YES", then press (Enter) .

RESTART DEVICE NO YES

Step 4 The LCD will show the following message and the ***I-DSL128*** will restart after 3 seconds.

RESTART DEVICE AFTER 3 SECONDS

3.5 Load Default Settings

For factory default settings, please refer to Table 5.

Step 1 Enter "DEVICE CONFIGURATION" screen, then press (Enter)

DEVICE CONFIGURATION

Step 2 Use (Left arrow) or (Right arrow) to choose "LOAD DEFAULT SETTINGS", then press (Enter) .

LOAD DEFAULT SETTINGS

Step 3 Use (Left arrow) or (Right arrow) to choose "YES", then press (Enter) .

LOAD DEFAULT NO YES

Step 4 The LCD will display the following message and the ***I-DSL128*** will load default settings from EEROM and restart after 3 seconds.

LOAD DEFAULT & RESTART DEVICE

4 Maintenance

The ***I-DSL128*** provides a user-friendly interface. The user can utilize the LCD and four push buttons (Left arrow, Right arrow, Esc, Enter) on the front panel to view system status (local).

The ***I-DSL128*** provides four kinds of loopback and one built-in BERT function. These can be used to maintain, diagnose and test system and loop performance without any other equipment. The following screens can be displayed.

- Show Status
- Local Loopback
- Digital Loopback
- CSU Loopback
- DSU Loopback
- BERT G64KC (2047)

Note 1: The CSU and DSU loopbacks will work properly under the DSL environment with a 10^{-3} *bit error rate.*

Note 2: The Digital, CSU and DSU loopbacks could be activated only when the DSL is synchronized.

Note 3: The system will release the Digital, CSU and DSU loopbacks when the DSL is out-of-sync.

4.1 Show Status

The ***I-DSL128*** can display system status of the local or remote site. 18 items are available:

- LT/NT mode
- Data Port Number
- Clock mode
- G64KC speed
- Local loopback
- Digital loopback
- CSU loopback
- DSU Loopback (G64KC)
- BERT G64KC

4.1.1 To View System Status

Step 1 Enter "SHOW STATUS" screen, then press (Enter)

SHOW STATUS

Step 2 Use (Left arrow) or (Right arrow) to check the system current status.

* MODE * XX
* PORT NUMBER * XX
* CLOCK MODE * XXXXXX
* G64KC SPEED * XXXXXX
* LOCAL LOOPBACK * XXXXXX
* DIGITAL LOOPBACK * XXXXXX
* CSU LOOPBACK * XXXXXX
* DSU LOOP G64KC * XXXXXX
* BERT G64KC * XXXXXX

4.2 Local Loopback

When the local loopback is activated, it will utilize the local site of the ***I-DSL128*** (see Figure 7). This will test the transmitting/receiving functions of the local site. During this test, the remote unit will lose DSL synchronization. When the local loopback test is released, the system will restart and return to its initial state. During the local loopback testing period, the TST and ACT LED's will be lit.

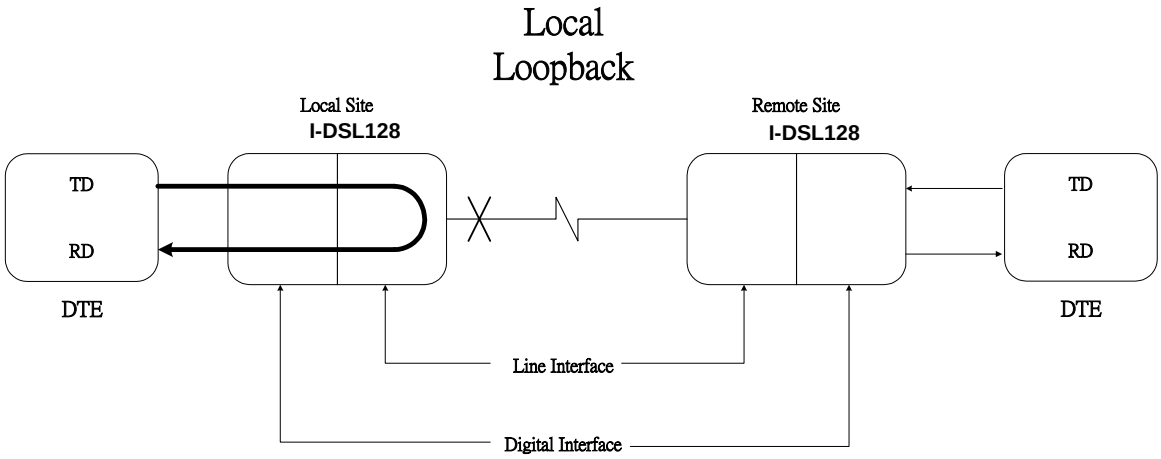

Figure 7 Local Loopback

4.2.1 To Execute Local Loopback

Step 1 Enter "DEVICE DIAGNOSTIC" screen, then press (Enter)

DEVICE DIAGNOSTIC

Step 2 Use (Left arrow) or (Right arrow) to choose "LOCAL LOOPBACK", then press (Enter) .

LOCAL LOOPBACK

Step 3 Use (Left arrow) or (Right arrow) to choose "ON", then press (Enter) .

* LOCAL LOOP * OFF ON

Step 4 The local loopback is executed successfully when the LCD shows "-- LOCAL LOOP — OK !!" and both the SYNC and Loop LED's are lit. Otherwise, it shows "-- LOCAL LOOP -- FAILED !!", meaning the local loopback was not activated.

-- LOCAL LOOP -- OK !!

-- LOCAL LOOP -- FAILED !!

Step 5 Use (Left arrow) or (Right arrow) to choose "OFF", then press (Enter) .

* LOCAL LOOP * OFF ON

Step 6 When the local loopback has been released successfully, the LCD shows " -- LOCAL LOOP -- RELEASE OK !! ". The Loop LED is turned off and the system returns to initial state.

-- LOCAL LOOP -- RELEASE OK !!

4.3 Digital Loopback

When the digital loopback is activated, it will test the transmitting/receiving functions of the ***I-DSL128*** when using a DSL condition. The digital loopback function is only executable when the DSL connection is synchronized with the remote site. When this test is executed, all the payloads (B1 and B2 Channels) are looped and the Loop LED is lit and the DTE ports are turned off.

Note: When the digital loopback is activated, all the DSL payloads (B1 and B2 Channels) are occupied into a testing mode. So, CSU, DSU loopback and 2047 BERT are disabled in the local site.

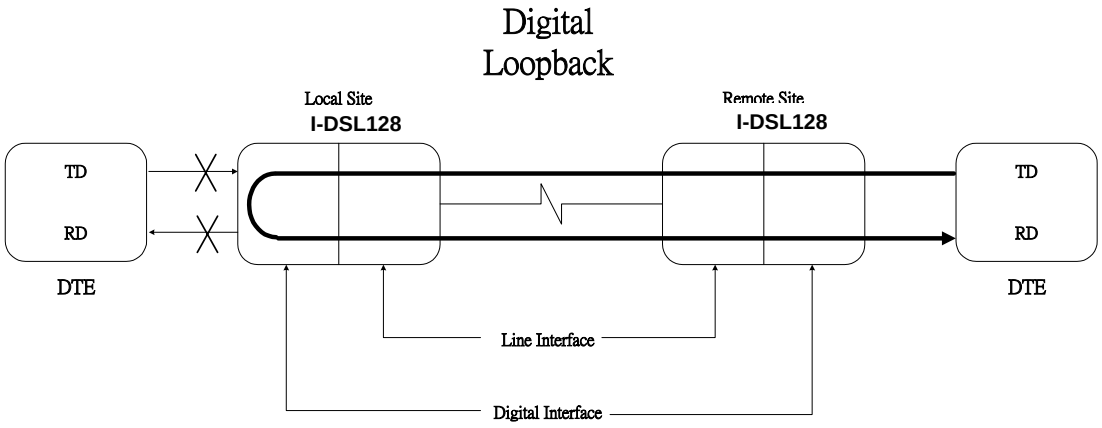

Figure 8 Digital Loopback

4.3.1 To Execute Digital Loopback

Step 1 Enter "DEVICE DIAGNOSTIC" screen, then press (Enter).

DEVICE DIAGNOSTIC

Step 2 Use (Left arrow) or (Right arrow) to choose "DIGITAL LOOPBACK", then press (Enter) .

DIGITAL LOOPBACK

Step 3 Use (Left arrow) or (Right arrow) to choose "B1+B2", then press (Enter) .

* DIGITAL LOOP * OFF B1+B2

Step 4 Digital loopback is executed successfully when LCD shows "--DIGITAL LOOP — B1+B2 !!" and the Loop LED is lit.

-- DIGITAL LOOP -- B1+B2 OK !!

Step 5 Use (Left arrow) or (Right arrow) to choose "OFF", then press (Enter) .

* DIGITAL LOOP * OFF B1+B2

Step 6 When the digital loopback has been released successfully, the LCD shows " -- DIGITAL LOOP -- RELEASE OK !! ". The Loop LED is turned off.

-- DIGITAL LOOP -- RELEASE OK !!

4.4 CSU Loopback

The CSU loopback is a testing function controlled from the unit in the LT mode. The LT unit (the local site in Figure 9) sends loopback messages through an EOC, specified by ANSI T1.601, and the NT unit (the remote site in Figure 9) executes the loopback function when it receives a valid loopback command. The loopback tests the local and remote units and the DSL. This procedure may be performed without using other personnel. (The digital loopback requires two or more people).

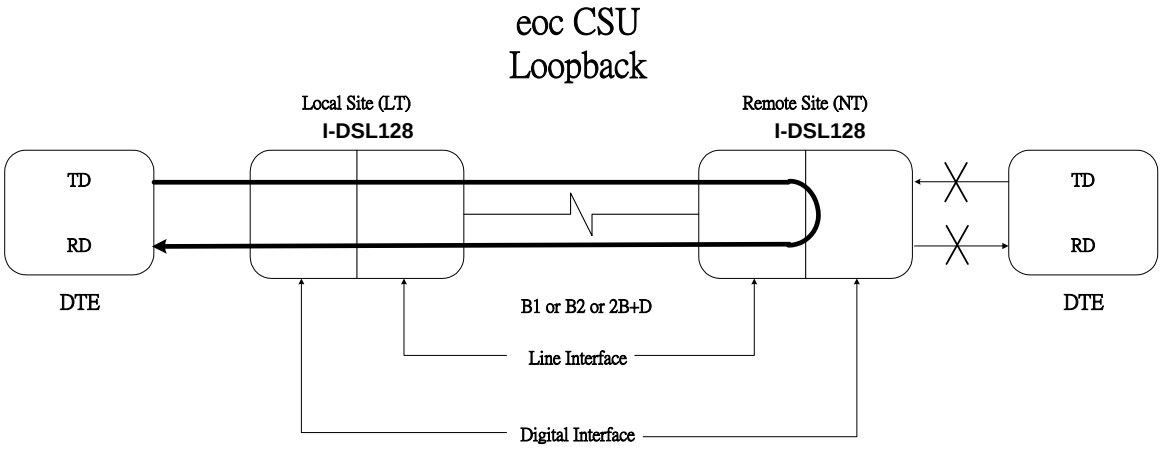

Figure 9 CSU Loopback

4.4.1 LT Mode

There are four kinds of EOC loopback messages that can be chosen :

- Return To Normal (RTN): 1111 1111
- Operate B1-Channel Loopback: 0101 0001
- Operate B2-Channel Loopback: 0101 0010
- Operate 2B+D Loopback: 0101 0000

When you specify the eoc loopback message, it is sent continuously with the address "000". When one of the "operate" messages activates the CSU loopback, the TST LED will be turned on. It will be turned off when the RTN message is sent.

Note: When the CSU loopback is activated, the assigned DSL payloads (B1, B2 Channels or 2B+D) are occupied in a testing mode, so the digital loopback and DSU loopback of the corresponding DTE ports are disabled at the local site.

4.4.2 NT Mode

There are two modes available for the user:

- AUTO: Automatically detect EOC messages from the LT and execute the corresponding activation or release of CSU loopback.
- OFF: Ignore EOC messages from the LT.

Note 1: When the CSU loopback is activated, the assigned DSL payloads (B1, B2 Channels or 2B+D) are occupied in a testing mode, so the DSU loopback of the corresponding DTE ports and 2047 BERT are disabled at the local site.
Note 2: If the ***I-DSL128*** *is set to "OFF", the system will release all the CSU loopbacks.*

When the CSU loopback is activated, the Loop LED will be turned on. It will be turned off when the unit receives a valid RTN command.

All CSU replies (loopbacks) from the NT will be latching, permitting multiple EOC loopback messages to be in effect simultaneously. When the NT receives the RTN message, all the CSU loopbacks are released.

4.4.3 To Execute CSU Loopback

4.4.3.1 LT Mode

Step 1 Enter "DEVICE DIAGNOSTIC" screen, then press (Enter)

DEVICE DIAGNOSTIC

Step 2 Use (Left arrow) or (Right arrow) to choose "CSU LOOPBACK", then press (Enter) .

CSU LOOPBACK

Step 3 Use (Left arrow) or (Right arrow) to choose "B1", "B2" or "2B+D", then press (Enter) .

* CSU LOOP * RTN B1 B2 2B+D

Step 4 The CSU loopback is executed successfully when the LCD shows "-- CSU LOOP – REMOTE B1 OK!!", "-- CSU LOOP – REMOTE B2 OK!!" or "-- CSU LOOP – REMOTE 2B+D !!" and the Loop LED is turned on.

-- CSU LOOP -- REMOTE B1 OK !!
-- CSU LOOP -- REMOTE B2 OK !!
-- CSU LOOP -- REMOTE 2B+D OK !!

Step 5 Use (Left arrow) or (Right arrow) to choose "RTN", then press (Enter) .

* CSU LOOP * RTN B1 B2 2B+D

Step 6 When the LCD shows " -- CSU LOOP – REMOTE RTN OK !! ", the CSU loopback has been released. The Loop LED is then turned off.

-- CSU LOOP -- REMOTE RTN OK !!

4.4.3.2 NT Mode

Step 1 Enter "DEVICE DIAGNOSTIC" screen, then press (Enter)

DEVICE DIAGNOSTIC

Step 2 Use (Left arrow) or (Right arrow) to choose "CSU LOOPBACK", then press (Enter) .

CSU LOOPBACK

Step 3 Use (Left arrow) or (Right arrow) to choose "AUTO" or "OFF", then press (Enter) .

* CSU LOOP * AUTO OFF

4.5 DSU Loopback

When you initiate the DSU loopback test, the transmitting unit will send a loopback message, specified by ITU-T V.54, to the receiving unit. Either the local or remote site can initiate the test. When the receiving unit receives a valid loopback message from the transmitting unit, it will send back an acknowledgement message and execute a DSU loopback. This tests the B1, B2 or B1+B2 channel, as well as the condition of the DSL.

When the DSU loopback is activated, the Loop LED will be turned on. It will be turned off when a valid release pattern is received.

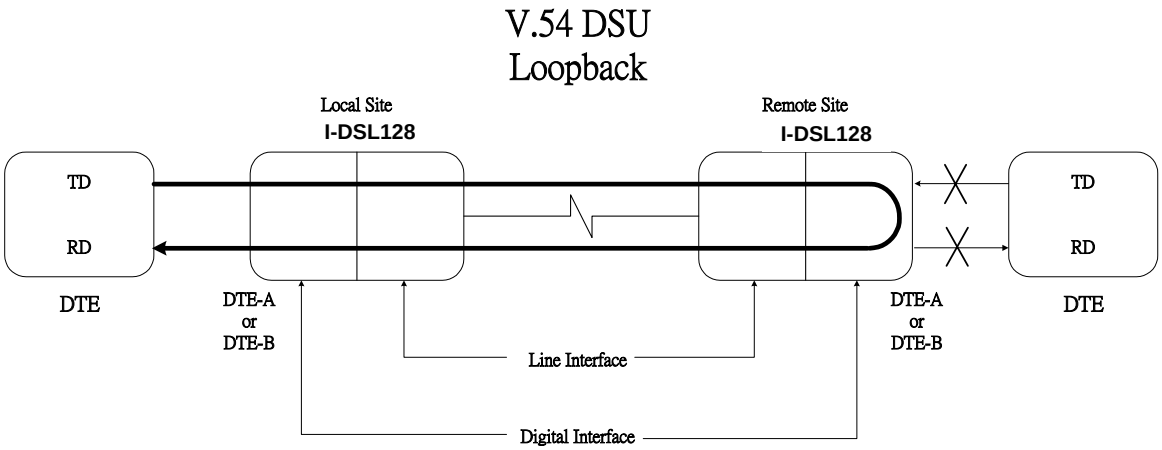

Figure 10 DSU Loopback

There are four modes can be chosen by the user:

- DISABLE: Ignore ITU-T V.54 pattern from remote.
- ENABLE: Detect ITU-T V.54 pattern from the remote site and execute the corresponding activation or release of DSU loopback automatically.
- REQ REMOTE LOOP: Send ITU-T V.54 loopback pattern to the remote site to activate remote DSU loopback.
- REQ REM RELEASE: Send ITU-T V.54 release pattern to remote site, to release remote DSU loopback.

4.5.1 To Execute DSU Loopback

4.5.1.1 Request Remote Loopback and Release

Step 1 Enter "DEVICE DIAGNOSTIC" screen, then press (Enter)

DEVICE DIAGNOSTIC

Step 2 Use (Left arrow) or (Right arrow) to choose "DSU LOOPBACK V.54 (G64KC))", then press (Enter) .

DSU LOOPBACK V.54(G64KC)

Step 3 Use (Left arrow) or (Right arrow) to choose "REQ REMOTE LOOP" for request for remote CSU loopback, then press (Enter) .

DSU LOOP (G64KC) REQ REMOTE LOOP

Step 4 The DSU loopback is executed successfully when the LCD shows "REQUEST OK!!" and the Loop LED is turned on. Otherwise, the LCD shows "REQUEST FAIL!!" and the Loop LED is off.

DSU LOOP (G64KC) REQUEST OK!!
DSU LOOP (G64KC) REQUEST FAIL!!

Step 5 Use (Left arrow) or (Right arrow) to choose "REQ REM RELEASE" to request the remote CSU loopback release, then press (Enter) .

DSU LOOP (G64KC) REQ REM RELEASE

Step 6 When the DSU loopback has been released successfully, the LCD shows "REQ REM RELEASE" and Loop LED is off.

DSU LOOP (G64KC) REM LOOP RELEASE

4.5.1.2 Disable and Enable DSU Loopback Function

Step 1 Enter "DEVICE DIAGNOSTIC" screen, then press (Enter)

DEVICE DIAGNOSTIC

Step 2 Use (Left arrow) or (Right arrow) to choose "DSU LOOPBACK V.54 (G64KC)", then press (Enter) .

DSU LOOPBACK V.54(G64KC)

Step 3 Use (Left arrow) or (Right arrow) to choose "DISABLE" for disabling CSU loopback function or "ENABLE" for enabling CSU loopback function, then press (Enter) .

DSU LOOP (G64KC) DISABLE
DSU LOOP (G64KC) ENABLE

4.6 2047 BERT

There is one built-in 2047 BERT test pattern generator and receiver in each DTE port of the ***I-DSL128***. You can easily use the testing mechanism and other loopback functions to check the status of system itself, the DSL and the remote equipment (Figure 11,12,13).

Note: The 2047 BERT function is not available under the following conditions.

- *Time slot you wish to use occupied by Digital Loopback test.*
- *Time slot you wish to use occupied by CSU loopback test initiated from remote site.*
- *DTE port you wish to use occupied by DSU loopback test initiated from remote site.*

When 2047 BERT function is activated, the BERT LED is turned on, the assigned DTE port off and the timer activated. Users may check the RUN TIME and BIT ERR results on the LCD.

- RUN TIME: The elapsed time with range from 0 to 65535 seconds. If results are out of this range, a "+" sign appears to the left of the digits.
- BIT ERR: The error bit count with range from 0 to 65535 bits. If results are out of this range, a "+" sign appears to the left of the digits. For each bit error, the counter will add one and the ERR LED will blink. If the bit errors are too numerous to synchronize the 2047 BERT pattern, or there is no data input, the BIT ERR will display "NO SYNC" and the bit error counter will stop counting.

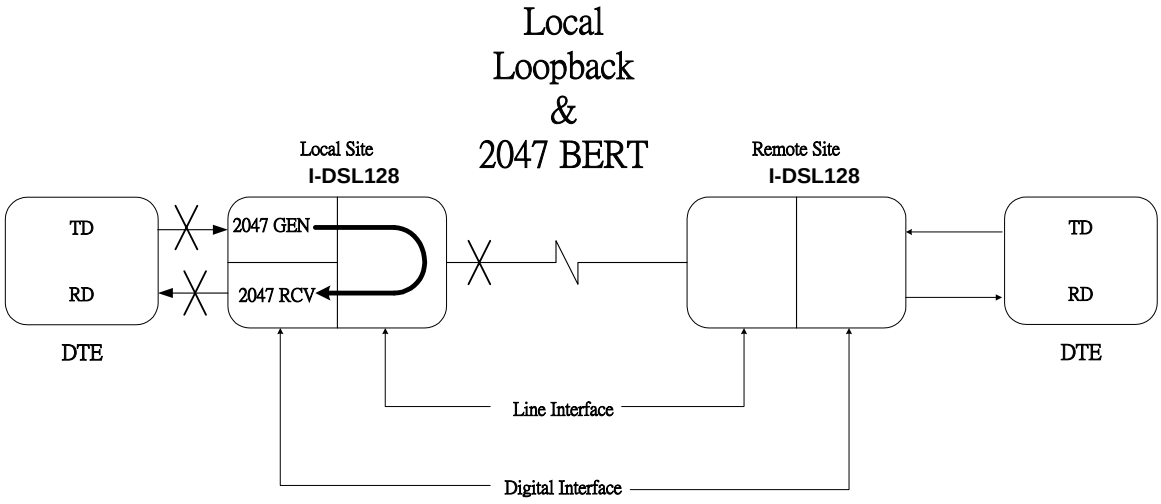

Figure 11 Local Loopback & 2047 BERT

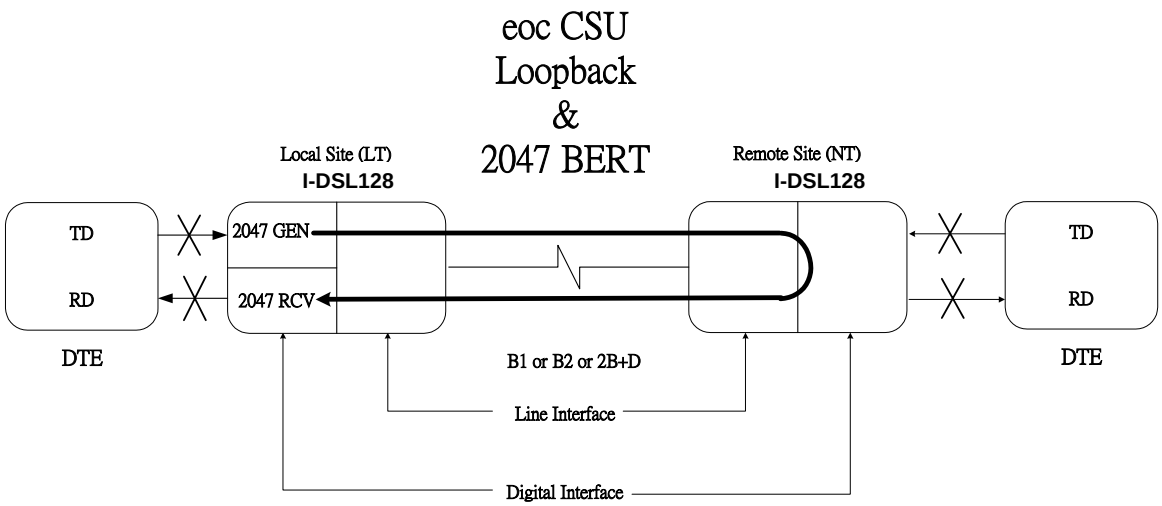

Figure 12 CSU Loopback & 2047 BERT

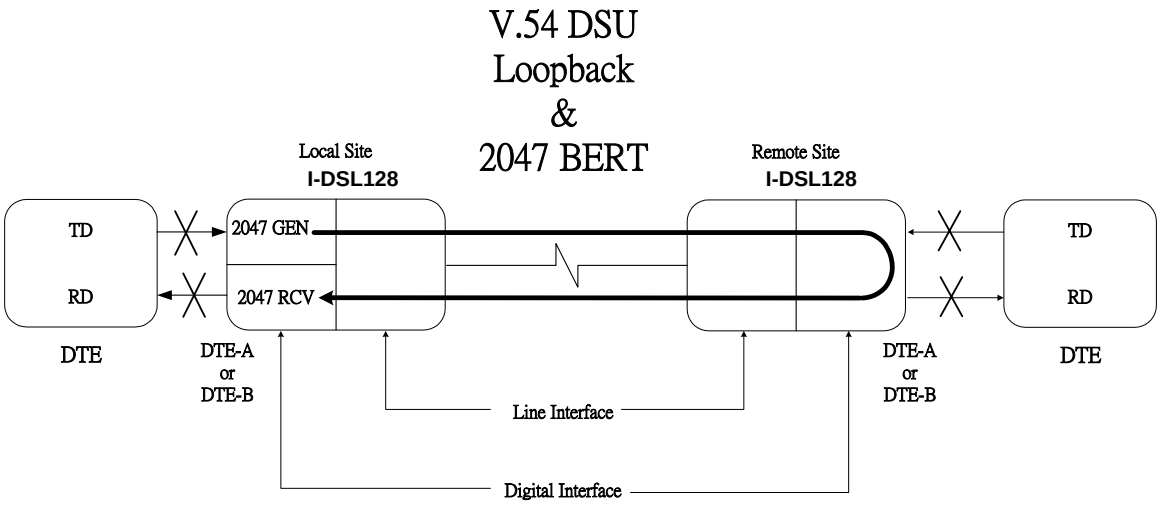

Figure 13 DSU Loopback & 2047 BERT

4.6.1 To Execute 2047 BERT

Step 1 Enter "DEVICE DIAGNOSTIC" screen, then press (Enter)

DEVICE DIAGNOSTIC

Step 2 Use (Left arrow) or (Right arrow) to choose "BERT 2047 (G64KC)" , then press (Enter) .

BERT 2047 (G64KC)

Step 3 Use **(**Left arrow) or **(**Right arrow) to choose "RUN", then press (Enter) .

BERT 2047(G64KC) STOP RUN RST

Step 4 The 2047 BERT has executed successfully when the LCD shows as below. The RUN (SEC) counter should be increasing and the BERT LED should be on.

RUN(SEC) : XXXXX BIT ERR : XXXXX

Step 5 Use **(**Left arrow) or **(**Right arrow) to choose "STOP" to stop counting or "RST" to reset counter, then press (Enter) .

BERT 2047(G64KC) STOP RUN RST

Step 6 IF you choose "STOP", the counters will stop. If you choose "RST", the counters will reset to zero and begin counting again.

RUN(SEC) : XXXXX BIT ERR : XXXXX

Appendix A

Specifications:

Items		Notes
Network Line Interface	**Type**	Full duplex with adaptive echo cancellation
	Line coding	2B1Q
	Line Type	Unconditioned twisted pair， 19-26 AWG
	Surge Protection	Meets FCC Part 68 Type A，B
	Connector	RJ45
DTE Interface	**Number of Ports**	1
	Data Rate	Synchronous : 64Kbps
	Connector	G.703 64K Co-Directional 4-wire twisted pair
Operation Range		2-wire mode Up to 5.5Km over 26 AWG Up to 7.0Km over 24 AWG Meet ANSI T1.601 and ETSI ETR 080 standard loop
Clock Source		Internal Line G64KC
Diagnostic	**eoc**	Fully detect EOC message defined by ANSI T1.601
	Loopbacks	Local loopback Digital loopback ITU-T V.54 DTE loopback ANSI T1.601 CSU loopback
	2047 BERT	DTE-(G64KC)
Front Panel	**Keypad**	4 operation keys (Esc, Left arrow, Right arrow, Enter)
	LED	7 status LED's PWR, SYNC, Loop, BERT, Data[Tx, Rx, ERR]
	LCD	16 X 2 with backlight
Power	**AC Input**	90~264VAC, 47~63Hz
	DC Input	18~60VDC
	Consumption	>10VA
Physical	**Dimensions**	19.5X4.8X16.8 cm (W X H X D)
	Mounting	Desk-top stackable
Environment	**Temperature**	0~50℃
	Humidity	0%~95%RH (non-condensing)
EMI		Meets IEC CISPR22 Class A Meets FCC Part 15 Subpart B Class A

Appendix B

DSL Connector and Pin Designations

PIN NUMBER	FUNCTION	NOTES
1	No Connection	Reserved for future standardization
2	No Connection	Reserved for future standardization
3	No Connection	Reserved for future standardization
4	Signal	Tip or ring of pair to and from the network interface
5	Signal	Tip or ring of pair to and from the network interface
6	No Connection	Reserved for future standardization
7	No Connection	Reserved for future standardization
8	No Connection	Reserved for future standardization

Data Connector and Pin Designations

Signal Function	Pin	Direction	Description
Protective Ground	4 10		Chassis Ground May be isolated from Signal Ground.
Signal Ground	8		Common Signal Ground.
Transmitted Data	3 11	To I-DSL128	Serial Co-directional data from DTE.
Received Data	1 9	Fm I-DSL128	Serial Co-directional data at the output of the I-DSL128 receiver.

Transmission Units

CTC Union Technologies Co., Ltd.
Far Eastern Vienna Technology Center
(Neihu Technology Park)
8F, No.60, Zhouzi Street
Neihu, Taipei, Taiwan
Phone:(886) 2.2659.1021 Fax:(886) 2.2799.1355
E-mail: info@ctcu.com http://www.ctcu.com