



## **IQ 310 System Manual**

<b>1203800L1</b>	<b>IQ 310 Base Unit</b>
<b>1202801L1</b>	<b>56k/64k Network Interface Module</b>
<b>1202802L1</b>	<b>T1/FT1 Network Interface Module</b>
<b>1202803L1</b>	<b>T1/FT1 + DSX-1 Network Interface Module</b>
<b>1202804L1</b>	<b>T1 Probe Network Interface Module</b>
<b>1204002L3</b>	<b>V.34 DBU Module</b>
<b>1204004L2</b>	<b>ISDN BRI DBU Module</b>
<b>1204008L2</b>	<b>ISDN PRI DBU Module</b>
<b>1204006L2</b>	<b>DCE DBU Module</b>
<b>4203801L1</b>	<b>IQ 310 with 56k/64k Network Interface Module</b>
<b>4203802L1</b>	<b>IQ 310 with T1/FT1 Network Interface Module</b>
<b>4203803L1</b>	<b>IQ 310 with T1/FT1 + DSX-1 Network Interface Module</b>
<b>4203804L1</b>	<b>IQ 310 with T1 Probe Network Interface Module</b>

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## About this Manual

This manual provides a complete description of the IQ 310 system and system software. The purpose of this manual is to provide the technician, system administrator, and manager with general and specific information related to the planning, installation, operation, and maintenance of the IQ 310. This manual is arranged so that needed information can be quickly and easily found.



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## Revision History

Document Revision	Date	Description of Changes
A	March 2004	Initial Release

## Conventions

**NOTE**

*Notes provide additional useful information.*

**CAUTION**

*Cautions signify information that could prevent service interruption.*

**WARNING**

*Warnings provide information that could prevent damage to the equipment or endangerment to human life.*

**Safety Instructions**

When using your telephone equipment, please follow these basic safety precautions to reduce the risk of fire, electrical shock, or personal injury:

1. Do not use this product near water, such as a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
2. Avoid using a telephone (other than a cordless-type) during an electrical storm. There is a remote risk of shock from lightning.
3. Do not use the telephone to report a gas leak in the vicinity of the leak.
4. Use only the power cord, power supply, and/or batteries indicated in the manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for special disposal instructions.

**Save These Important Safety Instructions**

## FCC-Required Information

FCC regulations require that the following information be provided in this manual:

1. This equipment complies with Part 68 of FCC rules and requirements adopted by ACTA. On the equipment housing is a label that contains, among other information, a product identifier in the format US: AAAEQ##TXXXX. If requested, provide this information to the telephone company.
2. If this equipment causes harm to the telephone network, the telephone company may temporarily discontinue service. If possible, advance notification is given; otherwise, notification is given as soon as possible. The telephone company will advise the customer of the right to file a complaint with the FCC.
3. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of this equipment. Advance notification and the opportunity to maintain uninterrupted service are given.
4. If experiencing difficulty with this equipment, please contact ADTRAN for repair and warranty information. The telephone company may require this equipment to be disconnected from the network until the problem is corrected or it is certain the equipment is not malfunctioning.
5. This unit contains no user-serviceable parts. In the event of equipment malfunction, all repairs should be performed by ADTRAN. It is the responsibility of users requiring service to report the need for service to their distributor or ADTRAN. See Customer Service, Product Support Information, and Training in this front matter for information on contacting ADTRAN for service.
6. An FCC compliant telephone cord with a modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using an FCC compatible modular jack, which is compliant with Part 68 and requirements adopted by ACTA.
7. The following information may be required when applying to the local telephone company for leased line facilities.

Part Number	FCC Reg. Number	Service Type	REN/SOC	FIC	USOC
1202801L1	HDCUSA-44573-DE-N	56 kbps Digital Interface 64 kbps Digital Interface	6.0F	04DU5-56 04DU5-64	RJ-48S
1202802L1	HDCUSA-44574-DE-N	1.544 Mbps - SF	6.0N	04DU9-BN 04DU9-DN	RJ-48C
1202803L1		1.544 Mbps - SF and B8ZS			
1202804L1		US: HDCDENAN1202804L1			

8. The REN is useful in determining the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most areas, the sum of the RENs of all devices should not exceed five. To be certain of the number of devices you may connect to your line as determined by the REN, call your telephone company to determine the maximum REN for your calling area.
9. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.

## Federal Communications Commission Radio Frequency Interference Statement

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 frequencies. 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.

 **NOTE**

*Shielded cables must be used with this unit to ensure compliance with Class A FCC limits.*

**WARNING**

*Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

**Affidavit Requirements for Connection to Digital Services**

- An affidavit is required to be given to the telephone company whenever digital terminal equipment without encoded analog content and billing protection is used to transmit digital signals containing encoded analog content which are intended for eventual conversion into voiceband analog signal and transmitted on the network.
- The affidavit shall affirm that either no encoded analog content or billing information is being transmitted or that the output of the device meets Part 68 encoded analog content or billing protection specifications.
- End user/customer will be responsible to file an affidavit with the local exchange carrier when connecting unprotected CPE to a 1.544 Mbps or subrate digital service.
- Until such time as subrate digital terminal equipment is registered for voice applications, the affidavit requirements for subrate services are waived.

**Affidavit for Connection of Customer Premises Equipment to 1.544 Mbps and/or Subrate Digital Services**

For the work to be performed in the certified territory of \_\_\_\_\_ (telco name)

State of \_\_\_\_\_

County of \_\_\_\_\_

I, \_\_\_\_\_ (name), \_\_\_\_\_ (business address),  
\_\_\_\_\_ (telephone number) being duly sworn, state:

- ( ) I have responsibility for the operation and maintenance of the terminal equipment to be connected to 1.544 Mbps and/or \_\_\_\_\_ subrate digital services. The terminal equipment to be connected complies with Part 68 of the FCC rules except for the encoded analog content and billing protection specifications. With respect to encoded analog content and billing protection:
- ( ) I attest that all operations associated with the establishment, maintenance, and adjustment of the digital CPE with respect to analog content and encoded billing protection information continuously complies with Part 68 of the FCC Rules and Regulations.
- ( ) The digital CPE does not transmit digital signals containing encoded analog content or billing information which is intended to be decoded within the telecommunications network.
- ( ) The encoded analog content and billing protection is factory set and is not under the control of the customer.

I attest that the operator(s)/maintainer(s) of the digital CPE responsible for the establishment, maintenance, and adjustment of the encoded analog content and billing information has (have) been trained to perform these functions by successfully having completed one of the following (check appropriate blocks):

- ( ) A. A training course provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- ( ) B. A training course provided by the customer or authorized representative, using training materials and instructions provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- ( ) C. An independent training course (e.g., trade school or technical institution) recognized by the manufacturer/grantee of the equipment used to encode analog signals; or
- ( ) D. In lieu of the preceding training requirements, the operator(s)/maintainer(s) is (are) under the control of a supervisor trained in accordance with \_\_\_\_\_ (circle one) above.

I agree to provide \_\_\_\_\_ (telco's name) with proper documentation to demonstrate compliance with the information as provided in the preceding paragraph, if so requested.

\_\_\_\_\_ Signature

\_\_\_\_\_ Title

\_\_\_\_\_ Date

Transcribed and sworn to before me

This \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

\_\_\_\_\_  
Notary Public

My commission expires:  
\_\_\_\_\_

## Industry Canada Compliance Information



*The Industry Canada Certification label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department of Commerce does not guarantee the equipment will operate to the user's satisfaction.*

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic waterpipe system, if present, are connected together. This precaution may be particularly important in rural areas.



*Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or an electrician, as appropriate.*

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the equipment that the total of the LNs of all devices does not exceed 100.

The ringer equivalence number (REN) assigned to each terminal adapter is used to determine the total number of devices that may be connected to each circuit. The sum of the RENs from all devices in the circuit should not exceed a total of 5.0.

## Canadian Emissions Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Class A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par le ministre des Communications.

## Product Warranty

ADTRAN will repair and return this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found at [www.adtran.com/warranty](http://www.adtran.com/warranty).

## Product Registration

Registering your product helps ensure complete customer satisfaction. Please take time to register your products on line at [www.adtran.com](http://www.adtran.com). Click *Service and Support* on the top of the page, and then click *Product Registration* under *Support*.

## Customer Service, Product Support Information, and Training

ADTRAN will repair and return this product within the warranty period if it does not meet its published specifications or fails while in service. Warranty information can be found at [www.adtran.com/warranty](http://www.adtran.com/warranty).

A return material authorization (RMA) is required prior to returning equipment to ADTRAN. For service, RMA requests, training, or more information, use the contact information given below.

### Repair and Return

If you determine that a repair is needed, please contact our Customer and Product Service (CAPS) department to have an RMA number issued. CAPS should also be contacted to obtain information regarding equipment currently in house or possible fees associated with repair.

CaPS Department (256) 963-8722

Identify the RMA number clearly on the package (below address), and return to the following address:

ADTRAN Customer and Product Service  
901 Explorer Blvd. (East Tower)  
Huntsville, Alabama 35806

RMA # \_\_\_\_\_

### Pre-Sales Inquiries and Applications Support

Your reseller should serve as the first point of contact for support. If additional pre-sales support is needed, the ADTRAN Support web site provides a variety of support services such as a searchable knowledge base, latest product documentation, application briefs, case studies, and a link to submit a question to an Applications Engineer. All of this, and more, is available at:

<http://support.adtran.com>

When needed, further pre-sales assistance is available by calling our Applications Engineering Department.

Applications Engineering (800) 615-1176

## Post-Sale Support

Your reseller should serve as the first point of contact for support. If additional support is needed, the ADTRAN Support web site provides a variety of support services such as a searchable knowledge base, updated firmware releases, latest product documentation, service request ticket generation and trouble-shooting tools. All of this, and more, is available at:

<http://support.adtran.com>

When needed, further post-sales assistance is available by calling our Technical Support Center. Please have your unit serial number available when you call.

Technical Support (888) 4ADTRAN

## Installation and Maintenance Support

The ADTRAN Custom Extended Services (ACES) program offers multiple types and levels of installation and maintenance services which allow you to choose the kind of assistance you need. This support is available at:

<http://www.adtran.com/aces>

For questions, call the ACES Help Desk.

ACES Help Desk (888) 874-ACES (2237)

## Training

The Enterprise Network (EN) Technical Training Department offers training on our most popular products. These courses include overviews on product features and functions while covering applications of ADTRAN's product lines. ADTRAN provides a variety of training options, including customized training and courses taught at our facilities or at your site. For more information about training, please contact your Territory Manager or the Enterprise Training Coordinator.

Training Phone (800) 615-1176, ext. 7500

Training Fax (256) 963-6700

Training Email [training@adtran.com](mailto:training@adtran.com)

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# SYSTEM DESCRIPTION

*This section of ADTRAN's IQ 310 System Manual is designed for use by network engineers, planners, and designers for overview information about the IQ 310.*

*It contains general information and describes physical and operational concepts, module functions, network relationships, provisioning, testing, alarm status, and system monitoring. This section should be used in conjunction with Section 2, Engineering Guidelines.*

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## 1. SYSTEM OVERVIEW

The IQ 310 is a performance monitoring device with monitoring capabilities up to Layer 3 of the network. This intelligent solution for managed Frame Relay access allows you to enjoy the monetary savings of Frame Relay and provides the visibility and control you need for physical connections made in Frame Relay networks.

The IQ 310 provides two slots (one for Dial Backup and one for a Network Interface Module) and features an Ethernet 10BaseT port for management applications. This product provides up to a full T1 worth of access or DDS.

The IQ 310 is complemented by ADTRAN's network management software suite, called N-Form. N-Form is a modular, Java-enabled, Windows-based platform combining the features of a complete SNMP management platform with a network trend analysis tool. Using N-Form, the IQ 310 can be configured remotely through a graphical interface. All alarm conditions and monitoring matrices may be viewed in either graphical or tabular forms.

## 2. FEATURES AND BENEFITS

The following is a brief list of IQ 310 features and benefits:

### Configuration and Management

- ADTRAN N-Form web-based network management suite
- Local and remote VT100 terminal via the **CONTROL** port
- SNMP
- Telnet in-band access through shared or dedicated PVC
- 10BaseT interface for management access
- N-Formant (the N-Form Java Applet)

### Software Upgradeable

- Flash memory
- TFTP download
- XMODEM via **CRAFT/CONTROL** port

### Statistics

- Access line statistics (T1 errors, alarms, tests, ...)
- PVC statistics (PVC state, Tx/Rx bytes and frames, frame size, throughput, ...)
- Port statistics (Tx/Rx bytes and frames, throughput/utilization, invalid frames, ...)
- LMI statistics (LMI state/state changes, polls and responses, timeouts, ...)
- Layer 3 statistics (protocol monitoring per PVC/port for IP/IPX, ARP, SNA, ...)

### 3. NETWORK MODULE DESCRIPTIONS

The IQ 310 has four Network Interface Modules:

- 56k/64k Network Interface Module (P/N 1202801L1)
- T1/FT1 Network Interface Module (P/N 1202802L1)
- T1/FT1 + DSX-1 Network Interface Module (P/N 1202803L1)
- T1 Probe Network Interface Module (P/N 1202804L1)

Each module has a variety of performance and alarm status information. Several features of each module are user-configurable, although default values reflect the most common configurations. All option modules contain an extensive self-test as well as tests designed for the technology they incorporate.

#### **56k/64k Network Interface Module (P/N 1202801L1)**

The 56k/64k Network Interface Module provides one 56k/64k interface for Frame Relay. This interface supports both 56k and 64k operation. The IQ 310 with 56k/64k Network Interface Module system (P/N 4203801L1) ships with one installed 56k/64k Network Interface Module.

#### **T1/FT1 Network Interface Module (P/N 1202802L1)**

The T1/FT1 Network Interface Module provides one channelized T1 interface for Frame Relay. This interface operates in DS-1 or DSX-1 mode and can deliver timing for the system. The IQ 310 with T1/FT1 Network Interface Module system (P/N 4203802L1) ships with one installed T1/FT1 Network Interface Module.

#### **T1/FT1 + DSX-1 Network Interface Module (P/N 1202803L1)**

The T1/FT1 + DSX-1 Network Interface Module provides one channelized T1 interface for Frame Relay and includes an additional DSX-1 interface for TDM voice applications. This T1 interface operates in DS-1 or DSX-1 mode and can deliver timing for the system. The IQ 310 with T1/FT1 + DSX-1 Interface Module system (P/N 4203803L1) ships with one installed T1/FT1 + DSX-1 Network Interface Module.

#### **T1 Probe Network Interface Module (P/N 1202804L1)**

The T1 Probe Network Interface Module provides two channelized T1 interfaces. The Network interface connects to the WAN and the DTE interface connects to a device such as a router enabling the IQ 310 to be an in-line probe. This module has a passive feature that maintains T1 continuity during power loss. The IQ 310 with T1 Probe Module (P/N 4203804L1) ships with one installed T1 Probe Network Interface Module.

## 4. DIAL BACKUP INTERFACE MODULES

The IQ 310 has four Dial Backup Interface Modules:

- V.34 DBU Module (P/N 1204002L3)
- ISDN BRI DBU Module (P/N 1204004L2)
- ISDN PRI DBU Module (P/N 1204008L2)
- DCE DBU Module (P/N 1204006L2)

The IQ 310 Dial Backup (DBU) Modules provide single or multiple site backup, depending on the DBU Module option selected. The IQ 310 can be configured to originate a call based on physical layer conditions (i.e., port failures) and/or PVC outages. Once the criteria are met, the IQ 310 establishes a call to the configured phone number and the connection is used to carry traffic for the PVC(s) configured for DBU operation.

### V.34 DBU Module (P/N 1204002L3)

The V.34 DBU Module provides switched backup of the leased line application. This module allows backup data rates of up to 33.6 kbps over the public switched telephone network (PSTN).

### ISDN BRI DBU Module (P/N 1204004L2)

The ISDN BRI DBU (basic rate interface dial backup) Module supports a U-interface to the Basic Rate ISDN and is compatible with National ISDN, Lucent 5ESS, DMS 100, and NEC. When a T1/FT1 or T1/FT1 + DSX-1 Network Interface Module is installed, the ISDN BRI DBU Module provides a 2B+D Basic Rate ISDN service. When a 56k/64k Network Interface Module is installed, the ISDN BRI DBU Module provides a 1B+D Basic Rate ISDN service.

### ISDN PRI DBU Module (P/N 1204008L2)

The ISDN PRI DBU (primary rate interface dial backup) Module allows the IQ 310 to accept or place up to 23 dial backup calls simultaneously. This module supports 64 kbps data service. Incoming calls will be accepted for 56 kbps or 64 kbps service. Bonding is not supported. Fractional PRI capability is supported.

### DCE DBU Module (P/N 1204006L2)

The DCE DBU Module connects the IQ 310 to an external DBU device such as an ISDN terminal adapter. The DTR signal lead is used to initiate dial backup through the DCE DBU Module. The IQ 310 supports up to 512 kbps of backup service using the DCE DBU Module.

# ENGINEERING GUIDELINES

*Provides information to assist network designers with incorporating the IQ 310 system into their networks.*

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## 1. EQUIPMENT DIMENSIONS

The IQ 310 base unit is 8.1" W, 9.6" D, and 2.7" H. All other pieces of equipment (option modules) fit inside the base unit.

## 2. POWER REQUIREMENTS

The IQ 310 has a maximum power consumption of 9.9 Watts and a maximum current draw of 82 milliAmps regardless of the configuration of option modules installed.

## 3. REVIEWING THE FRONT PANEL DESIGN

The front panel contains the LCD display window, status LEDs, and keypad buttons. The LEDs provide visual information about the IQ 310 base unit and any option module that may be installed. Figure 1 identifies the LCD display window, the LEDs, and the keypad buttons.

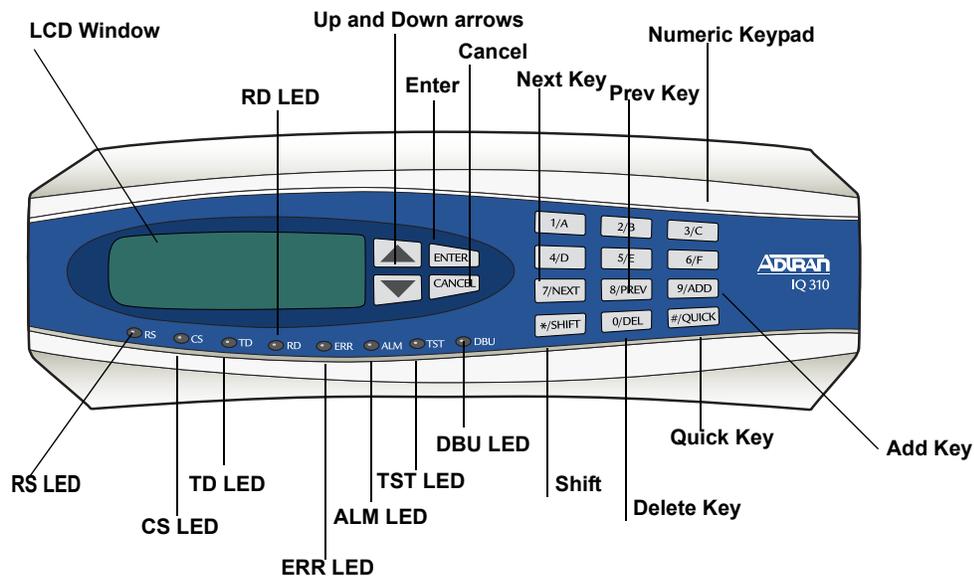


Figure 1. IQ 310 Front Panel Layout

### LCD Window

Displays menu items and messages in this 2 line by 16 character display.

### Enter Key

Selects active menu items. To activate a menu item, scroll to it using the arrow keys or press the number of the item. The flashing cursor indicates the active parameter. Press **<ENTER>** to select the active menu item.

### Up and Down Arrow Keys

Scrolls through the menu and activates the menu items of the current menu. The flashing cursor indicates an active parameter.

## Cancel Key

Press the **CANCEL** key to stop the current activity and return to the previous menu. Press repeatedly until the desired menu level is reached. When a submenu item is displayed, press **CANCEL** to exit the current display and return to the previous menu.

## Quick Key

Pressing the **QUICK** key returns the front panel to the Main menu.

## Numeric Keypad

The numeric keypad contains the numbers **0** through **9** and alpha characters **A** through **F**, which are used to activate menu items and enter information such as the IP address.

## Next, Prev, Add, Delete Keys

To activate these functions, press and release the **SHIFT** key, then press the **NEXT**, **PREV**, **ADD**, or **DELETE** key. Use these keys when editing tables such as the PVC Options table.

## Shift Key

Enter alpha characters by first pressing and releasing the **SHIFT** key and then pressing the desired character. The **NEXT**, **PREV**, **ADD**, and **DELETE** keys are also activated by first pressing **SHIFT**.

To activate a menu item designated by an alpha character rather than a number, place the cursor on the menu item using the up and down arrows or press and release **SHIFT** and then press the letter. The flashing cursor indicates the active parameter. Press **<ENTER>** to select the item.

## Front Panel LEDs

With the IQ 310 powered-up, the front panel LEDs provide visual information about the status of the IQ 310 and any option modules that may be installed. Table 1 provides detailed information about the front panel LEDs.

**Table 1. IQ 310 LEDs**

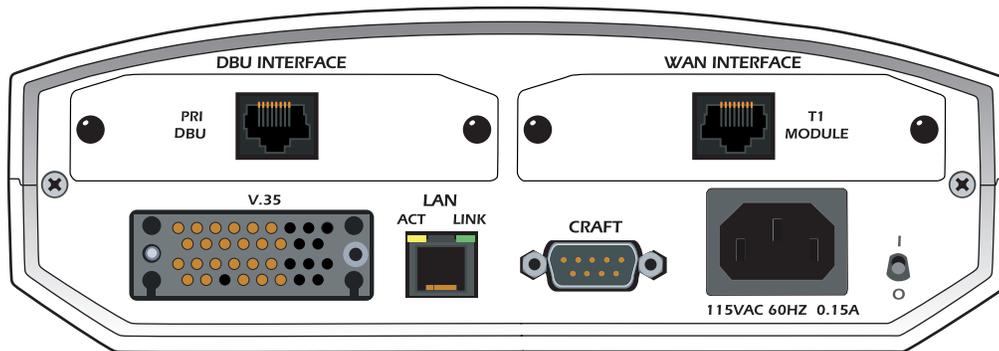
For these LEDs...	This color light...	Indicates that...
<b>RS (Request to Send)</b>	Green	there is an active RS signal on DTE interface.
<b>CS (Clear to Send)</b>	Green	there is an active CS signal on DTE interface.
<b>TD (Transmit Data)</b>	Green (flashes)	there is transmit data activity on the DTE interface.
<b>RD (Receive Data)</b>	Green (flashes)	there is receive data activity on the DTE interface.
<b>ERR (Error)</b>	Red (flashes)	there is an active T1 line code violation or T1 path code violation.

**Table 1. IQ 310 LEDs (Continued)**

For these LEDs...	This color light...	Indicates that...
<b>ALM (Alarm)</b>	Red	one of the following alarm conditions exists: <ul style="list-style-type: none"> <li>• Loss of signal</li> <li>• Loss of T1 frame sync (red alarm)</li> <li>• Receiving AIS (alarm indication signal) from the service provider</li> <li>• Frame Relay signaling is down.</li> </ul>
<b>TST (Test)</b>	Amber	the network interface is in a loopback condition triggered locally or from the service provider.
<b>DBU (Dial Backup)</b>	Red	the unit is in dial backup.

#### 4. REVIEWING THE REAR PANEL DESIGN

The IQ 310 rear panel contains two expansion slots (one for Dial Backup and one for a Network Interface Module), a DTE connector which provides primary channel V.35, and an Ethernet 10BaseT port for management applications (see Figure 2).



**Figure 2. IQ 310 Rear Panel**

#### V.35 Nx56/64 Connector

The DTE should be connected to the V.35 connector (labeled **V.35**) with a maximum cable length of 100 feet. Table 2 on page 24 shows the pinout for the V.35 Winchester-style connector.

**Table 2. V.35 Winchester Pinout**

Pin	CCITT	DESCRIPTION
A	101	Protective ground (PG)
B	102	Signal ground (SG)
C	105	Request to send (RTS) from DTE
D	106	Clear to send (CTS) to DTE
E	107	Data set ready (DSR) to DTE
F	109	Received line signal detector (DCD) to DTE
H	—	Data terminal ready (DTR) from DTE
J	—	Ring indicator (RI)
R	104	Received data (RD-A) to DTE
T	104	Received data (RD-B) to DTE
V	115	RX clock (RC-A) to DTE
X	115	RX clock (RC-B) to DTE
P	103	Transmitted data (TD-A) from DTE
S	103	Transmitted data (TD-B) from DTE
Y	114	TX clock (TC-A) to DTE
AA	114	TX clock (TC-B) to DTE
U	113	External TX clock (ETC-A) from DTE
W	113	External TX clock (ETC-B) from DTE
NN	—	Test mode (TM) to DTE

**CRAFT/CONTROL Port (DB-9)**

The **CRAFT/CONTROL** port (EIA-232) connects to a computer or modem or to a VT100 terminal. The **CRAFT/CONTROL** port input provides the following functions:

- Accepts EIA-232 input from a PC or a modem for controlling the IQ 310
- Operates at 9600, 19200, 38400, or 57600 bps
- Acts as input for either VT100 terminal or PC control
- Acts as an interface for flash memory software downloads using XMODEM

Table 3 on page 25 shows **CRAFT/CONTROL** pinout.

**Table 3. CRAFT/CONTROL Pinout**

PIN	NAME	DESCRIPTION
1	DCD	Carrier detect
2	RD	Data received by the IQ 310
3	TD	Data transmitted by the IQ 310
4	DTR	Data terminal ready
5	GND	Ground - connected to unit chassis
6	DSR	Data set ready
7	RTS	Request to send - flow control
8	CTS	Clear to send - flow control
9	UNUSED	—

### LAN Ethernet Connection (RJ-48C)

The LAN port provides a 10BaseT Ethernet connection, which is used for IP Routing, TFTP, SNMP, and Telnet connection. Table 4 shows the pinout.

**Table 4. LAN Ethernet Pinout**

PIN	NAME	DESCRIPTION
1	TX1	Transmit positive
2	TX2	Transmit negative
3	RX1	Receive positive
4, 5	UNUSED	—
6	RX2	Receive negative
7, 8	UNUSED	—

## 5. NETWORK INTERFACE MODULES

The IQ 310 provides two expansion slots that allow different types of interfaces to be used. The following is a discussion of the available Network Interface Modules.

### 56k/64k Network Interface Module – RJ-48S (P/N 1202801L1)

The 56k/64k Network Interface Module provides a single 8-position modular jack to connect to the DDS network. The 56k/64k Network Interface Module provides the following functions:

- Network performance monitoring and reporting
- Extensive self-testing

Table 5 on page 26 shows the 56k/64k NIM pinout.

**Table 5. 56k/64k Network Interface Module Pinout**

PIN	NAME	DESCRIPTION
1	R1	Transmit data toward the network - Ring 1
2	T1	Transmit data toward the network - Tip 1
3	UNUSED	—
4	UNUSED	—
5	UNUSED	—
6	UNUSED	—
7	T	Receive data from the network - Tip
8	R	Receive data from the network - Ring

**T1/FT1 Network Interface Module – RJ-48C (P/N 1202802L1)**

The T1/FT1 Network Interface Module provides a single T1 port and complies with the applicable ANSI and AT&T® standards. The T1/FT1 Network Interface Module provides the following functions:

- AMI or B8ZS coding
- Manual line build-out
- D4 or ESF framing
- Network performance monitoring and reporting
- Test loopbacks
- Extensive self-testing

Table 6 shows the T1/FT1 NIM pinout.

**Table 6. T1/FT1 Network Interface Module Pinout**

PIN	NAME		DESCRIPTION
1	R1	RXDATA-RING	Receive data from the network
2	T1	RXDATA-TIP	Receive data from the network
3	—	UNUSED	—
4	R	TXDATA-RING	Transmit data toward the network
5	T	TXDATA-TIP	Transmit data toward the network
6, 7, 8	—	UNUSED	—

### T1/FT1 + DSX-1 Network Interface Module – RJ-48C (P/N 1202803L1)

The T1/FT1 + DSX-1 Network Interface Module provides one T1 port and one DSX-1 port and complies with the applicable ANSI and AT&T® standards. The T1/FT1 + DSX-1 Network Interface Module provides the following functions:

- AMI or B8ZS coding
- Manual line build-out
- D4 or ESF framing
- Network performance monitoring and reporting
- Test loopbacks
- Extensive self-testing

The pinouts for the T1/FT1 + DSX-1 NIM T1 and DSX-1 ports are shown in Table 7 and Table 8 below.

**Table 7. T1/FT1 + DSX-1 Network Interface Module Pinout (T1 Port)**

PIN		NAME	DESCRIPTION
1	R1	RXDATA-RING	Receive data from the network
2	T1	RXDATA-TIP	Receive data from the network
3	—	UNUSED	—
4	R	TXDATA-RING	Transmit data toward the network
5	T	TXDATA-TIP	Transmit data toward the network
6, 7, 8	—	UNUSED	—

**Table 8. T1/FT1 + DSX-1 Network Interface Module Pinout (DSX Port)**

PIN		NAME	DESCRIPTION
1	R1	TXDATA-RING	Transmit data toward the PBX
2	T1	TXDATA-TIP	Transmit data toward the PBX
3	—	UNUSED	—
4	R	RXDATA-RING	Receive data from the PBX
5	T	RXDATA-TIP	Receive data from the PBX
6, 7, 8	—	UNUSED	—

### T1 Probe Network Interface Module - RJ-48C (P/N 1202804L1)

The T1 Probe Network Interface Module provides a T1 **NETWORK** interface and a T1 **DTE** interface. The T1 Probe complies with the applicable ANSI and AT&T® standards and provides the following functions:

- AMI or B8ZS coding
- Manual line build-out
- D4 or ESF framing
- Network performance monitoring and reporting
- Test loopbacks
- Extensive self-testing

Table 9 and Table 10 show the T1 Probe NIM pinout.

**Table 9. T1 Network (RJ-48C) Connection Pinout**

Pin	Name	Description
1	R1	Receive data from the network
2	T1	Receive data from the network
3	—	UNUSED
4	R	Transmit data toward the network
5	T	Transmit data toward the network
6-8	—	UNUSED

**Table 10. DTE Interface (RJ-48C) Pinout**

Pin	Name	Description
1	R1	Transmit data toward the DTE device
2	T1	Transmit data toward the DTE device
3	—	UNUSED
4	R	Receive data from the DTE device
5	T	Receive data from the DTE device

## 6. DIAL BACKUP INTERFACE MODULES

The IQ 310 provides two expansion slots that allow different types of interfaces to be used. The following is a discussion of the available Dial Backup Interface Modules.

**V.34 DBU Module (P/N 1204002L3)**

The following table shows the pinouts for the V.34 DBU Module.

**Table 11. V.34 DBU Module Pin Assignments**

Pin	Name	Description
1-3	-	Not used
4	T	Network-Tip
5	R	Network-Ring
6-8	-	Not used

**ISDN BRI DBU Module (P/N 1204004L2)**

The following table shows the pinouts for the ISDN BRI DBU Module.

**Table 12. ISDN BRI DBU Module Pin Assignments**

Pin	Name	Description
1-3	-	Not used
4	T	Network-Tip
5	R	Network-Ring
6-8	-	Not used

**ISDN PRI DBU Module (P/N 1204008L2)**

The following table shows the pinouts for the ISDN PRI DBU Module.

**Table 13. ISDN PRI DBU Module Pin Assignments**

Pin	Name	Description
1	R1 RXDATA-RING	Receive data from the network
2	T1 RXDATA-TIP	Receive data from the network
3	UNUSED	--
4	R TXDATA-RING	Send data toward network
5	T TXDATA-TIP	Send data toward network
6,7,8	UNUSED	--

**External DCE DBU Module (P/N 1204006L2)**

The following table shows the pinouts for the DCE DBU Module.

**Table 14. DCE Connector Pin Assignments**

DB25 Pin#	V.35 Pin#	Function	DTE Port Direction	DCE Port Direction
1	A	FGND		
2		TD(EIA-232)	I	O
3		RD(EIA-232)	O	I
4	C	RTS	I	O
5	D	CTS	O	I
6	E	DSR	O	I
7	B	GND		
8	F	DCD	O	I
9		NEG		
10		POS		
11	AA	TC-B(V.35)	O	I
12	Y	TC-A(V.35)	O	I
13	V	RC-A(V.35)	O	I
14	T	RC-B(V.35)	O	I
15		TC(EIA-232)	O	I
16	R	RD-A(V.35)	O	I
17		RC		
18	S	TD-B(V.35)	I	O
19	P	TD-A(V.35)	I	O
20	H	DTR	I	O
21	W	ETC-B(V.35)	I	O
22	-	-	-	-
23	U	ETC-A(V.35)	I	O
24		ETC(EIA-232)	I	O
25	X	RC-B(V.35)	O	I



*The IQ 310 External DCE Module DB-25 interface supports EIA-232 or V.35. V.35 requires an external DCE V.35 adapter cable (male DB-25 to male V.35, P/N 1200193L1; or male DB-25 to female V.35, P/N 1200194L1).*

# NETWORK TURNUP PROCEDURE

*Provides shipment contents list, grounding instructions, mounting options, and specifics of supplying power to the unit.*

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## 1. INTRODUCTION

This section discusses installation of the IQ 310 system.

### **WARNING**

*To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*



*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

## 2. UNPACK AND INSPECT THE SYSTEM

Each IQ 310 is shipped in its own cardboard shipping carton. Open each carton carefully and avoid deep penetration into the carton with sharp objects.

After unpacking the unit, inspect it for possible shipping damage. If the equipment has been damaged in transit, immediately file a claim with the carrier, then contact ADTRAN Customer Service (see *Warranty and Customer Service Information* in the front of this manual).

### **Contents of ADTRAN Shipments**

Your ADTRAN shipment includes the following items:

- The IQ 310 base unit
- The IQ 310 System CD including the System Manual and ADTRAN Utilities
- RJ-45 to RJ-45 cable - ADTRAN P/N 3127004
- AC power cord - ADTRAN P/N 3127031
- Network Interface Module and appropriate contents (depending on system level part number)
  - 4203801L1 IQ 310 with 56k/64k Network Interface Module
  - 4203802L1 IQ 310 with T1 Network Interface Module
  - 4203803L1 IQ 310 with T1 with DSX Network Interface Module
  - 4203804L1 IQ 310 with T1 Probe Network Interface Module



*Refer to the individual Network Interface Module shipping contents on page 35 for additional information.*

### 3. GROUNDING INSTRUCTIONS

The following provides grounding instruction information from the Underwriters' Laboratory UL 60950 Standard for Safety of Information Technology Equipment Including Electrical Business Equipment, of December, 2000.

An equipment grounding conductor that is not smaller in size than the ungrounded branch-circuit supply conductors is to be installed as part of the circuit that supplies the product or system. Bare, covered, or insulated grounding conductors are acceptable. Individually covered or insulated equipment grounding conductors shall have a continuous outer finish that is either green, or green with one or more yellow stripes. The equipment grounding conductor is to be connected to ground at the service equipment.

The attachment-plug receptacles in the vicinity of the product or system are all to be of a grounding type, and the equipment grounding conductors serving these receptacles are to be connected to earth ground at the service equipment. A supplementary equipment grounding conductor shall be installed between the product or system and ground that is in addition to the equipment grounding conductor in the power supply cord.

The supplementary equipment grounding conductor shall not be smaller in size than the ungrounded branch-circuit supply conductors. The supplementary equipment grounding conductor shall be connected to the product at the terminal provided, and shall be connected to ground in a manner that will retain the ground connection when the product is unplugged from the receptacle. The connection to ground of the supplementary equipment grounding conductor shall be in compliance with the rules for terminating bonding jumpers at Part K or Article 250 of the National Electrical Code, ANSI/NFPA 70. Termination of the supplementary equipment grounding conductor is permitted to be made to building steel, to a metal electrical raceway system, or to any grounded item that is permanently and reliably connected to the electrical service equipment ground.

The supplemental grounding conductor shall be connected to the equipment using a number 8 ring terminal and should be fastened to the grounding lug provided on the rear panel of the equipment. The ring terminal should be installed using the appropriate crimping tool (AMP P/N 59250 T-EAD Crimping Tool or equivalent).



- *This unit shall be installed in accordance with Article 400 and 364.8 of the NEC NFPA 70 when installed outside of a Restricted Access Location (i.e., central office, behind a locked door, service personnel only area).*
- *Power to the IQ 310 must be from a grounded 115 VAC, 60 Hz source.*
- *The power receptacle uses double-pole, neutral fusing.*
- *Maximum recommended ambient operating temperature is 50 °C.*

### 4. SUPPLYING POWER TO THE UNIT

The AC-powered IQ 310 comes equipped with a detachable 8-foot power cord with a 3-prong plug for connecting to a grounded power receptacle. As shipped, the IQ 310 is set to factory default conditions. After installing the base unit and any option modules, the IQ 310 is ready for power-up. To power-up the unit, ensure that the unit is properly connected to an appropriate power source and turn on the unit using the on/off switch on the rear panel.

## 5. MOUNTING OPTIONS

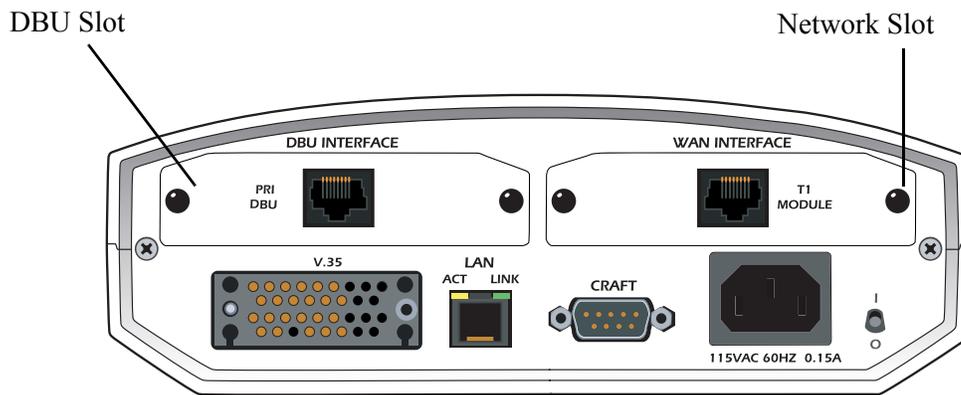
The IQ 310 base unit may be installed for tabletop, 19-inch or 23-inch rack mount, or wall mount configuration. Shelves may be purchased from ADTRAN to achieve the rack mount configuration.



*Be careful not to upset the stability of the equipment mounting rack when installing this product.*

## 6. INSTALLING NETWORK AND DIAL BACKUP INTERFACE MODULES

Figure 1 shows the option slot numbering designation as viewed from the rear of the IQ 310. The network slot accepts only IQ 310 Network Interface Modules, and the DBU slot accepts any of the IQ Series Dial Backup Interface Modules.



**Figure 1. IQ 310 Slot Designation (Rear Panel)**

**WARNING**

*Option modules are intended to be serviced by qualified service personnel only.*

**WARNING**

*Modules are **not** hot swappable.*

## Instructions for Installing the IQ 310 Network and Dial Backup Interface Modules

Instructions for Installing the IQ 310 Option Modules	
Step	Action
1.	Power off the unit.
2.	Remove the cover plate from the appropriate option slot of the IQ 310 rear panel.
3.	Slide the option module into the option slot until the module is firmly seated against the front of the chassis.
4.	Secure the tabs at both edges of the module.
5.	Connect the cables to the associated device(s).
6.	Complete installation of remaining modules and base unit as specified in the appropriate sections of this Network Turnup Procedure.
7.	Power on the unit.

### 56k/64k Network Interface Module (P/N 1202801L1)

#### **Shipping Contents**

The ADTRAN shipment of the 56k/64k Network Interface Module includes the following items:

- 56k/64k Network Interface Module
- 56k/64k Network Interface Module Quick Start Guide
- RJ-45 to RJ-45 cable - ADTRAN P/N 3127004

### T1/FT1 Network Interface Module (P/N 1202802L1)

#### **Shipping Contents**

The ADTRAN shipment of the T1/FT1 Network Interface Module includes the following items:

- T1/FT1 Network Interface Module
- T1/FT1 Network Interface Module Quick Start Guide
- RJ-45 to RJ-45 cable - ADTRAN P/N 3127004

### T1/FT1 + DSX-1 Network Interface Module (P/N 1202803L1)

#### **Shipping Contents**

The ADTRAN shipment of the T1/FT1 + DSX-1 Network Interface Module includes the following items:

- T1/FT1 + DSX-1 Network Interface Module
- T1/FT1 + DSX-1 Network Interface Module Quick Start Guide
- Two RJ-45 to RJ-45 cables - ADTRAN P/N 3127004

**T1 Probe Network Interface Module (P/N 1202804L1)*****Shipping Contents***

The ADTRAN shipment of the T1 Probe Network Interface Module includes the following items:

- T1 Probe Network Interface Module
- T1 Probe Network Interface Module Quick Start Guide
- Two RJ-45 to RJ-45 cables - ADTRAN P/N 3127004

# USER INTERFACE GUIDE

*This section of ADTRAN's IQ 310 System Manual is designed for use by network administrators and others who will configure and provision the system. It contains information about navigating the VT100 user interface and using the front panel LCD display.*

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## 1. NAVIGATING THE TERMINAL MENU

### Terminal Menu Window

The IQ 310 uses a multi-level menu structure that contains both menu items and data fields. All menu items and data fields display in the terminal menu window (see Figure 1), through which you have complete control of the IQ 310.

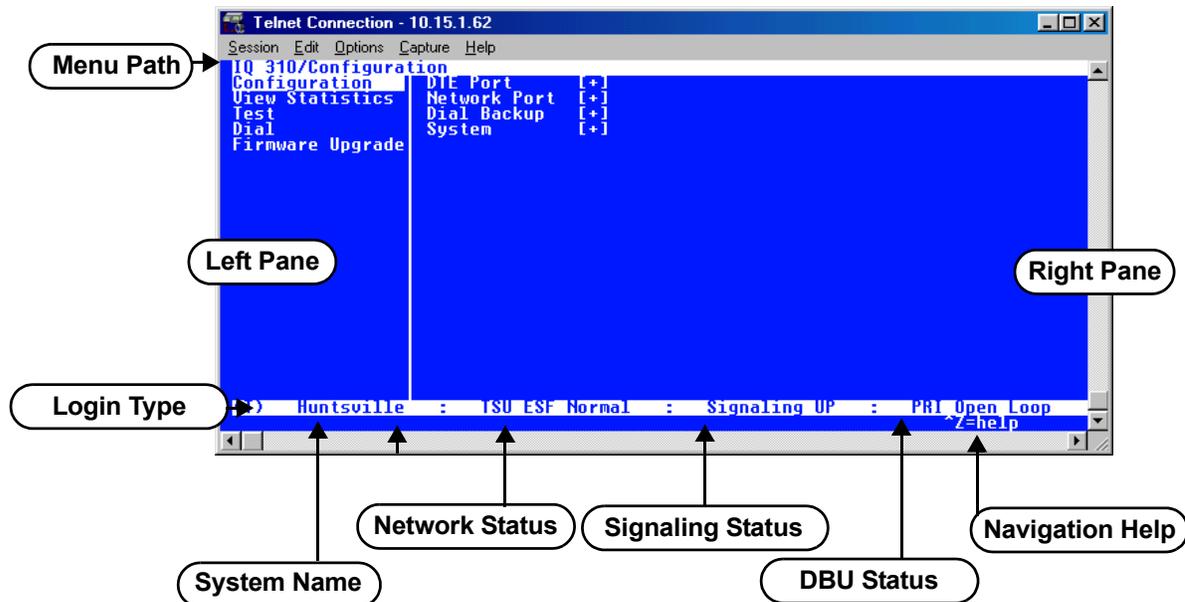


Figure 1. Top-Level Terminal Menu Window

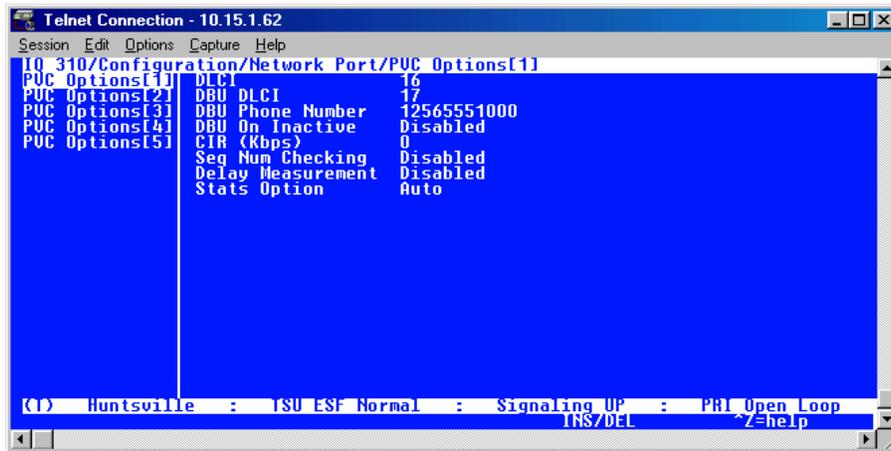
### Menu Path

The first line of the terminal menu window (the menu path) shows the session's current position (path) in the menu structure. For example, Figure 1 shows the top-level menu with the cursor on the **CONFIGURATION** submenu; therefore, the menu path reads **IQ 310/CONFIGURATION**.

### Window Panes

When you first start a terminal menu session, the terminal menu window is divided into left and right panes. The left pane shows the list of available submenus, while the right pane shows the contents of the currently selected submenu.

You can view the terminal windows in two ways: with fields and submenus displaying horizontally across the right pane, or with fields and submenus displaying vertically down the right pane. Viewing submenus vertically rather than horizontally allows you to see information at a glance rather than scrolling horizontally across the window. To change the view, move your cursor to an index number and press **<ENTER>**. Figure 2 shows this alternate view. Fields and submenu names may vary slightly in this view.



**Figure 2. Alternate Menu View**

**Window Pane Navigation**

Use the following chart to assist you in moving between and within the two window panes.

To do this...	Press one of the following keys...
Move from left pane to right pane	Tab Enter Right arrow
Move from right pane to left pane	Shift+Tab Escape Left arrow Backspace
Move within each pane	Up arrow Down arrow Left arrow Right arrow

**Right Window Pane Notation**

The right window pane shows the contents of the currently selected menu. These contents can include both submenu items and data fields. Some submenus contain additional submenus and some data fields contain additional data fields. The chart on the following page explains the notation used to identify these additional items.

This notation...	Means that...
[+]	More items are available when selected.
<+>	An action is to be taken, such as activating a test.
Highlighted field	You can enter data in this field.
Underlined field	The field contains read-only information.

### **Additional Terminal Menu Window Features**

- Login Type - Displays **L** when menu reflects the local unit, **R** for a remote unit, and **T** during a Telnet session.
- System Name - Displays the name entered in the **SYSTEM NAME** field.
- Network Status - Displays the current state of the incoming network circuit.
- Signaling Status - Displays the current LMI state of the network interface.
- DBU Status - Displays the current state of the DBU service (available when a DBE module is installed).
- Navigation Help - Lists characters used for navigating the terminal menu **<CTRL + Z>**.

### **Navigating Using the Keyboard Keys**

You can use various keystrokes to move through the terminal menu, to manage a terminal menu session, and to configure the system. Press **<CTRL + Z>** to activate a pop-up screen listing the navigation keystrokes.

### **Moving through the Menus**

To do this...	Press this key...
Return to the home screen	H
Select items	Arrows
Edit a selected menu item	Enter
Cancel an edit	Escape
Close pop-up help screen	Escape
Move between the left and right panes	Tab Arrows
Move to the top of a screen	A
Move to the bottom of a screen	Z
Ascend one menu level	Backspace

### Session Management Keystrokes

To do this...	Press this key...
Log out of a session	CTRL + L
Refresh the screen To save time, only the portion of the screen that has changed is refreshed. This option should only be necessary if the display picks up incorrect characters.	CTRL + R

### Configuration Keystrokes

To do this...	Press this key...
Insert a new list item. For example, add a new item to the list by pressing <I> while the cursor is over the index number.	I
Delete a list item. For example, delete an item from the list by pressing <D> while the cursor is over the index number.	D

### Getting Help

Press **<CTRL + Z>** to activate a help screen that displays the available keystrokes you can use to navigate the terminal menu.

## 2. TERMINAL MENU AND SYSTEM CONTROL

### Selecting the Appropriate Menu

The terminal menu is the access point to all other operations. Each terminal menu item has several functions and submenus that identify and provide access to specific operations and parameters. Use the chart below to help select the appropriate terminal menu.

To do this...	Go to this menu...
Set network operating parameters for the DTE, network, and dial backup interfaces, to provision system options.	<b>CONFIGURATION</b>
Display status information for the DTE port, network port, DBU port, <b>ETHERNET</b> port, <b>CRAFT/CONTROL</b> port, and system.	<b>VIEW STATISTICS</b>
Activate ping, Net and DTE loopback, and PVC loopback testing functions.	<b>TEST</b>
Access dialing functions (only available when DBU module is installed).	<b>DIAL</b>
Upgrade firmware.	<b>FIRMWARE UPGRADE</b>

### 3. MENU DESCRIPTIONS

#### CONFIGURATION MENUS

---



*The following **PHYSICAL LAYER OPTIONS** do not apply if the T1 Probe Network Interface Module is installed.*

#### **CONFIGURATION > DTE PORT > PHYSICAL LAYER OPTIONS > FLOW CONTROL**

This option determines how the IQ 310 responds to congestion during DBU operation.

**NONE** - No flow control is used and the IQ 310 drops frames during severe congestion while in DBU operation.

**HARDWARE** - The IQ 310 varies the DTE TC clock as necessary to relieve congestion during DBU operation.

**FECN/BECN** - While in a congested state during DBU operation, frames across the DBU PVCs have **FECN** or **BECN** set depending on the direction. Frames outbound to the network have **FECN** set, while frames inbound to the attached DTE device have **BECN** set. This method is useful if the attached DTE devices can respond to congestion notification.

#### **CONFIGURATION > DTE PORT > PHYSICAL LAYER OPTIONS > CTS OPTION**

Set the CTS lead to **FORCED ON** or **FOLLOW RTS**.

**FORCED ON** - The CTS lead is always on and the RTS lead is ignored.

**FOLLOW RTS** - The CTS lead is on when the RTS lead is on (and off when the RTS lead is off).

#### **CONFIGURATION > DTE PORT > PHYSICAL LAYER OPTIONS > DSR OPTION**

Set the DSR lead to **FORCED ON** or **NORMAL**.

**FORCED ON** - The DSR lead is always on.

**NORMAL** - The DSR lead is off when the IQ 310 is in a loopback test or an alarm state.

#### **CONFIGURATION > DTE PORT > PHYSICAL LAYER OPTIONS > CD OPTION**

Set the CD lead to **FORCED ON** or **NORMAL**.

**FORCED ON** - The CD lead is always on.

**NORMAL** - The CD lead is off when the IQ 310 is in alarm state.

**CONFIGURATION > DTE PORT > PHYSICAL LAYER OPTIONS > TC CLOCK OPTION**

**NORMAL** - Clock for DTE's transmit data normal phase.

**INVERTED** - Clock for DTE's transmit data inverted phase. May be used in high speed circuits (>512 kbps) when the DTE's V.35 interface has high delay. This is usually indicated by HDLC errors on the IQ 310's DTE port.



*The following **DTE > FRAME RELAY OPTIONS** applies to all Network Interface Modules.*

**CONFIGURATION > DTE PORT > FRAME RELAY OPTIONS**

Use the following selections to configure timeout intervals and error thresholds, and to configure PVC management settings.

**CONFIGURATION > DTE PORT > FRAME RELAY OPTIONS > T392**

Set the timeout (in seconds) between polling intervals. This parameter needs to be a few seconds longer than the T391 setting of the attached frame relay device. Range is **5** to **30** seconds.

**CONFIGURATION > DTE PORT > FRAME RELAY OPTIONS > N392 AND N393**

These parameters define the error threshold for the UNI (user to network interface) formed by the IQ 310 DTE port and the attached frame relay device. If the error threshold is met, the signaling state status is changed to down, which indicates a service-affecting condition. This condition is cleared once N393 consecutive error-free events are received. N392 defines the number of errors required in a given event window, while N393 defines the number of polling events in each window.

For example:

If N392=3 and N393=4, then if three errors occur within any four events, the interface is determined inactive.

The status of the connection can be viewed in the **VIEW STATISTICS > DTE PORT > SIGNAL STATE** menu (see *Stats Menu* on page 60). The status returns to **ACTIVE** once the threshold is no longer exceeded.

**CONFIGURATION > DTE PORT > FRAME RELAY OPTIONS > MANAGEMENT DLCI**

To use local PVC management, enter the management data link connection identifier (DLCI). The **MANAGEMENT DLCI** is a special DLCI used between the attached DTE device and the IQ 310 to carry SNMP and Telnet packets to/from the IQ 310 on the DTE port.

**Guidelines for Configuring Management DLCI**

If the attached router or FRAD is used to route SNMP/Telnet frames to the IQ 310, set the **MANAGEMENT DLCI** to a unique value (between 16 and 1007) that identifies the virtual circuit between the router/FRAD and the IQ 310. The router/FRAD must also be configured to route the IQ 310 IP address to this DLCI. The **IP ADDRESS** and **SUBNET MASK** for the DTE (V.35) port must also be set in the **SYSTEM CONFIGURATION** menu.

**CONFIGURATION > DTE PORT > FRAME RELAY OPTIONS > MANAGEMENT PVC OPTION**

If this option is set to **ENABLED**, the management DLCI is included in the Full Status response to the router. Enable this option when the management DLCI is used to route management traffic to the IQ 310. Options are **ENABLED** and **DISABLED**.

**CONFIGURATION > DTE PORT > FRAME RELAY OPTIONS > SIGNALING RESPONSES**

This option determines when PVC **SIGNALING RESPONSES** are sent to the router.

**ALWAYS ON** - If enabled, PVC **SIGNALING RESPONSES** are sent to the router regardless of the network signaling state. Enable this option when the IQ 310 is used for dial backup.

**FOLLOW NETWORK (FOLLOW NET)** - If enabled, PVC **SIGNALING RESPONSES** are sent to the router only when the network signaling state is up. Enable this option when the router is going to use an alternate path for dial backup.

**ALWAYS OFF** - If enabled, PVC signaling responses are NOT sent to the router, regardless of the network signaling state. Enable this option to simulate a PVC failure when the router is going to use an alternate path for dial backup.



*The following **NETWORK > PHYSICAL LAYER OPTIONS** are in groups based on the Network Interface Module (NIM).*

**CONFIGURATION > NETWORK PORT > PHYSICAL LAYER OPTIONS > T1 + DSX NIM**

**CHANNEL MAP** - This field allows the user to map each individual DS0 to the **DSX-1** port or to the **DTE** port, or to set it to **IDLE**.

**DS01 . . . DS024** - Listing of individual DS0s in the Channel Map.

**FRAMING FORMAT** - Set the frame format for the network interface.  
Choices: **D4**, **ESF**, and **AUTO**.



*D4 is equivalent to superframe format (SF).*

**LINE CODE** - Set the line code for the network interface.

Choices: **AMI** (alternate mark inversion) or **B8ZS**.

**CLOCK SOURCE** - Select the clock source to be derived from the network or from the unit's internal clock. The selected clocking option designates the clock source for transmission. Clocking necessary for receiving data is recovered from incoming data. This option is most commonly set to **FROM NETWORK**.

Choices: **INTERNAL** and **FROM NETWORK**.

**LINE BUILDOUT (LBO)** - Select the line buildout for the network interface. In **AUTO** mode, the IQ 310 sets the **LBO** based on the strength of the receive signal. Options: **AUTO, 0, 7.5, 15, and 22.5 dB**.

**RX GAIN** - Select the desired receiver sensitivity setting. The factory default is **NORMAL**, which is adequate for most applications. The extended setting should be used only in applications where the **NORMAL** setting is not sufficient. If the receive signal strength is less than 30 dB, choose **EXTENDED**.

**CHANNEL RATE** - Set the channel bandwidth for **56** or **64** kbps.

**TRANSMIT PRM** - Enabling performance report messages (PRM) allows the IQ 310 to send messages across the facility data link (FDL) per ANSI T1.403. The terminating device at the telco may use this information for management of the T1 loop. The IQ 310 supports PRM messages per AT&T Pub 54016 which is a poll/response type protocol. Because of this poll/response nature, the transmit PRM option does not disable the IQ 310 from processing or responding to 54016-type messages.

Choices: **YES** or **NO**.

## CONFIGURATION > NETWORK PORT > PHYSICAL LAYER OPTIONS > T1 NIM

**FRAMING FORMAT** - Set the frame format for the network interface.

Choices: **D4, ESF**, and **AUTO**.



*D4 is equivalent to superframe format (SF).*

**LINE CODE** - Set the line code for the network interface.

Choices: **AMI** (alternate mark inversion) or **B8ZS**.

**CLOCK SOURCE** - Select the clock source to be derived from the network or from the unit's internal clock. The selected clocking option designates the clock source for transmission. Clocking necessary for receiving data is recovered from incoming data. This option is most commonly set to **FROM NETWORK**.

Choices: **INTERNAL** and **FROM NETWORK**.

**LINE BUILDOUT (LBO)** - Select the line buildout for the network interface. In **AUTO** mode, the IQ 310 sets the **LBO** based on the strength of the receive signal. Options: **AUTO, 0, 7.5, 15, and 22.5 dB**.

**RX GAIN**- Select the desired receiver sensitivity setting. The factory default is **NORMAL**, which is adequate for most applications. The extended setting should be used only in applications where the **NORMAL** setting is not sufficient. If the receive signal strength is less than 30 dB, choose **EXTENDED**.

**CHANNEL RATE** - Set the channel bandwidth for **56** or **64 KBPS**.

**CHANNEL ALIGNMENT** - This field allows the user to select the channel alignment to be **CONTIGUOUS** or **ALTERNATING**.

**START CHANNEL** - Select the channel in which the T1 stream starts. The setting must be consistent with the carrier if using a public network. The range is **1** to **24**.

**NUMBER OF CHANNELS** - Select the number of DS0s (channels) to be used. The range is **1** to **24**.

**TRANSMIT PRM** - Enabling performance report messages (PRM) allows the IQ 310 to send messages across the facility data link (FDL) per ANSI T1.403. The terminating device at the telco may use this information for management of the T1 loop. The IQ 310 supports PRM messages per AT&T Pub 54016 which is a poll/response type protocol. Because of this poll/response nature, the transmit PRM option does not disable the IQ 310 from processing or responding to 54016-type messages.

Choices: **YES** or **NO**.

#### **CONFIGURATION > NETWORK PORT > PHYSICAL LAYER OPTIONS > 56/64K NIM**

**LOOP RATE** - Set the loop rate for **56 KBPS**, **64 KBPS**, or **AUTO**.

**CLOCK SOURCE** - Configure the IQ 310 to derive clocking from itself (**INTERNAL**) or from the network. The most common application is **FROM NETWORK**.

#### **CONFIGURATION > NETWORK PORT > PHYSICAL LAYER OPTIONS > T1 PROBE NIM**

**FRAMING FORMAT** - Set the frame format for the network interface.

Choices: **D4**, **ESF**, and **AUTO**.

**LINE CODE** - Set the line code for the network interface.

Choices: **AMI** (alternate mark inversion) or **B8ZS**.

**CLOCK SOURCE** - Select the clock source to be derived from the network or from the unit's internal clock. The selected clocking option designates the clock source for transmission. Clocking necessary for receiving data is recovered from incoming data. This option is most commonly set to **FROM NETWORK**.

Choices: **INTERNAL** and **FROM NETWORK**.

**LINE BUILDOUT (LBO)** - Select the line buildout for the network interface. In **AUTO** mode, the IQ 310 sets the **LBO** based on the strength of the receive signal.

Options: **AUTO**, **0**, **7.5**, **15**, and **22.5 dB**.

**RX SENSITIVITY** - Select the desired receiver sensitivity setting. The factory default is **NORMAL**, which is adequate for most applications. The extended setting should be used only in applications where the **NORMAL** setting is not sufficient. If the receive signal strength is less than 30 dB, choose **EXTENDED**.

**CHANNEL BANDWIDTH** - Set the channel bandwidth for **56** or **64 KBPS**.

**CHANNEL ALIGNMENT** - This field allows the user to select the channel alignment to be **CONTIGUOUS** or **ALTERNATING**.

**START CHANNEL** - Select the channel in which the T1 stream starts. The setting must be consistent with the carrier if using a public network. The range is **1** to **24**.

**TRANSMIT PRM** - Enabling performance report messages (PRM) allows the IQ 310 to send messages across the facility data link (FDL) per ANSI T1.403. The terminating device at the telco may use this information for management of the T1 loop. The IQ 310 supports PRM messages per AT&T Pub 54016 which is a poll/response type protocol. Because of this poll/response nature, the transmit PRM option does not disable the IQ 310 from processing or responding to 54016-type messages.

Choices: **YES** or **NO**.



*The following **NETWORK PORT** and **FRAME RELAY OPTIONS** applies to all Network Interface Modules.*

#### **CONFIGURATION > NETWORK PORT > FRAME RELAY OPTIONS > SIGNAL TYPE**

Set the signaling type option to match the network signaling type. **AUTO** mode forces the IQ 310 to use the same signaling type as the attached frame relay DTE. If **AUTO** is selected and there is no DTE device attached, the IQ 310 uses ANSI T1.617-D signaling type.

Choices: **NONE**, **LMI** (gang of four), **ANSI T1.617-D** (Annex D), **ITU-T Q.933-A** (Annex A), or **AUTO**.

#### **CONFIGURATION > NETWORK PORT > FRAME RELAY OPTIONS > SIGNAL POLLS**

Set the signal polls to either **NORMAL** or **FOLLOWS DTE**. If set to **NORMAL**, the signal state will reflect the signal state of the network. If set to **FOLLOWS DTE**, the signal state will reflect the signal state of the DTE device.

#### **CONFIGURATION > NETWORK PORT > FRAME RELAY OPTIONS > T391**

Set the time (in seconds) between polls to the frame relay network.

#### **CONFIGURATION > NETWORK PORT > FRAME RELAY OPTIONS > N391**

Determine how many link integrity polls occur in between full status polls.

**CONFIGURATION > NETWORK PORT > FRAME RELAY OPTIONS > N392 AND N393**

These parameters define the error threshold for the UNI formed by the IQ 310 network port and the frame relay switch. If the error threshold is met, the signaling state is changed to down, which indicates a service-affecting condition. This condition is cleared once N393 consecutive error-free events are received. N392 defines the number of errors required in a given event window, while N393 defines the number of polling events in each window.

For example:

If N392=3 and N393= 4, then if three errors occur within any four events the interface is determined inactive.

The status of the connection can be viewed in the **STATISTICS** menu under **NETWORK PORT SIGNALING STATE**. The status will return to active again once the threshold is no longer exceeded.



*The network service provider should recommend the values entered into the T391, N391, N392, and N393 fields.*

**CONFIGURATION > NETWORK PORT > MANAGEMENT DLCI 1 AND DLCI 2**

Enter the management data link connection identifiers (DLCIs). These DLCIs are used to carry management traffic to and from the network.

**CONFIGURATION > NETWORK PORT > MGMT DLCI 1 AND DLCI 2 MODE**

Set to **DEDICATED** if the management DLCI is used only to manage the IQ 310 (and not used to carry customer traffic). If set to **DEDICATED**, the router is not notified of that DLCI. Set to **SHARED** if the management DLCI is used for carrying customer traffic and management data.

**CONFIGURATION > NETWORK PORT > MAXIMUM PVC COUNT**

Set the maximum number of PVCs that the IQ 310 will monitor for statistical information. This value determines the amount of history intervals available for storage. To get the maximum amount of statistical history storage, set this value equal to the number of PVCs assigned to the frame relay port. A smaller value increases history interval count.

**CONFIGURATION > NETWORK PORT > HISTORY INTERVAL COUNT**

Set the number of history intervals to store for statistics. History intervals are displayed in the **INTERVAL** portions of the **STATISTICS** menus. These views provide data grouped by the interval of time selected in the **HISTORY INTERVAL SIZE** field. The **HISTORY INTERVAL COUNT** field determines how many intervals can be stored at a time. The maximum value allowed is affected by the **MAX PVC COUNT** selection (previously described).

**CONFIGURATION > NETWORK PORT > PVC CONFIG**

The information in this menu must be entered for each PVC. DLCI numbers and their corresponding CIRs are provided by the service provider.



*The following **NETWORK PORT > PVC CONFIG** options are **not** applicable if the TI Probe NIM is installed.*



*When configuring PVC options using the front panel the **NEXT**, **PREV**, **ADD**, and **DELETE** keys are used.*

**CONFIGURATION > NETWORK PORT > PVC CONFIG > DLCI**

Enter the Network DLCI.

Range: **16** to **1007**.

**CONFIGURATION > NETWORK PORT > PVC CONFIG > DBU DLCI**

Enter the far end DLCI for each PVC used for dial backup. Only the IQ 310 that originates the call is required to have this option set. These options are only available if a DBU module is installed.

The range for the DBU DLCI field is from **16** to **1007**. Therefore, you cannot manually enter 0 for the PVCs not used in DBU. When an entry is first created with the **ADD** selection, it is set to 0 by default. To reset a previously configured DBU DLCI to 0, delete the entry and then add it back in (using the **DELETE** and **ADD** selections).



*Only PVCs that are used in DBU should have the DBU DLCI set to a non-zero value.*



*The **PVC CONFIG > DBU PHONE NUMBER**, **DBU CALL ORDER**, and **DBU ON INACTIVE** options are only available if a DBU module is installed. However, they are not available with the DCE DBU module installed.*

**CONFIGURATION > NETWORK PORT > PVC CONFIG > DBU PHONE NUMBER**

The phone number entry stores the phone number that is used when the IQ 310 triggers auto DBU in case of port or PVC failure. The phone number should correspond to a location that is equipped with an “Adtran Safety Net” device that is capable of restoring the PVC which is designated by the DBU DLCI element.

If auto DBU is triggered by port failure, then the DBU Call Order element determines the order of a dialing list for alternate backup locations.

**CONFIGURATION > NETWORK PORT > PVC CONFIG > DBU CALL ORDER**

This determines the order in which a list of backup locations will be dialed. This applies only to auto dial backup processes that are triggered by port failure. If all DBU Call Order entries are set to **NONE**, then the first entry with a DBU phone number will be used.

**CONFIGURATION > NETWORK PORT > PVC CONFIG > DBU ON INACTIVE**

This option works in conjunction with the dial backup criteria option **WITH PVC INACTIVE**. For the **DBU ON INACTIVE** option to have an affect on auto DBU operation, the **WITH PVC INACTIVE** option must be set to **ENABLE**.

If **DBU ON INACTIVE** is set for **ENABLED** and the PVC designated by the DLCI element goes to an inactive or unknown state, the IQ 310 will dial the phone number designated by the **DBU PHONE NUMBER** element in the table entry.

**GROUP** is a special case in which all PVCs that are part of a group must be in an inactive or unknown state before the auto DBU process is triggered. This special case is treated as a port failure in which the **DBU CALL ORDER** entry applies.

**CONFIGURATION > NETWORK PORT > PVC OPTIONS > CIR (Kbps)**

Enter the CIR (committed information rate) in kbps for the corresponding DLCI. The information is provided by your service provider and must be entered for each PVC.



*The following **PVC OPTIONS** are applicable to all Network Interface Modules.*

**CONFIGURATION > NETWORK PORT > PVC OPTIONS > SEQ NUM CHECKING**

Set to **ENABLE** only if there is an IQ or ATLAS product on the other end of the PVC. When enabled, the IQ 310 tags each frame with a sequence number which is then used by the remote IQ or ATLAS unit to detect lost packets. Lost packet counts are given in the **STATISTICS** menus.

**CONFIGURATION > NETWORK PORT > PVC OPTIONS > DELAY MEASUREMENT**

Set to **ENABLE** only if there is an IQ or ATLAS product on the other end of the PVC. When enabled, the IQ 310 periodically transmits a loopback frame to the remote IQ or ATLAS unit which is then returned to measure round trip delay of each PVC. Minimum, maximum, and average delay measurements are given in the **STATISTICS** menus.

**CONFIGURATION > NETWORK PORT > PVC OPTIONS > STATS OPTION**

This option prioritizes PVCs for **STATISTICS** counts. The IQ 310 tracks statistics for a limited number of the PVCs that pass through. This number is determined in the **MAX PVC COUNT** field. The three choices for this field are described below:

**AUTO** - If set to **AUTO**, then statistics will be logged for this PVC if the **MAX PVC COUNT** has not been exceeded. The **AUTO** selection designates a PVC as second priority to a PVC set to **ENABLED**.

**ENABLED** - If set to **ENABLED**, then statistics will be logged for this PVC if the **MAX PVC COUNT** has not been exceeded. A PVC set to **ENABLED** is designated as a higher priority than one set to **AUTO**.

**DISABLED** - If set to **DISABLED**, then statistics will not be logged for this PVC at any time.



*If the IQ 310 encounters a PVC that has not been entered into the **PVC OPTIONS** table, the PVC is set to **AUTO** by default.*



*The following **DSX PORT** and **DIAL BACKUP** options do not apply to the T1 Probe NIM.*

**CONFIGURATION > DSX PORT > FRAMING FORMAT**

Set the frame format for the DSX-1 interface. These options are only available if a T1/DSX network interface module is installed.

Choices: **D4**, **ESF**, and **AUTO**.

**CONFIGURATION > DSX PORT > LINE CODE**

Set the line code for the DSX-1 interface. These options are only available if a T1/DSX network interface module is installed.

Choices: **AMI** (alternate mark inversion) or **B8ZS**.

**CONFIGURATION > DSX PORT > YELLOW ALARM**

**YEL ALARM** enables and disables the transmitting of yellow alarms. These options are only available if a T1/DSX network interface module is installed.

Choices: **ENABLE**, **DISABLE**

**CONFIGURATION > DSX PORT > LINE LENGTH**

**LINE LENGTH** provides selection of the proper output level for the DSX-1 based on the length of the interface cable. These options are only available if a T1/DSX network interface module is installed.

Choices: **1-133 FT**, **133-266 FT**, **266-399 FT**, **399-533 FT**, **533-655 FT**, **7.5 DB**

**CONFIGURATION > DSX PORT > IN-BAND LOOPBACK**

**INBAND LOOPBACK** sets the DSX-1 to accept or reject in-band loopup or loopdown codes (per ANSI T1.403 specification) which may be sent to the module over the DSX-1 interface. This loopback is a line loopback. These options are only available if a T1/DSX network interface module is installed.

Choices: **ACCEPT**, **REJECT**

**CONFIGURATION > DSX PORT > ROBBED BIT SIGNALING**

This menu option is used to enable/disable robbed-bit signaling. Whenever the DSX-1 interface is connected to terminal equipment (i.e., PBX/SW56) for voice or dialed data services, this option should be enabled. The only exception is when the terminal equipment is using a form of common channel signaling (i.e., PRI). These options are only available if a T1/DSX network interface module is installed.

Choices: **ENABLE**, **DISABLE**

**CONFIGURATION > DIAL BACKUP > AUTO DBU**

The **AUTOMATIC DBU** option specifies whether the unit automatically enters dial backup mode or waits for manual setup. The factory default setting is **DISABLE**. This option is only available with the DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > ANSWER/ORIGINATE**

This option is only available when the frame relay signaling is set to none. When using a non-frame relay circuit, one unit must be set to originate the DBU call and the other unit must be set to answer the call. This option is only available with the DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > ANSWER ALWAYS**

If this feature is enabled, the unit will answer a call. If disabled, it will not answer a call. However, the **ANSWER ALWAYS** option must work in conjunction with the **AUTO DBU** and **ORIGINATE/ANSWER** options. The **AUTO DBU** option is the controlling option and if it is disabled, the unit *will not answer* the call regardless of how **ANSWER ALWAYS** is set, except for the DCE DBU which *will answer* the call regardless of the **AUTO DBU** setting. The **ORIGINATE/ANSWER** feature only appears when the unit is programmed for a nonframe-relay circuit (signaling none). If both **ANSWER ALWAYS** and **AUTO DBU** are enabled, the unit will answer the call even if it is set to **ORIGINATE**.

The **ANSWER ALWAYS** option is only available with the DBU module installed. This option is not available with DCE or PRI DBU modules installed.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > BEEPER OPTION**

If enabled, the IQ 310 issues an intermittent beep while in dial backup. This option is only available with the DBU module installed.

Choices: **DISABLE** or **ENABLE**.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > PASSWORD OPT**

When enabled, the passwords entered in the **DBU PASSWORD** fields of both the near and far end IQ 310s are required to match before a dial backup connection can be made. The setting in this field must also be identical in both units (i.e., they both must be set to either **ENABLED** or **DISABLED**).

The **PASSWORD OPT** option is only available with the DBU module installed. However, this option is not available with DCE or PRI DBU modules installed.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > DBU PASSWORD**

Enter the authentication string used for making a dial backup connection. The near and far end IQ 310 DBU passwords must be identical. This option is only available with the DBU module installed. However, this option is not available with DCE or PRI DBU modules installed.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > DAILY LOCKOUT**

Enable/disable the daily lockout specified by the fields **LOCKOUT START** and **LOCKOUT END**. This option is only available with the DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > LOCKOUT START**

Enter the hour that the daily lockout begins and dial backup is disabled. This setting only applies if the **DAILY LOCKOUT** parameter is enabled. This option is only available with the DBU module installed. Choices are **0** to **23**.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > LOCKOUT END**

Enter the hour that the daily lockout ends and dial backup is reactivated (0 to 23). This setting only applies if the **DAILY LOCKOUT** parameter is enabled. This option is only available with the DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU OPTIONS > WEEKEND LOCK**

If enabled, no backup will occur from midnight Friday to midnight Sunday. This option is only available with the DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU CRITERIA**

These options are only available with the DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU CRITERIA > T1/DSX MODULE**

These options are only available with the DBU module installed.

**WITH NETWORK FAILURE** - When enabled, the IQ 310 enters backup mode when network failure is detected. The factory default setting is **ENABLE**.

**WITH NO LMI** - When enabled, the IQ 310 enters backup mode when a loss of signaling from the frame relay switch is detected. The default setting is **ENABLE**.

**WITH PVC INACTIVE** - This option works in conjunction with the **DBU ON INACTIVE** option in the PVC configuration table. The **WITH PVC INACTIVE** option acts as a master switch for auto DBU operation based on the PVC state. If this option is set to **ENABLED**, then each **DBU ON INACTIVE** option applies. If this option is set to **DISABLE**, then each **DBU ON INACTIVE** option is disabled. This option is not available with a DCE DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU CRITERIA > T1 MODULE**

These options are only available with the DBU module installed.

**WITH NETWORK FAILURE** - When enabled, the IQ 310 enters backup mode when network failure is detected. The factory default setting is **ENABLE**.

**WITH NO LMI** - When enabled, the IQ 310 enters backup mode when a loss of signaling from the frame relay switch is detected. The default setting is **ENABLE**.

**WITH PVC INACTIVE** - This option works in conjunction with the **DBU ON INACTIVE** option in the PVC configuration table. The **WITH PVC INACTIVE** option acts as a master switch for auto DBU operation based on the PVC state. If this option is set to **ENABLED**, then each **DBU ON INACTIVE** option applies. If this option is set to **DISABLE**, then each **DBU ON INACTIVE** option is disabled. This option is not available with a DCE DBU module installed.

**CONFIGURATION > DIAL BACKUP > DBU CRITERIA > 56/64K NETWORK INTERFACE MODULE**

These options are only available with the DBU module installed.

**WITH OOS** - When enabled, the IQ 310 enters backup mode when an **OUT OF SERVICE** message is received from the network.

**WITH NO RX** - When enabled, the IQ 310 enters backup mode when a no receive signal condition exists.

**WITH NO SC** - When enabled, the IQ 310 enters backup mode when a loss of sealing current is detected.

**WITH NO LMI** - When enabled, the IQ 310 enters backup mode when a loss of signaling from the frame relay switch is detected. The default setting is **ENABLE**.

**WITH PVC INACTIVE** - This option works in conjunction with the **DBU ON INACTIVE** option in the PVC configuration table. The **WITH PVC INACTIVE** option acts as a master switch for **AUTO DBU** operation based on the PVC state. If this option is set to **ENABLED**, then each **DBU ON INACTIVE** option applies. If this option is set to **DISABLE**, then each **DBU ON INACTIVE** option is disabled. This option is not available with a DCE DBU module installed.

#### **CONFIGURATION > DIAL BACKUP > DBU TIMERS > FAIL TIMER (X10 SECS)**

This option sets the amount of time the frame relay circuit failure condition must exist before the IQ 310 attempts backup. The value entered is multiplied by 10. The amount of time can be up to 990 seconds (i.e., an entry of 99). The factory default setting is 10 seconds (an entry of **1**). This option is only available with the DBU module installed. This option is only available with the DBU module installed.

#### **CONFIGURATION > DIAL BACKUP > DBU TIMERS > RESTORE TIMER (MINS)**

Once the frame relay circuit is down, the IQ 310 remains in backup until the frame relay circuit is active for the length of time specified for the restore timer. The selection is entered in minutes (up to 255). If set to 0, the line must be restored manually. The factory default setting is **1** minute. This option is only available with the DBU module installed.

#### **CONFIGURATION > DIAL BACKUP > DBU TIMERS > REDIAL COUNTER**

This option sets the number of times the IQ 310 redials the far end when entering backup mode. The redial count, which is manually entered, can be up to a maximum of 99 attempts. If the IQ 310 encounters a busy or reorder, it attempts to establish the call the specified number of times. The factory default setting is **5**. This option is only available with the DBU module installed.

#### **CONFIGURATION > DIAL BACKUP > DBU TIMERS > WAIT TO REDIAL (SECS)**

This option works in conjunction with the preceding **REDIAL COUNTER**. It selects the amount of time between redial attempts to connect the backup line. The amount of time, which is manually entered, can be up to 99 seconds. The factory default setting is 15 seconds. This option is only available with the DBU module installed.

**CONFIGURATION > DIAL BACKUP > ISDN OPTIONS**

This option is only available with the BRI ISDN DBU module installed.

**SWITCH TYPE** - Select which type of telco switch is providing the ISDN service. There are four options for ISDN switch types:

- **LUCENT 5ESS**
- **DMS100**
- **NATIONAL**
- **NEC**

**B-CHANNEL BIT RATE** - Select the channel bit rate for the ISDN service. Select 64k unless your service only provides 56k.

**NUMBER OF B-CHANNELS** - Select the number of B-channels supported by the ISDN service. Select **2** if bonding is used. This option is not available when a 56k/64k network interface module is installed.

**SPID 1** and **SPID 2** - Enter the service profile identifier (SPID) for both B-channels. The SPID is a sequence of digits identifying ISDN terminal equipment to the ISDN switch when more than one ISDN set has been attached to the same central office line. The SPID is assigned by the telco when the ISDN line is installed and normally resembles the phone number.

Only the Lucent 5ESS switch is capable of recognizing a point-to-point configuration, eliminating the need for a SPID. All other switch types require a SPID.

The **SPID 2** option is not available when a 56k/64k network interface module is installed.

**LDN 1 AND LDN 2** - Enter the LDNs for both B-channels. The LDNs are assigned by the telco when the ISDN line is installed. The **LDN 2** option is not available when a 56/64K network interface module is installed.

**CONFIGURATION > DIAL BACKUP > CALL SCREENING**

If **CALL SCREENING** is set to **ENABLE**, the IQ 310 will only accept incoming calls from the numbers entered in the **NUMBER 1** through **NUMBER 5** fields. Calls from any other number or from an unidentifiable number are rejected (for BRI module only). This option only available with BRI ISDN DBU Module installed.

**CONFIGURATION > DIAL BACKUP > MODEM OPTIONS**

These options are only available with a V.34 DBU module installed.

**TONE/PULSE** - Select the dialing method for the dial backup service.

**MAX BAUD RATE** - This sets the maximum rate at which the call will connect.

Choices: **2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200, 33600.**

**SYNC/ASYNC** - Set to **SYNC** if the unit is connecting to another IQ unit. Set to **ASYNC** if the unit is connecting to an ATLAS. Changing this option will reboot the unit. This option is not available via N-Formant.

**CONFIGURATION > DIAL BACKUP > PRI OPTIONS**

These options are only available with a PRI DBU module installed.

**PHYSICAL LAYER OPTIONS** - The following sections describe the **PHYSICAL LAYER OPTIONS** available for the PRI DBU module.

**LINE CODE** - Set the line coding of the PRI DBU module to **B8ZS** for PRI applications.

**CLOCK SOURCE** - Set the clock source to be derived from the network or from the unit's internal clock. The selected clocking option designates the clock source for transmission. Clocking necessary for receiving data is recovered from incoming data. This option is most commonly set to **NETWORK**.

**LBO** - Select the output level (in dB) for the PRI DBU module interface.  
Choices: **AUTO, 0, 7.5, 15.0, and 22.5 dB**.

**RX GAIN** - Select the desired receiver sensitivity setting. The factory default setting is **NORMAL**, which is adequate for most applications. The **EXTENDED** setting should be used only in applications where the **NORMAL** setting is not sufficient. If the receive signal strength is less than 30 dB, choose **EXTENDED**.

**START CHANNEL** - Select the channel in which the T1 stream starts. The setting must be consistent with the carrier if using a public network.

**NUMBER OF CHANNELS** - Select the number of DS0s (channels) that are to be used. Note that the PRI module uses one DS0 per connected call.

**TX YELLOW ALARM** - Set **TX YEL ALARM** to **YES** to transmit yellow alarms when a red alarm is detected. Set this entry to **NO** to avoid transmitting yellow alarms upon red alarm detection.

**LOCAL LOOPBACK** - This forces the PRI into loopback on the network. This option can be used instead of setting the loopback up using loop codes from external test equipment.  
Choices: **NONE, PAYLOAD, and LINE**.

**TRANSMIT PRM** - Set this entry to **YES** to enable the unit to send messages across the facility data link (FDL) per ANSI T1.403.

**SWITCH TYPE** - Select which type of telco switch is providing the ISDN service. This information is available from your service provider.  
Choices: **LUCENT 5ESS, DMS 100, NATIONAL**.

**LDN** - Enter the LDN for this location. This information is available from your service provider.

**CONFIGURATION > DIAL BACKUP > DCE OPTIONS**

These options are only available with a DCE DBU module installed.

**INTERFACE TYPE** - Select the connector type for the **DCE** interface.  
Choices: **EIA-232; V.35**.

**DBU BIT RATE (KBPS)** - Set to the operating speed of the **DBU** interface.  
Choices: **0 to 1536** kbps.

**CONFIGURATION > BAUD RATE**

This field allows the user to select the baud rate of the **CRAFT/CONTROL** port. This option is only available on the front panel interface.

Choices: **9600**, **19.2K**, **38.4K**, and **57.6K**.



*The following **SYSTEM** options are applicable for all Network Interface Modules.*

**CONFIGURATION > SYSTEM > PASSWORD**

Enter a new password of ten characters or less. The default password is **adtran** (not available on front panel).

**CONFIGURATION > SYSTEM > IP ADDRESS**

Enter the IQ 310 IP (internet protocol) address.

**CONFIGURATION > SYSTEM > SUBNET MASK**

Enter the subnet mask assigned to the LAN that the **ETHERNET** port is attached to.

**CONFIGURATION > SYSTEM > GATEWAY IP ADDR**

Enter the IP address of the Gateway. The Gateway IP address is used when an Ethernet packet is transmitted from the IQ 310 to a different subnet.

**CONFIGURATION > SYSTEM > READ COMMUNITY**

Enter the authentication strings used for SNMP management. Match the IQ 310 to the SNMP manager for read privileges.

**CONFIGURATION > SYSTEM > WRITE COMMUNITY**

Enter the authentication strings used for SNMP management. Match the IQ 310 to the SNMP manager for write privileges.

**CONFIGURATION > SYSTEM > TRAP MGR OPTIONS > TRAP MANAGER DLCI**

If the **TRAP MANAGER PORT** is set for **NETWORK** or **DTE**, this parameter identifies the virtual circuit used for all traps generated by the IQ 310.

**CONFIGURATION > SYSTEM > TRAP MGR OPTIONS > TRAP MANAGER IP**

Enter the IP address of the SNMP manager to which the IQ 310 sends traps.

**CONFIGURATION > SYSTEM > TRAP MGR OPTIONS > TRAP MANAGER PORT**

Enter the IQ 310 port used to transmit traps to the SNMP manager.

Choices: **NONE**, **DTE PORT**; **NETWORK PORT**; **CRAFT/CONTROL PORT**, **ETHERNET PORT**.

**CONFIGURATION > SYSTEM > SYSTEM NAME**

Enter a descriptive name for the unit. This name can help you distinguish between different installations. Enter up to 20 alpha-numeric characters in this field, including spaces and special characters (such as an underbar). The name is then displayed in the terminal menu. This selection is only available for the terminal interface.

**CONFIGURATION > SYSTEM > PROPRIETARY OPTIONS**

The proprietary option affects the following functions: remote login, delay measurement, sequence number checking, and dial backup. The following sections describe the interaction of the proprietary option and these functions:

**Remote Login**

Both units must have the proprietary option set to enabled in order for **REMOTE LOGIN** to function properly.

If the proprietary option is disabled on the unit, the **REMOTE LOGIN** option will not appear as a choice on the unit's menus via the terminal interface. If the proprietary option is enabled on the local unit but disabled on the remote unit, the local unit will have the **REMOTE LOGIN** option on the menu, but the remote login will not be successful. The screen will lock at the "Any key to continue or <CTRL + L> <ENTER> to exit" screen. Pressing <CTRL + L> will unlock the screen.

**Delay Measurement and Sequence Number Checking**

Both units must have the proprietary option set to enabled in order for **DELAY MEASUREMENT** and **SEQUENCE NUMBER CHECKING** options to function properly.

If the proprietary option is disabled on the unit, the **DELAY MEASUREMENT** and **SEQUENCE NUMBER CHECKING** options will not appear as a choice on the unit's menus via Telnet or terminal interface. If the user tries to initiate a PVC loopback test, the unit will display "Proprietary Option Disabled."

If the proprietary option is enabled on the local unit and disabled on the remote unit, the local unit's PVC Loopback test will indicate Frames TX incrementing and Frames RX will be zero.

**Dial Backup**

Both units must have the proprietary option set to enabled in order for the **DIAL BACKUP** options to function properly. All DBU is proprietary (V.34, ISDN BRI, ISDN PRI, and DCE). The **PROPRIETARY** option must work in conjunction with the **AUTO DBU** option. If **AUTO DBU** is disabled, the unit will not answer an incoming call regardless of the **PROPRIETARY** option setting. If the **PROPRIETARY** option is disabled, all DBU menus will still appear on all interfaces (Telnet, terminal, and front panel). If the **PROPRIETARY** option is disabled on the unit where the DBU criteria are met, that unit will not attempt to dial. If the **PROPRIETARY** option is enabled on a unit where the DBU criteria are met and disabled on the answer unit, the call will connect (provided **AUTO DBU** is set to enabled on the answer unit), but data will not pass over the dial backup link.

**CONFIGURATION > SYSTEM > FRF.12 OPTION**

FRF-12 defines a standard method for transmitting packets into multiple smaller Frame Relay Frames. Choices: **ENABLE** or **DISABLE**.

**CONFIGURATION > SYSTEM > SYSTEM TIME**

Set the current hour, minute, and second to be used to time stamp all statistical data captured by the IQ 310.

**CONFIGURATION > SYSTEM > SYSTEM DATE**

Set the day, month, and year to be used to date stamp all statistical data captured by the IQ 310.

**CONFIGURATION > SYSTEM > HISTORY INTERVAL SIZE**

The time entered in this field affects the **INTERVAL VIEW** in the **STATISTICS** menus. The **INTERVAL VIEW** provides historical data for the current day. The data is divided into columns grouped by the interval of time selected in this field. Once the maximum amount of storage time is reached, new information overwrites existing information, beginning with the least current.

Choices: **5**, **10**, **15**, **20**, or **30** minutes.

**CONFIGURATION > SYSTEM > SYSTEM REBOOT!**

Restarts the IQ 310 System.

Choices: **No** and **YES REBOOT SYSTEM**



*If data is not retrieved before the Total Time Stored is exceeded, it is overwritten and cannot be restored. Total Time Stored = History Interval Size x History Interval Count.*

**STATS MENU****Menu Viewing Options**

Some statistics are given in two formats: view by **INTERVALS** and view by **DAYS**. Once a viewing format is selected, the statistics can be viewed horizontally or vertically. The viewing choices are described in the following sections.

**Selecting a View Format (Intervals or Days)****View by Interval**

In this view, the first interval selection is a running total for the current day. All other selections are grouped into user-configured time frames with the most recent information displayed first. The first interval's header displays the current date, and the interval selections which follow display the time the intervals began. In order to categorize the intervals by date also, the midnight time stamp is replaced with the date. Note that this column still represents the timed interval (not a day's worth of information).

To configure the interval time frame, go to the **SYSTEM CONFIGURATION** menu and select **HISTORY INTERVAL SIZE**. Then enter the time you want the history interval to be set for (choices are **5 MIN**, **10 MIN**, **15 MIN**, **20 MIN**, and **30 MIN**). The IQ 310 gathers and displays the

information according to the time selected. An example of a **STATISTICS** screen in the **INTERVALS** view format is shown in Figure 3.



*The IQ 310 cuts the first gathering session short in order to begin falling on the selected time boundary. For example: If the unit or the statistics information was last reset at 12:03 and the History Interval Size is set for five minutes, then the first interval session will last only two minutes. Therefore, the earliest interval column (i.e., the interval listed last if no intervals have been deleted yet) normally represents a time shorter than the other columns.*

### View by Day

This view provides historical information for the last seven days (not including the current day). The most recent information is displayed first.



*The first day's information (i.e., the last listing) does not represent a full day's worth of information (unless the unit or the statistics information was reset at exactly 12 AM).*

```

Telnet Connection - 10.15.1.62
Session Edit Options Capture Help
IQ 310/View Statistics/DIE Port/Port Stats/Intervals[04/14]
Intervals[04:14] Loc PUC Rx Fr 0
Intervals[22:00] Loc PUC Rx Bt 0
Intervals[21:30] Loc PUC Tx Fr 0
Intervals[21:00] Loc PUC Tx Bt 0
Intervals[20:30] Port UA Time 0
Intervals[20:00] Sig Down Time 0
Intervals[19:30] Signal Error 0
Intervals[19:00] Signal T/O 0
Intervals[18:30] Sig State Chg 0
Intervals[18:00] Rx Full Stat 1269
Intervals[17:30] Rx LI Only 6342
Intervals[17:00] Tx Full Stat 1269
Intervals[16:30] Tx LI Only 6342
Intervals[16:00] Async Status 0
Intervals[15:30] Discard Frames 8
Intervals[15:00] Aborts 8
Intervals[14:30] CRC Error 0
Intervals[14:00] Octet Align 0
Intervals[13:30] Length Error 0
Intervals[13:00] EA Violation 0
Intervals[12:30] Encap Error 0
(1) Huntsville : ISU ESF Normal : Signaling UP : PRI Open Loop
**/=help

```

Figure 3. Example of Interval View

### **Horizontal or Vertical Display**

View statistical information either horizontally or vertically, according to your preference. When you first enter the statistics menu, the unit defaults to the horizontal presentation. When the fields are displayed horizontally, scroll using your left and right arrow keys to view the fields not shown on the current screen.

To set the screen to vertical presentation (as shown in Figure 3), use the arrow keys to highlight the left-most column of one of the rows (this will be either the date or time, depending on the viewing type selected). Press **<ENTER>**. When the fields are displayed vertically, scroll using your up and down arrow keys to view the fields not shown on the current screen.

### **VIEW STATISTICS > DTE PORT > PORT STATS > INTERVALS**



*The following DTE PORT statistics are not applicable to the T1 Probe NIM. See page 64 for the beginning of the T1 Probe DTE PORT statistics.*

**LOC PVC Rx FR** - Total frames received by the DTE port on the local management PVC.

**LOC PVC Rx BT** - Total bytes received by the DTE port on the local management PVC.

**LOC PVC Tx FR** - Total frames transmitted by the DTE port on the local management PVC.

**LOC PVC Tx BT** - Total bytes transmitted by the DTE port on the local management PVC.

**FRF-12 Rx FRAMES** - Number of FRF-12 frames received on this interface. FRF-12 defines a standard method for transmitting packets into multiple smaller Frame Relay Frames.

**PORT UA TIME** - Time in seconds the DTE port is unavailable for data delivery.

**SIG DOWN TIME** - Time in seconds the signaling state is down on the DTE port.

**SIGNAL ERROR** - Number of signal frames received by the DTE port with PVC signaling protocol violations.

**SIGNAL T/O** - Number of T392 timeouts that have occurred on the DTE port.

**SIG STATE CHG** - Number of changes in the signaling protocol state on the DTE port.

**RX FULL STAT** - Number of full status polls received on the DTE port.

**RX LI ONLY** - Number of link integrity (LI) responses received on the DTE port.

**TX FULL STAT** - Number of full status responses transmitted on the DTE port.

**TX LI ONLY** - Number of link integrity (LI) responses transmitted on the DTE port.

**ASYNCR STATUS** - Number of asynchronous status messages received by the DTE port.

**DISCARD FRAMES** - Number of frames discarded by the IQ 310 on the DTE port due to ADLC violations. This count includes **ABORTS**, **CRC ERRORS**, **OCTET ALIGN**, and **LENGTH ERRORS**.

**ABORTS** - Number of frames received by the DTE port without a closing flag. This transmission error is also reflected in the **DISCARD FRAME** field.

**CRC ERROR** - Number of frames received by the DTE port with CRC violations. This transmission error is also reflected in the **DISCARD FRAME** field.

**OCTET ALIGN** - Number of frames received by the DTE port with a bit count that does not fall on 8-bit boundaries. This transmission error is also reflected in the **DISCARD FRAME** field.

**TX UNDERRUN** - Number of underrun frames sent to the network indicating that the interface buffers are empty.

**LENGTH ERROR** - Number of frames received by the DTE port with fewer than 5 octets or greater than 4500 octets. This link violation is also reflected in the **DISCARD FRAME** field.

**EA VIOLATION** - Number of frames received by the DTE port with an error in the extended address (EA) bit field of the frame relay header.

**ENCAP ERROR** - Number of frames received by the DTE port on the management DLCI that have RFC 1490 errors.

**INACTIVE DLCI** - Number of frames received by the DTE port on an inactive DLCI.

**INVALID DLCI** - Number of frames received by the DTE port on a DLCI that is out of range. The valid DLCI range is **16** to **1007**.

**UNROUTEABLE** - Number of frames received by the DTE port on the management DLCI with an IP address that does not match the IQ 310 IP address.

#### **VIEW STATISTICS > DTE PORT > PORT STATS > DAYS**

The definitions for the **DTE PORT > PORT STATS > DAYS** statistics are identical to the **DTE PORT > PORT STATS > INTERVALS** statistics. The day view provides historical information for the last seven days (not including the current day).

#### **VIEW STATISTICS > DTE PORT > DTE STATUS > STATUS**

**SIGNAL STATE** - Indicates whether the frame relay signaling state is currently up or down.

**CTS** - Clear to send.

**RTS**- Request to send.

**DTR**- Data terminal ready.

**DSR**- Data set ready.

**DCD**- Data carrier detect.



*The Signal State and **T1 STATE** DTE statistics are only available for the T1 Probe Network Interface Module.*

**SIGNAL STATE** - Displays the signal status of the DTE T1 port.

**T1 STATE** - Displays the framing status of the DTE T1 port.

#### VIEW STATISTICS > DTE PORT > LAYER1 STATS > INTERVALS



*The following intervals are only available when a T1 Probe NIM is installed.*

**STATE CHG** - Number of changes in the signaling protocol state on the DTE port.

**UA TIME** - Time in seconds the DTE T1 link is down.

**SIGNAL LOSS** - If **ALARM** is displayed, a loss of signal occurred one or more times during the given interval.

**TELCO TEST** - If **ALARM** is displayed, a loopback code was received on the T1 interface one or more times during the given interval.

**AIS ALARM** - If **ALARM** is displayed, unframed all ones were received on the T1 interface one or more times during the given interval. This indicates that the T1 is out of service.

**RED ALARM** - If **ALARM** is displayed, a loss of frame synchronization occurred one or more times during the given interval.

**YELLOW ALARM** - If **ALARM** is displayed, the network end of the T1 was out of frame sync one or more times during the given interval.

**PLL ALARM** - **ALARM** displayed in this field usually signifies that both ends of the T1 interface are set to provide timing.

**PATH CODE** - Number of path code violations received by the DTE port. Path code violations include frame bit errors for D4 framing and superframes with CRC errors for ESF framing.

**LINE CODE** - Number of line code violations received by the DTE port. Line code violations include BPVs that are not part of B8ZS code or excess zero violations.

**VIEW STATISTICS > DTE PORT > LAYER1 STATS > DAYS**

The definitions for the **DTE PORT > LAYER1 STATS > DAYS** statistics are identical to the **DTE PORT > LAYER1 STATS > INTERVALS** statistics. The day view provides historical information for the last seven days (not including the current day). View **STATISTICS > DTE PORT > LAYER2 STATS > INTERVALS**



*The following intervals are only available when a T1 Probe NIM is installed.*

**VIEW STATISTICS > NETWORK PORT > PORT STATS > INTERVALS**

*The following Network Port intervals are applies to all IQ 310 Network Interface Modules unless specified in the Interval definition.*

**RX FRAMES** - Number of frames received by the network port.

**RX BYTES** - Number of bytes received by the network port.

**MAX RX THRU** - Maximum throughput sample in the receive direction of the network port for the given interval. This is displayed in kbps.

**AVG RX THRU** - Average throughput in the receive direction of the network port for the given interval. This is displayed in kbps.

**MAX RX UTIL %** - Maximum utilization sample in the receive direction of the network port for the given interval. Utilization is displayed as a percentage of network port bandwidth.

**AVG RX UTIL %** - Average utilization sample in the receive direction of the network port for the given interval. Utilization is displayed as a percentage of network port bandwidth.

**FRF-12 RX FRAMES** - Number os FRF-12 frames received on this interface. FRF-12 defines a standard method for transmitting packets into multiple smaller Frame Relay frames.

**TX FRAMES** - Number of frames transmitted by the network port.

**TX BYTES** - Number of bytes transmitted by the network port.

**MAX TX THRU** - Maximum throughput sample in the transmit direction of the network port for the given interval. This is displayed in kbps.

**AVG TX THRU** - Average throughput in the transmit direction of the network port for the given interval. This is displayed in kbps.

**MAX TX UTIL %** - Maximum utilization sample in the transmit direction of the network port for the given interval. Utilization is displayed as a percentage of network port bandwidth.

**AVG TX UTIL %** - Average utilization sample in the transmit direction of the network port for the given interval. Utilization is displayed as a percentage of network port bandwidth.

**PORT UA TIME** - Time in seconds the network port is unavailable for data delivery. This means that the network link is down or in test, or that the frame relay signaling state is down.

**SIG DOWN TIME** - Time in seconds the signaling state has been down on the network port.

**SIGNAL ERROR** - Number of signal frames received with PVC signaling protocol violations on the network port.

**SIGNAL T/O** - Number of T391 timeouts that have occurred on the network port.

**SIG STATE CHG** - Number of changes in the signaling protocol state on the network port.

**RX FULL STAT** - Number of full status responses received on the network port.

**RX LI ONLY** - Number of link integrity (LI) responses received on the network port.

**TX FULL STAT** - Number of full status polls transmitted by the IQ 310.

**TX LI ONLY** - Number of link integrity polls transmitted by the IQ 310.

**ASYNC STATUS** - Number of asynchronous status messages received by the IQ 310.

**DISCARD FRAMES** - Number of frames discarded by the IQ 310 due to on the DTE port due to ADLC violations.

**ABORTS** - Number of frames received by the network port without a closing flag. This transmission error is also reflected in the **DISCARD FRAME** field.

**CRC ERROR** - Number of frames received by the network port with CRC violations. This transmission error is also reflected in the **DISCARD FRAME** field.

**OCTET ALIGN** - Number of frames received by the network port with a bit count that does not fall on 8-bit boundaries. This transmission error is also reflected in the **DISCARD FRAME** field.

**TX UNDERRUN** - Number of underrun frames sent to the network indicating that the interface buffers are empty.

**LENGTH ERROR** - Number of frames received by the network port with fewer than 5 octets or greater than 4500 octets. This link violation is also reflected in the **DISCARD FRAME** field.

**EA VIOLATION** - Number of frames received by the network port with an error in the extended address (EA) bit field of the frame relay header.

**ENCAP ERROR** - Number of frames received by the network port on a dedicated management DLCI that have RFC 1490 errors. These errors are also reflected in the Discard Frame field.



*If both management DLCIs are shared, the Encapsulation Error field is N/A.*

**INACTIVE DLCI** - Number of frames received by the network port on an inactive DLCI.

**INVALID DLCI** - Number of frames received by the network port on a DLCI that is out of range. The valid DLCI range is **16** to **1007**.

**UNROUTEABLE** - Number of frames received by the network port on a dedicated management DLCI with an IP address that does not match the IQ 310 IP address.



*If both **MANAGEMENT DLCIS** are **SHARED**, the **UNROUTEABLE** field is non-applicable.*

**DDS/T1 STATE CHG** (module dependent) - The **DDS STATE CHG** statistic is available for the 56k/64k Network Interface Module. It is a count of state changes for the DDS port. The **T1 STATE CHG** statistic is available for the T1 and T1/DSX Network Interface Modules. It is a count of state changes for the T1 port.

**DDS/T1 UA TIME** (module dependent) - The **DDS UA TIME** statistic is available for the 56k/64k Network Interface Module. It is the time in seconds the DDS link is down. The **T1 UA TIME** statistic is available for the T1 and T1/DSX Network Interface Modules. It is time in seconds the T1 link is down.

**BPV/FRAME ERR** - Only available with a 56k/64k Network Interface Module installed. This statistic is a count of the bipolar violations (BPV) and frame errors.



*The next six parameters (**SIGNAL LOSS**, **TELCO TEST**, **AIS ALARM**, **RED ALARM**, **YELLOW ALARM**, and **PLL ALARM**) are events with two states: active and inactive. If the event occurs one or more times for the given interval, the field is active and **ALARM** is displayed. The first column of the **VIEW BY INTERVAL** menu represents information for the entire current day. Therefore, once an alarm becomes active, it remains active in the first field for the entire 24-hour period.*

**SIGNAL LOSS** - Only available with a T1 or T1/DSX Network Interface Module installed. If **ALARM** is displayed, a loss of signal occurred one or more times during the given interval.

**TELCO TEST** - Only available with a T1 or T1/DSX Network Interface Module installed. If **ALARM** is displayed, a loopback code was received on the T1 interface one or more times during the given interval.

**AIS ALARM** - Only available with a T1 or T1/DSX Network Interface Module installed. If **ALARM** is displayed, unframed all ones were received on the T1 interface one or more times during the given interval. This indicates that the T1 is out of service.

**RED ALARM** - Only available with a T1 or T1/DSX Network Interface Module installed. If **ALARM** is displayed, a loss of frame synchronization occurred one or more times during the given interval.

**YELLOW ALARM** - Only available with a T1 or T1/DSX Network Interface Module installed. If **ALARM** is displayed, the telco end of the T1 was out of frame sync one or more times during the given interval.

**PLL ALARM** - Only available with a T1 or T1/DSX Network Interface Module installed. **ALARM** displayed in this field usually signifies that both ends of the T1 circuit are set to provide timing.

**PATH CODE** - Only available with a T1 or T1/DSX Network Interface Module installed. Number of path code violations received by the network port. Path code violations include frame bit errors for D4 framing and superframes with CRC errors for ESF framing.

**LINE CODE** - Only available with a T1 or T1/DSX Network Interface Module installed. Number of line code violations received by the network port. Line code violations include BPVs that are not part of B8ZS code or excess zero violations.

**VIEW STATISTICS > NETWORK PORT > PORT STATS > DAYS**

The definitions for the **NETWORK PORT > PORT STATS > DAYS** statistics are identical to the **NETWORK PORT > PORT STATS > INTERVALS** statistics. The day view provides historical information for the last seven days (not including the current day).

**VIEW STATISTICS > NETWORK PORT > DLCI STATS > DLCI INTERVALS**

**RX FRAMES** - Number of frames received by the network port on the specified DLCI.

**RX BYTES** - Number of bytes received by the network port on the specified DLCI.

**TX FRAMES** - Number of frames transmitted by the network port on the specified DLCI.

**TX BYTES** - Number of bytes transmitted by the network port on the specified DLCI.

**TIME IN DBU** - Time (in seconds) that the specified DLCI is in DBU mode.

**MAX RX THRU** - Maximum throughput sample in the receive direction on the specified DLCI for the given interval. This is displayed in kbps.

**FRF-12 RX FRAMES** - Number of FRF-12 frames received on this interface. FRF-12 defines a fragmentation implementation agreement to dictate fragmenting long data to address the impact of delay for real-time data packets traveling through the Frame Relay network. The **IQ 310** does not have fragment data using FRF-12; this counter only recognizes that FRF-12 packets have been received on this port.

**AVG RX THRU** - Average throughput in the receive direction on the specified DLCI for the given interval. This is displayed in kbps.

**MAX RX UTIL %** - Maximum utilization sample in the receive direction on the specified DLCI for the given interval. Utilization is displayed as a percentage of CIR.

**AVG RX UTIL %** - Average utilization in the receive direction on the specified DLCI for the given interval. Utilization is displayed as a percentage of CIR.

**MAX TX THRU** - Maximum throughput sample in the transmit direction on the specified DLCI for the given interval. This is displayed in kbps.

**AVG TX THRU** - Average throughput in the transmit direction on the specified DLCI for the given interval. This is displayed in kbps.

**MAX TX UTIL %** - Maximum utilization sample in the transmit direction on the specified DLCI for the given interval. Utilization is displayed as a percentage of CIR.

**AVG TX UTIL %** - Average utilization sample in the transmit direction on the specified DLCI for the given interval. Utilization is displayed as a percentage of CIR.

**Rx FECN** - Number of frames received by the network port on the specified DLCI with the FECN bit of the frame relay header enabled.

**Rx BECN** - Number of frames received by the network port on the specified DLCI with the BECN bit of the frame relay header enabled.

**Rx DE** - Number of frames received by the network port on the specified DLCI with the discard eligibility (DE) bit of the frame relay header enabled.

**Rx CR** - Number of frames received by the network port on the specified DLCI with the CR bit of the frame relay header enabled.

**PVC IA TIME** - Time in seconds that the PVC is in the inactive state.

**Rx FECN** - Number of frames received by the network port on the specified DLCI with the FECN bit of the frame relay header enabled.

**Rx BECN** - Number of frames received by the network port on the specified DLCI with the BECN bit of the frame relay header enabled.

**Rx DE** - Number of frames received by the network port on the specified DLCI with the discard eligibility (DE) bit of the frame relay header enabled.

**Rx CR** - Number of frames received by the network port on the specified DLCI with the CR bit of the frame relay header enabled.

**LOST FRAMES** - Number of frames lost on the specified PVC. This field is applicable only if the network port's **SEQUENCE NUMBER CHECKING** option is **ENABLED**.

**RMT LOST FRMS** - Number of lost frames reported by the remote **IQ 310**. This field is applicable only if the network port's **SEQUENCE NUMBER CHECKING** option is **ENABLED**.

**Rx BURST SEC** - Amount of time (in seconds) that throughput in the receive direction is greater than CIR.

**Tx BURST SEC** - Amount of time (in seconds) that throughput in the transmit direction is greater than CIR.

**MIN Rx FRAME** - Size of smallest frame received on the specified DLCI.

**MAX Rx FRAME** - Size of largest frame received on the specified DLCI.

**AVG Rx FRAME** - Average size of frames received on the specified DLCI.

**MIN Tx FRAME** - Size of smallest frame transmitted on the specified DLCI.

**MAX Tx FRAME** - Size of largest frame transmitted on the specified DLCI.

**AVG Tx FRAME** - Average size of frames transmitted on the specified DLCI.

**MIN FRAME DLY** - Minimum round trip delay of the specified DLCI. This field is applicable only if the network port's **PVC DELAY MEASUREMENT** option is **ENABLED**.

**MAX FRAME DLY** - Maximum round trip delay of the specified DLCI. This field is applicable only if the network port's **PVC DELAY MEASUREMENT** option is **ENABLED**.

**AVG FRAME DLY** - Average round trip delay of the specified DLCI. This field is applicable only if the network port's **PVC DELAY MEASUREMENT** option is **ENABLED**.

**PVC STATE CHG** - Number of changes in the PVC state.

#### **VIEW STATISTICS > NETWORK PORT > DLCI STATS > DLCI DAYS**

The definitions for the **NETWORK PORT > DLCI STATS > DLCI DAYS** statistics are identical to the **NETWORK PORT > DLCI STATS > DLCI INTERVALS** statistics. The day view provides historical information for the last seven days (not including the current day).

#### **VIEW STATISTICS > NETWORK PORT > DLCI LIST > STATE**

The **STATE** statistic reflects the state of the selected DLCI. Possibilities are **A** (active), **I** (inactive), and **U** (unknown). A DLCI is listed as unknown if the DLCI was present on the network port and is no longer present.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > RX FRAMES**

Number of frames received by the network port on the specified DLCI.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > TX FRAMES**

Number of frames transmitted by the network port on the specified DLCI.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > RX FECN**

Number of frames received by the network port on the specified DLCI with the FECN bit of the frame relay header enabled.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > RX BECN**

Number of frames received by the network port on the specified DLCI with the BECN bit of the frame relay header enabled.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > RX CR**

Number of frames received by the network port on the specified DLCI with the CR bit of the frame relay header enabled.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > RX DE**

Number of frames received by the network port on the specified DLCI with the discard eligibility (DE) bit of the frame relay header enabled.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > RX BYTES**

Number of bytes received by the network port on the specified DLCI.

**VIEW STATISTICS > NETWORK PORT > DLCI LIST > TX BYTES**

Number of bytes transmitted by the network port on the specified DLCI.

**VIEW STATISTICS > DSX PORT > INTERVALS****DSX STATE CHANGE**

Count of state changes for the **DSX-1** port. This stat is only available if a T1/DSX network interface module is installed.

**DSX UA TIME**

Time in seconds the **DSX-1** port is unavailable for data delivery. This means that the T1 link is down or in test, or that the frame relay signaling state is down. This stat is only available if a T1/DSX network interface module is installed.

**SIGNAL LOSS**

If **ALARM** is displayed, no physical signal is present on the DSX port. This stat is only available if a T1/DSX Network Interface Module is installed.

**TELCO TEST**

This field will indicate when the unit is in a loopback test initiated by the Telco. This stat is only available if a T1/DSX Network Interface Module is installed.

**AIS ALARM**

If **ALARM** is displayed, unframed all ones were received by the DSX-1 port one or more times during the given interval. This indicates that the T1 is out of service. This stat is only available if a T1/DSX Network Interface Module is installed.

**RED ALARM**

If **ALARM** is displayed, a loss of frame synchronization occurred on the DSX-1 port one or more times during the given interval. This stat is only available if a T1/DSX Network Interface Module is installed.

**YELLOW ALARM**

If **ALARM** is displayed, the far end of the DSX-1 was out of frame sync one or more times during the given interval. This stat is only available if a T1/DSX Network Interface Module is installed.

**PLL ALARM**

**ALARM** displayed in this field usually signifies that both ends of the DSX-1 circuit are set to provide timing. This stat is only available if a T1/DSX Network Interface Module is installed.

**PATH CODE**

Number of path code violations received by the DSX-1 port. Path code violations include frame bit errors for D4 framing and superframes with CRC errors for ESF framing. This stat is only available if a T1/DSX Network Interface Module is installed.

**LINE CODE**

Number of line code violations received by the DSX-1 port. Line code violations include BPVs that are not part of B8ZS code or excess zero violations. This stat is only available if a T1/DSX Network Interface Module is installed.

**VIEW STATISTICS > DSX PORT > DAYS**

The definitions for the **DSX PORT > DAYS** statistics are identical to the **DSX PORT > INTERVALS** statistics. The day view provides historical information for the last seven days (not including the current day).

**VIEW STATISTICS > DBU PORT > INTERVALS > RX FRAMES**

Number of frames received by the **DBU** port. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > RX BYTES**

Number of bytes received by the **DBU** port. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > MAX RX THRU**

Maximum throughput sample in the receive direction of the DBU port for the given interval. This is displayed in kbps. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > AVG RX THRU**

Average throughput in the receive direction of the DBU port for the given interval. This is displayed in kbps. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > MAX RX UTIL %**

Maximum utilization sample in the receive direction of the DBU port for the given interval. Utilization is displayed as a percentage of DBU port bandwidth. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > AVG RX UTIL %**

Average utilization sample in the receive direction of the DBU port for the given interval. Utilization is displayed as a percentage of DBU port bandwidth. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > FRF12 RX FRAMES**

Number of FRF-12 frames received on this interface. FRF-12 defines a standard method for transmitting packets into multiple smaller Frame Relay Frames.

**VIEW STATISTICS > DBU PORT > INTERVALS > TX FRAMES**

Number of frames transmitted by the DBU port. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > TX BYTES**

Number of bytes transmitted by the DBU port. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > MAX TX THRU**

Maximum throughput sample in the transmit direction of the DBU port for the given interval. This is displayed in kbps. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > AVG TX THRU**

Average throughput in the transmit direction of the DBU port for the given interval. This is displayed in kbps. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > MAX TX UTIL %**

Maximum utilization sample in the transmit direction of the DBU port for the given interval. Utilization is displayed as a percentage of DBU port bandwidth. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > AVG TX UTIL %**

Average utilization sample in the transmit direction of the DBU port for the given interval. Utilization is displayed as a percentage of DBU port bandwidth. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > DISCARD FRAMES**

Number of frames discarded by the IQ 310 due on the DTE port due to ADLC violations.

**VIEW STATISTICS > DBU PORT > INTERVALS > ABORTS**

Number of frames received by the DBU port without a closing flag. This transmission error is also reflected in the **DISCARD FRAME** field. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > CRC ERROR**

Number of frames received by the DBU port with CRC violations. This transmission error is also reflected in the **DISCARD FRAME** field. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > OCTET ALIGN**

Number of frames received by the DBU port with a bit count that does not fall on 8-bit boundaries. This transmission error is also reflected in the **DISCARD FRAME** field. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > LENGTH ERROR**

Number of frames received by the DBU port with fewer than 5 octets or greater than 4500 octets. This link violation is also reflected in the **DISCARD FRAME** field. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > ENCAP ERROR**

Number of frames received by the DBU port that have RFC 1490 errors. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > UNROUTEABLE**

Number of frames received by the DBU port with an IP address that does not match the IQ 310 IP address. This stat is only available if a DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > T1 STATE CHG**

This is a count of state changes for the T1 DBU port. This stat is only available if a PRI DBU module is installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > T1 UA TIME**

This is the time in seconds the T1 DBU link is down. Only available with PRI DBU module installed.



*The next six parameters (**SIGNAL LOSS**, **TELCO TEST**, **AIS ALARM**, **RED ALARM**, **YELLOW ALARM**, and **PLL ALARM**) are events with two states: active and inactive. If the event occurs one or more times for the given interval, the field is active and **ALARM** is displayed. The first column of the **VIEW BY INTERVAL** menu represents information for the entire current day. Therefore, once an alarm becomes active, it remains active in the first field for the entire 24-hour period.*

**VIEW STATISTICS > DBU PORT > INTERVALS > SIGNAL LOSS**

If **ALARM** is displayed, a loss of signal occurred on the T1 DBU port one or more times during the given interval. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > TELCO TEST**

If **ALARM** is displayed, a loopback code was received on the T1 DBU port one or more times during the given interval. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > AIS ALARM**

If **ALARM** is displayed, unframed all ones were received on the T1 DBU port one or more times during the given interval. This indicates that the T1 is out of service. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > RED ALARM**

If **ALARM** is displayed, a loss of frame synchronization occurred on the T1 DBU port one or more times during the given interval. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > YELLOW ALARM**

If **ALARM** is displayed, the telco end of the T1 was out of frame sync one or more times during the given interval. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > PLL ALARM**

**ALARM** displayed in this field usually signifies that both ends of the T1 circuit are set to provide timing. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > PATH CODE**

Number of path code violations received by the T1 DBU port. Path code violations include frame bit errors for D4 framing and superframes with CRC errors for ESF framing. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > INTERVALS > LINE CODE**

Number of line code violations received by the T1 DBU port. Line code violations include BPVs that are not part of B8ZS code or excess zero violations. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > DAYS**

The definitions for the **DBU PORT > DAYS** statistics are identical to the **DBU PORT > INTERVALS** statistics. The day view provides historical information for the last seven days (not including the current day).

**VIEW STATISTICS > DBU PORT > DS0 STATS > PRI CHANNEL**

DS0 Channel identifier (channels 1 through 24) - (PRI DBU only). See Table 1.

**Table 1. PRI Channel Descriptions**

This Channel	Signifies that...
<b>D</b>	the DS0 is the active D channel.
<b>A</b>	there is an active call on the DS0.
.	the DS0 is assigned to the PRI interface but there is no active call.
–	the DS0 is unassigned to the Fractional PRI interface.

**VIEW STATISTICS > DBU PORT > DS0 STATS > DS0 STATUS**

An **A** indicates the DS0 is being used to transfer data. A **D** indicates the D channel is up. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > CALL MANAGER MENU > PHONE NUMBER**

Phone number associated with a call on the site. On an incoming call, this field may display **CALLER UNKNOWN** if the switch does not provide caller identification. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT CALL MANAGER MENU > CALL STATUS LABELS**

This field displays the status of each call. The possibilities are idle, answering, dialing, connected, manual connect, waiting to dial, and connection fail. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > CALL MANAGER MENU > RETRIES**

Number of retries the unit has attempted to establish a call. Only available with PRI DBU module installed.

**VIEW STATISTICS > DBU PORT > CALL MANAGER MENU > DLCI**

Local DLCI associated with the connection. An \* displayed to the right of the DLCI signifies that more than one DLCI is associated with the connection. Only available with PRI DBU module installed.

**VIEW STATISTICS > ETHERNET > RX FRAMES**

Number of frames received by the **ETHERNET** port.

**VIEW STATISTICS > ETHERNET > RX BYTES**

Number of bytes received by the **ETHERNET** port.

**VIEW STATISTICS > ETHERNET > TX FRAMES**

Number of frames transmitted by the **ETHERNET** port.

**VIEW STATISTICS > ETHERNET > TX BYTES**

Number of frames transmitted by the **ETHERNET** port.

**VIEW STATISTICS > ETHERNET > RESET STATS**

Selecting this option will clear the Ethernet statistics and reset them to zero.

**VIEW STATISTICS > CRAFT/CONTROL PORT > SIGNAL LEAD RTS**

This statistic shows whether the **CRAFT/CONTROL** port request to send signal is active.

**VIEW STATISTICS > CRAFT/CONTROL PORT > SIGNAL LEAD CTS**

This statistic shows whether the **CRAFT/CONTROL** port clear to send signal is active.

**VIEW STATISTICS > CRAFT/CONTROL PORT > SIGNAL LEAD DTR**

This statistic shows whether the **CRAFT/CONTROL** port data terminal ready signal is active.

**VIEW STATISTICS > CRAFT/CONTROL PORT > SIGNAL LEAD DCD**

This statistic shows whether the **CRAFT/CONTROL** port data carrier detect signal is active.

**VIEW STATISTICS > CRAFT/CONTROL PORT > RX BYTES**

Number of bytes received by the **CRAFT/CONTROL** port.

**VIEW STATISTICS > CRAFT/CONTROL PORT > TX BYTES**

Number of bytes transmitted by the **CRAFT/CONTROL** port.

**VIEW STATISTICS > CRAFT/CONTROL PORT > RESET STATS**

Selecting this option will clear the **CRAFT/CONTROL** port statistics.

**VIEW STATISTICS > SYSTEM STATS > BUFFER STATS**

The **BUFFER STATS** are used by ADTRAN engineering and technical support in troubleshooting situations.

**VIEW STATISTICS > SYSTEM STATS > HEAP SIZE**

The **HEAP SIZE** statistic is used by ADTRAN engineering and technical support in troubleshooting situations.

**VIEW STATISTICS > SYSTEM STATS > MAX HEAP USED**

The **MAX HEAP USED** statistic is used by ADTRAN engineering and technical support in troubleshooting situations.

**VIEW STATISTICS > SYSTEM STATS > MAIN VERSION CHECKSUM**

The **MAIN VERSION CHECKSUM** statistic is the firmware version and checksum of the main code file. The main code file is used during a normal powerup sequence.

**VIEW STATISTICS > SYSTEM STATS > SAFE VERSION CHECKSUM**

The **SAFE VERSION CHECKSUM** statistic is the firmware version and checksum of the safe code file. The safe code file is used during a powerup sequence in which the main code fails.

**VIEW STATISTICS > SYSTEM STATS > BOOT VERSION CHECKSUM**

The **BOOT VERSION CHECKSUM** statistic is the firmware version and checksum of the boot code.

**VIEW STATISTICS > SYSTEM STATS > SYSTEM DATE**

This statistic displays the current day, month, and year. The date is configured under the **CONFIGURATION > SYSTEM > SYSTEM DATE** menu.

**VIEW STATISTICS > SYSTEM STATS > SYSTEM TIME**

This statistic displays the current hour and minute. The time is configured under the **CONFIGURATION > SYSTEM > SYSTEM TIME** menu.

**VIEW STATISTICS > SYSTEM STATS > ELAPSED TIME**

The elapsed time since the unit was turned on (or since the last restart) is given in seconds.

**VIEW STATISTICS > SYSTEM STATS > MAX MEMORY**

Max Memory is the installed memory size.

**VIEW STATISTICS > SYSTEM STATS > USED TCP SOCKETS**

This is the current count of TCP sockets used for management applications such as Telnet and web interface.

**VIEW STATISTICS > SYSTEM STATS > PLL MULTIPLIER**

This is an internal code used for hardware identification.

**VIEW STATISTICS > SYSTEM STATS > HW ID**

This is an internal code used for hardware identification.

**VIEW STATISTICS > SYSTEM STATS > ETHERNET ADDRESS**

This is the MAC address assigned to the unit.

**VIEW STATISTICS > SYSTEM LOG > SYSTEM EXCEPTION**

The System Exception statistic is used by ADTRAN engineering and technical support in troubleshooting situations.

**VIEW STATISTICS > RESET STATISTICS**

Selecting this option will clear all statistics.

**TEST MENU**

This menu allows you to perform diagnostics by initiating ping tests, PVC loopback tests, or NET and DTE loopback tests. The **TEST** menu is shown in Figure 4.

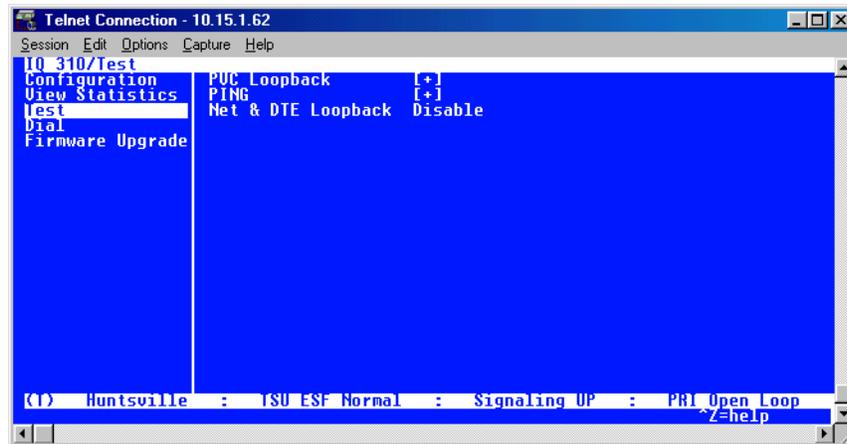


Figure 4. Test Menu

**TEST > PVC LOOPBACK > DLCI**

Select the DLCI of the PVC to be tested.

**TEST > PVC LOOPBACK > TEST STATE**

Selecting **<ACTIVE>** will start the PVC loopback test. Selecting **<IDLE>** will stop an active PVC loopback test. The **TEST STATE** will display **<ACTIVE>** if either the **SEQUENCE NUMBER CHECKING** or **DELAY MEASUREMENT** option is enabled.

**TEST > PVC LOOPBACK > RESET STATS**

Selecting this option will clear all the **PVC LOOPBACK** statistics.

**TEST > PVC LOOPBACK > REMAIN**

**REMAIN** is the amount of time in seconds the PVC loopback test will be active. The range is **0** to **3600**.

**TEST > PVC LOOPBACK > FRAMES RX**

Number of frames received on the selected PVC during the current loopback test.

**TEST > PVC LOOPBACK > FRAMES TX**

Number of frames transmitted on the selected PVC during the current loopback test.

**TEST > PVC LOOPBACK > MIN RESP TIME**

Minimum round-trip time (in seconds) for the current test.

**TEST > PVC LOOPBACK > MAX RESP TIME**

Maximum round-trip time (in seconds) for the current test.

**TEST > PVC LOOPBACK > AVG RESP TIME**

Average round-trip time (in seconds) for the current test.

**TEST > PVC LOOPBACK > LOST FRAMES**

Number of frames lost in the receiving direction (traveling from the remote IQ to the local IQ 310).

**TEST > VC LOOPBACK > RMT LOST FRAMES**

Number of frames lost in the transmitting direction (traveling from the local IQ 310 to the remote IQ).

**TEST > DSX LOOPBACK > LOOPBACK > NONE**

A DSX loopback test allows the user to initiate a loopback test at the DSX-1 interface. Select **NONE** to stop a test in progress. Only available with a T1/DSX Network Interface module installed.

**TEST > DSX LOOPBACK > LOOPBACK > LINE**

Select **LINE** to execute a line loopback test at the DSX-1 port. During this test, data loops back toward the terminal equipment (usually a PBX) connected to the DSX-1 port. Only available with a T1/DSX Network Interface module installed.

**TEST > DSX LOOPBACK > LOOPBACK > PORT**

Select **PORT** to execute a port loopback test at the DSX-1 port. During this test, data loops back toward the network interface. Only available with a T1/DSX Network Interface module installed.

**TEST > PING > IP ADDRESS**

Enter the IP address of the unit the IQ 310 is sending and echo request (ping) to.

**TEST > PING > COUNT**

This field defines the number of pings to be sent. Range is **1** to **99**.

**TEST > PING > SIZE (BYTES)**

This field defines the size of the ping packet in bytes. Range is **1** to **1024**.

**TEST > PING > TIMEOUT (MS)**

This field defines the time (in msec) the unit waits for a response between the pings. Range is **0** to **10000**.

**TEST > PING > ROUND TRIP MIN**

This field shows the shortest round-trip delay (in ms) of the received responses. Round-trip delay is counted from the time the ping is sent until the response is received.

**TEST > PING > ROUND TRIP AVG**

This field shows the average response time (in ms) based on all received responses.

**TEST > PING > ROUND TRIP MAX**

This field shows the longest round-trip delay (in ms) of the received responses. If a response is not received before the unit times out, the delay is not calculated in.

**TEST > PING > TX PKTS**

This field shows the number of pings sent (always 10).

**TEST > PING > RX PKTS**

This field shows the number of responses received from the pinged device.

**TEST > PING > LOST PKTS**

This field shows the number of pings for which pings were transmitted and no response was received.

**TEST > PING > RESET STATS**

Selecting this option will clear all ping statistics.

**TEST > PING > START/STOP**

This option will activate and deactivate the ping test.

**TEST > NET & DTE LOOPBACK**

This test will implement simultaneous dual loopbacks within the unit toward the network port and toward the DTE port.

---

## DIAL MENU

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This menu is used for manual dial backup.

### **DIAL > DIAL BACKUP > ENTER DIAL #**

Available for all DBU modules when DBU is idle. The user will enter a number to dial for dial backup in this field.

### **DIAL > DIAL BACKUP > DIAL <+>**

Available for all DBU modules when DBU is idle. Selecting this option will cause the unit to initiate the dial.

### **DIAL > STAY ON LEASED**

Available for V.34, DCE, and BRI ISDN DBU modules when DBU is idle. The unit will remain on the dedicated line and not attempt dial backup.

### **DIAL > HANG UP**

Available for V.34, DCE, and BRI ISDN DBU modules when DBU is active. The option will disconnect the current DBU session.

### **DIAL > TURN OFF BEEP**

Available for all DBU modules when DBU is active. This option will stop the audible beeper.

### **DIAL > ENTER DIAL #**

Available only for the PRI DBU module and only when DBU is active. This option will force the unit to attempt dial backup to the phone number entered.

### **DIAL > HANG UP PHONE #**

Available only for the PRI DBU module and only when DBU is active. This option will disconnect the dial backup session to the phone number entered.

### **DIAL > HANG UP SITE #**

Available only for the PRI DBU module terminal interface and only when DBU is active. This option will disconnect the dial backup session to a specific site. The site number may be obtained from the **CALL MANAGER** menu.

### **DIAL > HANG UP ALL CALLS**

Available only for the PRI DBU module and only when DBU is active. This option will disconnect all dial backup sessions currently active.

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## UTILITIES MENU

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### **FIRMWARE UPGRADE > XFER METHOD**

The two methods for upgrading are XMODEM and TFTP. TFTP requires a TFTP server running on the network. The IQ 310 starts a TFTP client function which gets the upgrade code from the TFTP server. Selecting XMODEM will load the upgrade code through the **CRAFT/CONTROL** port using any PC terminal emulator with XMODEM capability.

### **FIRMWARE UPGRADE > TFTP SERVER IP ADDRESS**

This is the IP address or domain name (if DNS is configured) of the TFTP server. Only available if Xfer Method is set to TFTP.

### **FIRMWARE UPGRADE > TFTP FILENAME**

This is the file name which contains the upgrade code. Only available if Xfer Method is set to TFTP.

### **FIRMWARE UPGRADE > CURRENT STATUS**

This displays the status of the transfer as it happens. Any error or success message will be displayed here.

### **FIRMWARE UPGRADE > PREVIOUS STATUS**

This displays the status of the previous firmware upgrade.

### **FIRMWARE UPGRADE > BEGIN UPGRADE**

This activator is used when the configurable items in this menu are complete.

## DETAIL LEVEL PROCEDURES

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## DLP-1 Connecting the Terminal or PC to the CONTROL/CRAFT Port

### **Introduction**

IQ 310 management and provisioning is facilitated by a series of intuitive menus that are accessible on a computer screen. Connecting either a VT100 terminal or a PC emulating a VT100 terminal to the **CRAFT/CONTROL** port on the rear of the unit allows access to the menus and management features of the IQ 310. This section specifies how to connect the VT100 terminal or PC to the IQ 310.

### **Prerequisite Procedures**

The IQ 310 must be powered for terminal communication to function.

### **Tools and Materials Required**

- Male-to-female DB-9 cable (customer-provided) to connect to a VT100 terminal or a PC configured as a VT100 terminal
- VT100 compatible terminal or computer with terminal emulation software
- DB-9 to DB-25 adapter if the PC's com port is DB-25 (customer-provided)

### **WARNING**

*To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*



*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

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**Perform the steps below in the order listed.**

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1. Connect a VT100 terminal to IQ 310.
  - Set the parameters of the VT100 terminal to:
    - 9600 baud rate
    - 8 data bits
    - No parity
    - 1 stop bit
    - No flow control
  - If the terminal has a parallel setting, disable it and use serial port.
  - Plug one end of the DB-9 data cable into the IQ 310 **CRAFT/CONTROL** port. Plug the other end of the DB-9 cable into the VT100 terminal. Make the connection to the VT100 terminal as appropriate for your equipment.

or

Connect a PC emulating a VT100 terminal to the IQ 310.

Most personal computers or laptops can run communications software that will emulate a VT100 terminal. Windows programs such as Terminal© or Hyperterminal© are two such examples in the Windows format. However, there are many other adequate, commercially available software packages which will allow your PC or laptop to emulate a VT100 terminal. Certain configuration items must be set on a PC or laptop to act as a VT100 terminal for the IQ 310.

- Set the PC for direct connect on the appropriate com port (instead of dial up connection).
- Set the parameters of the communications software to:
  - 9600 baud rate
  - 8 data bits
  - No parity
  - 1 stop bit
  - No flow control
- Plug one end of the DB-9 data cable into the IQ 310 **CRAFT/CONTROL** port. Plug the other end of the DB-9 cable into the com port of the PC or laptop. Make connection to the PC or laptop as appropriate for your equipment.

You are now ready to login to the IQ 310, as described in DLP-002, Logging in to the System.

### ***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.

## DLP-2 Logging in to the System

### **Introduction**

Once connected to the IQ 310 via either a VT100 terminal or PC configured as a VT100 terminal, it is necessary to login to the system to gain access to the management and provisioning functions. This DLP provides specific steps for logging into the system and accessing the various management and provisioning functions.

### **Prerequisite Procedures**

Complete DLP-001, Connecting the Terminal or PC to the **CRAFT/CONTROL** Port, before logging in to IQ 310.

### **Tools and Materials Required**

- Male-to-female DB-9 cable (customer-provided) to connect to a VT100 terminal or a PC configured as a VT100 terminal
- VT100 terminal or PC configured as a VT100 terminal
- DB-9 to DB-25 adapter if the PC's com port is DB-25 (customer-provided)

### **WARNING**

*To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*



### **CAUTION**

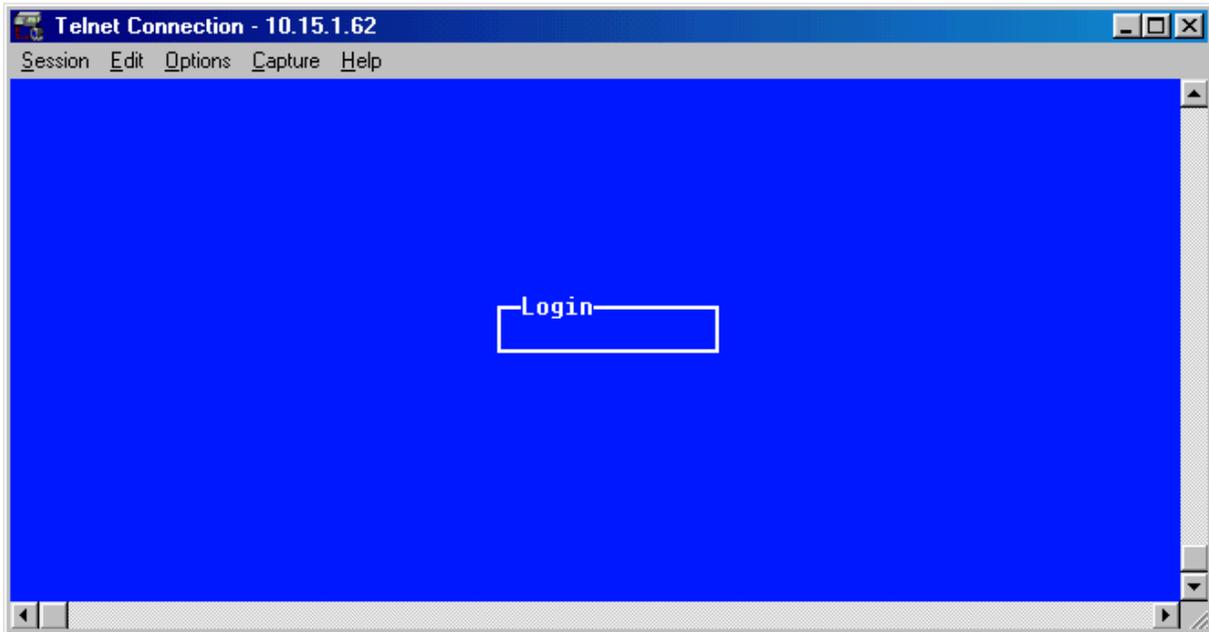
*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

---

**Perform the steps below in the order listed.**

---

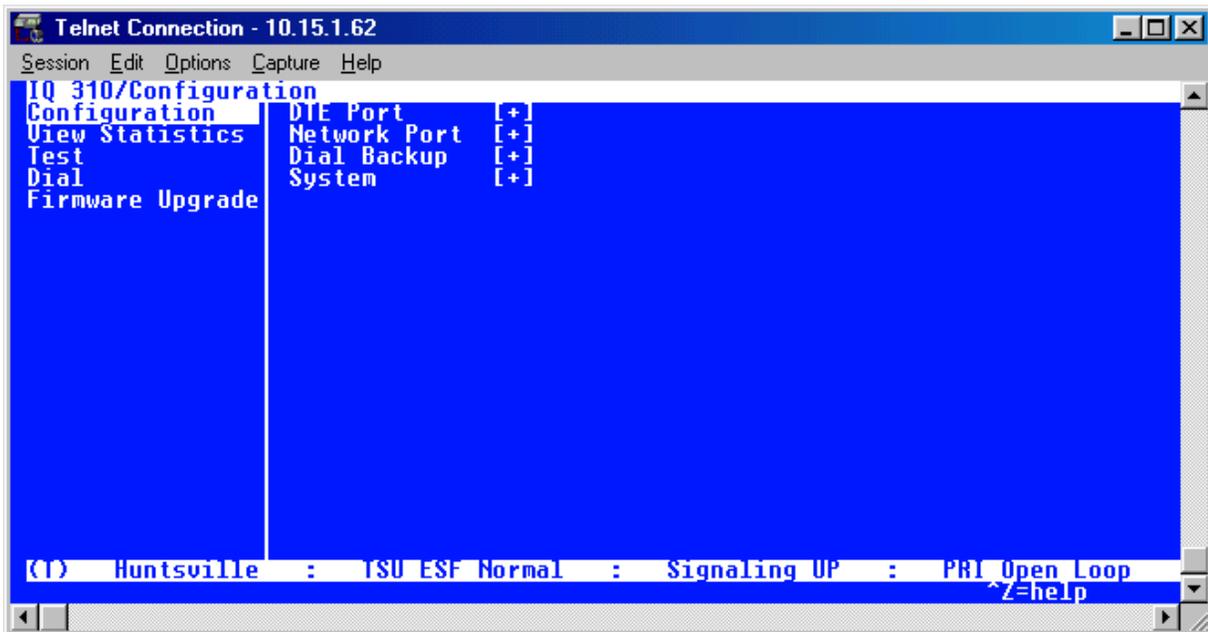
1. After connecting to the system, a blank screen will appear.  
Pressing any key will display the login screen shown below.



The cursor will blink at the **LOGIN** field, waiting for a password to be entered.

2. At the **LOGIN** field, enter the password for the IQ 310.  
The manufacturer's default password for the IQ 310 system is "**adtran**" in lowercase letters

- Upon entering the correct password, the IQ 310 Main menu is displayed as shown below.



```
Telnet Connection - 10.15.1.62
Session Edit Options Capture Help
IQ 310/Configuration
Configuration      DTE Port      [+
View Statistics    Network Port  [+
Test               Dial Backup   [+
Dial               System        [+
Firmware Upgrade

(1) Huntsville : TSU ESF Normal : Signaling UP : PRI Open Loop
^Z=help
```

- You are now logged in to the IQ 310 menu system.



*You may also connect to the unit via Telnet if the IP parameters have been provisioned (as discussed in DLP-004).*

### **Follow-up Procedures**

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.



## **DLP-3 Connecting the IQ 310 to an External Modem**

### ***Introduction***

The IQ 310 can be accessed and managed via modem, allowing the same capabilities to the user as if connected to the local **CRAFT/CONTROL** access port. Access is provided by a female DB-9 connector, labeled **CRAFT**, located on the back of the unit.

### ***Prerequisite Procedures***

The IQ 310 should be mounted in its permanent location before connecting to an external modem.

### ***Tools and Materials Required***

- Modem
- Modem Cable

---

**Perform the steps below in the order listed.**

---

1. Mount the modem in its permanent position.
2. Connect power to the modem using manufacturer instructions.
3. Configure the modem as follows:

Speed	9600 bps
Data bits	8
Parity	none
Stop bits	1
Flow control	hardware
Auto answer	on
DTR	ignore

4. Connect the male DB-9 connector of the modem cable to the female DB-9 connector, labeled **CRAFT**, located on the back of the unit.
5. Connect the DB-25 end of the modem cable to the modem, configured as described above.
6. Connect the modem to the POTS line as required by the manufacturer.



*To complete the modem connection, the IQ 310 must now be called from a PC that is configured to emulate a VT100 terminal, with communication software set as in step 3 and configured for dial mode.*

**Follow-up Procedures**

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.

## DLP-4 Setting IP Parameters for the IQ 310

### **Introduction**

If the IQ 310 is connected to an IP network for Telnet, TFTP, or SNMP management, there are several IP parameters that must be set in order for the unit to communicate with the network. These parameters are described in this DLP along with the procedures for setting them.



*Please see your Network Administrator for the proper assignment of the following parameters: IP address, Subnet Mask, and Default Gateway.*

### **Prerequisite Procedures**

This procedure assumes that the IQ 310 unit is connected to an IP network and is powered up.

### **Tools and Materials Required**

- Male-to-female DB-9 cable (customer-provided) to connect to either a VT100 terminal or a PC configured as a VT100 terminal
- VT100 terminal or PC configured as a VT100 terminal
- DB-9 to DB-25 adapter if the PC's com port is DB-25 (customer-provided)



*To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*



*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

---

**Perform the steps below in the order listed.**

---

### ***Terminal Configuration***

1. Connect the IQ 310 unit to your VT100 system (details found in DLP-1).
2. Login to the system (details for logging in are in DLP-2).
3. From the **CONFIGURATION** menu, select the **SYSTEM** option and press **<ENTER>**.
4. From the **CONFIGURATION > SYSTEM** menu, select the **IP ADDRESS** option and press **<ENTER>**.
5. Enter the appropriate IP address.
6. From the **CONFIGURATION > SYSTEM** menu, select the **SUBNET MASK** option and press **<ENTER>**.
7. Enter the appropriate Subnet Mask.
8. From the **CONFIGURATION > SYSTEM** menu, select the **GATEWAY IP ADDR** option and press **<ENTER>**.
9. Enter the appropriate **GATEWAY IP ADDR**.
10. Escape out to the **CONFIGURATION** menu and logoff by pressing **<CTRL + L>**.

### ***Front Panel Configuration***

1. From the Main menu, press **1** for **CONFIG** and press **<ENTER>**. Then press **6** for the **SYSTEM** option and press **<ENTER>**.
2. From the **CONFIGURATION > SYSTEM** menu, press **1** to select the **IP ADDRESS** option and press **<ENTER>**.  
Enter the appropriate IP address.
3. From the **CONFIGURATION > SYSTEM** menu, press **2** to select the **SUBNET MASK** option and press **<ENTER>**.  
Enter the appropriate Subnet Mask.
4. From the **CONFIGURATION > SYSTEM** menu, press **3** to select the **GW IP ADDRESS** option and press **<ENTER>**.  
Enter the appropriate **GATEWAY IP ADDRESS**.

### ***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.

## DLP-5 Verifying Communications Over an IP LAN

### **Introduction**

When an **ETHERNET** port is connected to a local area network (LAN), test steps must be performed on the IQ 310 to ensure that the unit is communicating properly over the network. This procedure outlines those steps.

### **Prerequisite Procedures**

Before beginning this procedure, the unit should be physically connected to the LAN and the provisioning tasks detailed in DLP-4 should be complete.

### **Tools and Materials Required**

- Access to a PC or other computer connected to the LAN

#### **WARNING**

*To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*



*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

---

**Perform Steps Below in the Order Listed.**

---

## 1. Ascertain the IQ 310 IP address.

If you do not already have the IP Address for the IQ 310, either obtain it from the network administrator or manually check for the address in the **CONFIGURATION > SYSTEM > IP ADDRESS** menu of the Network Management interface.

## 2. Ping the IQ 310 unit from a remote computer on the network.

Using a remote computer system connected to the LAN, perform an ICMP Ping on the IP Address of the IQ 310. Verify that the unit responds properly.

If the IQ 310 fails to respond, try the following:

- Verify that the proper IP Address, Subnet Mask, and **GATEWAY IP ADDRESS** are provisioned in the unit (see DLP-4 for details).
- Verify that the IQ 310 is properly cabled into the LAN and that the Ethernet cable is properly seated in the RJ-45 jack on the rear of the unit.
- If the IQ 310 is connected to a hub or other network device that provides a carrier sense light for each port, verify that the carrier sense light for the port to which the IQ 310 is connected is lit. If this light is not lit, check the cabling between the hub and the shelf.
- Verify the IP Address, Subnet Mask, and Default Gateway on the remote computer system.

If none of these steps are successful, contact the LAN Administrator for assistance.



*Refer to the documentation of the computer system if you are unsure how to perform a Ping command. Most computers running a networked version of Microsoft Windows™ or UNIX allow a Ping to be performed by simply typing “**ping <IP Address>**” at a command line prompt. Typically, the Ping program will respond by indicating that the remote IP Address has responded in a certain amount of time or that no response was received.*



*Some versions of Ping will continue running until you explicitly tell them to stop. If the program does not terminate on its own, type **<CTRL + C>** to get the program to stop.*

### 3. Telnet to the IQ 310.

From the same computer used in the previous step, Telnet to the IQ 310 and verify that the Telnet session is properly opened (see DLP-13 for connecting to the IQ 310 using Telnet.) Once the Telnet session is established, press **<CTRL+ L>** to logout and close the session.



*Refer to the documentation of the computer system if you are unsure how to perform a Telnet. Most computers running a networked version of Microsoft Windows™ or UNIX allow a Telnet to be performed by simply typing “**Telnet <IP Address>**” at a command line prompt. Telnet is a utility common on many local area networks that allows remote access to another computer or piece of equipment.*

### **Follow-up Procedures**

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.



## DLP-6 Updating the Firmware of an IQ 310 using TFTP

### **Introduction**

The IQ 310 supports firmware updates via the **ETHERNET** port using TFTP from a network server or via the **CRAFT/CONTROL** port using XMODEM. This DLP provides the steps to follow for a successful firmware upgrade using the **ETHERNET** port and a TFTP Server.

### **Tools and Materials Required**

- A PC with a Telnet client software
- A TFTP server accessible on the local network (a TFTP server is provided with the unit as part of the ADTRAN Utilities software and may also be downloaded from the ADTRAN website at: [www.adtran.com](http://www.adtran.com))

#### **WARNING**

*To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*



*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

---

**Perform Steps Below in the Order Listed.**

---

1. Connect to the IQ 310 using the **ETHERNET** interface.  
If you are not already connected to the unit's **ETHERNET** port using Telnet client software, use the procedure in DLP-13 to connect to the unit.
2. Login to the unit (see DLP-2 for details).
3. Go to the **UTILITIES > FIRMWARE UPGRADE** menu and press the right arrow key to access the right-pane menus.
4. Go to the **XFER METHOD** menu and select **TFTP**.
5. Enter into **TFTP SERVER IP ADDRESS**, the IP address of the network TFTP server.



*The ADTRAN Utilities TFTP server must be active before performing TFTP transfers.*



*If using ADTRAN Utilities, the server IP address will appear in the status window.*

6. Enter into **TFTP FILENAME**, the full path name and filename of the update file.
7. View **CURRENT STATUS** to verify the progress of the current firmware update or any errors encountered during the download process.

Refer to the table on the following page for a detailed description of messages found in this field.

8. Select **BEGIN UPDATE** to start the update process. Enter **Y** to confirm the transfer and to set up the module to receive the TFTP Upload.

During the TFTP upload process, various status messages display in **CURRENT UPDATE STATUS** to indicate progress. The following table describes these messages.

Message	Meaning
<b>TFTP UPLOAD IN PROGRESS</b>	Indicates communication with the TFTP network server has been established and the update file is being transferred between the IQ 310 and the TFTP network server.
<b>MODULE UPDATE IN PROGRESS</b>	The IQ 310 is now writing the code file into the flash (RAM to ROM).
<b>MODULE UPDATE COMPLETE</b>	Indicates the IQ 310 successfully received the update file.
<b>TFTP ERROR: TIMEOUT</b>	This message will appear if the TFTP server IP address is incorrect.
<b>TFTP ERROR: FILE NOT FOUND</b>	Indicates the TFTP network server was unable to locate the specified filename or path in the TFTP Server Filename field. Filename may be incorrect.

9. When the update process has successfully completed, **MODULE UPDATE COMPLETE** displays in the **CURRENT STATUS** field.

The IQ 310 will restart immediately and resume operation. The user may then Telnet back into the unit.

### ***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.



## DLP-7 Updating the Firmware of an IQ 310 using XMODEM

### **Introduction**

The IQ 310 supports firmware updates via the **ETHERNET** port using TFTP from a network server or via the **CRAFT/CONTROL** port using XMODEM. This procedure outlines the steps for a successful firmware upgrade using the **CRAFT/CONTROL** port and XMODEM software.

### **Tools and Materials Required**

- VT100 terminal or PC with VT100 terminal emulation software
- XMODEM software

#### **WARNING**

*To prevent electrical shock, do not install equipment in a wet location or during a lightning storm.*



*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

---

**Perform Steps Below in the Order Listed.**

---

1. Connect to the IQ 310 using the DB-9 **CRAFT/CONTROL** interface on the back of the unit.  
If you are not already connected to the IQ 310's **CRAFT/CONTROL** port (either with a VT100 compatible terminal or with a PC running VT100 emulation software), follow the procedure in DLP-1. Connecting to the **CRAFT/CONTROL** port limits the upgrade procedure to XMODEM only.
2. Login to the unit (see DLP-2 for details).
3. Go to the **UTILITIES > FIRMWARE UPGRADE** menu and press the right arrow key to access the right-pane menus.
4. Go to the **XFER METHOD** menu and select **XMODEM**.
5. View **CURRENT STATUS** to verify the progress of the current firmware update or any errors encountered during the download process.
6. Select **BEGIN UPDATE** to start the update process. Enter **Y** to confirm the transfer and set up the module to receive the XMODEM Upload.

When the IQ 310 is ready to receive the XMODEM upload, the menu screen will clear and display **Awaiting XMODEM Upload...<CTRL + X> to Cancel**. If this does not appear, please review the steps above for possible configuration errors.

7. From the terminal emulation software, begin the XMODEM upload by using the appropriate command sequence. This may take several minutes.

If necessary, refer to the terminal emulation software documentation for help. Also, when specifying the filename, ensure that the file transferred is the one provided by ADTRAN. Otherwise, the update will not complete successfully.

Because XMODEM data is being transferred in-band through the menu interface, the VT100 menus of the IQ 310 will be inoperable from the **CRAFT/CONTROL** interface. You can cancel the update at any point in time within the terminal emulation software. (Please consult the documentation provided with the terminal emulation software to determine how to do this.)

8. When the update process has successfully completed, **IDLE** displays in the **CURRENT STATUS** field and **MODULE UPDATE COMPLETE** displays in the **PREVIOUS STATUS** field.

The IQ 310 will restart immediately and resume operation.



*The IQ 310 continues to pass data during the XMODEM update. During restart, the IQ 310 is inoperable.*

Alternately, if the unit is part of a management cluster connected to the local network, you may use a PC connected to the network to Telnet into the unit. By utilizing the **ETHERNET** port, the IQ 310 may be quickly upgraded using TFTP, provided there is a TFTP server on the local network. The IQ 310 ships with ADTRAN Utilities software, which includes a TFTP server. See DLP-6, *Updating the Firmware of an IQ 310 using TFTP*, for more details.

The ADTRAN Utilities software is also available on the ADTRAN website at: [www.adtran.com](http://www.adtran.com).

***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.



## DLP-8 Remote Login to an IQ 310 over Frame Relay

### Introduction

The ADTRAN IQ 310 supports remote configuration via the VT100 interface when the frame relay circuit is active and functional to the remote site. This means that while directly connected to one IQ 310, you may configure another IQ 310 or ADTRAN IQ series product located at a remote location. For example, in the figure shown below, the customer is using a terminal directly connected to the Huntsville IQ 310 to configure the Atlanta IQ 310.

### Prerequisite Procedures

Complete DLP-1, *Connecting the Terminal or PC to the CONTROL/CRAFT Port*, or DLP-12, *Connecting to the IQ 310 Using the N-Formant*, before logging in to IQ 310.

### Tools and Materials Required

- Male-to-female DB-9 cable (customer-provided) to connect to either a VT100 terminal or a PC configured as a VT100 terminal
- VT100 terminal or PC configured as a VT100 terminal
- DB-9 to DB-25 adapter if the PC's com port is a DB-25 (customer-provided)

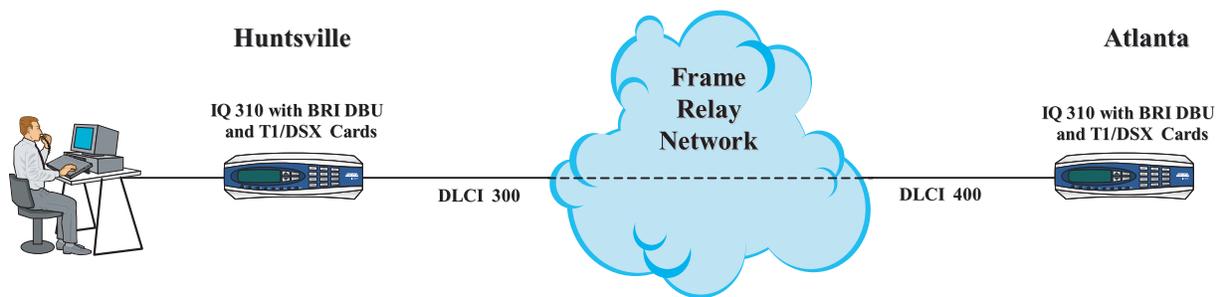


Figure 1. Remote Configuration

---

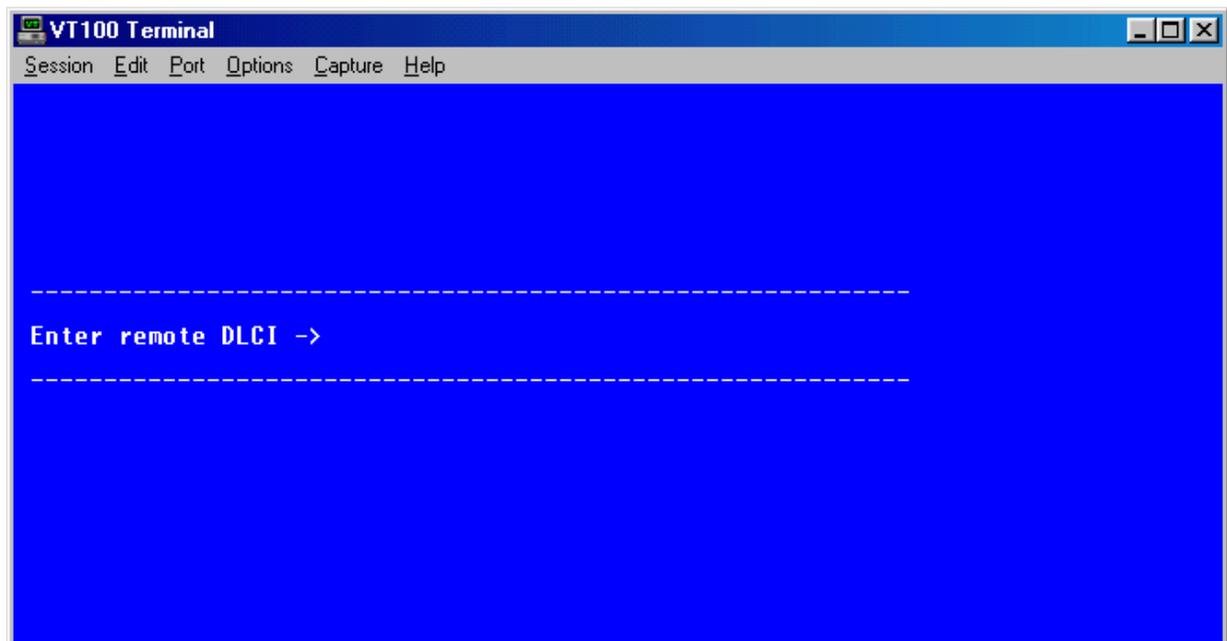
**Perform Steps Below in the Order Listed.**

---

There are two ways to access the remote login screen: pressing **<CTRL + R>** at initial login or logging into and out of the local unit. The **<CTRL + R>** at initial login is not available with the ADTRAN Utilities VT100 since you must first choose **SESSION > CONNECT** to login to the unit. This DLP will describe both methods.

**Control-R at Initial Login to Access Remote Login**

1. Connect the IQ 310 to the VT100 system (details found in DLP-1).
2. After connection to the system, a blank screen will appear.
3. Type **<CTRL + R>**, and the following screen will appear.

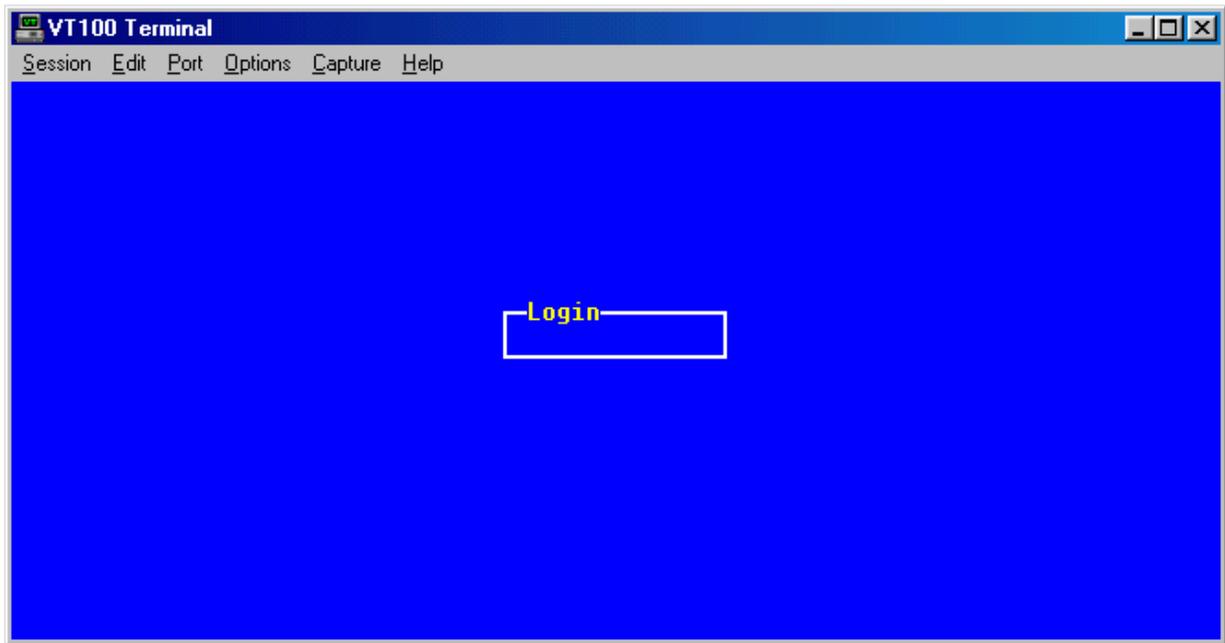


4. Enter the remote DLCI (see the following note), and press **<ENTER>**.

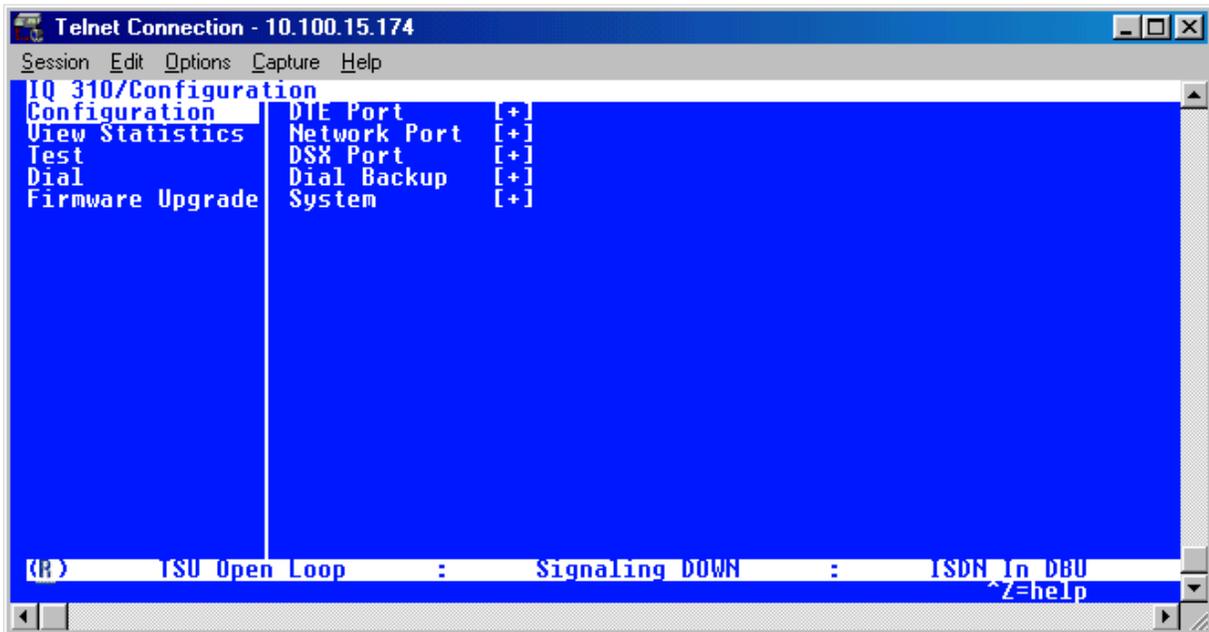


*When entering the DLCI for a remote application, enter the DLCI associated with the local unit that you are logged into (not the far end DLCI). The correct local unit DLCI for that remote site may be determined by looking for the active DLCI in the **VIEW STATISTICS > NETWORK PORT > DLCI LIST** menu. In Figure 1, a user trying to configure the Atlanta unit from the Huntsville site would enter a DLCI of 300.*

5. The following login screen will appear.



6. Enter the password. The factory default password is **adtran** in lowercase letters.
7. The IQ 310 Main menu for the remote unit is displayed as shown below.



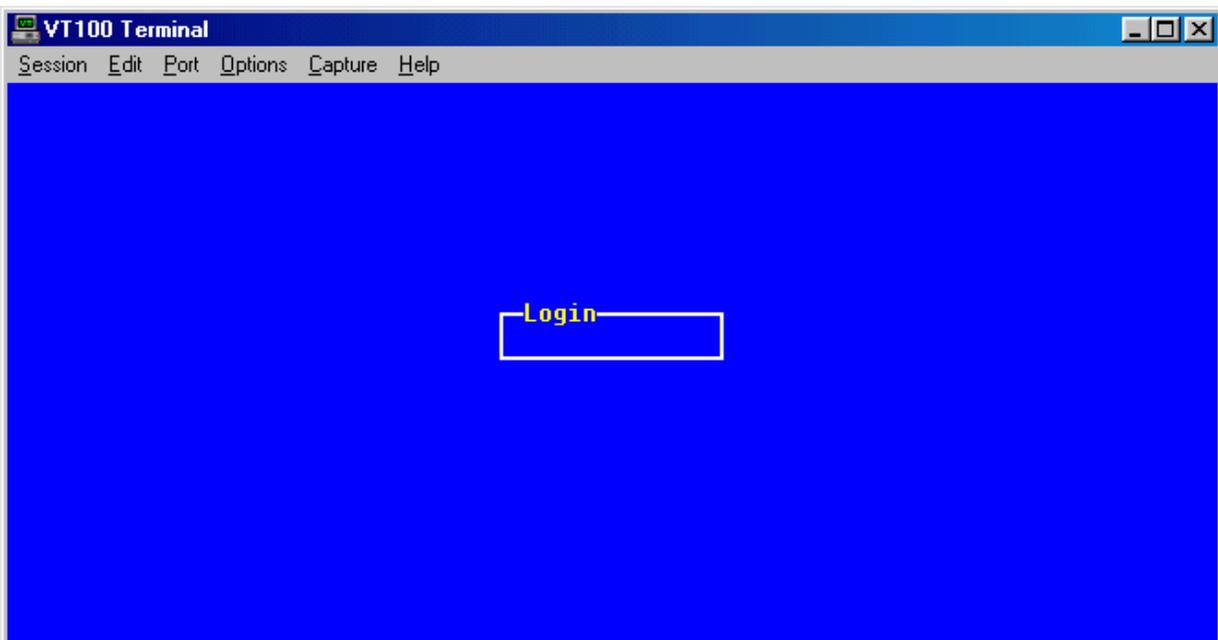


*In the lower left-hand corner of the VT100 screen, (R) is displayed, indicating the current screen represents the remote unit.*

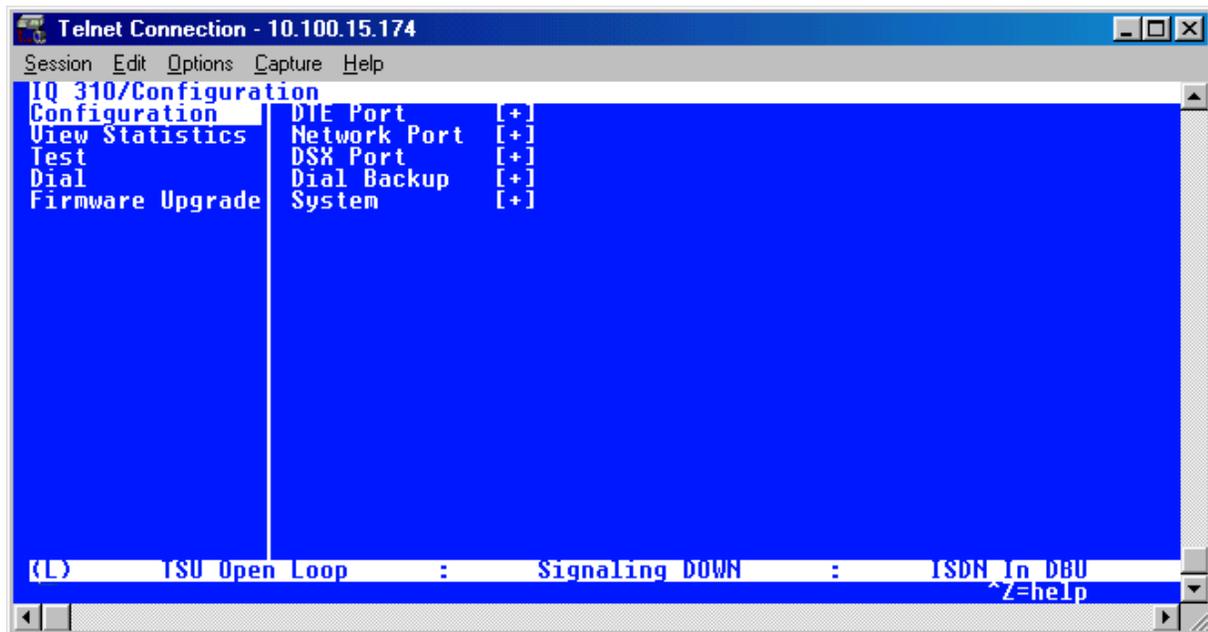
8. You may now begin configuration of the remote unit. Press **<CTRL + L>** to log out of the remote unit.

### ***Logging into and out of the Local Unit to Access Remote Login***

1. Connect the IQ 310 to your VT100 system (details found in DLP-1).
2. After connection to the system, a blank screen will appear. Pressing **<ENTER>** will display the login screen shown below.



3. Enter the password for the IQ 310. The manufacturer's default password for the IQ 310 is **adtran** in lowercase letters.
4. The IQ 310 Main menu for the local unit is displayed as shown below.



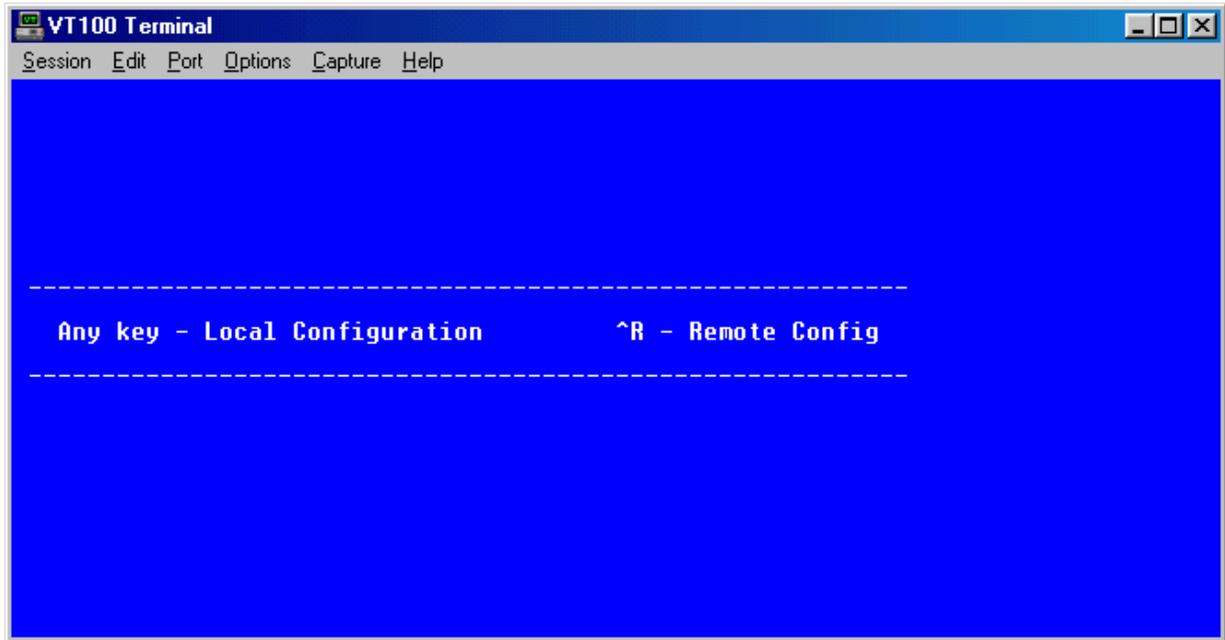
The screenshot shows a Telnet connection window titled "Telnet Connection - 10.100.15.174". The window has a menu bar with "Session", "Edit", "Options", "Capture", and "Help". The main content area is a blue screen with white text. At the top, it says "IQ 310/Configuration". Below that, there is a list of menu items: "Configuration", "View Statistics", "Test", "Dial", and "Firmware Upgrade". To the right of these items, there are several options with plus signs in brackets: "DTE Port [+]", "Network Port [+]", "DSX Port [+]", "Dial Backup [+]", and "System [+]". At the bottom of the screen, there is a status line: "(L) ISU Open Loop : Signaling DOWN : ISDN In DBU ^Z=help".

You are now logged in to the local IQ 310.

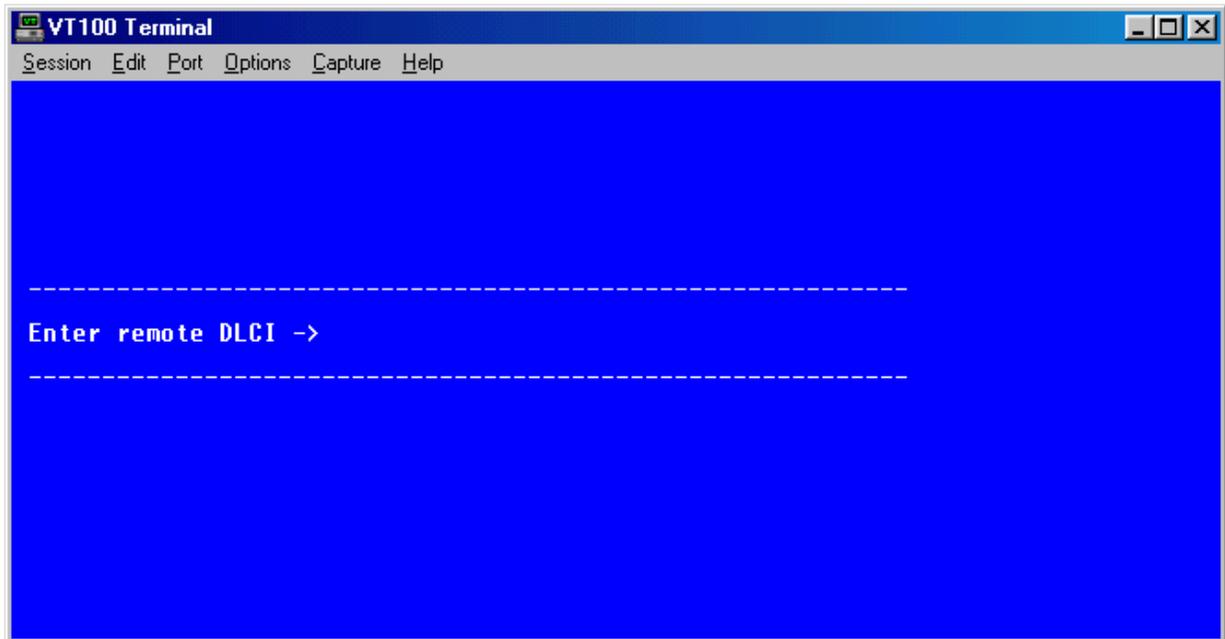


*In the lower left-hand corner of the VT100 screen, (L) is displayed, indicating the current screen represents the local unit.*

5. Press **<CTRL + L>** to log out of the unit. The following screen will appear.



6. Press **<CTRL + R>** to select remote login and the following screen will appear.

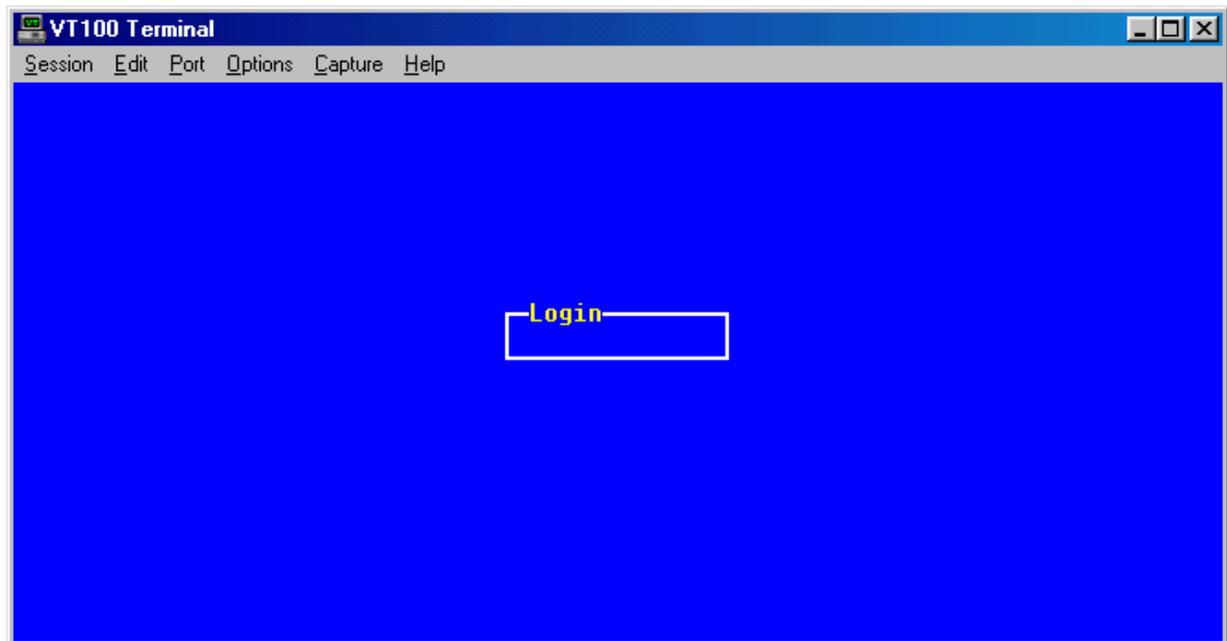


7. Enter the remote DLCI (see the following note), and press <ENTER> again.

**NOTE**

*When entering the DLCI for a remote application, enter the DLCI associated with the local unit that you are logged into (not the far end DLCI). The correct local unit DLCI for that remote site may be determined by looking for the active DLCI in the **VIEW STATISTICS > NETWORK PORT > DLCI LIST** menu. In Figure 1, a user trying to configure the Atlanta unit from the Huntsville site would enter a DLCI of 300.*

8. The following login screen will appear.



9. Enter the password. The factory default password is **adtran** in lowercase letters.
10. The IQ 310 Main menu for the remote unit is displayed as shown below.

```

Telnet Connection - 10.100.15.174
Session Edit Options Capture Help
IQ 310/Configuration
Configuration      DTE Port      [+]
View Statistics    Network Port  [+]
Test               DSX Port      [+]
Dial               Dial Backup   [+]
Firmware Upgrade   System        [+]

(R) ISU Open Loop : Signaling DOWN : ISDN In DBU ^Z=help

```



*In the lower left-hand corner of the VT100 screen, (R) is displayed, indicating the current screen represents the remote unit.*

11. You may now begin configuration of the remote unit. Press **<CTRL + L>** to log out of the remote unit.

### ***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.

## DLP-9 Shared PVC Management (In-Band)

### Introduction

The ADTRAN IQ 310 supports in-band shared PVC management. Shared PVC management refers to a PVC that is used for normal data traffic and management traffic. The IQ 310 monitors this PVC for packets that contain its IP address. When the IQ 310 detects a packet containing a destination IP address that matches the IQ 310 IP address, the unit intercepts the packet and processes its TCP/IP information. Shared PVC management is used to manage remote IQ 310s without being dependent on services from the remote router. This sometimes requires a static route at the host location. See the illustration below for an example of the Shared PVC Management Application.

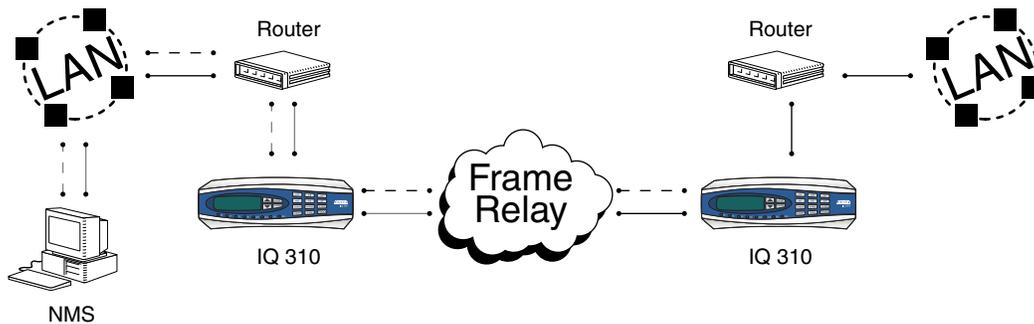


Figure 2. Shared PVC Management Application



*To support this type of management, all traffic on the selected PVC must be RFC 1490 encapsulated, noncompressed IP traffic.*



*By setting local PVC management and shared PVC management on the remote IQ 310, its IP address can be found through Inverse ARP. Since the unit is set up for shared PVC management, all management traffic will be intercepted prior to reaching the remote router.*

### **Prerequisite Procedures**

This procedure assumes that the IQ 310 is powered up and connected to an active frame relay network.

### **Tools and Materials Required**

- Male-to-female DB-9 cable (customer-provided) to connect to either a VT100 terminal or a PC configured as a VT100 terminal.
- VT100 terminal or PC configured as a VT100 terminal
- A DB-9 to DB-25 adapter will be required if the PC's com port is DB-25.

#### **WARNING**

*To prevent electric shock, do not install equipment in a wet location or during a lightning storm.*



#### **CAUTION**

*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

---

**Perform Steps Below in the Order Listed.**

---

**Terminal Configuration*****Enter the IP Address:***

1. Connect the IQ 310 unit to the VT100 system (details found in DLP-1).
2. Login to the system (details for login found in DLP-2).
3. From the **CONFIGURATION** menu, select the **SYSTEM** option and press **<ENTER>**.
4. From the **CONFIGURATION > SYSTEM** menu, select the **IP ADDRESS** option and press **<ENTER>**. Enter the appropriate IP address and press **<ENTER>**.
5. From the **CONFIGURATION > SYSTEM** menu, select the **SUBNET MASK** option and press **<ENTER>**. Enter the appropriate **SUBNET MASK** and press **<ENTER>**.
6. From the **CONFIGURATION > SYSTEM** menu, select the **GATEWAY IP ADDRESS** option and press **<ENTER>**. Enter the appropriate **GATEWAY IP ADDRESS** and press **<ENTER>**.

***Enter the Management DLCI:***

1. From the **CONFIGURATION** menu, select **NETWORK PORT** and press **<ENTER>**.
2. From the **CONFIGURATION > NETWORK PORT** menu, select the **MANAGEMENT DLCI 1** option and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.
3. If more than one management DLCI is being used, select the **MANAGEMENT DLCI 2** option from the **CONFIGURATION > NETWORK PORT** menu and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.

***Enter the Management DLCI Mode:***

1. From the **CONFIGURATION > NETWORK PORT** menu, select the **MGMT DLCI 1 MODE** option and press **<ENTER>**. Select **SHARED** if the DLCI is used to carry customer traffic as well as management data, and press **<ENTER>**.
2. If more than one management DLCI is being used, select the **MGMT DLCI 2 MODE** option and press **<ENTER>** from the **CONFIGURATION > NETWORK PORT** menu and press **<ENTER>**. Select **SHARED** if the DLCI is used to carry customer traffic as well as management data, and press **<ENTER>**.
3. Logoff by pressing **<CTRL + L>**.

## Front Panel Configuration

### ***Enter the IP Address:***

1. From the front panel, press 1 for **CONFIG** and press **<ENTER>**.
2. Press 6 for **SYSTEM** and press **<ENTER>**.
3. The cursor will now be blinking on 1 for **IP ADDRESS**. Press **<ENTER>**. Enter the appropriate **IP ADDRESS** and press **<ENTER>**.
4. Press 2 for **SUBNET MASK** and press **<ENTER>**. Enter the appropriate **SUBNET MASK** and press **<ENTER>**.
5. Press 3 for **GW IP ADDRESS** option and press **<ENTER>**. Enter the appropriate Gateway IP address and press **<ENTER>**.

### ***Enter the Management DLCI:***

1. Cancel back to the Main menu.
2. Press 1 for **CONFIG** and press **<ENTER>**.
3. Press 2 for **NETWORK PORT** and press **<ENTER>**.
4. Press 3 for **DLCI 1** and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.
5. If more than one management DLCI is being used, press 4 for **DLCI 2** and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.

### ***Enter the Management DLCI Mode:***

1. Press 5 for **DLCI 1 MODE** and press **<ENTER>**. Use the arrow keys to select **SHARED** if the DLCI is used to carry customer traffic as well as management data, and press **<ENTER>**.
2. If more than one management DLCI is being used, press 6 for **DLCI 2 MODE** and press **<ENTER>**. Use the arrow keys to select **SHARED** if the DLCI is used to carry customer traffic as well as management data, and press **<ENTER>**.

**NOTE**

*The IQ 310 supports management from two network DLCIs either shared or dedicated.*

**NOTE**

*The IQ 310 can simultaneously support management on two DLCIs. The unit will support both DLCIs set to **SHARED**, both DLCIs set to **DEDICATED**, or one DLCI set to **SHARED** and one to **DEDICATED**.*

## ***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.

## DLP-10 Dedicated PVC Management (In-Band)

### Introduction

The ADTRAN IQ 310 supports in-band dedicated PVC management. Dedicated PVC management refers to the ability to have a PVC originated from the network and terminated in the IQ 310. This is an ideal configuration for third-party management. It isolates the customer's data traffic from network management traffic, and it also acts as a fire-wall that restricts management data to the IQ 310. Dedicated PVC management is also ideal when the user wants to guarantee access to a remote IQ 310 regardless of the state of the remote LAN. If set to **DEDICATED**, the router is not notified of that DLCI. See the illustration below for an example of the Dedicated PVC Management Application.

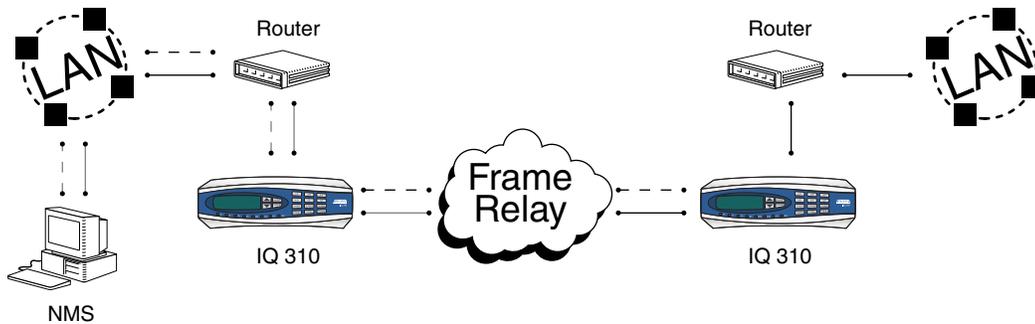


Figure 3. Dedicated PVC Management Application



*To support this type of management, all traffic on the selected PVC must be RFC 1490 encapsulated, noncompressed IP traffic.*

### **Prerequisite Procedures**

This procedure assumes that the IQ 310 is powered up and connected to an active frame relay network that is providing an additional PVC for management.

### **Tools and Materials Required**

- Male-to-female DB-9 cable (customer-provided) to connect to either a VT100 terminal or a PC configured as a VT100 terminal.
- VT100 terminal or PC configured as a VT100 terminal
- A DB-9 to DB-25 adapter will be required if the PC's com port is DB-25.

#### **WARNING**

*To prevent electric shock, do not install equipment in a wet location or during a lightning storm.*



*Electronic modules can be damaged by static electrical discharge. Before handling modules, wear an antistatic discharge wrist strap to prevent damage to electronic components. Place modules in antistatic packing material when transporting or storing. When working on modules, always place them on an approved antistatic mat that is electrically grounded.*

---

**Perform Steps Below in the Order Listed.**

---

**Terminal Configuration*****Enter the IP Address:***

1. Connect the IQ 310 unit to the VT100 system (details found in DLP-1).
2. Login to the system (details for login found in DLP-2).
3. From the **CONFIGURATION** menu, select the **SYSTEM** option and press **<ENTER>**.
4. From the **CONFIGURATION > SYSTEM** menu, select the **IP ADDRESS** option and press **<ENTER>**. Enter the appropriate IP address and press **<ENTER>**.
5. From the **CONFIGURATION > SYSTEM** menu, select the **SUBNET MASK** option and press **<ENTER>**. Enter the appropriate **SUBNET MASK** and press **<ENTER>**.
6. From the **CONFIGURATION > SYSTEM** menu, select the **GATEWAY IP ADDRESS** option and press **<ENTER>**. Enter the appropriate **GATEWAY IP ADDRESS** and press **<ENTER>**.

***Enter the Management DLCI:***

1. From the **CONFIGURATION** menu, select **NETWORK PORT** and press **<ENTER>**.
2. From the **CONFIGURATION > NETWORK PORT** menu, select the **MANAGEMENT DLCI 1** option and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.
3. If more than one management DLCI is being used, select the **MANAGEMENT DLCI 2** option from the **CONFIGURATION > NETWORK PORT** menu and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.

***Enter the Management DLCI Mode:***

1. From the **CONFIGURATION > NETWORK PORT** menu, select the **MGMT DLCI 1 MODE** option and press **<ENTER>**. Select **DEDICATED** if the management DLCI is used only to manage the IQ 310 (and not used to carry customer traffic), and press **<ENTER>**.
2. If more than one management DLCI is being used, select the **MGMT DLCI 2 MODE** option from the **CONFIGURATION > NETWORK PORT** menu and press **<ENTER>**. Select **DEDICATED** if the management DLCI is used only to manage the IQ 310 (and not used to carry customer traffic), and press **<ENTER>**.
3. Logoff by pressing **<CTRL + L>**.

**Front Panel Configuration*****Enter the IP Address:***

1. From the front panel, press 1 for **CONFIG** and press **<ENTER>**.
2. Press 6 for **SYSTEM** and press **<ENTER>**.
3. The cursor will now be blinking on 1 for **IP ADDRESS**. Press **<ENTER>**. Enter the appropriate **IP ADDRESS** and press **<ENTER>**.
4. Press 2 for **SUBNET MASK** and press **<ENTER>**. Enter the appropriate **SUBNET MASK** and press **<ENTER>**.

5. Press 3 for **GW IP ADDRESS** option and press **<ENTER>**. Enter the appropriate Gateway IP address and press **<ENTER>**.

### ***Enter the Management DLCI:***

1. Cancel back to the Main menu.
2. Press 1 for **CONFIG** and press **<ENTER>**.
3. Press 2 for **NETWORK PORT** and press **<ENTER>**.
4. Press 3 for **DLCI 1** and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.
5. If more than one management DLCI is being used, press 4 for **DLCI 2** and press **<ENTER>**. Enter the appropriate DLCI and press **<ENTER>**.

### ***Enter the Management DLCI Mode:***

1. Press 5 for **DLCI 1 MODE** and press **<ENTER>**. Use the arrow keys to select **DEDICATED** if the management DLCI is used only to manage the IQ 310 (and not used to carry customer traffic), and press **<ENTER>**.
2. If more than one management DLCI is being used, press 6 for **DLCI 2 MODE** and press **<ENTER>**. Use the arrow keys to select **DEDICATED** if the management DLCI is used only to manage the IQ 310 (and not used to carry customer traffic), and press **<ENTER>**.

**NOTE**

*The IQ 310 supports management from two network DLCIs either shared or dedicated.*

**NOTE**

*The IQ 310 can simultaneously support management on two DLCIs. The unit will support both DLCIs set to **SHARED**, both DLCIs set to **DEDICATED**, or one DLCI set to **SHARED** and one to **DEDICATED**.*

### ***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.

## **DLP-11 Manual Dial Backup**

### ***Introduction***

The ADTRAN IQ 310 supports manual dial backup. This option can be accessed under the **DIAL** option of the Main menu. This option is only available when a dial backup module is installed.

### ***Prerequisite Procedures***

The unit must have a dial backup line connected and all relevant dial backup parameters programmed. For example, with the BRI ISDN module installed, SPIDs, LDNs, and Switch Type must be configured.

See the Dial Backup Configuration Guides for instructions on programming these parameters.

### ***Tools and Materials Required***

- Male-to-female DB-9 cable (customer-provided) to connect to either a VT100 terminal or a PC configured as a VT100 terminal.
- VT100 terminal or PC configured as a VT100 terminal
- A DB-9 to DB-25 adapter will be required if the PC's com port is DB-25 (customer-provided).

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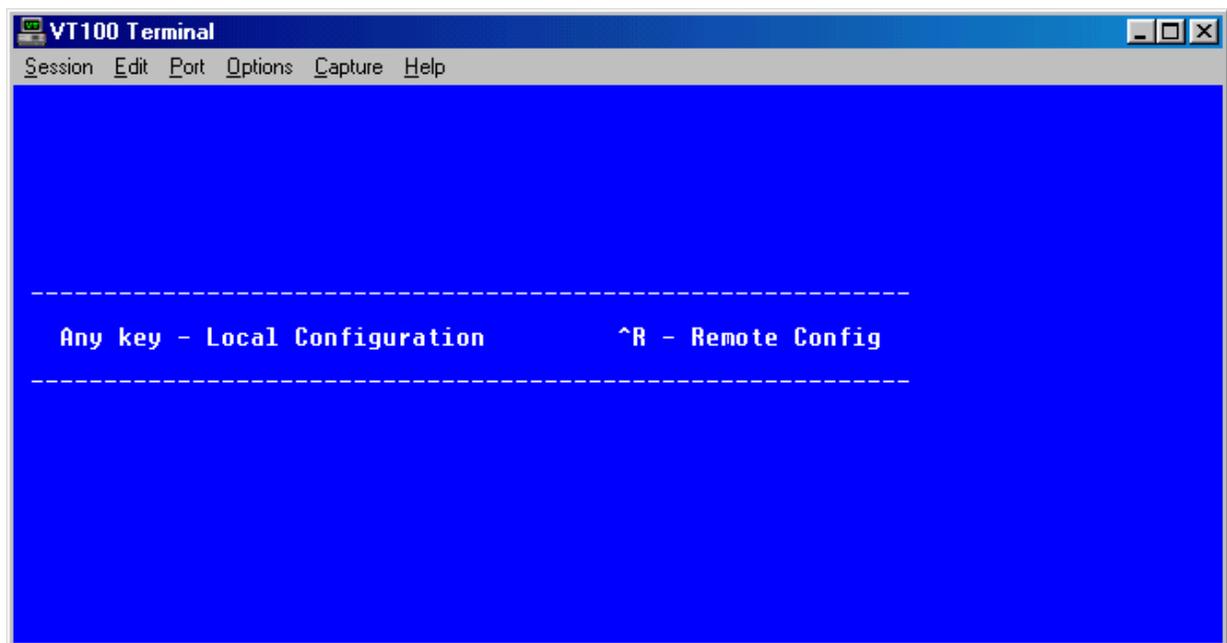
**Perform Steps Below in the Order Listed.**

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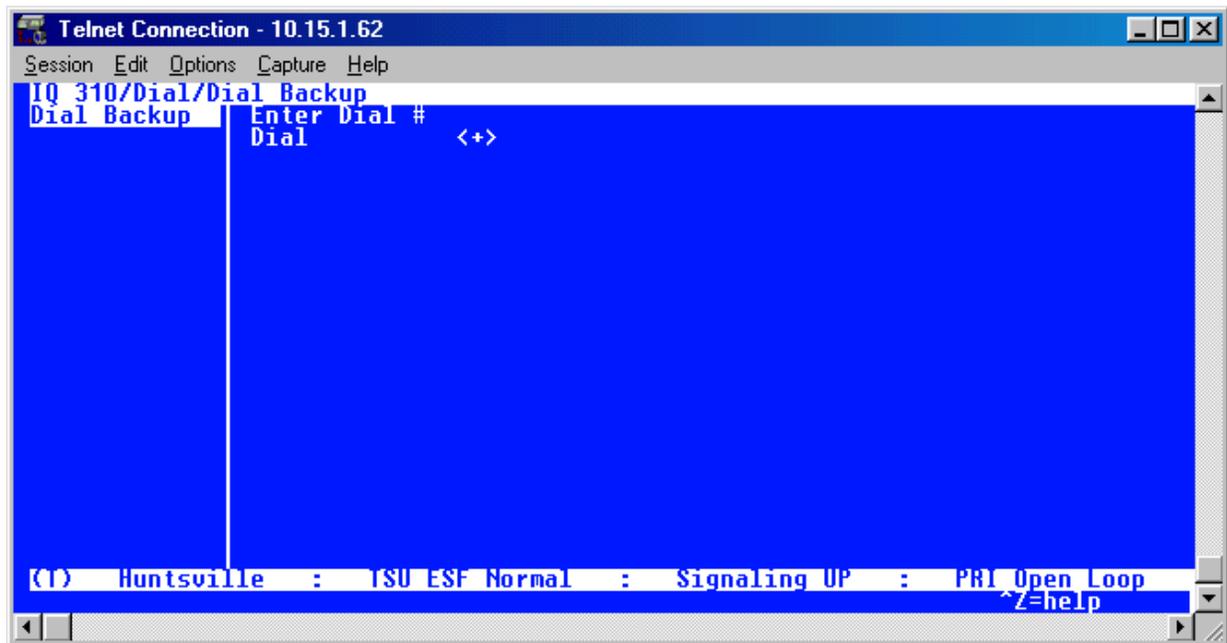
## Terminal Directions

### *Dial Options When Dial Backup is Idle (all DBU modules):*

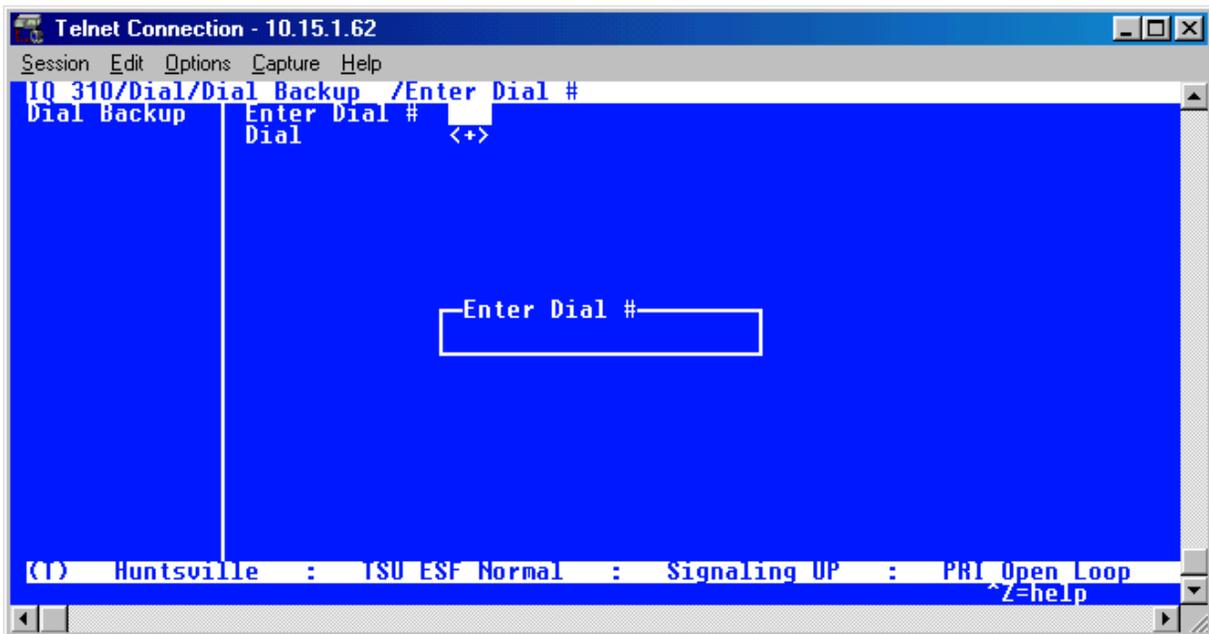
1. Connect the IQ 310 unit to the VT100 system (details found in DLP-1).
2. Login to the system (details for login found in DLP-2).
3. From the Main menu, select **DIAL** and press **<ENTER>**. The **DIAL** menu will appear. The **STAY ON LEASED** option is not available with the PRI DBU Module installed.



4. To initiate manual dial backup, use the arrow key to select **DIAL BACKUP**; press **<ENTER>**. The **DIAL BACKUP** menu will appear. (If **STAY ON LEASED** is selected, the IQ 310 will remain on the leased line and will not enter dial backup mode.)



- Use the arrow keys to select **ENTER DIAL #**; press **<ENTER>**. The **ENTER DIAL #** screen will appear.



- Enter the phone number you want to dial and press **<ENTER>**. Then select **Dial <+>** and press **<ENTER>**. Assuming the unit is configured properly for dial backup and the dial backup line is good, the unit will then initiate a manual dial backup.

***Dial Options during Dial Backup (for V.34, BRI ISDN, and DCE DBU modules):***

1. The **HANG UP** option will terminate the current dial backup session and attempt to reestablish communication on the dedicated line.
2. The **TURN OFF BEEP** option will discontinue the audible beep for the duration of the current DBU session.

***Dial Options during Dial Backup (for PRI DBU module):***

1. The **ENTER DIAL #** option will force the unit to attempt dial backup to the site corresponding to the phone number entered.
2. The **HANG UP PHONE #** option will disconnect the DBU session to the site corresponding to the phone number entered.
3. The **HANG UP SITE #** option is only available on the terminal interface. This option will disconnect the dial backup session to a specific site. The site number may be obtained from the call manager menu.
4. The **HANG UP ALL CALLS** option will disconnect all dial backup sessions currently active.
5. The **TURN OFF BEEP** option will discontinue the audible beep for the duration of the current DBU session.

**Front Panel Directions*****Dial Options When Dial Backup is Idle (all DBU modules):***

1. Press 4 for **DIAL** and press **<ENTER>**.
2. The cursor will then be flashing on 1 for **DIAL BACKUP**. Press **<ENTER>**. If **STAY ON LEASED** is selected, the IQ 310 will remain on the leased line and will not enter dial backup mode. The **STAY ON LEASED** option is not available with a PRI DBU module installed.
3. The cursor will then be flashing on 1 for **ENTER DIAL #**. Press **<ENTER>**.
4. Enter the phone number and press **<ENTER>**.
5. Press 2 for **DIAL** and press **<ENTER>**. The unit will then initiate a manual dial backup session.

***Dial Options during Dial Backup (for V.34, BRI ISDN, and DCE DBU modules):***

1. Press 4 for **DIAL** and press **<ENTER>**.
2. Press 1 for **HANG UP** and press **<ENTER>** to terminate the current dial backup session and attempt to reestablish communication on the dedicated line.
3. Press 2 for **TURN OFF BEEP** and press **<ENTER>** to discontinue the audible beep for the duration of the current DBU session.

***Dial Options during Dial Backup (for PRI DBU module):***

1. Press 1 for **ENTER DIAL #** and press **<ENTER>** to force the unit to attempt dial backup to the site corresponding to the phone number entered.
2. Press 2 for **HANG UP #** and press **<ENTER>** to disconnect the dial backup session to the site corresponding to the phone number entered.
3. Press 3 for **DROP ALL CALLS** and press **<ENTER>** to discontinue all dial backup sessions currently active.
4. Press 4 for **TURN OFF BEEP** and press **<ENTER>** to discontinue the audible beep for the duration of the current DBU session.



## DLP-12 Connecting to the IQ 310 Using the N-Formant

### **Introduction**

This procedure details the steps which must be performed to connect to the IQ 310 using the N-Formant.

### **Prerequisite Procedures**

Complete DLP-4, *Setting IP Parameters for the IQ 310* and DLP-5, *Verifying Communications Over an IP LAN* (steps 1 and 2 only).

### **Tools and Materials Required**

- Access to a PC or other computer connected to the internet
- Web browser installed on PC. The N-Formant will work with Netscape Navigator 4.7 and 6.1 and with Internet Explorer 5.5 or later.
- JAVA plug-in (from Sun). It must run on a platform that supports the previously mentioned browsers (Netscape Navigator and Internet Explorer) and the plug-in.
- At least the 1.2 version of the JAVA Runtime Environment (JRE).



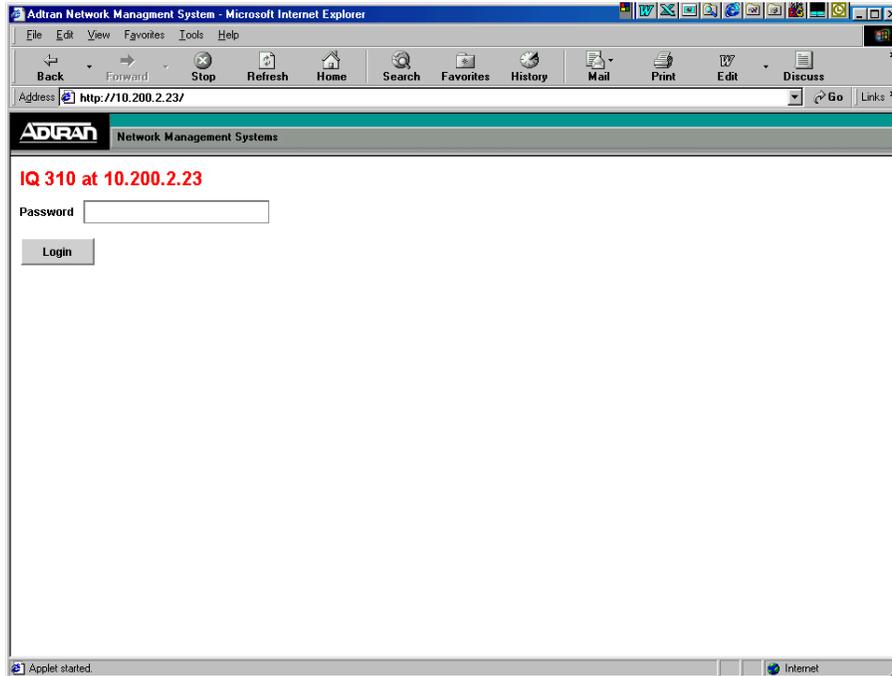
*If JRE 1.3 or better is used, it will take advantage of JAR caching, so that the web browser does not have to reload the applet from the unit every time it runs, instead using a cached copy from the local hard drive.*

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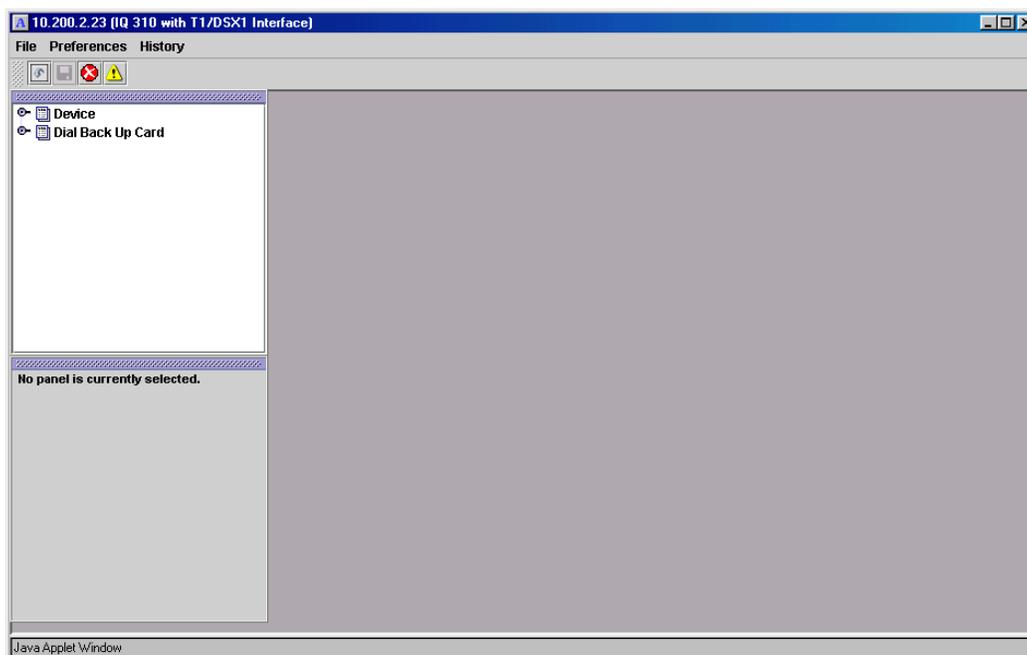
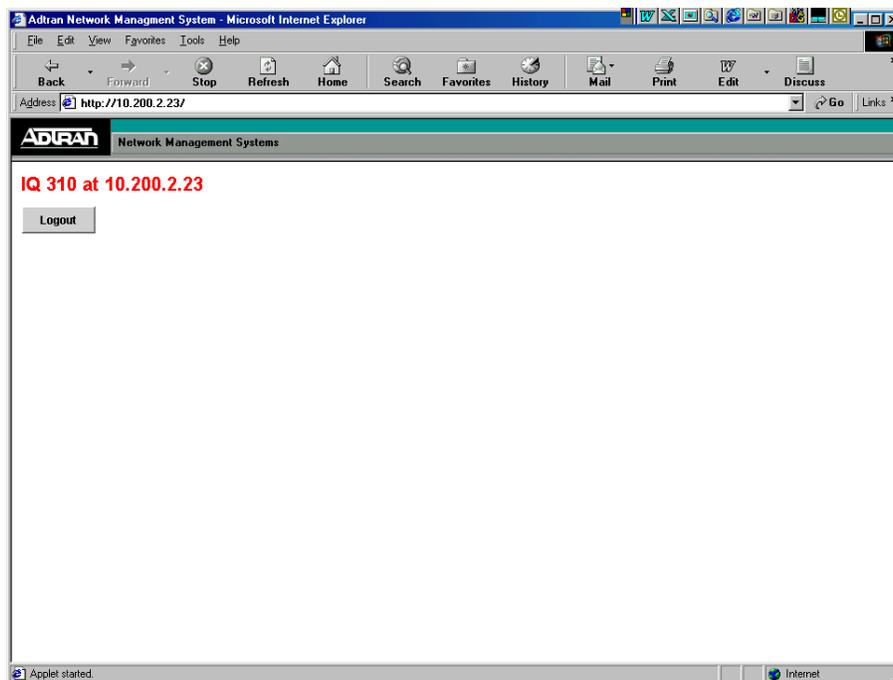
**Perform Steps Below in the Order Listed.**

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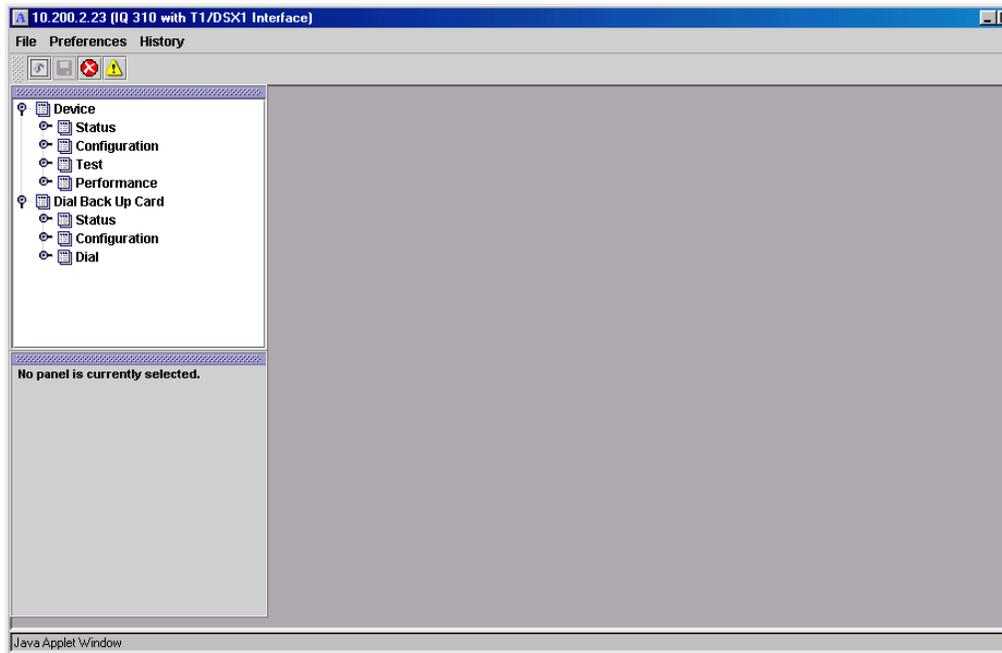
1. Open the Web browser.
2. On the address line, enter the IQ 310 IP address.
3. The following login screen will appear:



4. Enter the appropriate password. The default password is **adtran** (all lowercase).
5. Click on the login button. The following two screens will then appear:



6. You are now connected to the IQ 310 menu system through the N-Formant.
7. The Main menu items for the base unit can be selected by clicking on the **DEVICE** icon in the left pane of the window, shown in the previous figure. The **DIAL BACKUP** menu items can be selected by clicking on the **DIAL BACKUP CARD** icon in the left pane of the window. Clicking on these icons will result in the expanded screen shown below.



- When you complete your configuration changes, click on the logout button shown in the screen at the top of page 131 of this DLP to log out and close the session.



*This logout screen will automatically appear once a log on to the unit is complete as shown in Step 5.*

### **Follow-up Procedures**

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.

## **DLP-13 Connecting to the IQ 310 Using Telnet**

### ***Introduction***

If the IQ 310 is part of a management cluster connected to the local network, you may use a PC connected to the network to Telnet into the unit. This procedure details the steps which must be performed to Telnet into the unit.

### ***Prerequisite Procedures***

Complete DLP-4, *Setting IP Parameters for the IQ 310* and DLP-5, *Verifying Communications Over an IP LAN* (steps 1 and 2 only).

### ***Tools and Materials Required***

- Access to a PC or other computer connected to the LAN

---

**Perform Steps Below in the Order Listed.**

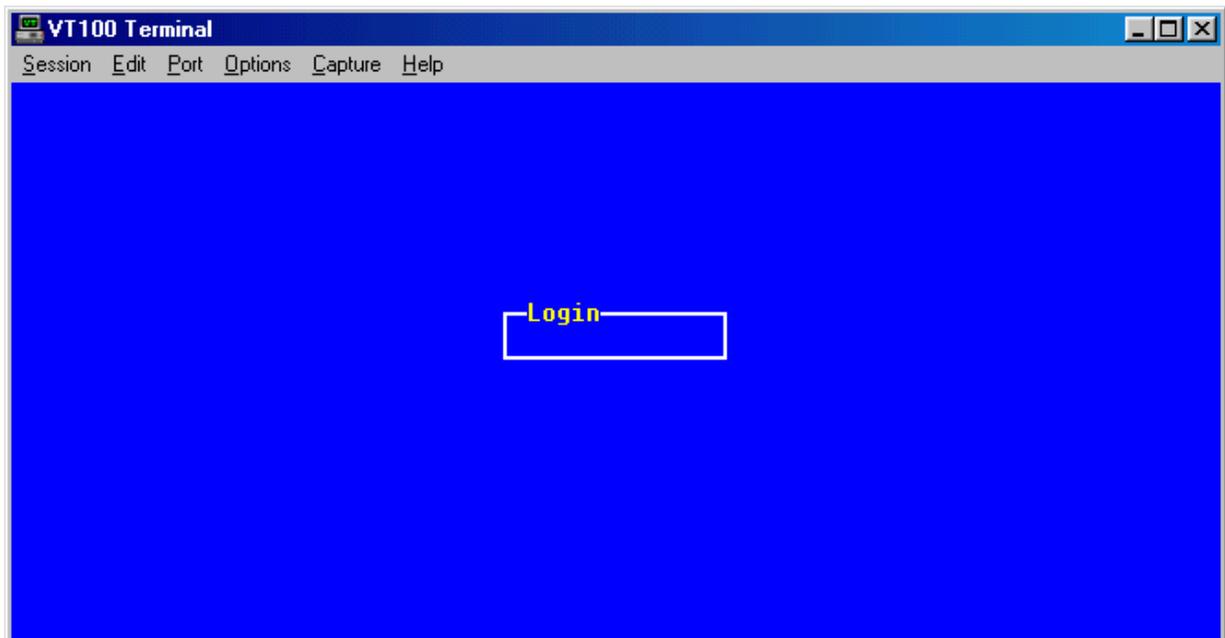
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1. Connect the IQ 310 **ETHERNET** port to a hub on the local LAN.
2. From a computer system connected to the LAN, Telnet to the IQ 310 IP address.

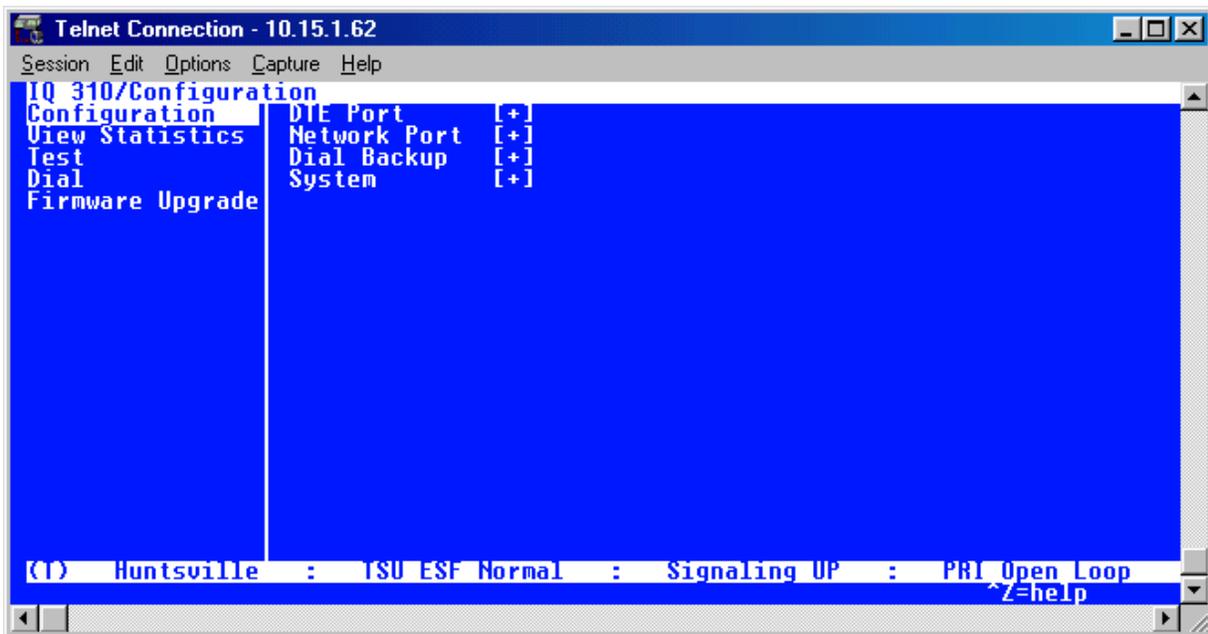
**NOTE**

*Refer to the documentation of the computer system if you are unsure how to perform a Telnet. Most computers running a networked version of Microsoft Windows or UNIX allow a Telnet to be performed by simply typing "**Telnet<IP Address>**" at a command line prompt. Telnet is a utility common on many local area networks that allows remote access to another computer or piece of equipment.*

3. The following login screen will appear:



4. Enter the appropriate password. The default password is **adtran** (all lowercase).
5. The following screen will appear:



The screenshot shows a Telnet connection window titled "Telnet Connection - 10.15.1.62". The window has a menu bar with "Session", "Edit", "Options", "Capture", and "Help". The main content area is a blue background with white text. The text is organized into two columns. The left column contains the following menu items: "IQ 310/Configuration", "Configuration", "View Statistics", "Test", "Dial", and "Firmware Upgrade". The right column contains: "DTE Port [+]", "Network Port [+]", "Dial Backup [+]", and "System [+]". At the bottom of the window, there is a status bar with the text: "(1) Huntsville : TSU ESF Normal : Signaling UP : PRI Open Loop". A cursor is positioned at the end of the status bar, and the text "Z=help" is visible below it.

6. You are now Telnetted into the IQ 310 menu system.
7. When you complete your configuration changes, press **<CTRL + L>** to logout and close the session.

### ***Follow-up Procedures***

Once this procedure is complete, return to the procedure which referred you to this DLP and continue with the tasks indicated there.



## CONFIGURATION GUIDES

CFG-1	Basic Frame Relay Dial Backup Between Multiple Sites with the IQ 310 .....	139
CFG-2	Example of the IQ 310 DBU on Inactive Group Parameter .....	159
CFG-3	Frame Relay Primary Rate ISDN Dial Backup with the IQ 310 .....	181
CFG-4	Example of the IQ 310 Call Order Parameter .....	227



## **CFG-1      Basic Frame Relay Dial Backup Between Multiple Sites with the IQ 310**

### ***Introduction***

The ADTRAN IQ 310 provides disaster recovery protection for Frame Relay circuits. This configuration guide will describe how to configure dial backup (DBU) between a host site and two remote sites. The units used in this example are IQ 310s with ISDN BRI DBU and T1/DSX modules.

### ***Before You Begin***

For this example, each IQ 310 unit will require an ISDN BRI DBU module (P/N 1204004L2) and a T1/DSX module (P/N 1202803L1).

### ***Network Description***

Figure 1 on page 140 is a diagram of the Frame Relay example network used in this configuration guide. In this example, the host site is Huntsville. Two Permanent Virtual Circuits (PVCs) originate from Huntsville. One circuit is connected to Atlanta and the other to Birmingham. The two DLCIs used by the host site to communicate with the remotes are 16 and 17. Atlanta and Birmingham are the two remote sites. They both use DLCI 20 for communication with Huntsville. Please remember that DLCIs have local significance and are assigned by the Telephone Company (TELCO) when the Frame Relay network is built; therefore the DLCIs for your Frame Relay network will most likely be different from the ones used in this example.

The remaining parameters described in Figure 1 provide a description of the BRI lines that terminate into the three IQ 310s. The Telephone Company will provide you with the Local Directory Numbers (LDNs) and Service Profile Identifiers (SPIDs) for each of your BRI lines. In addition, you must know which type of Central Office (CO) switch is providing the ISDN service.

To configure the sample network, perform the steps given in the following pages.

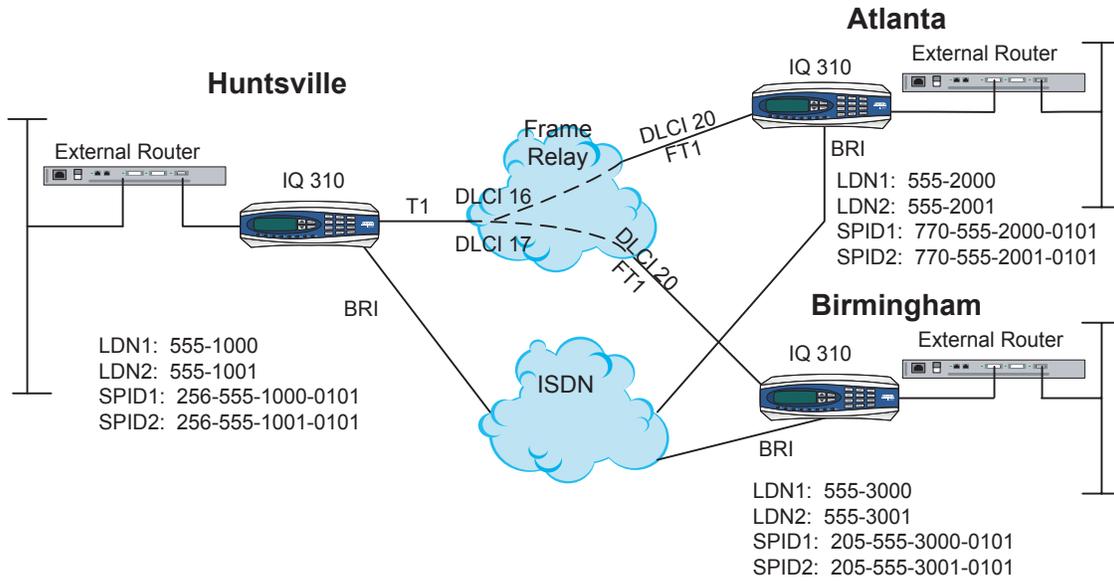


Figure 1. IQ 310 Frame Relay Dial Backup Example Network

## Configuring the Dial Backup Parameters

1. From the **CONFIGURATION** menu terminal screen (Figure 2) of the IQ 310, select **CONFIGURATION** and press **<ENTER>**.

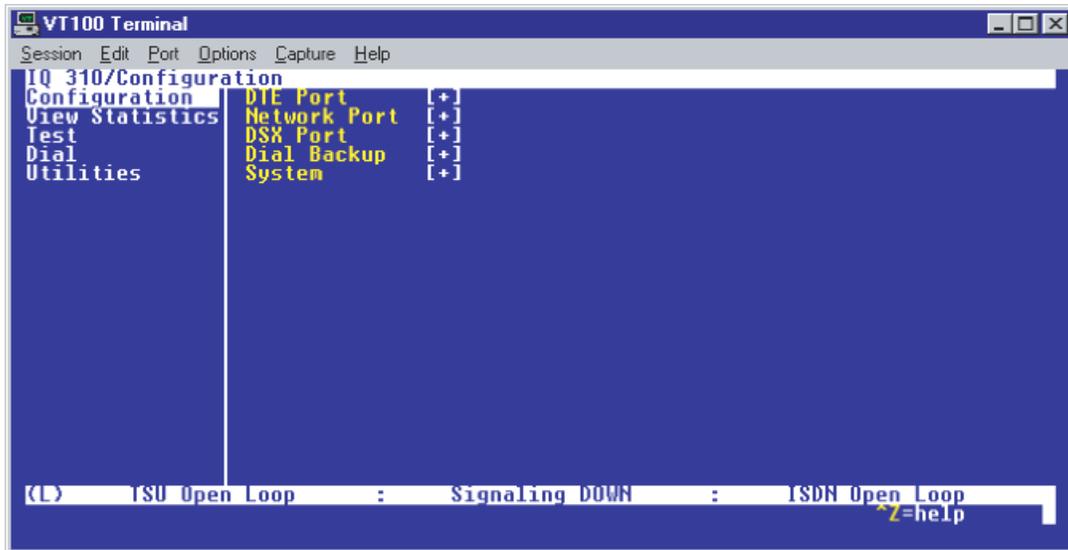


Figure 2. Main menu

2. Using the arrow keys, select **DIAL BACKUP** from the **CONFIGURATION** menu shown in Figure 2; then press **<ENTER>**. The resulting screen is displayed in Figure 3.

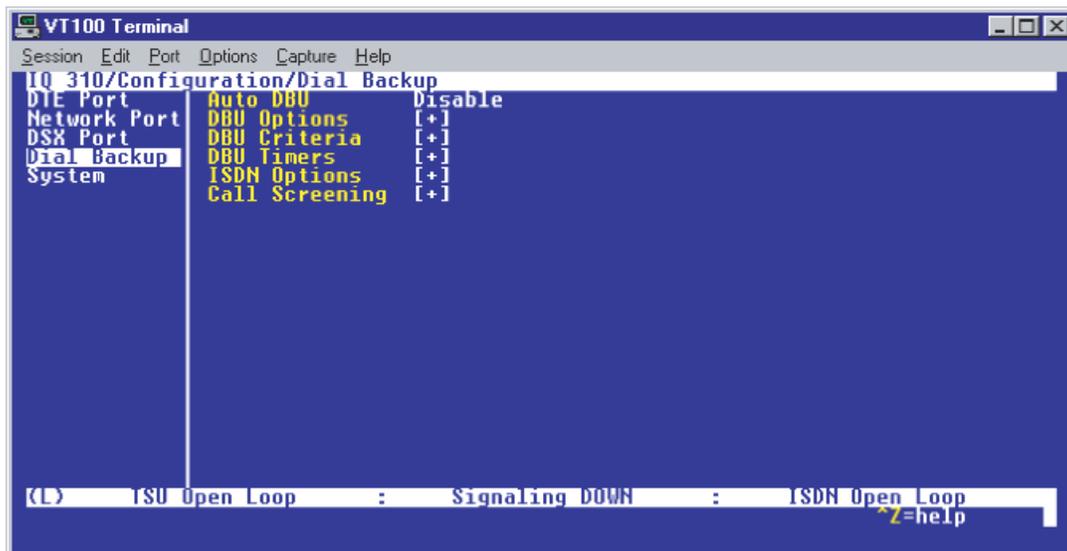


Figure 3. Dial Backup Menu

By default, **AUTO DBU** is disabled. This parameter must be changed to **ENABLE** for the IQ 310 to automatically dial the remote end once any of the DBU criteria are met. This setting must also be enabled in order for the IQ unit to automatically answer inbound calls from other units.

3. Use the right arrow key to select **AUTO DBU**; then press **<ENTER>**. The screen shown in Figure 4 will appear.

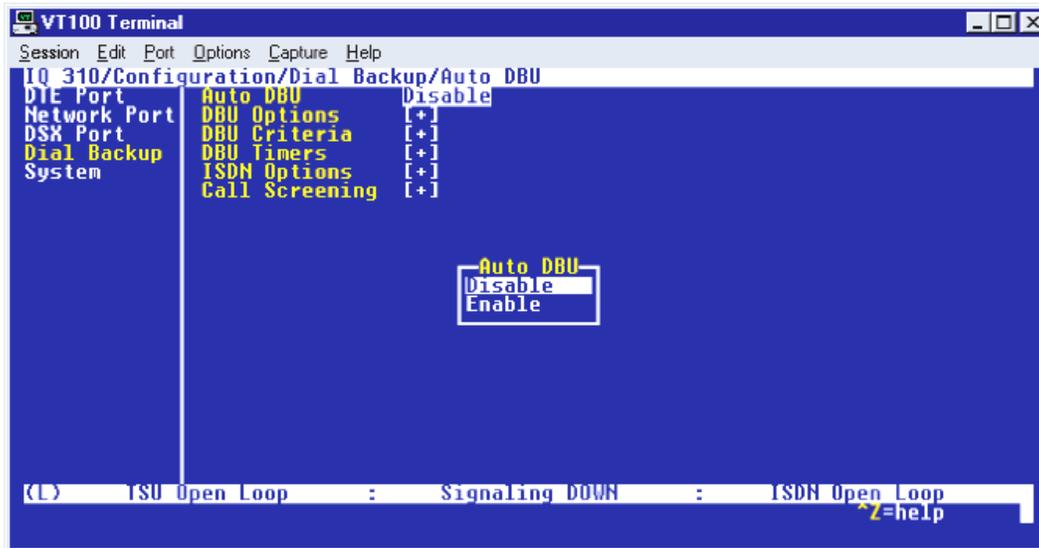


Figure 4. Auto DBU Selections

4. Use the down arrow to select **ENABLE**; then press **<ENTER>**. At this point, the **AUTO DBU** parameter will change to **ENABLE** and the screen shown in Figure 5 will appear.

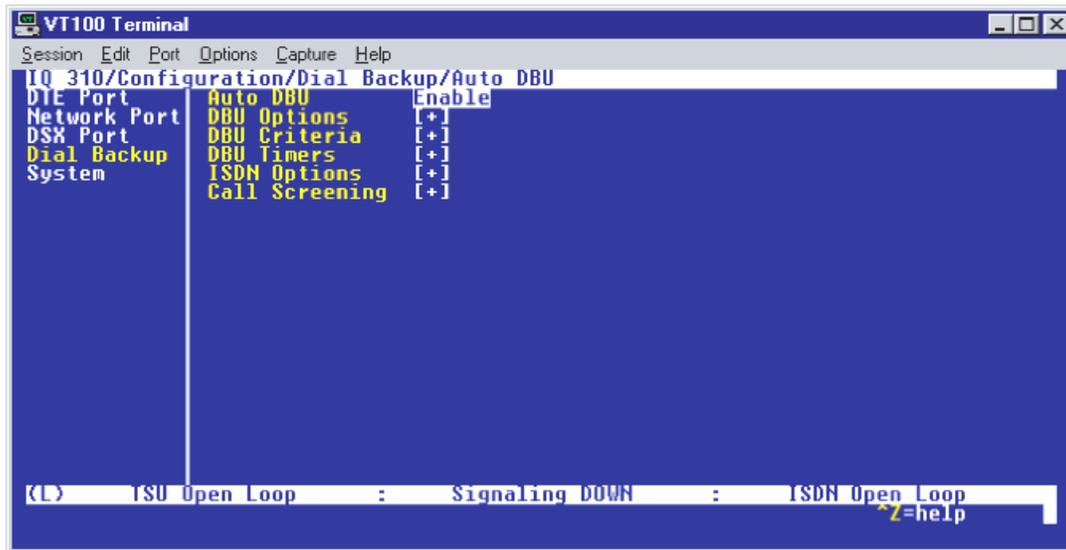


Figure 5. Auto DBU Enabled

### ***DBU Options***

1. Press the down arrow to select **DBU OPTIONS**; then press **<ENTER>**. The screen shown in Figure 6 will appear. The default parameter values for this screen are shown.

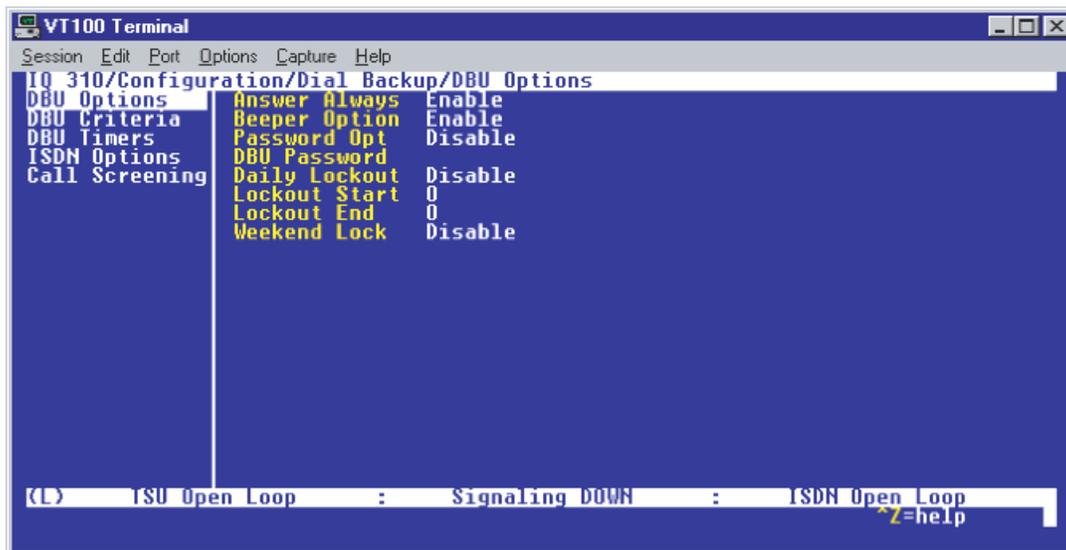


Figure 6. DBU Options Menu

For basic dial backup operation, these parameters do not need to be altered from their default values.

The **ANSWER ALWAYS** option must work in conjunction with the **AUTO DBU** option. The **AUTO DBU** option is still the controlling option. If **AUTO DBU** is disabled, the unit will not answer the call regardless of how **ANSWER ALWAYS** is set. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Answer Always	Result
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Enabled	Unit will answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Disabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Enabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Disabled	Unit will not answer an incoming call.

In addition, the **ANSWER ALWAYS** feature must work in conjunction with the **ORIGINATE/ANSWER** feature. The **ORIGINATE/ANSWER** feature only appears when the unit is programmed for a non frame-relay circuit (signaling none). If **ANSWER ALWAYS** is enabled (and **AUTO DBU** enabled), the unit will answer the call even if it is set to **ORIGINATE**. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Originate/Answer	Answer Always	Result
None	Enabled	Originate	Enabled	Unit will answer an incoming call.
None	Enabled	Originate	Disabled	Unit will not answer an incoming call.
None	Enabled	Answer	Enabled	Unit will answer an incoming call.
None	Enabled	Answer	Disabled	Unit will not answer an incoming call.
None	Disabled	Originate	Enabled	Unit will not answer an incoming call.
None	Disabled	Originate	Disabled	Unit will not answer an incoming call.
None	Disabled	Answer	Enabled	Unit will not answer an incoming call.
None	Disabled	Answer	Disabled	Unit will not answer an incoming call.

The **BEEPER OPTION** allows the user to control the intermittent beep issued during dial backup. **PASSWORD OPTION** and **DBU PASSWORD** are security features that can be used to prevent the IQ 310 unit from establishing dial backup with unknown units. **DAILY LOCKOUT** enabled prevents the IQ 310 unit from going into dial backup between the timeframes specified by **LOCKOUT START** and **LOCKOUT END**. With **WEEKEND LOCK** enabled, no dial backup will occur from midnight Friday to midnight Sunday.

## DBU Criteria

1. From the screen shown in Figure 6, press the down arrow to select **DBU CRITERIA**. The menu screen shown in Figure 7 is displayed. The default values for the parameters on this screen are shown.

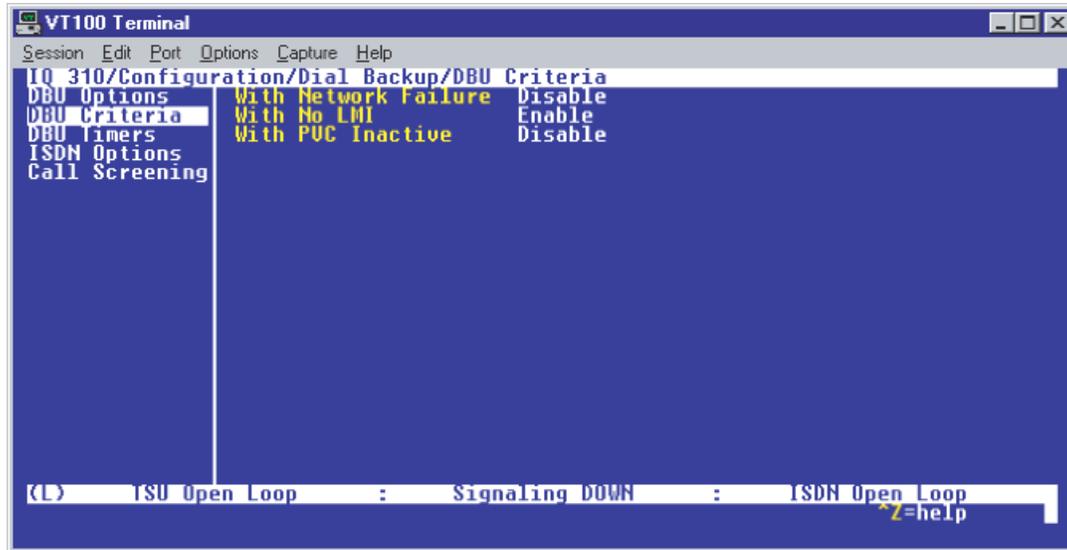


Figure 7. DBU Criteria Menu

2. Use the right arrow to select **WITH NETWORK FAILURE**; then press **<ENTER>**. Use the down arrow to select **ENABLE**; then press **<ENTER>**. This allows the IQ unit to enter dial backup in the event that the network T1 line goes into alarm.
3. **WITH NO LMI** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when the **FRAME RELAY SIGNALING STATE** is down.
4. Press the down arrow to select **WITH PVC INACTIVE**; then press **<ENTER>**. Use the down arrow to select **ENABLE**; then press **<ENTER>**.

This is a global setting that affects all of the PVCs in the IQ 310 DLCI table (under **NETWORK PVC OPTIONS**). A PVC is advertised as Inactive by the frame switch in the CO when there is a problem at the remote end of the frame circuit. With this option enabled, the IQ 310 will attempt to establish a dial backup call with the remote unit when its corresponding DLCI is advertised as Inactive (provided that DLCI does not have **DBU ON INACTIVE** disabled under the **NETWORK PVC** options).

Once these parameters have been configured properly, the **DBU CRITERIA** screen should look exactly like Figure 8.



Figure 8. DBU Criteria Menu with Options Enabled

### DBU Timers

1. Press the left arrow key once and the down arrow key once to select **DBU TIMERS**. The **DBU TIMERS** screen shown in Figure 9 is displayed. The default parameter values are shown.

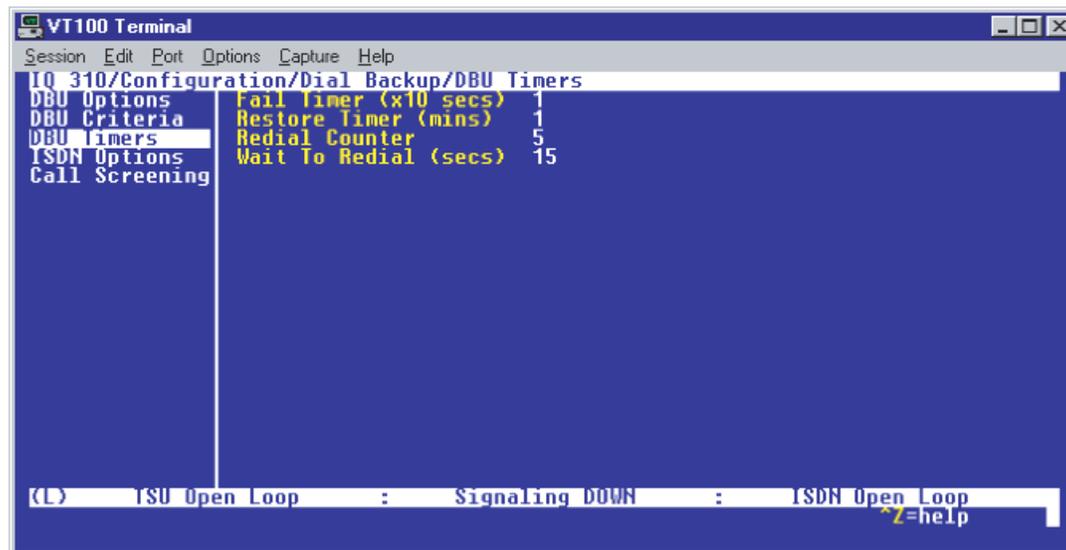


Figure 9. DBU Timers Menu

For basic dial backup operation, these parameters do not need to be altered from their default values. The **FAIL TIMER** programs the amount of time the IQ 310 will wait once any of the DBU criteria have been met before entering dial backup. Once the Frame Relay link has been reestablished on the network line, the **RESTORE TIMER** sets the amount of time the IQ 310 will wait before disconnecting the dial backup call. The **REDIAL COUNTER** programs the number of redial attempts performed if dial backup is not established on the first call. **WAIT TO REDIAL** defines the amount of time between redial attempts.

## ISDN Options

1. From the screen shown in Figure 9, press the down arrow to select **ISDN OPTIONS**. The screen shown in Figure 10 is now displayed. The default values for the parameters on this menu are shown.

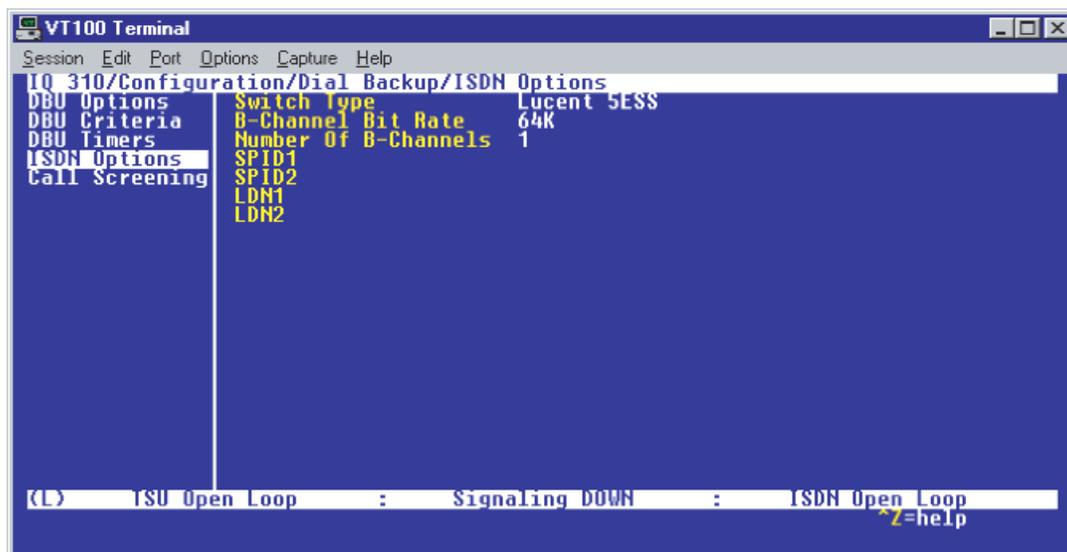


Figure 10. ISDN Options Menu

2. Use the right arrow to select **SWITCH TYPE**; then press **<ENTER>**. A list of available switch types is displayed. *The SWITCH TYPE selected here must match the TELCO CO switch providing the ISDN service.* Select **LUCENT 5ESS**, **DMS 100**, **NATIONAL**, or **NEC** and press **<ENTER>**. For the example network in Figure 1, we will assume the switch type for all three IQ 310 DBU modules is **NATIONAL**. Down arrow to select **NATIONAL**; then press **<ENTER>**.
3. Down arrow to select **B-CHANNEL BIT RATE**; then press **<ENTER>**. Select **54KBPS** or **64KBPS** and press **<ENTER>**. Generally leave this value to its default of **64 KBPS** unless your ISDN service only provides 56 kbps.
4. Down arrow to select the **NUMBER OF B-CHANNELS** on the BRI line; then press **<ENTER>**. Enter 1 for single channel service or 2 for dual channel service and press **<ENTER>**. If your Telephone Company has given you two SPIDs, you should set the **NUMBER OF B-CHANNELS** to 2.
5. Down arrow to select **SPID1**; then press **<ENTER>**. Enter the SPID assigned by the Telephone Company for the first B-channel and press **<ENTER>**. For the example network in Figure 1, the proper SPID is entered here depending upon which IQ 310 is being configured.

6. Down arrow to select **SPID2**; then press **<ENTER>**. Enter the SPID assigned by the Telephone Company for the second B-channel and press **<ENTER>**. Again, for the example network in Figure 1, the proper SPID is entered here depending upon which IQ 310 is being configured. If the **NUMBER OF B-CHANNELS** is set to 1, leave this entry blank.
7. Down arrow to select **LDN1**; then press **<ENTER>**. Insert the Local Directory Number provided by the Telephone Company for the first B-Channel and press **<ENTER>**. For the example network shown in Figure 1, the proper LDN is entered here depending upon which IQ 310 is being configured.
8. Down arrow to select **LDN2**; then press **<ENTER>**. Enter the Local Directory Number assigned to the second B-Channel by the Telephone Company and press **<ENTER>**. Again, for the example network shown in Figure 1, the proper LDN is entered here depending upon which IQ 310 is being configured. If the **NUMBER OF B-CHANNELS** is set to 1, leave this entry blank.

Sample screen shots of the **ISDN OPTIONS** screen for the Huntsville, Atlanta, and Birmingham IQ 310s are shown in Figures 11, 12, and 13, respectively.

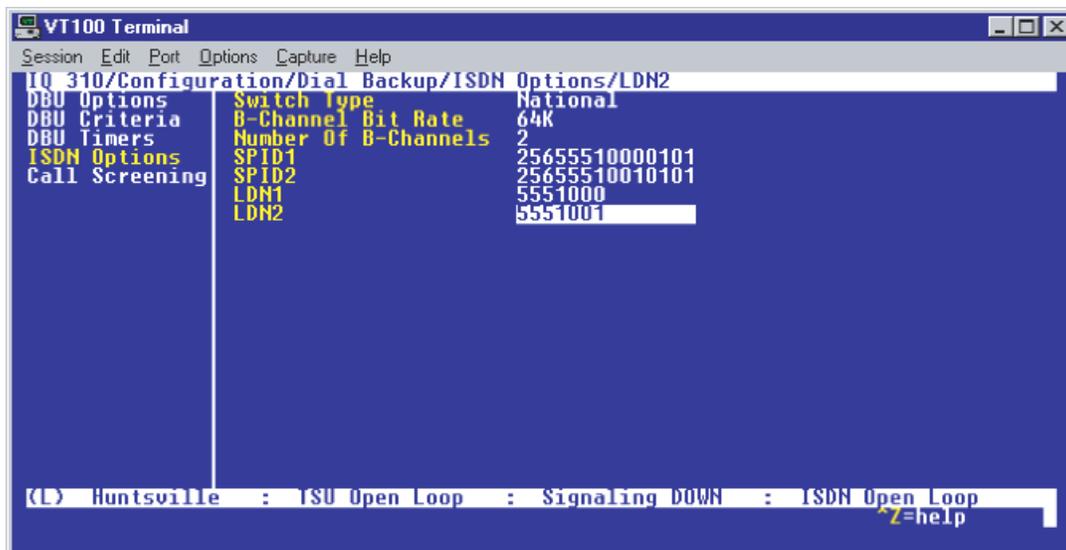


Figure 11. Huntsville ISDN Options Menu

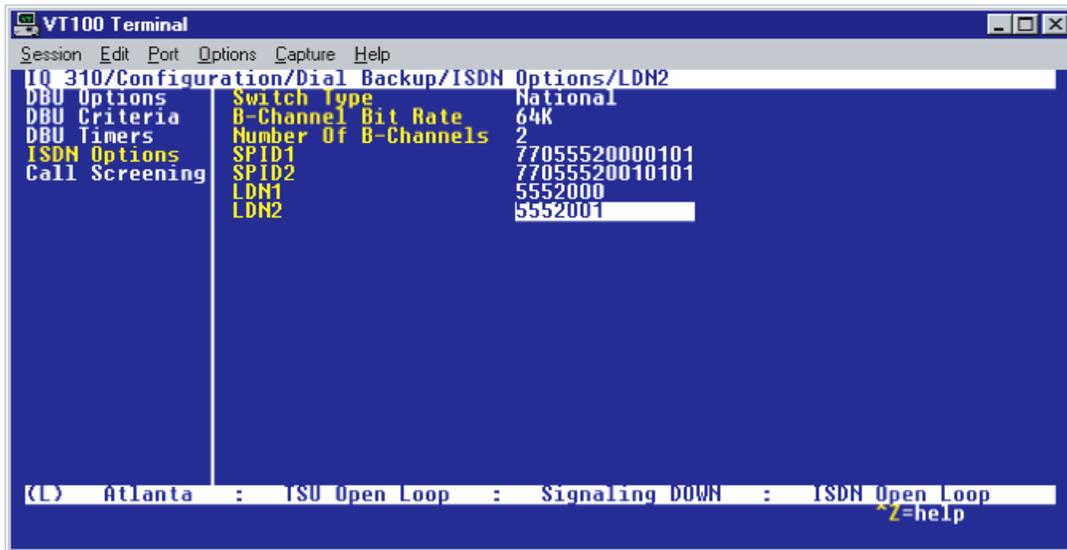


Figure 12. Atlanta ISDN Options Menu

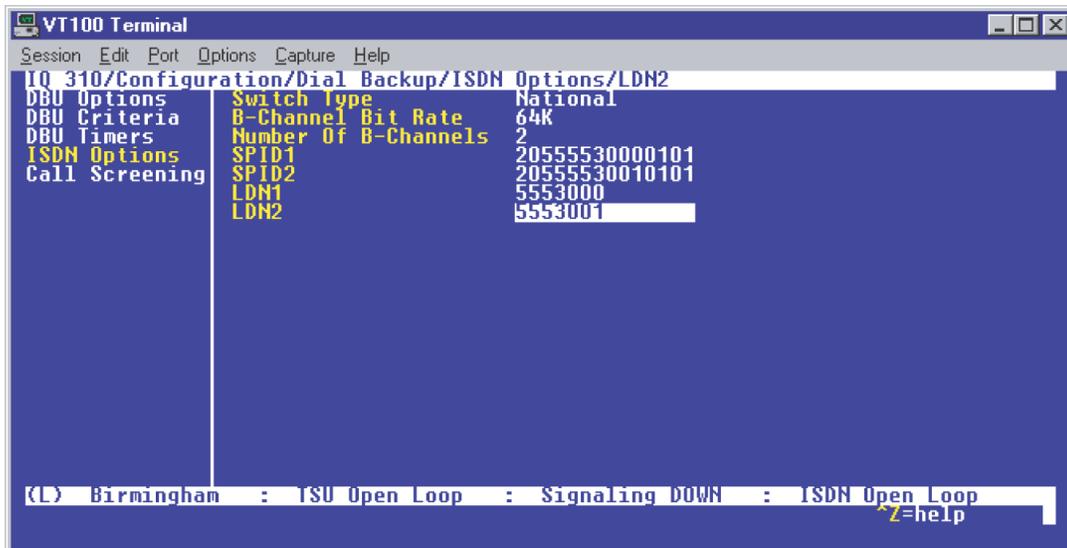
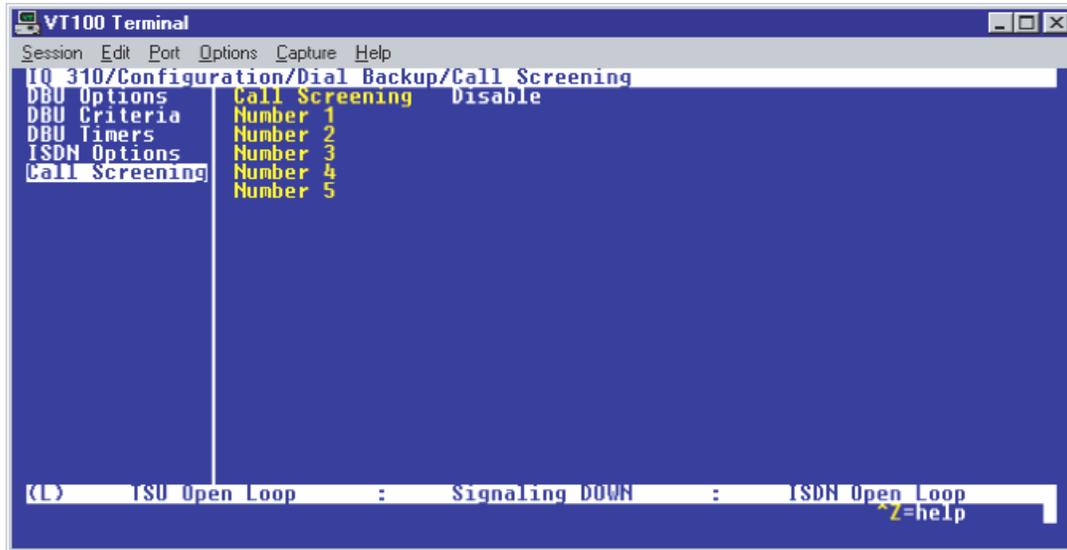


Figure 13. Birmingham ISDN Options Menu

## Call Screening

1. Press the left arrow key and then the down arrow key to select **CALL SCREENING**. The menu shown in Figure 14 will be displayed. The default values for the parameters listed on this menu are shown.



**Figure 14. Call Screening Menu**

It is not necessary to adjust these parameters from their default values for basic Frame Relay dial backup. With **CALL SCREENING** enabled, the IQ unit will only accept incoming calls from calling parties matching one of the phone numbers configured for Number 1 through Number 5.

## Configuring PVC Options

1. Press the left arrow key until the menu shown in Figure 15 appears.

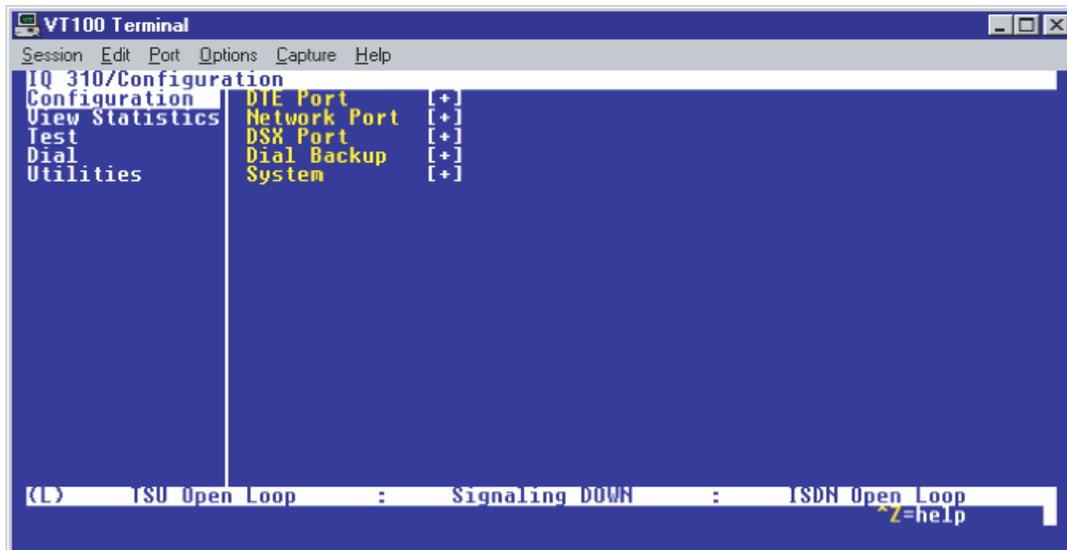


Figure 15. Configuration Menu

2. Use the arrow keys to select **NETWORK PORT**; then press **<ENTER>**. The screen shown in Figure 16 will appear.

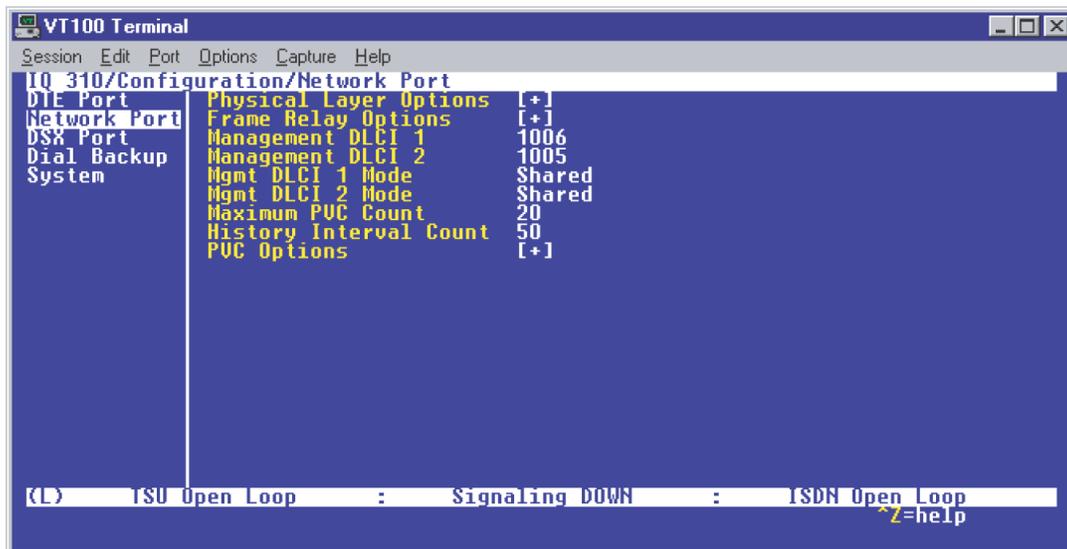


Figure 16. Network Port Menu

- Press the right arrow once and then down arrow until **PVC OPTIONS** is selected. Press **<ENTER>** and the screen shown in Figure 17 is shown.

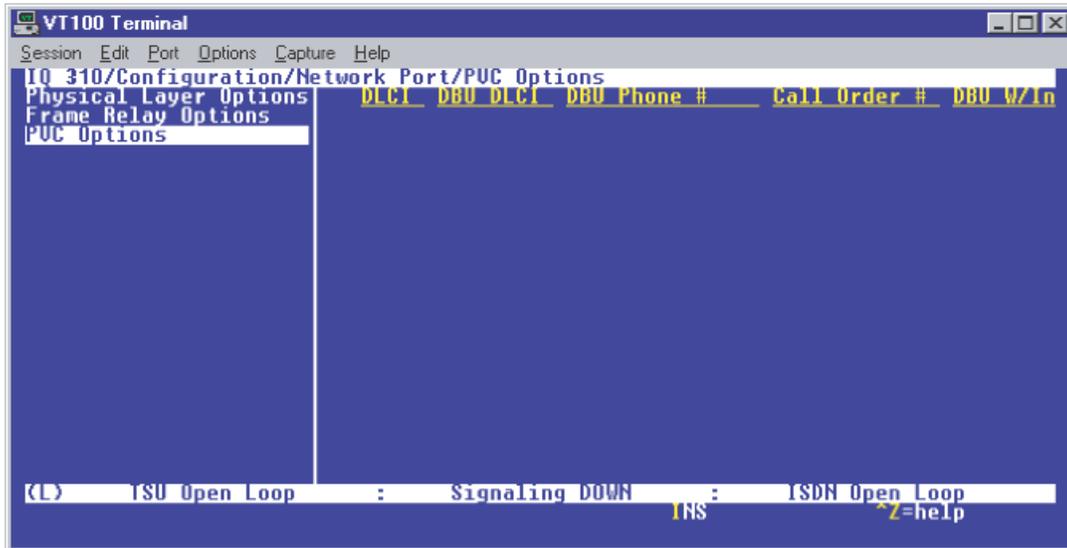


Figure 17. PVC Options Menu

### Huntsville IQ 310 (DLCI 16)

- Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 16 and press **<ENTER>**.
- Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 20 and press **<ENTER>**.

Notice that the Telco-assigned DLCI of 16 for Huntsville's Frame Relay link to Atlanta is programmed in the **DLCI** field. The Telco-assigned DLCI of 20 for Atlanta's Frame Relay link to Huntsville is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation. You can verify the correct DLCI by looking for the active DLCI in the DLCI list.

- Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 17705552000 and press **<ENTER>**. The phone number that the Huntsville IQ 310 will dial to reach the Atlanta IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. The default parameter of none is sufficient for basic dial backup operation. This parameter will be discussed further in a later example.
- Use the right arrow to select **DBU ON INACTIVE**; then press **<ENTER>**.
- Down arrow to select **ENABLED**; then press **<ENTER>**. This allows the Huntsville IQ 310 to dial out to the IQ 310 in Atlanta in the event that DLCI 16 is advertised as Inactive by the Frame Relay switch.

At this point all PVC options have been configured for basic Frame Relay dial backup to Atlanta. The PVC entry for DLCI 16 on the Huntsville IQ 310 should look like the screen shown in Figure 18. The vertical screen shown can be achieved by placing the cursor over the number 1 (indicating entry 1) to the left of the **DLCI** field and pressing **<ENTER>**. The remaining options may be left at their default values. The **CIR**, **SEQ NUM CHECKING**, **DELAY MEASUREMENT**, and **STATS OPTION** are features not related to dial backup. For an explanation of these features please refer to the User Interface Guide of this manual.



```
VT100 Terminal
Session Edit Port Options Capture Help
IQ 310/Configuration/Network Port/PVC Options[1]/DBU On Inactive
PVC Options[1]  DLCI          16
                  DBU DLCI          20
                  DBU Phone Number 17705552000
                  DBU Call Order  None
                  DBU On Inactive Enabled
                  CIR (Kbps)      0
                  Seq Num Checking Disabled
                  Delay Measurement Disabled
                  Stats Option    Auto

(L) Huntsville : TSU Open Loop : Signaling DOWN : ISDN Open Loop
Z=help
```

Figure 18. Huntsville IQ 310 (DLCI 16) Screen

### Huntsville IQ 310 (DCLI 17)

- Using the arrow keys, place the cursor over the number 1 (indicating entry 1) to the left of the **DLCI** field; then press the letter I for insert. This creates a new entry in the **PVC OPTIONS** table. The screen shown in Figure 19 should now appear.

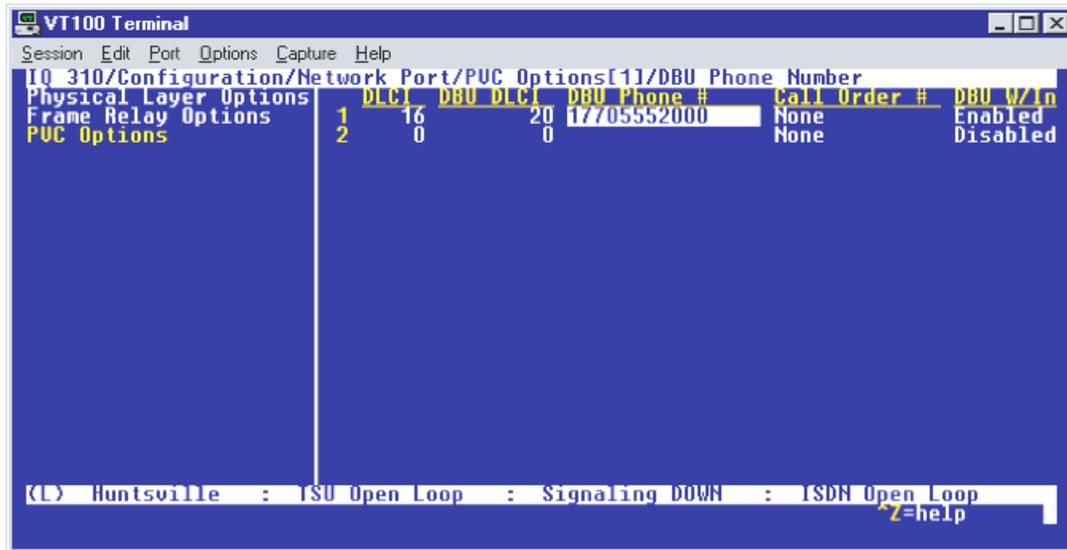


Figure 19. New Entry Screen

- Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 17 and press **<ENTER>**.
- Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 20 and press **<ENTER>**.
- Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 1205553000 and press **<ENTER>**. The phone number that the Huntsville IQ 310 will dial to reach the Birmingham IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **DBU ON INACTIVE**; then press **<ENTER>**. Down arrow to select **ENABLED**; then press **<ENTER>**. This allows the Huntsville IQ 310 to dial out to the IQ 310 in Birmingham in the event that DLCI 17 is advertised as Inactive by the Frame Relay switch.

All necessary parameters for the Huntsville IQ 310 have now been configured for dial backup between Huntsville and Birmingham. The **CONFIGURE PVC OPTIONS** screen for Huntsville is shown in Figure 20.

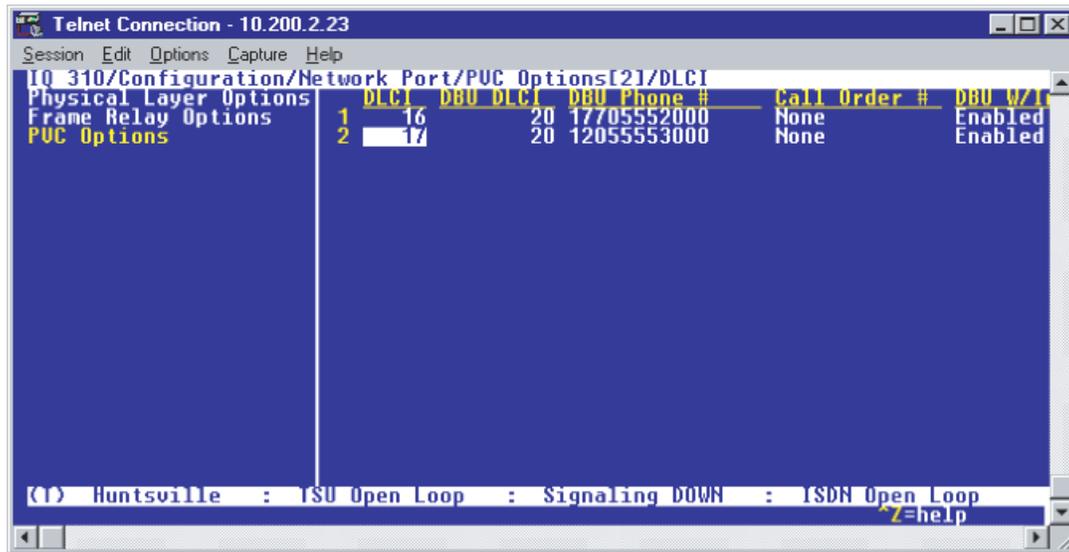


Figure 20. Huntsville IQ 310 (DLCI 17) Screen

### Atlanta IQ 310 (DLCI 20)

1. From the **CONFIGURE PVC OPTIONS** screen shown in Figure 17, use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 20 and press **<ENTER>**. This is the DLCI that Atlanta uses for communication with Huntsville.  
You can verify the correct DLCI by looking for the active DLCI in the DLCI list.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 16 and press **<ENTER>**. This is the DLCI that the Huntsville IQ 310 uses to communicate with Atlanta.
3. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Atlanta IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
4. Use the right arrow to select **DBU ON INACTIVE**; then press **<ENTER>**. Down arrow to select **ENABLED**; then press **<ENTER>**. This allows the Atlanta IQ 310 to dial out to the IQ 310 in Huntsville in the event that DLCI 20 is advertised as Inactive by the Frame Relay switch.

Since there is only one PVC for Atlanta, there is no need to enter another entry into the PVC table. At this point the Atlanta IQ 310 is configured for basic dial backup to Huntsville. The **CONFIGURE PVC OPTIONS** screen is shown in Figure 21. The vertical screen shown can be achieved by placing the cursor over the number 1 (indicating entry 1) to the left of the **DLCI** field and pressing **<ENTER>**.

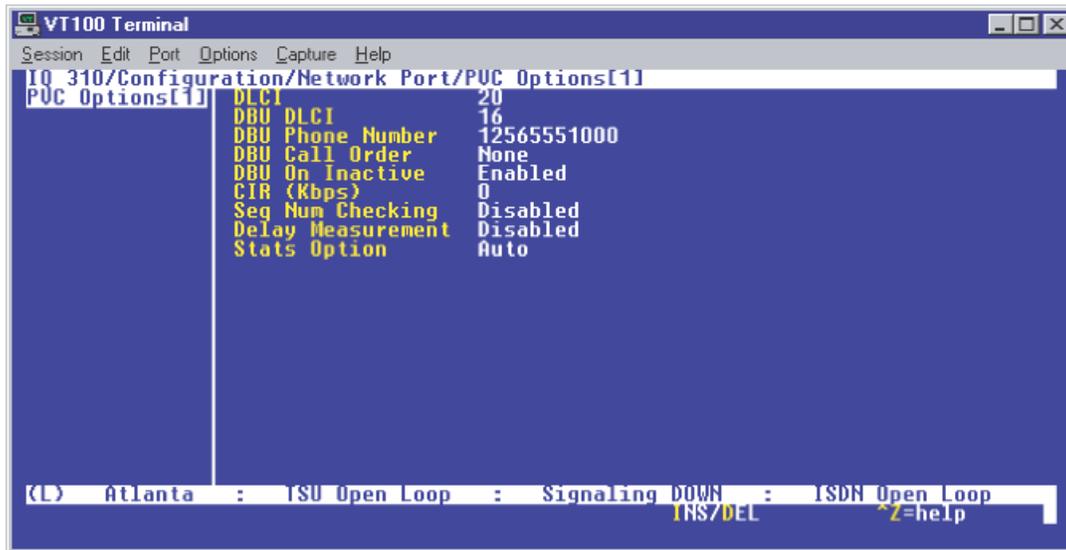


Figure 21. Atlanta IQ 310 (DLCI 20) Screen

### ***Birmingham IQ 310 (DLCI 20)***

1. From the **CONFIGURE PVC OPTIONS** screen shown in Figure 17, use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 20 and press **<ENTER>**. This is the DLCI that Birmingham uses for communication with Huntsville.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 17 and press **<ENTER>**. Please note that this is the DLCI that the Huntsville IQ 310 uses to communicate with Birmingham.
3. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Birmingham IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
4. Use the right arrow to select **DBU ON INACTIVE**; then press **<ENTER>**. Down arrow to select **ENABLED**; then press **<ENTER>**. This allows the Birmingham IQ 310 to dial out to the IQ 310 in Huntsville in the event that DLCI 20 is advertised as Inactive by the Frame Relay switch.

Since there is only one PVC for Birmingham, there is no need to enter another entry into the PVC table. At this point the Birmingham IQ 310 is configured for basic dial backup to Huntsville. The **CONFIGURE PVC OPTIONS** screen is shown in Figure 22. The vertical screen shown can be achieved by placing the cursor over the number 1 (indicating entry 1) to the left of the **DLCI** field and pressing **<ENTER>**.

```
VT100 Terminal
Session Edit Port Options Capture Help
IQ 310/Configuration/Network Port/PUC Options[1]
PUC Options[1]
DLCI 20
DBU DLCI 17
DBU Phone Number 12565551000
DBU Call Order None
DBU On Inactive Enabled
CIR (Kbps) 0
Seq Num Checking Disabled
Delay Measurement Disabled
Stats Option Auto

(L) Birmingham : TSU Open Loop : Signaling DOWN : ISDN Open Loop
INS/DEL ^Z=help
```

Figure 22. Birmingham IQ 310 (DLCI 20) Screen



## CFG-2 Example of the IQ 310 DBU on Inactive Group Parameter

### **Introduction**

The ADTRAN IQ 310 provides disaster recovery protection for Frame Relay circuits. This configuration guide will describe how the **DBU ON INACTIVE GROUP** parameter works. The units used in this example are IQ 310s with ISDN BRI DBU and T1/DSX modules.

### **Before You Begin**

For this example, each IQ 310 unit will require an ISDN BRI DBU module (P/N 1204004L2) and a T1/DSX module (P/N 1202803L1).

### **Network Description**

Figure 1 on page 160 is a diagram of the Frame Relay example network used in this configuration guide. In this example, the host site is Huntsville. Two Permanent Virtual Circuits (PVCs) originate from Huntsville. One circuit is connected to Atlanta and the other to Birmingham. There are two DLCIs used by the host site to communicate with the Atlanta remote site (DLCIs 16 and 18). These correspond to DLCIs 17 and 19 at the Atlanta site. The host site uses only one DLCI (DLCI 20) to communicate with Birmingham, which has a corresponding DLCI of 21. Please remember that DLCIs have local significance and are assigned by the Telephone Company (TELCO) when the Frame Relay network is built; therefore the DLCIs for your Frame Relay network will most likely be different from the ones used in this example.

The remaining parameters described in Figure 1 provide a description of the BRI lines that terminate into the three IQ 310s. The Telephone Company will provide you with the Local Directory Numbers (LDNs) and Service Profile Identifiers (SPIDs) for each of your BRI lines. In addition, you must know which type of Central Office (CO) switch is providing the ISDN service.

There is a special setting for the **DBU ON INACTIVE** parameter called **GROUP**. This allows you to group a set of DLCIs together. These DLCIs do not have to be assigned to the same physical site. When several DLCIs are set for **GROUP**, the IQ 310 will not attempt a dial backup session until all DLCIs in that group are inactive. When that happens, the IQ 310 will place calls based on the **CALL ORDER** parameter. If one of the DLCIs in the group returns to the active state, all dial backup connections to the remaining DLCIs in that group will be disconnected.

For the following example, the host DLCIs (DLCIs 16, 18, and 20) will be set as a group to illustrate how this parameter works. All criteria other than **DBU ON INACTIVE GROUP** have been disabled for all DLCIs on both the host and remote sites. This will ensure that only the host unit will initiate a DBU session and it will only initiate it based on the **DBU ON INACTIVE GROUP** conditions being met.

To configure the sample network, perform the steps given in the following pages.

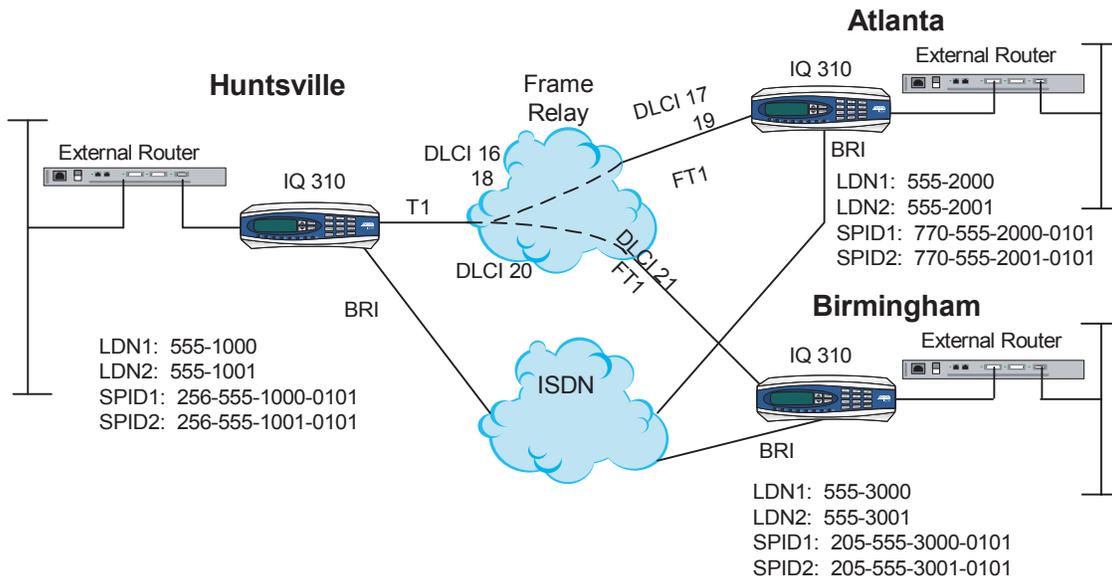


Figure 1. IQ 310 Frame Relay Dial Backup DBU On Inactive Group Example

## Configuring the Dial Backup Parameters

1. From the **CONFIGURATION** menu terminal screen (Figure 2) of the IQ 310, select **CONFIGURATION** and press **<ENTER>**.

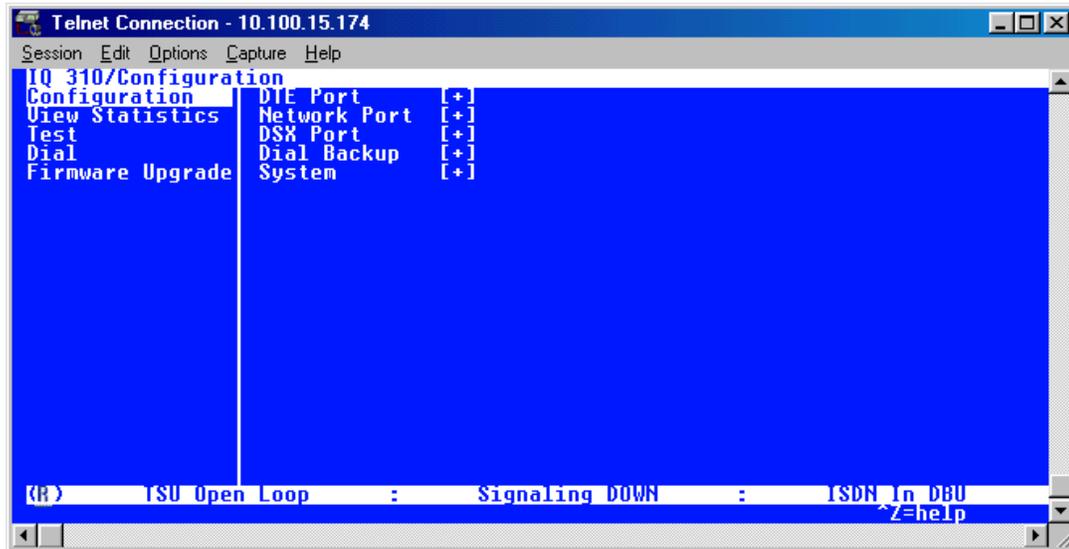


Figure 2. Main Menu

2. Using the arrow keys, select **DIAL BACKUP** from the **CONFIGURATION** menu shown in Figure 2; then press **<ENTER>**. The resulting screen is displayed in Figure 3.

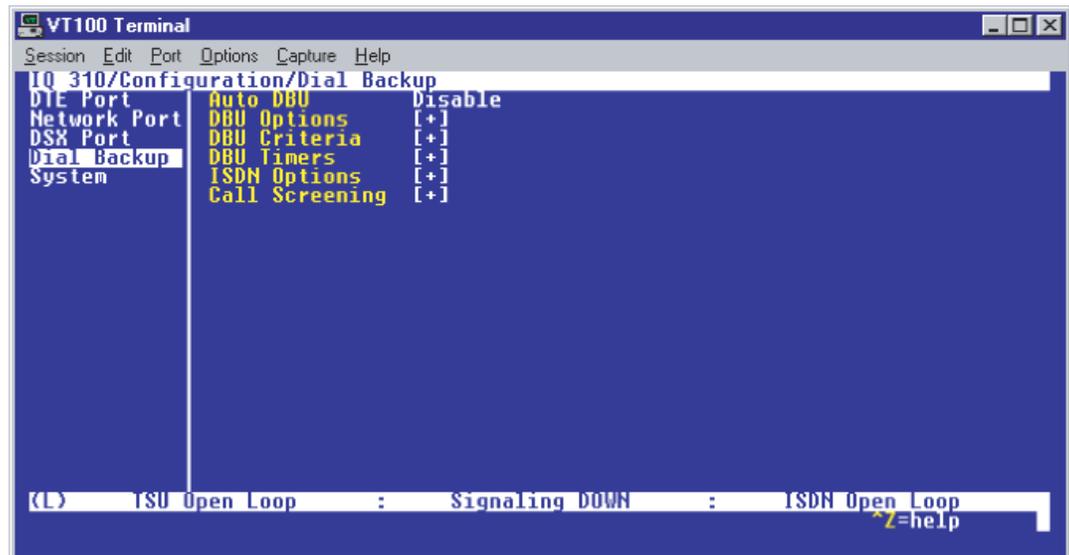


Figure 3. Dial Backup Menu

By default, **AUTO DBU** is disabled. This parameter must be changed to **ENABLE** for the IQ 310 unit to automatically dial the remote end once any of the DBU criteria are met. This setting must also be enabled in order for the IQ unit to automatically answer inbound calls from other units.

3. Use the right arrow key to select **AUTO DBU**; press **<ENTER>**. The screen shown in Figure 4 will appear.

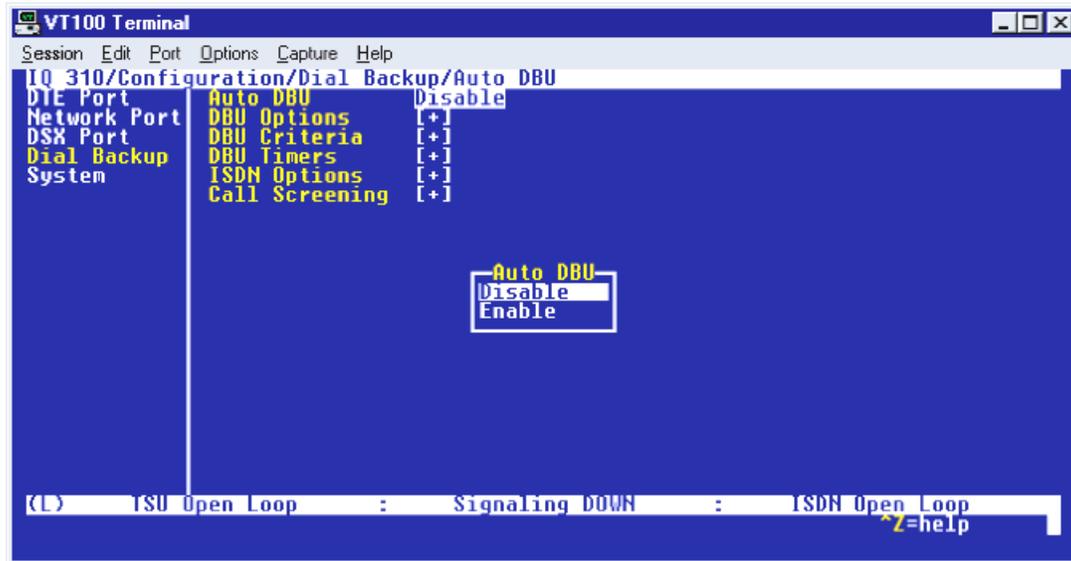


Figure 4. Auto DBU Selections

4. Use the down arrow to select **ENABLE**; then press **<ENTER>**. At this point, the **AUTO DBU** parameter will change to **ENABLE** and the screen shown in Figure 5 will appear.

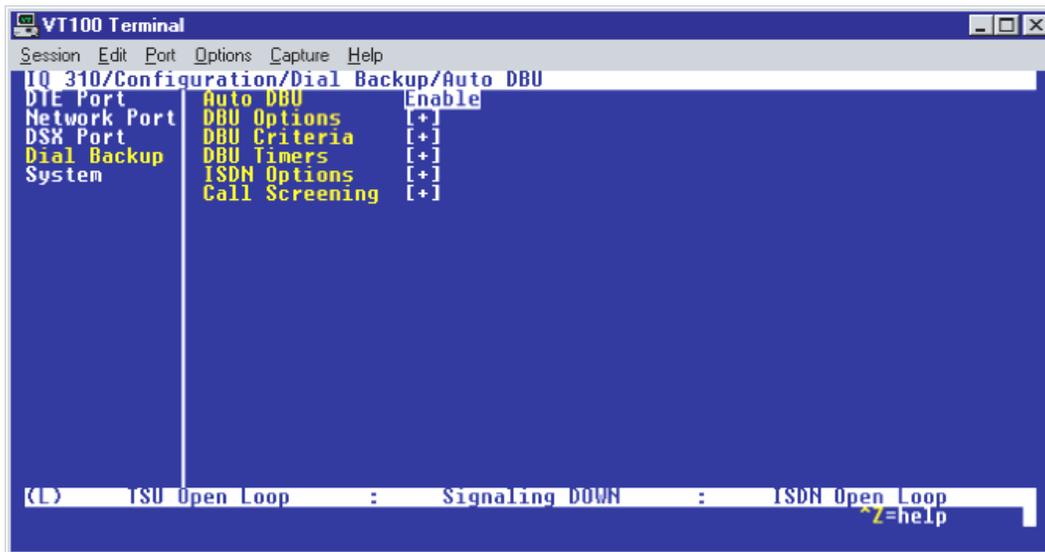


Figure 5. Auto DBU Enabled

### DBU Options

1. Press the down arrow to select **DBU OPTIONS**; then press **<ENTER>**. The screen shown in Figure 6 will appear. The default parameter values for this screen are shown.

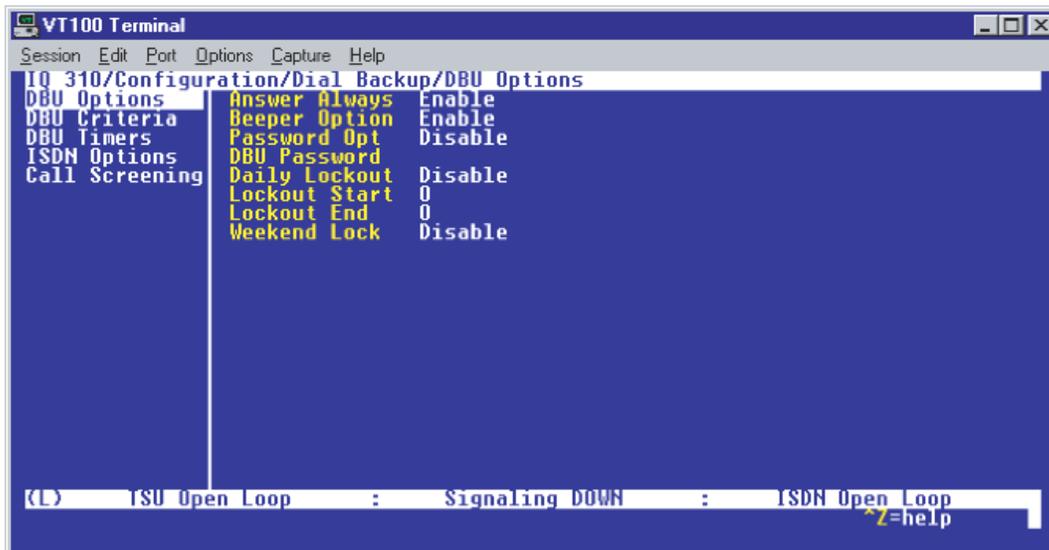


Figure 6. DBU Options Menu

For basic dial backup operation, these parameters do not need to be altered from their default values.

The **ANSWER ALWAYS** option must work in conjunction with the **AUTO DBU** option. The **AUTO DBU** option is still the controlling option. If **AUTO DBU** is disabled, the unit will not answer the call regardless of how **ANSWER ALWAYS** is set. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Answer Always	Result
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Enabled	Unit will answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Disabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Enabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Disabled	Unit will not answer an incoming call.

In addition, the **ANSWER ALWAYS** feature must work in conjunction with the **ORIGINATE/ANSWER** feature. The **ORIGINATE/ANSWER** feature only appears when the unit is programmed for a non frame-relay circuit (signaling none). If **ANSWER ALWAYS** is enabled (and **AUTO DBU** enabled), the unit will answer the call even if it is set to **ORIGINATE**. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Originate/Answer	Answer Always	Result
None	Enabled	Originate	Enabled	Unit will answer an incoming call.
None	Enabled	Originate	Disabled	Unit will not answer an incoming call.
None	Enabled	Answer	Enabled	Unit will answer an incoming call.
None	Enabled	Answer	Disabled	Unit will not answer an incoming call.
None	Disabled	Originate	Enabled	Unit will not answer an incoming call.
None	Disabled	Originate	Disabled	Unit will not answer an incoming call.
None	Disabled	Answer	Enabled	Unit will not answer an incoming call.
None	Disabled	Answer	Disabled	Unit will not answer an incoming call.

The **BEEPER OPTION** allows the user to control the intermittent beep issued during dial backup. **PASSWORD OPTION** and **DBU PASSWORD** are security features that can be used to prevent the IQ 310 unit from establishing dial backup with unknown units. **DAILY LOCKOUT** enabled prevents the IQ 310 unit from going into dial backup between the tomfooleries specified by **LOCKOUT START** and **LOCKOUT END**. With **WEEKEND LOCK** enabled, no dial backup will occur from midnight Friday to midnight Sunday.

## DBU Criteria

1. From the screen shown in Figure 6, press the down arrow to select **DBU CRITERIA**. The menu screen shown in Figure 7 is displayed. The default values for the parameters on this screen are shown.

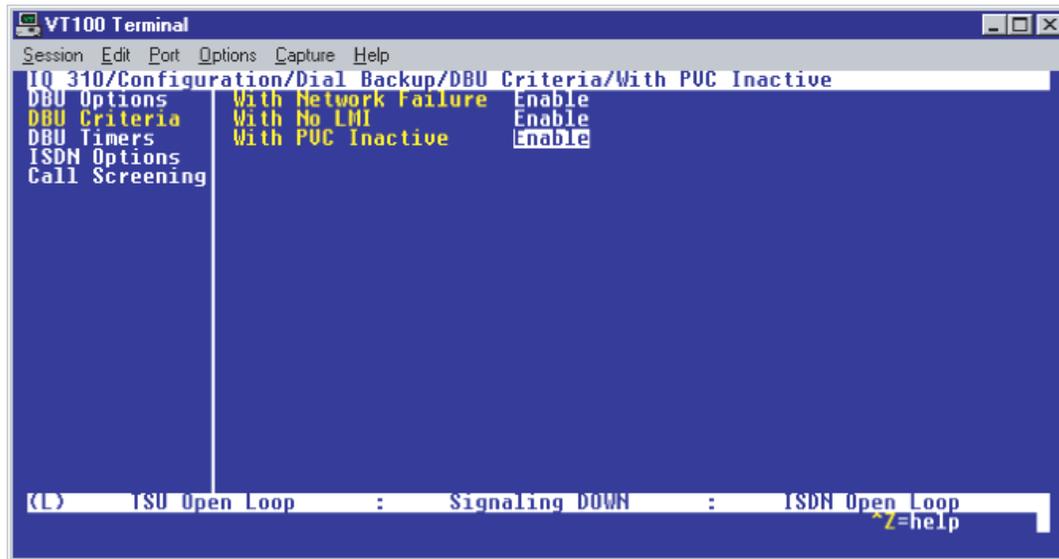


Figure 7. DBU Criteria Menu

## Huntsville IQ 310

**WITH NETWORK FAILURE** is disabled by default. For this example, leave it disabled in order to assure the **GROUP** parameter will initiate the dial backup.

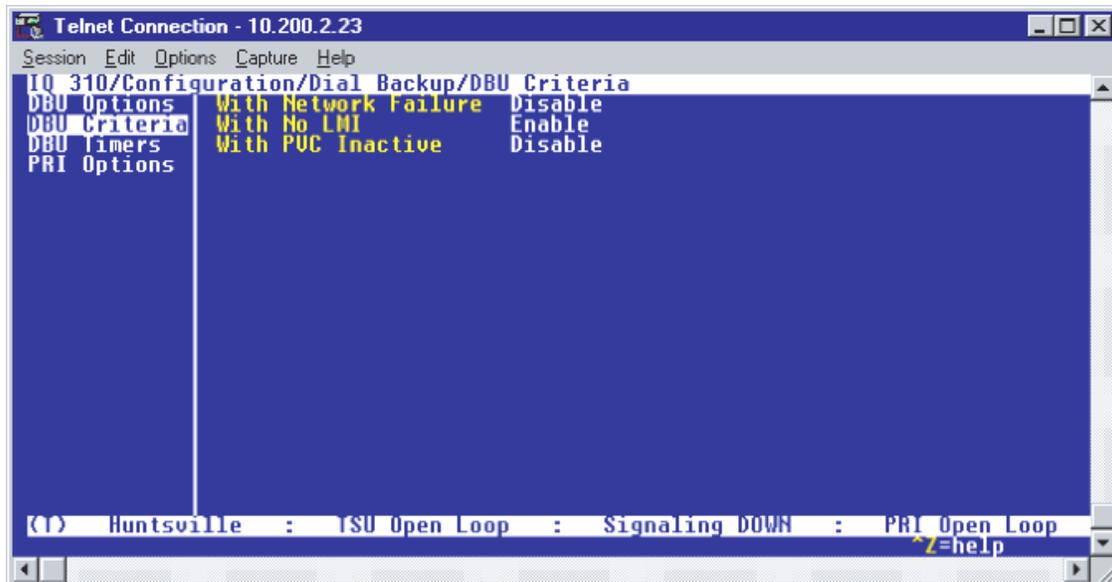
1. Use the arrow keys to select the **WITH NO LMI** parameter; then press **<ENTER>**. Select **DISABLED** and press **<ENTER>**. This will assure the **GROUP** parameter will initiate the dial backup.
2. Press the down arrow to select **WITH PVC INACTIVE**; then press **<ENTER>**.
3. Use the down arrow to select **ENABLE**; then press **<ENTER>**.

This is a global setting that affects all of the PVCs in the IQ 310 DLCI table (under **NETWORK PVC OPTIONS**). A PVC is advertised as Inactive by the frame switch in the CO when there is a problem at the remote end of the frame circuit. With this option enabled, the IQ 310 unit will attempt to establish a dial backup call with the remote unit when its corresponding DLCI is advertised as Inactive. This parameter must be enabled for the group parameter to function.

### **Atlanta IQ 310 and Birmingham IQ 310**

All **DBU CRITERIA** should be disabled on both these units. Again, this is only to clarify this example of how the **GROUP** parameter works. Under normal circuit conditions, these parameters would be enabled.

Once these **DBU CRITERIA** parameters have been configured properly, the Huntsville, Atlanta, and Birmingham DBU Criteria screens should look like Figures 8, 9, and 10 respectively.



**Figure 8. Huntsville DBU Criteria Screen**

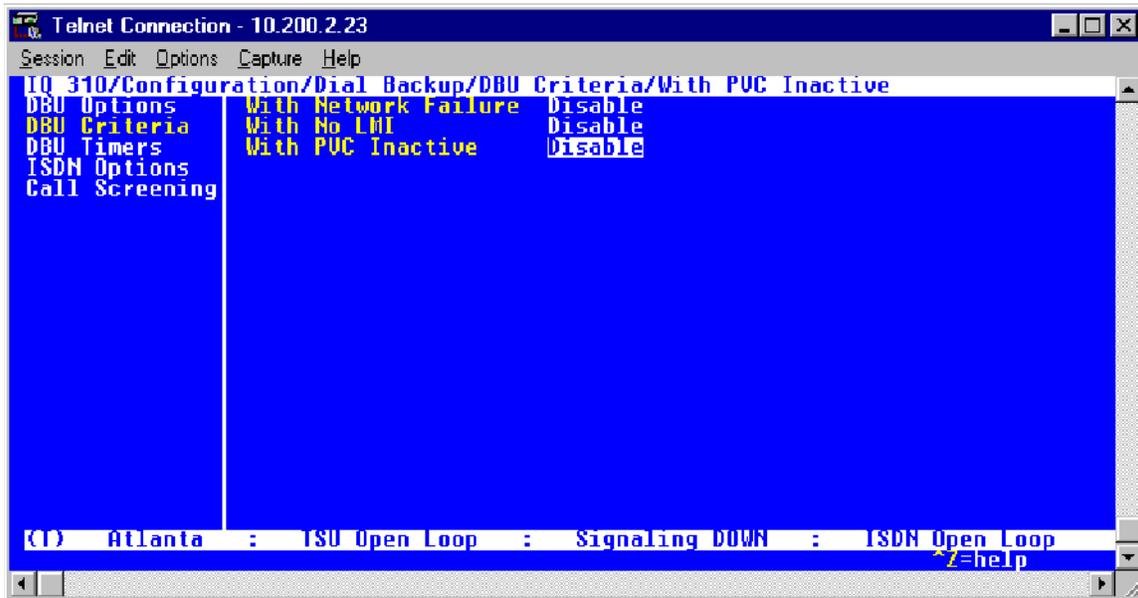


Figure 9. Atlanta DBU Criteria Screen

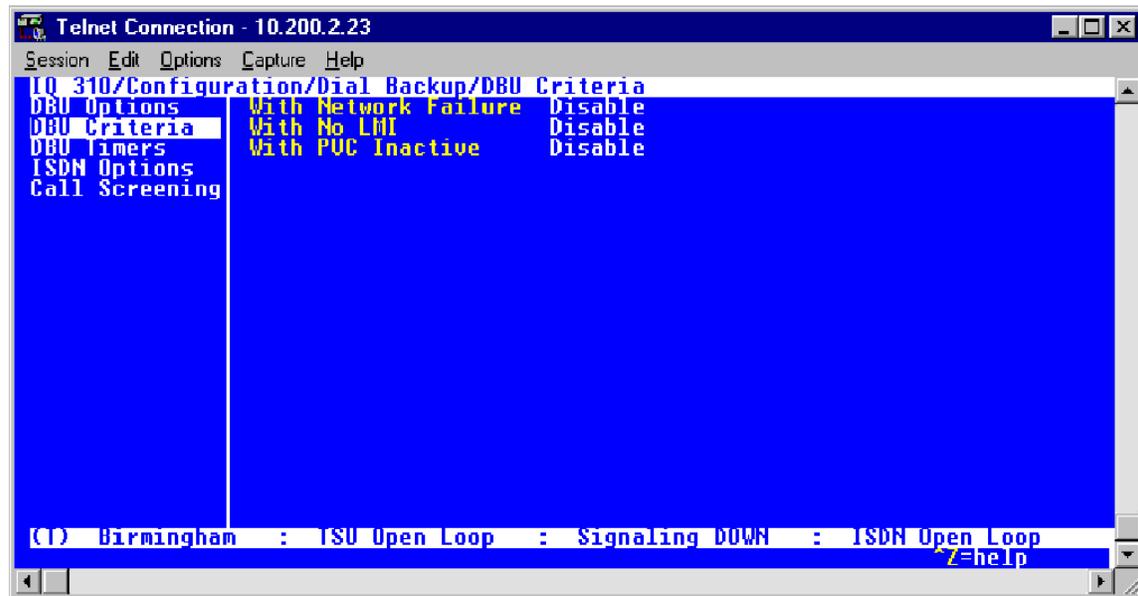


Figure 10. Birmingham DBU Criteria Screen

## DBU Timers

1. Press the left arrow key once and the down arrow key once to select **DBU TIMERS**. The **DBU TIMERS** screen shown in Figure 11 is displayed. The default parameter values are shown below.

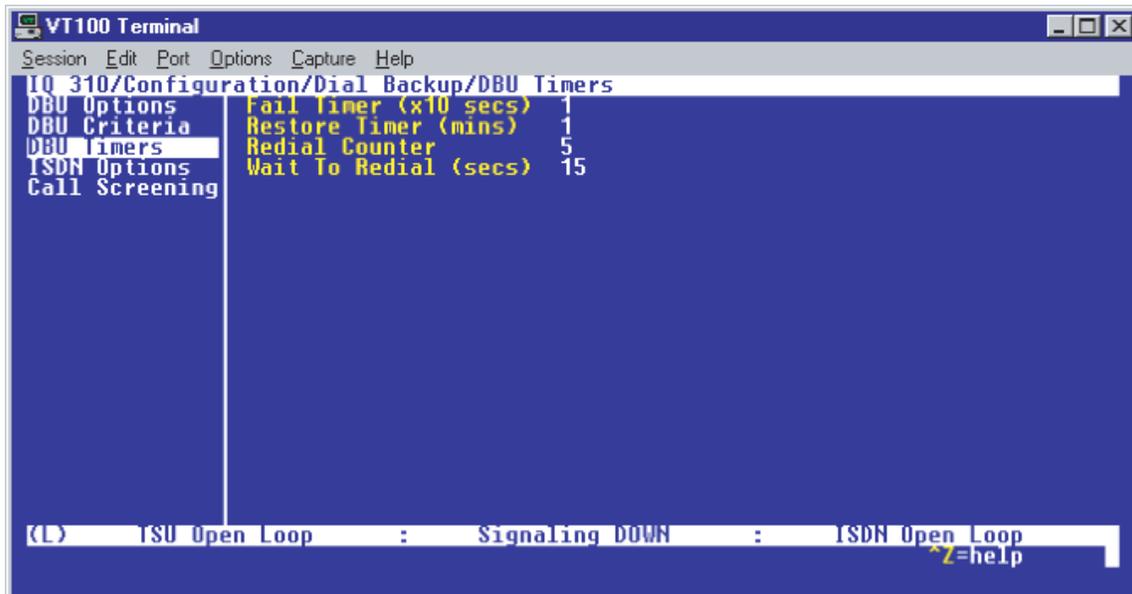


Figure 11. DBU Timers Menu

For basic dial backup operation, these parameters do not need to be altered from their default values. The **FAIL TIMER** programs the amount of time the IQ 310 will wait once any of the DBU Criteria have been met before entering dial backup. Once the Frame Relay link has been reestablished on the network line, the **RESTORE TIMER** sets the amount of time the IQ 310 will wait before disconnecting the dial backup call. The **REDIAL COUNTER** programs the number of redial attempts performed if dial backup is not established on the first call. **WAIT TO REDIAL** defines the amount of time between redial attempts.

## ISDN Options

1. From the screen shown in Figure 11, press the down arrow to select **ISDN OPTIONS**. The screen shown in Figure 12 is now displayed. The default values for the parameters on this menu are shown.

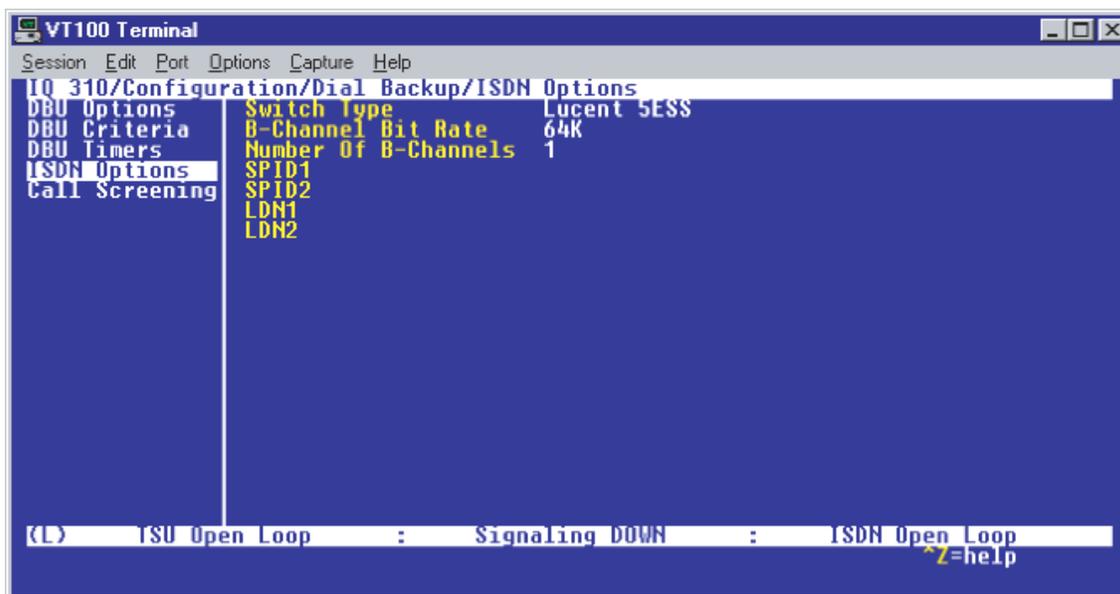


Figure 12. ISDN Options Menu

2. Use the right arrow to select **SWITCH TYPE**; then press **<ENTER>**. A list of available switch types is displayed. *The SWITCH TYPE selected here must match the TELCO CO switch providing the ISDN service.* Select **LUCENT 5ESS**, **DMS 100**, **NATIONAL**, or **NEC** and press **<ENTER>**. For the example network in Figure 1, we will assume the switch type for all three IQ 310 DBU modules is **NATIONAL**. Down arrow to select **NATIONAL**; then press **<ENTER>**.
3. Down arrow to select **B-CHANNEL BIT RATE**; then press **<ENTER>**. Select **54KBPS** or **64KBPS** and press **<ENTER>**. Generally leave this value to its default of **64KBPS** unless your ISDN service only provides 56kbps.
4. Down arrow to select the **NUMBER OF B-CHANNELS** on the BRI line; then press **<ENTER>**. Enter 1 for single channel service or 2 for dual channel service and press **<ENTER>**. If your Telephone Company has given you two SPIDs, you should set the **NUMBER OF B-CHANNELS** to 2.
5. Down arrow to select **SPID1**; then press **<ENTER>**. Enter the SPID assigned by the Telephone Company for the first B-channel and press **<ENTER>**. For the example network in Figure 1, the proper SPID is entered here depending upon which IQ 310 is being configured.
6. Down arrow to select **SPID2**; then press **<ENTER>**. Enter the SPID assigned by the Telephone Company for the second B-channel and press **<ENTER>**. Again, for the example network in Figure 1, the proper SPID is entered here depending upon which IQ 310 is being configured. If the **NUMBER OF B-CHANNELS** is set to 1, leave this entry blank.
7. Down arrow to select **LDN1**; then press **<ENTER>**. Insert the Local Directory Number provided by the Telephone Company for the first B-Channel and press **<ENTER>**. For the example network shown in Figure 1, the proper LDN is entered here depending upon which IQ 310 is being configured.

8. Down arrow to select **LDN2**; then press **<ENTER>**. Enter the Local Directory Number assigned to the second B-Channel by the Telephone Company and press **<ENTER>**. Again, for the example network shown in Figure 1, the proper LDN is entered here depending upon which IQ 310 is being configured. If the **NUMBER OF B-CHANNELS** is set to 1, leave this entry blank.

Sample screen shots of the **ISDN OPTIONS** screen for the Huntsville, Atlanta, and Birmingham IQ 310s are shown in Figures 13, 14, and 15, respectively.

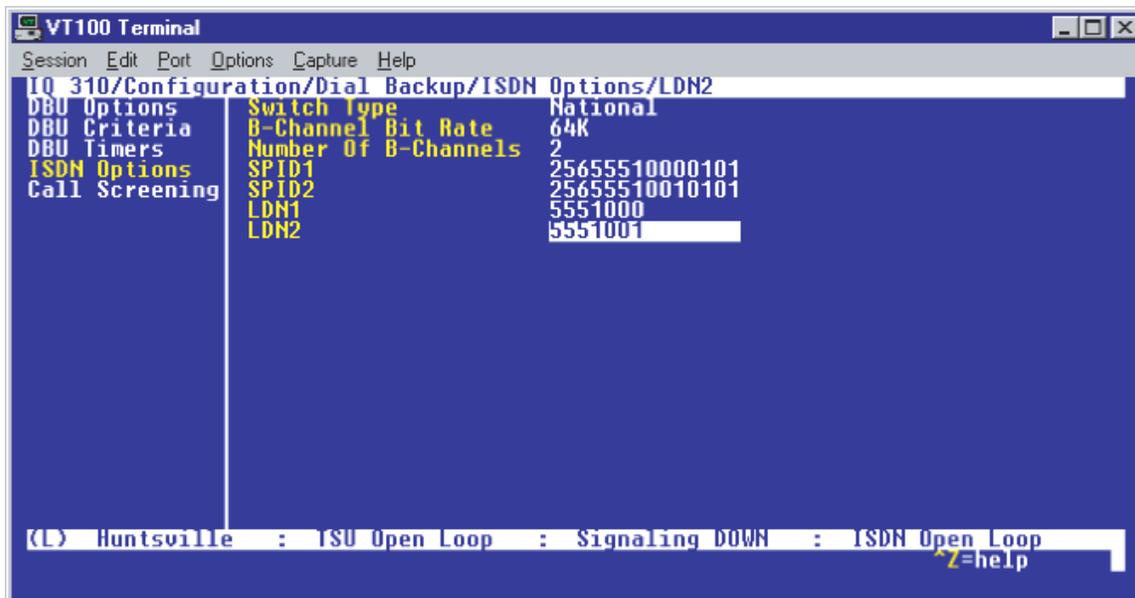


Figure 13. Huntsville ISDN Options Menu

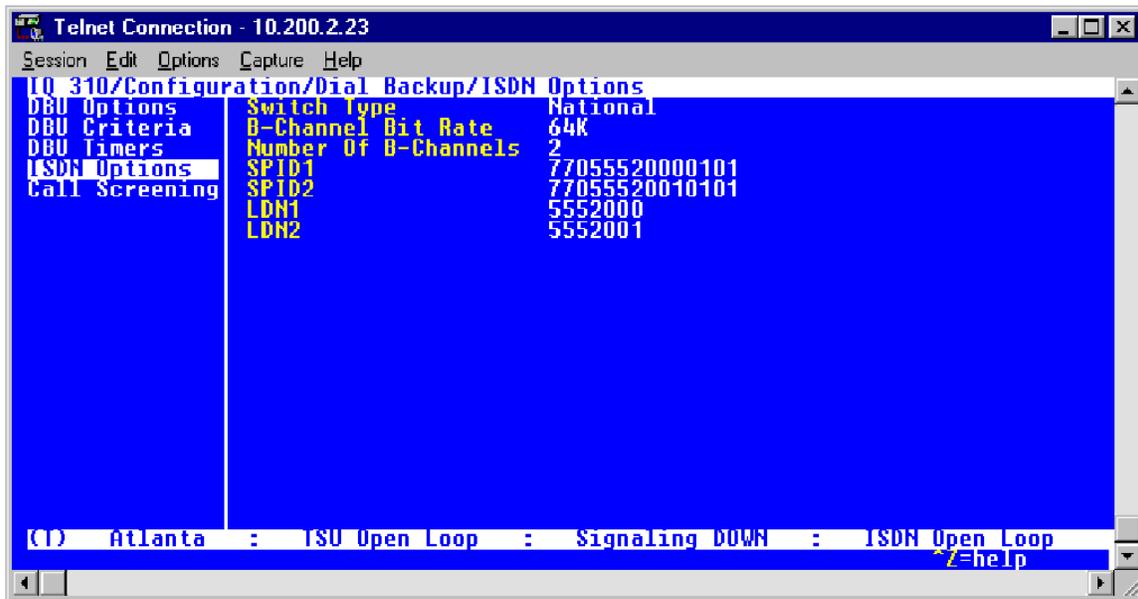


Figure 14. Atlanta ISDN Options Menu

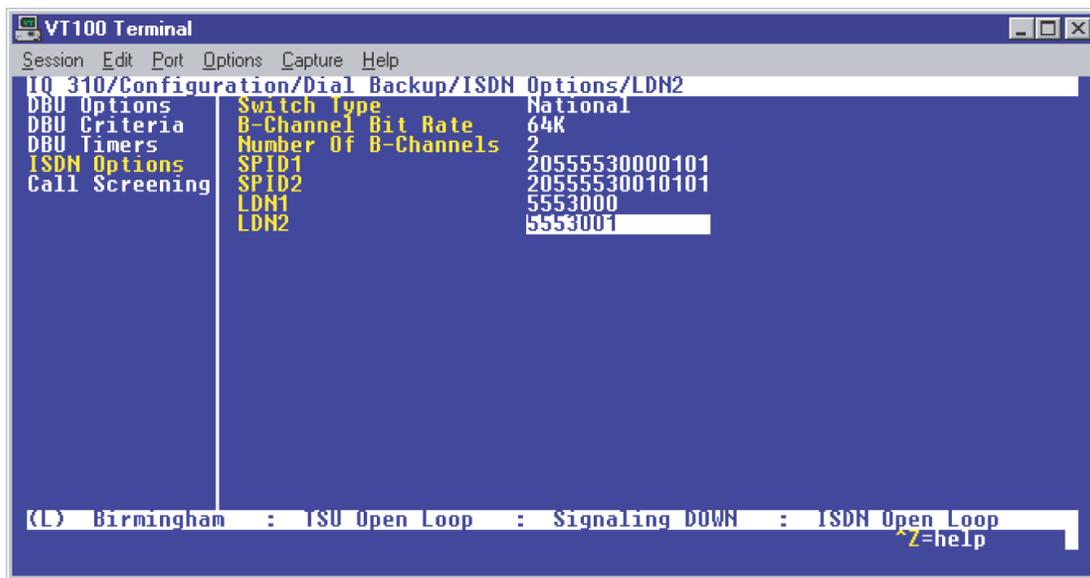


Figure 15. Birmingham ISDN Options Menu

## Call Screening

1. Press the left arrow key and then the down arrow key to select **CALL SCREENING**. The menu shown in Figure 16 will be displayed. The default values for the parameters listed on this menu are shown.

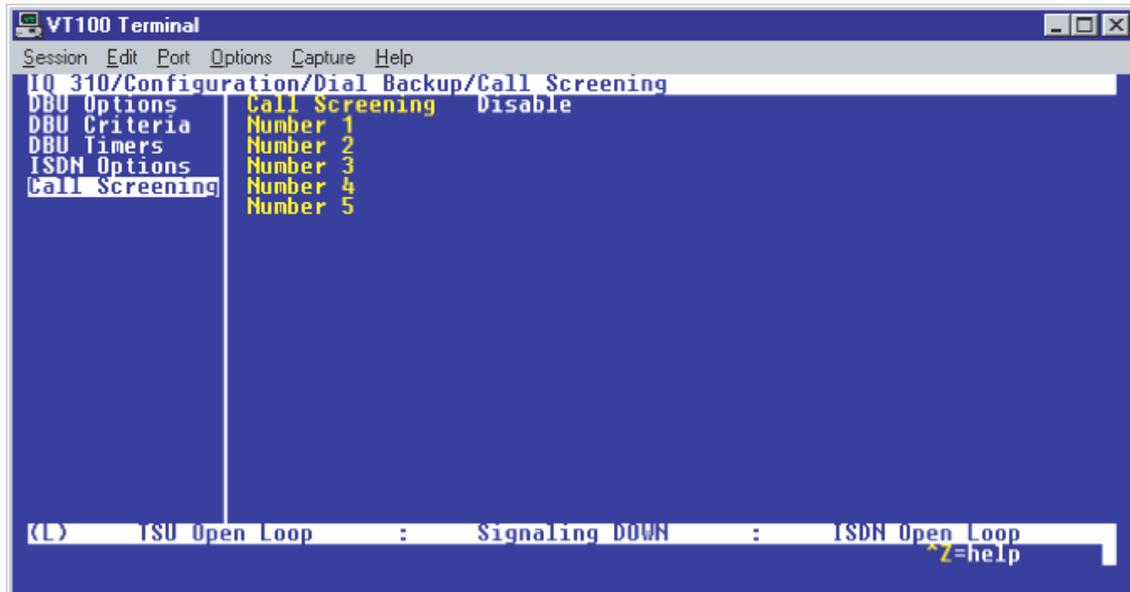


Figure 16. Call Screening Menu

It is not necessary to adjust these parameters from their default values for basic Frame Relay dial backup. With **CALL SCREENING** enabled, the IQ unit will only accept incoming calls from calling parties matching one of the phone numbers configured for Number 1 through Number 5.

## Configuring PVC Options

1. Press the left arrow key until the menu shown in Figure 17 appears.

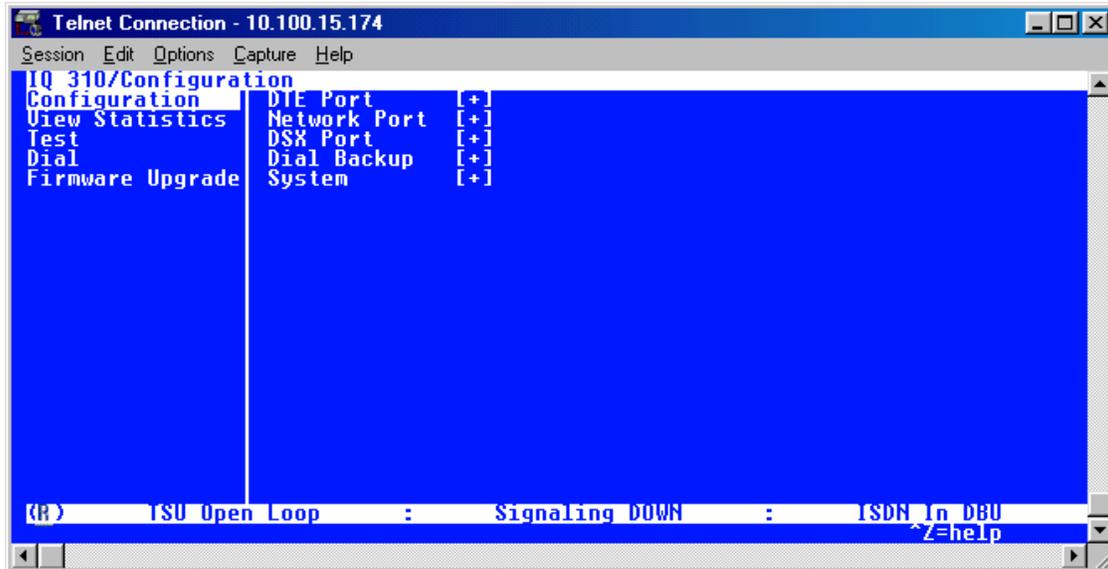


Figure 17. Configuration Menu

2. Use the right arrow key to select **NETWORK PORT**; then press **<ENTER>**. The screen shown in Figure 18 will appear.

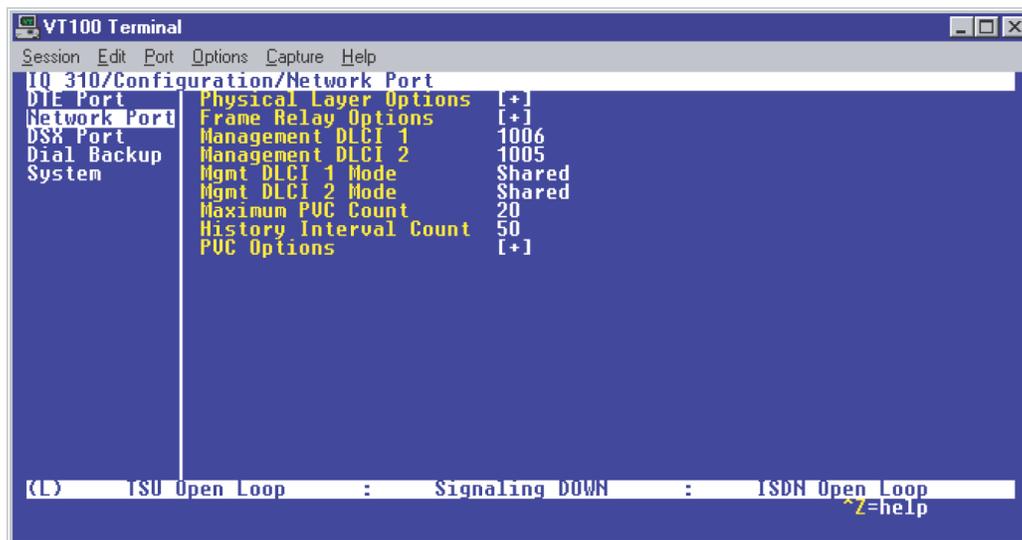


Figure 18. Network Port Menu

3. Press the right arrow once and then down arrow until **PVC OPTIONS** is selected. Press **<ENTER>** and the screen shown in Figure 19 is shown.

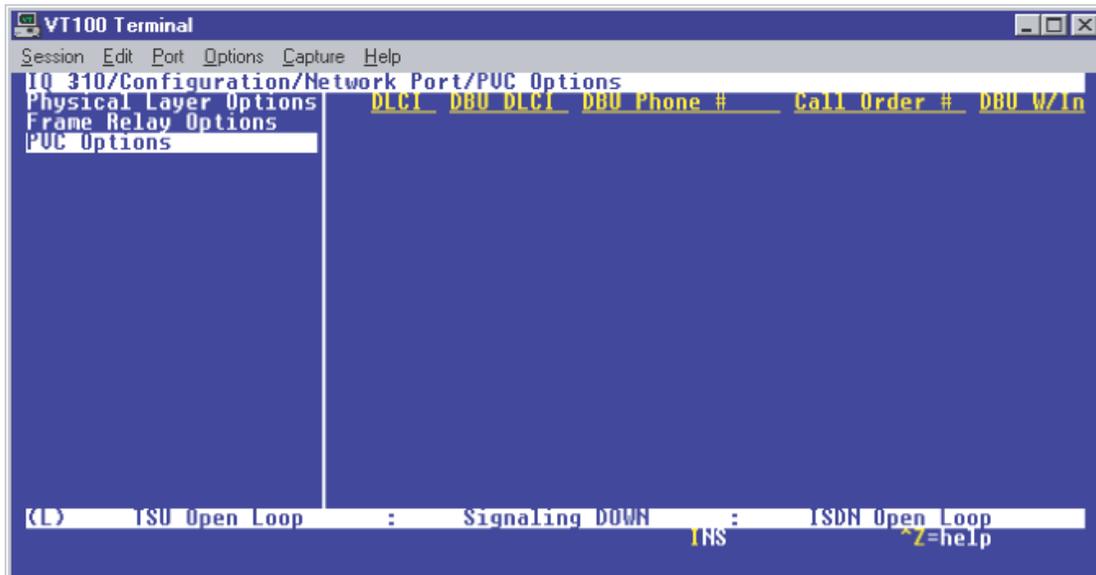


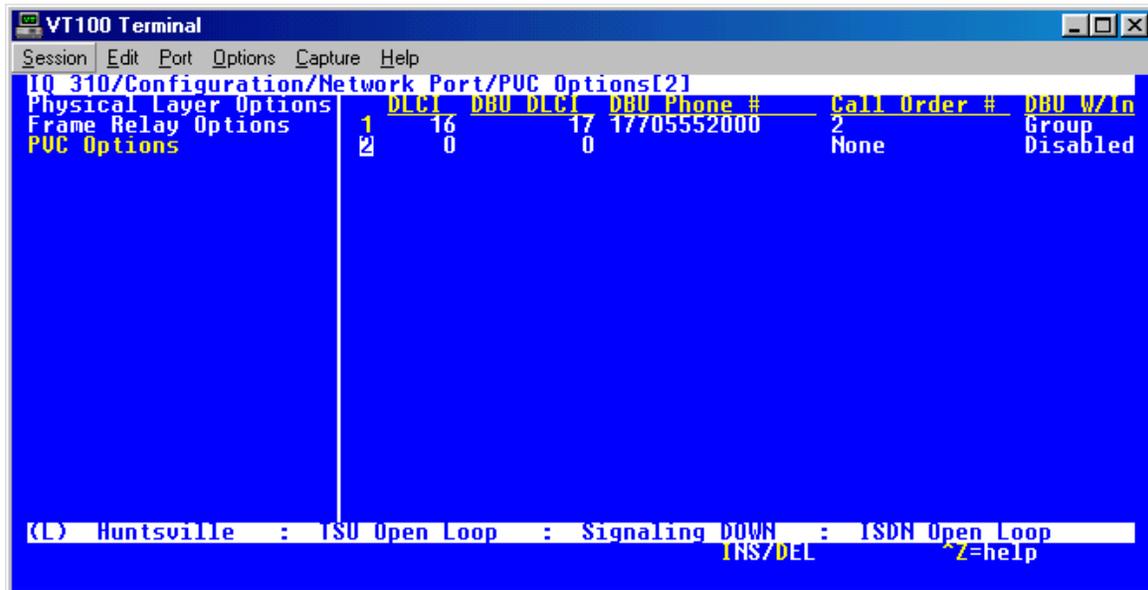
Figure 19. PVC Options Menu

### Huntsville IQ 310 (DLCI 16)

1. Use the right arrow to select **DLCI**; then press <ENTER>. Type in 16 and press <ENTER>.
2. Use the right arrow to select **DBU DLCI**; then press <ENTER>. Type in 17 and press <ENTER>.
3. Notice that the Telco-assigned DLCI of 16 for Huntsville's Frame Relay link to Atlanta is programmed in the **DLCI** field. The Telco-assigned DLCI of 17 for Atlanta's Frame Relay link to Huntsville is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
4. Use the right arrow to select **DBU PHONE NUMBER**; then press <ENTER>. Type in 17705552000 and press <ENTER>. The phone number that the Huntsville IQ 310 will dial to reach the Atlanta IQ 310 to establish a dial backup connection has now been programmed.
5. Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU Criteria settings. Set this Call Order to 2.
6. Use the right arrow to select **DBU ON INACTIVE**; then press <ENTER>.
7. Down arrow to select **GROUP**; then press <ENTER>.

**Huntsville IQ 310 (DCLI 18)**

- Using the left arrow, place the cursor over the number 1 (indicating entry 1) to the left of the **DLCI** field; then press <I> for insert. This should add an entry as shown in Figure 20.



**Figure 20. New Entry Screen**

- Now add the second DLCI to the Atlanta site. Use the right arrow to select **DLCI**; then press <ENTER>. Type in 18 and press <ENTER>.
- Use the right arrow to select **DBU DLCI**; then press <ENTER>. Type in 19 and press <ENTER>.
- Notice that the Telco-assigned DLCI of 18 for Huntsville's Frame Relay link to Atlanta is programmed in the DLCI field. The Telco-assigned DLCI of 19 for Atlanta's Frame Relay link to Huntsville is programmed in the DBU DLCI field. These two entries are critical for proper dial backup operation.
- Use the right arrow to select **DBU PHONE NUMBER**; then press <ENTER>. Type in 17705552000 and press <ENTER>. The phone number that the Huntsville IQ 310 will dial to reach the Atlanta IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU Criteria settings. Set this Call Order to 2.
- Use the right arrow to select **DBU ON INACTIVE**; then press <ENTER>. Down arrow to select **GROUP**; then press <ENTER>.

### Huntsville IQ 310 (DCLI 20)

- Using the left arrow, place the cursor over the number 2 (indicating entry 2) to the left of the **DLCI** field; then press <I> for insert. This should add an entry as shown in Figure 21.

	DLCI	DBU DLCI	DBU Phone #	Call Order #	DBU W/In
1	16	17	17705552000	2	Group
2	18	19	17705552000	2	Group
3	0	0		None	Disabled

(L) Huntsville : ISU Open Loop : Signaling DOWN : ISDN Open Loop  
INS/DEL Z=help

Figure 21. New Entry Screen

- Now add the DLCI to the Birmingham site. Use the right arrow to select **DLCI**; then press <ENTER>. Type in 20 and press <ENTER>.
- Use the right arrow to select **DBU DLCI**; then press <ENTER>. Type in 21 and press <ENTER>.
- Notice that the Telco-assigned DLCI of 20 for Huntsville's Frame Relay link to Birmingham is programmed in the **DLCI** field. The Telco-assigned DLCI of 21 for Birmingham's Frame Relay link to Huntsville is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
- Use the right arrow to select **DBU PHONE NUMBER**; then press <ENTER>. Type in 12055553000 and press <ENTER>. The phone number that the Huntsville IQ 310 will dial to reach the Birmingham IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU Criteria settings. Set this Call Order to 1.
- Use the right arrow to select **DBU ON INACTIVE**; then press <ENTER>. Down arrow to select **GROUP**; then press <ENTER>.

At this point all PVC Options have been configured for basic Frame Relay dial backup to Atlanta and Birmingham. The PVC entries on the Huntsville IQ 310 should look like the screen shown in Figure 22. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide of this manual.

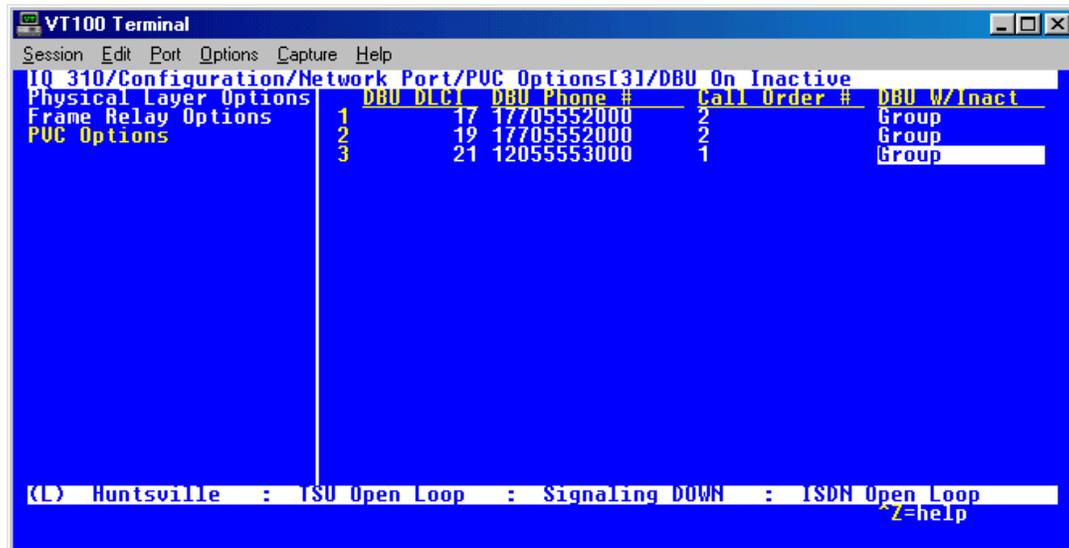


Figure 22. Huntsville IQ 310 (DLCI 17) Screen

### Atlanta IQ 310 (DLCI 17)

1. Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 17 and press **<ENTER>**.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 16 and press **<ENTER>**.

Notice that the Telco-assigned DLCI of 16 for Atlanta's Frame Relay link to Huntsville is programmed in the DLCI field. The Telco-assigned DLCI of 16 for Huntsville's Frame Relay link to Atlanta is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.

3. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Atlanta IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
4. Use the right arrow to select **CALL ORDER NUMBER**.

**DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU Criteria settings. Leave this parameter at the default value of none.

The **DBU ON INACTIVE** parameter is disabled by default. For this example, leave it disabled in order to assure the Group parameter on the host unit will initiate the dial backup.

**Atlanta IQ 310 (DCLI 19)**

- Using the left arrow, place the cursor over the number 1 (indicating entry 1) to the left of the **DLCI** field; then press <I> for insert. This should add an entry as shown in Figure 23.

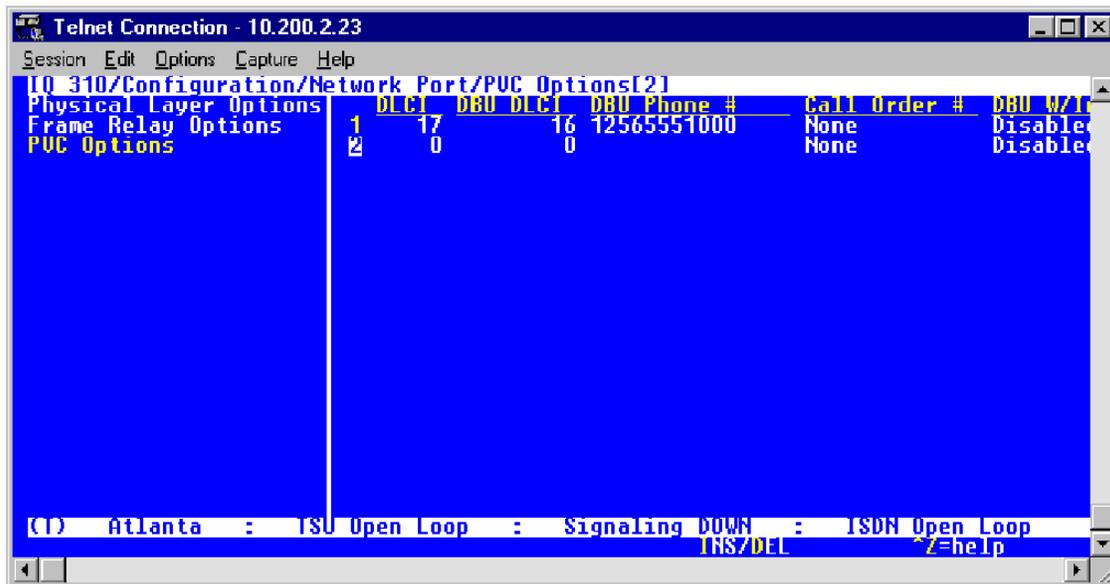


Figure 23. New Entry Screen

- Now add the second DLCI to the Huntsville site. Use the right arrow to select **DLCI**; then press <ENTER>. Type in 19 and press <ENTER>.
- Use the right arrow to select **DBU DLCI**; then press <ENTER>. Type in 18 and press <ENTER>.
- Notice that the Telco-assigned DLCI of 19 for Atlanta's Frame Relay link to Huntsville is programmed in the DLCI field. The Telco-assigned DLCI of 18 for Huntsville's Frame Relay link to Atlanta is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
- Use the right arrow to select **DBU PHONE NUMBER**; then press <ENTER>. Type in 12565551000 and press <ENTER>. The phone number that the Atlanta IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU Criteria settings. Leave this parameter at the default value of none.

The **DBU ON INACTIVE** parameter is disabled by default. For this example, leave it disabled in order to assure the **GROUP** parameter on the host unit will initiate dial backup.

At this point all PVC Options have been configured for basic Frame Relay dial backup to Huntsville. The PVC entries on the Atlanta IQ 310 should look like the screen shown in Figure 24. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide section of this manual.

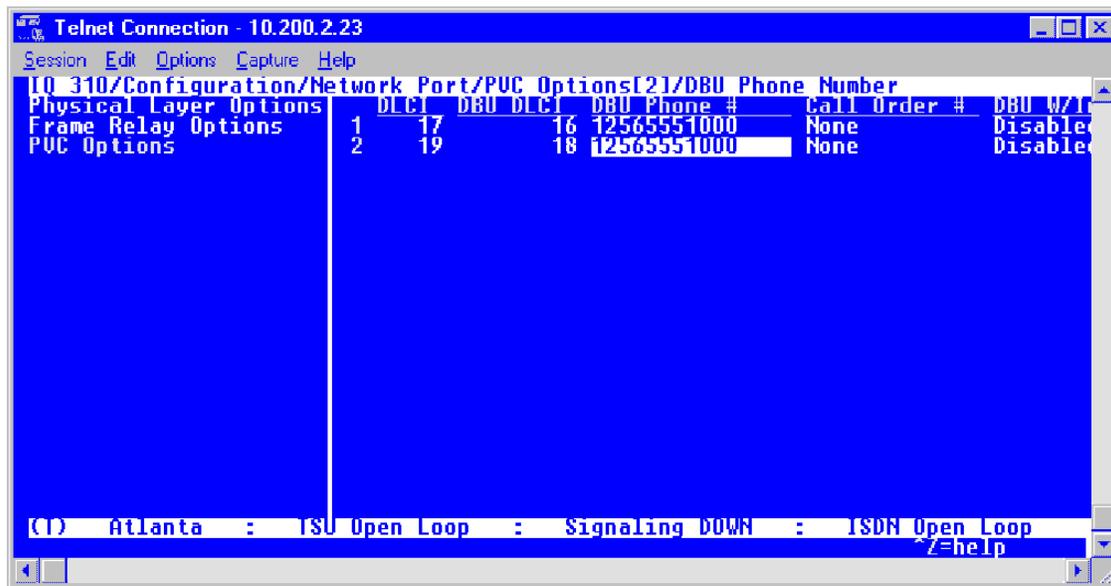


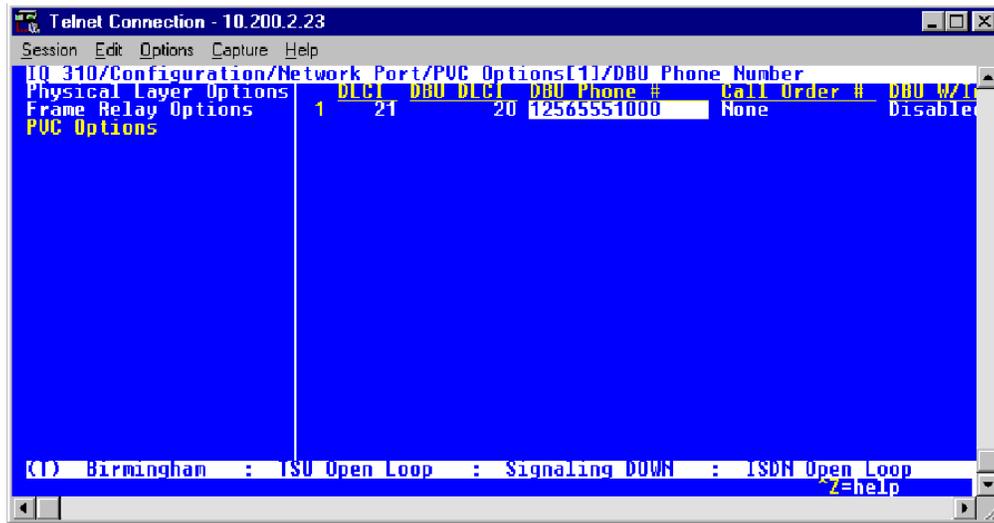
Figure 24. Atlanta IQ 310 PVC Options Screen

### Birmingham IQ 310 (DLCI 21)

1. Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 21 and press **<ENTER>**.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 20 and press **<ENTER>**.  
Notice that the Telco-assigned DLCI of 21 for Birmingham's Frame Relay link to Huntsville is programmed in the DLCI field. The Telco-assigned DLCI of 20 for Huntsville's Frame Relay link to Birmingham is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
3. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Birmingham IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
4. Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU Criteria settings. Leave this parameter at the default value of none.

The **DBU ON INACTIVE** parameter is disabled by default. For this example, leave it disabled in order to assure the **GROUP** parameter on the host unit will initiate dial backup.

At this point all PVC Options have been configured for basic Frame Relay dial backup to Huntsville. The PVC entries on the Birmingham IQ 310 should look like the screen shown in Figure 25. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide section of this manual.



**Figure 25. Birmingham IQ 310 (DLCI 21) Screen**

If there is a problem and DLCIs 16 and 18 go inactive, the IQ 310 would not dial because all DLCIs in the group are not inactive (DLCI 20 is still active). If DLCI 20 then goes inactive, all three DLCIs (16, 18, and 20) defined in the group are now inactive and the IQ 310 would dial. It will dial the Birmingham site first since it is defined as call order one.

If at this point DLCI 16 becomes active, the IQ 310 would disconnect the call to the Birmingham site, since all DLCIs in the group are not inactive.

## CFG-3 Frame Relay Primary Rate ISDN Dial Backup with the IQ 310

### ***Introduction***

The ADTRAN IQ 310 provides disaster recovery protection for Frame Relay circuits. This configuration guide will describe how to configure Primary Rate ISDN (PRI) Dial Backup (DBU) between a host site and 23 remote sites. The IQ 310 can simultaneously support 23 calls at 64K. The host unit used in this example is an IQ 310 with ISDN PRI DBU and T1/DSX modules. The IQ 310 will support DBU sessions with the various ADTRAN IQ and ATLAS units. The remote units used in this example are an ADTRAN DSU IQ, TSU IQ, and TSU IQ+ with BRI DBU modules.

### ***Before You Begin***

For this example, each IQ 310 unit will require an ISDN PRI DBU module (P/N 1204008L2) and a T1/DSX module (P/N 1202803L1). The remote units will require ISDN BRI DBU modules (P/N 1204004L2).

### ***Network Description***

Figure 1 on page 182 is a diagram of the Frame Relay example network used in this configuration guide. In this example, the host site is Huntsville. Twenty-three Permanent Virtual Circuits (PVCs) originate from Huntsville. Three of the twenty-three remote sites are shown (Atlanta, Montgomery, and Birmingham). The twenty-three DLCIs used by the host site to communicate with these remotes are 16-38 (with 16 connecting to remote site 1, 17 connecting to remote site 2, etc.). All remote sites use DLCI 20 for communication with Huntsville. The remote site extensions begin with 555-2000 and increment by one digit ending with 555-2022 at remote site 23. For example, remote site two's extension will be 555-2001, remote site three's extension will be 555-2002, and so on. All SPIDs will use the 256-555-20XX-0101 format. All area codes for this example will be 256. Please remember DLCIs have local significance and are assigned by the Telephone Company (TELCO) when the Frame Relay network is built; therefore the DLCIs for your Frame Relay network will most likely be different from the ones used in this example.

The remaining parameters described in Figure 1 provide a description of the BRI lines that terminate into the remote units. The Telephone Company will provide you with the Local Directory Numbers (LDNs) and Service Profile Identifiers (SPIDs) for each of your BRI lines. In addition, you must know which type of Central Office (CO) switch is providing the ISDN service. The PRI unit will require one LDN, as shown in Figure 1.

Configuration options vary depending on the DBU module and the network interface installed. In order to clarify the configurations, examples will be provided for the host and all three remote units.

To configure the sample network, perform the steps given in the following pages.

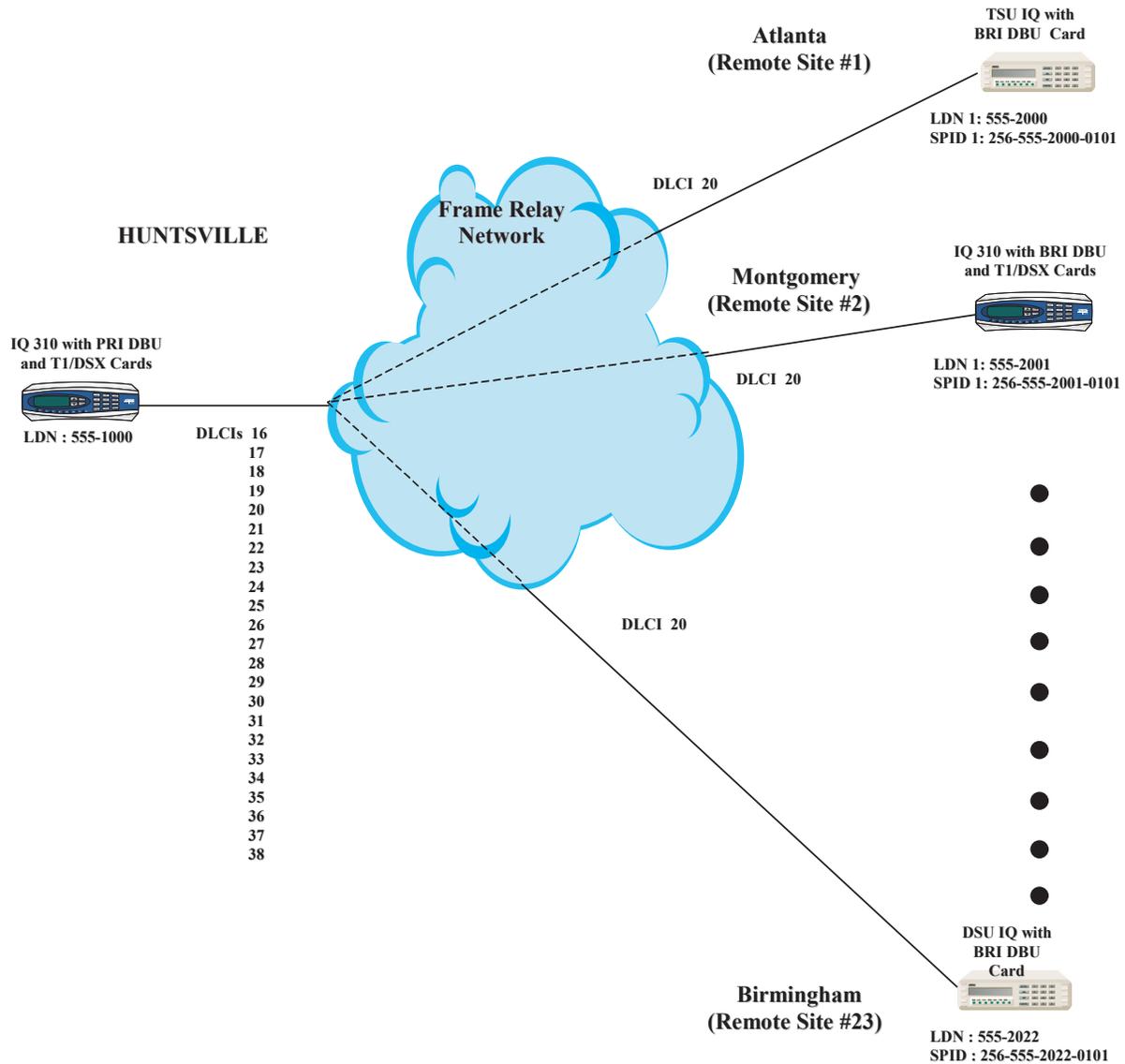


Figure 1. IQ 310 Frame Relay PRI Dial Backup Example Network

## Configuring the Dial Backup Parameters for the Host IQ 310 (Huntsville)

1. From the **CONFIGURATION** menu terminal screen (Figure 2) of the IQ 310, select **CONFIGURATION** and press <ENTER>.)



Figure 2. Configuration Menu

2. Using the arrow keys, select **DIAL BACKUP** from the **CONFIGURATION** menu shown in Figure 2; then press <ENTER>. The resulting screen is displayed in Figure 3.

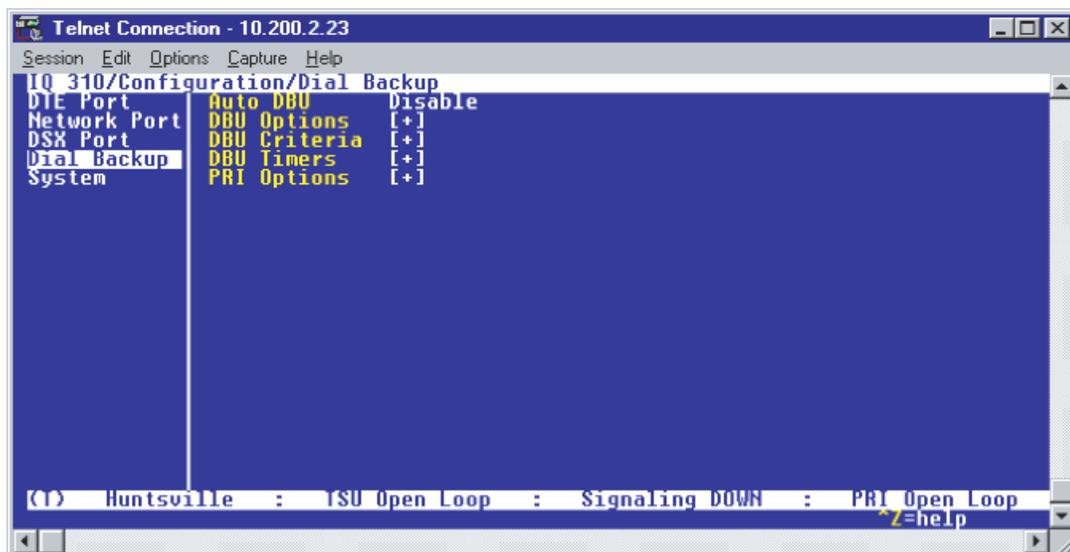


Figure 3. Dial Backup Menu

By default, **AUTO DBU** is disabled. This parameter must be changed to **ENABLE** for the IQ 310 to automatically dial the remote end once any of the DBU criteria are met. This setting must also be enabled in order for the IQ unit to automatically answer inbound calls from other units.

3. Use the right arrow key to select **AUTO DBU**; then press **<ENTER>**. The screen shown in Figure 4 will appear.

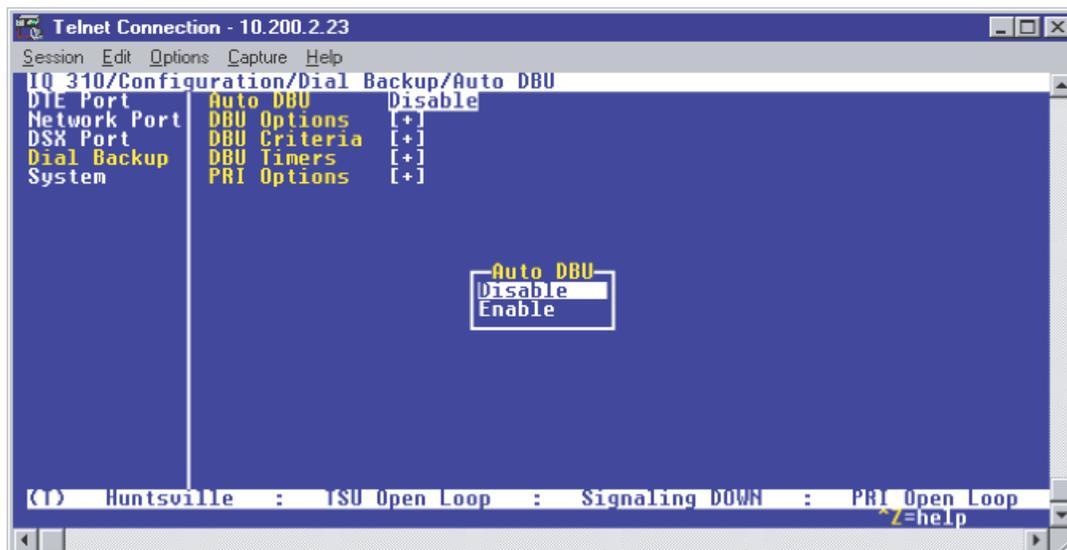


Figure 4. Auto DBU Selections

4. Use the down arrow to select **ENABLE**; then press **<ENTER>**. At this point, the **AUTO DBU** parameter will change to **ENABLE** and the screen shown in Figure 5 will appear.



Figure 5. Auto DBU Enabled

## DBU Options

1. Press the down arrow to select **DBU OPTIONS**; then press **<ENTER>**. The screen shown in Figure 6 will appear. The default parameter values for this screen are shown.

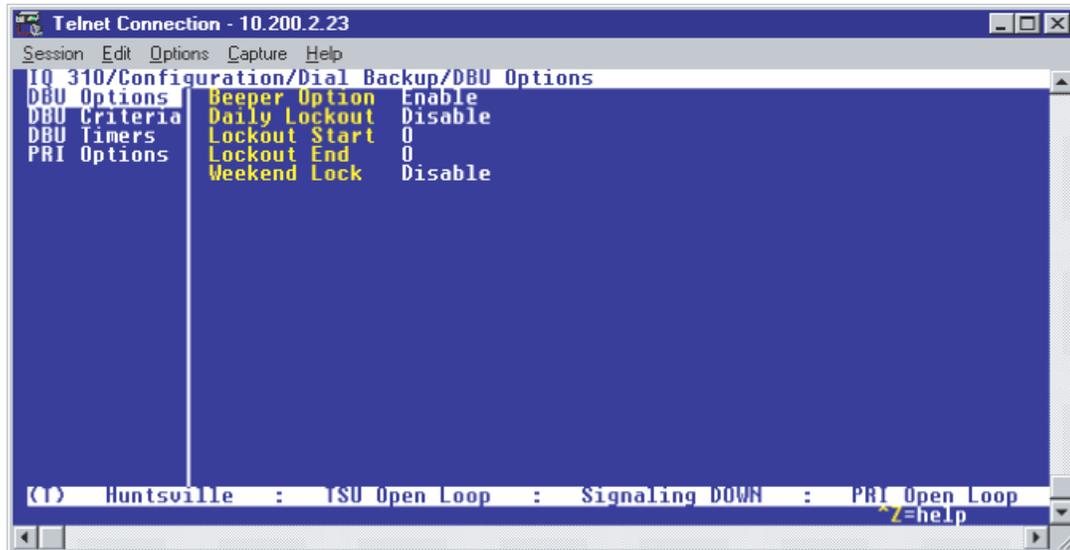


Figure 6. DBU Options Menu

For basic dial backup operation, these parameters do not need to be altered from their default values.

The **BEEPER OPTION** allows the user to control the intermittent beep issued during dial backup. **DAILY LOCKOUT** enabled prevents the IQ 310 from going into dial backup between the timeframes specified by **LOCKOUT START** and **LOCKOUT END**. With **WEEKEND LOCK** enabled, no dial backup will occur from midnight Friday to midnight Sunday.

## DBU Criteria

1. From the screen shown in Figure 6, press the down arrow to select **DBU CRITERIA**. The menu screen shown in Figure 7 is displayed. The default values for the parameters on this screen are shown.

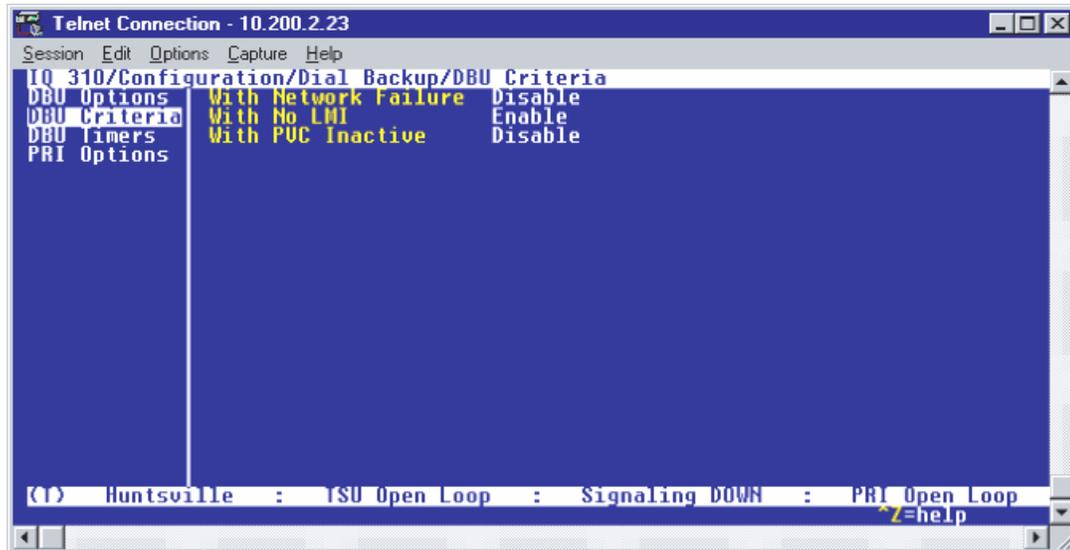


Figure 7. DBU Criteria Menu

2. Use the right arrow to select **WITH NETWORK FAILURE**; then press **<ENTER>**. Use the down arrow to select **ENABLE**; then press **<ENTER>**. This allows the IQ unit to enter dial backup in the event that the network T1 line goes into alarm.

**WITH NO LMI** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when the **FRAME RELAY SIGNALING STATE** is down.

3. Press the down arrow to select **WITH PVC INACTIVE**; then press **<ENTER>**. Use the down arrow to select **ENABLE**; then press **<ENTER>**.

This is a global setting that affects all of the PVCs in the IQ 310 DLCI table (under **NETWORK PVC OPTIONS**). If this option is disabled, the unit will not enter DBU based on an inactive DLCI regardless of how the **DBU ON INACTIVE** parameter is set for each DLCI in the **NETWORK PVC OPTIONS**. A PVC is advertised as Inactive by the frame switch in the CO when there is a problem at the remote end of the frame circuit. With this option enabled, the IQ 310 will attempt to establish a dial backup call with the remote unit when its corresponding DLCI is advertised as Inactive.

Once these parameters have been configured properly, the **DBU CRITERIA** screen should look exactly like Figure 8.

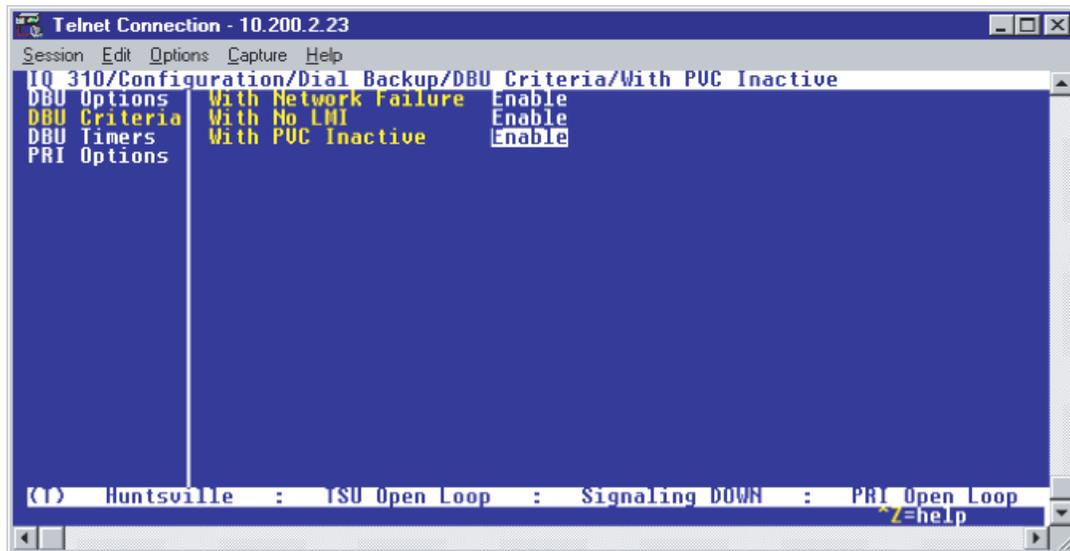


Figure 8. DBU Criteria Menu with Options Enabled

### DBU Timers

1. Press the left arrow key once and the down arrow key once to select **DBU TIMERS**. The **DBU TIMERS** screen shown in Figure 9 is displayed. The default parameter values are shown below.

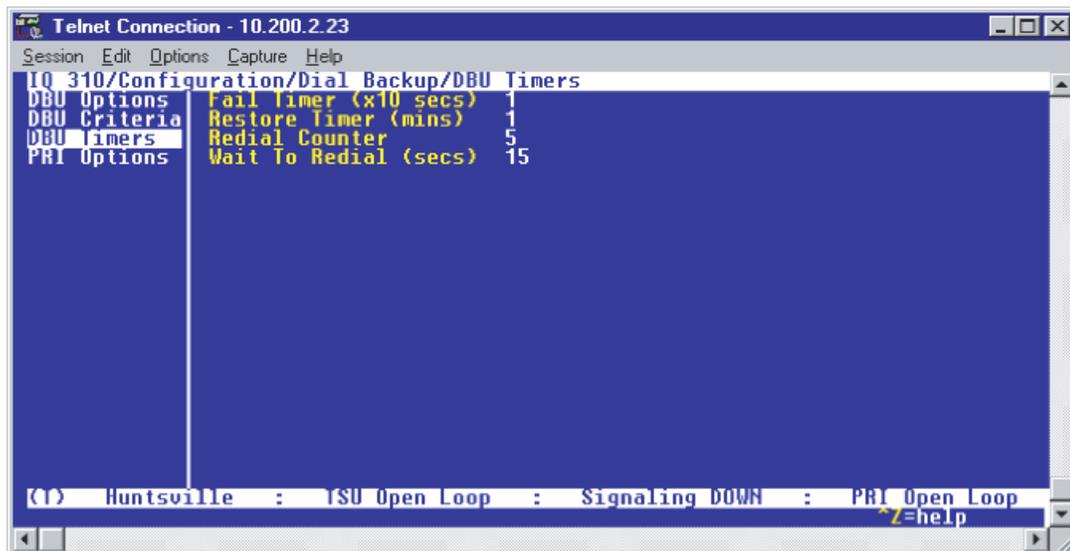
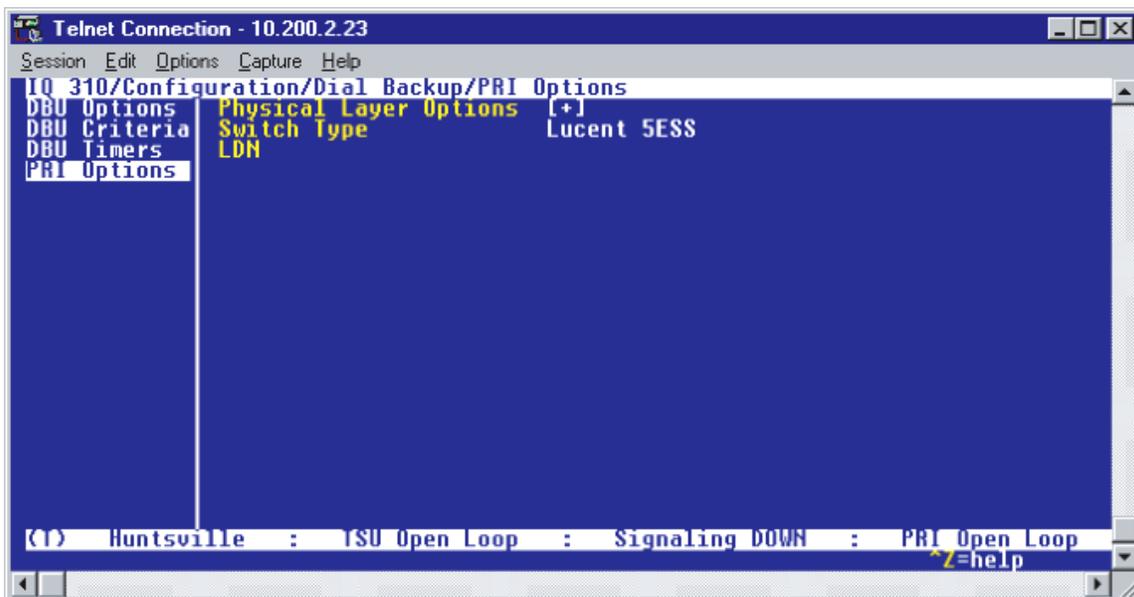


Figure 9. DBU Timers Menu

For basic dial backup operation, these parameters do not need to be altered from their default values. The **FAIL TIMER** programs the amount of time the IQ 310 will wait once any of the DBU criteria have been met before entering dial backup. Once the Frame Relay link has been reestablished on the network line, the **RESTORE TIMER** sets the amount of time the IQ 310 will wait before disconnecting the dial backup call. The **REDIAL COUNTER** programs the number of redial attempts performed if dial backup is not established on the first call. **WAIT TO REDIAL** defines the amount of time between redial attempts.

### **PRI Options**

1. From the screen shown in Figure 9, press the down arrow to select **PRI OPTIONS**. The screen shown in Figure 10 is now displayed. The default values for the parameters on this menu are shown.



**Figure 10. PRI Options Menu**

2. Use the right arrow to select **PHYSICAL LAYER OPTIONS**; then press **<ENTER>**. The screen shown in Figure 11 will appear.

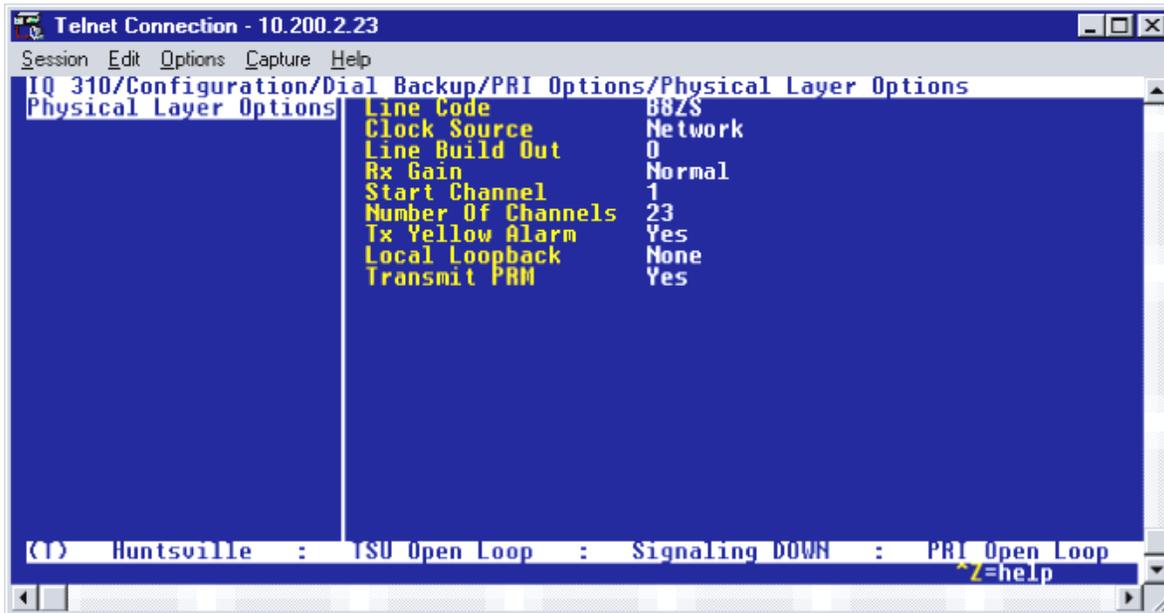


Figure 11. Physical Layer Options Menu

3. Use the right arrow to select **LINE CODE**; then press **<ENTER>**. Choices of **B8ZS** and **AMI** will appear. Use the arrow keys to select the line code that matches the line code on the TELCO-provided PRI line; then press **<ENTER>**.
4. Down arrow to select **CLOCK SOURCE**; then press **<ENTER>**. Choices of **INTERNAL** and **NETWORK** will appear. Use the arrow keys to select **NETWORK** if the TELCO is providing clocking on the PRI line. Select **INTERNAL** if there is no timing on the PRI circuit and the IQ 310 will have to provide the clock.
5. Down arrow to select **LINE BUILD OUT (LBO)**; then press **<ENTER>**. Choices of **0**, **7.5**, **15**, and **22.5** will appear. The LBO should be selected based on the strength of the receive signal. Use the arrow keys to select the correct value; press **<ENTER>**.
6. Down arrow to select **RX GAIN**; then press **<ENTER>**. Choices of **NORMAL** and **EXTENDED** will appear. The **NORMAL** setting is adequate for most applications. If the receive signal strength is less than 30 dB, choose **EXTENDED**.
7. Down arrow to select **START CHANNEL**; then press **<ENTER>**. Enter the first DS0 number available for the TELCO-provided PRI line. If a full PRI circuit was purchased, the start channel will be one. If a fractional PRI circuit was purchased, the start channel information can be obtained from the TELCO.
8. Use the down arrow to select **NUMBER OF CHANNELS**; then press **<ENTER>**. Enter the total number of channels for the TELCO-provided PRI line. If a full T1 circuit was purchased, the number of channels will be 23. The D-channel, which is used for call signaling, always resides on channel 24. If a fractional PRI circuit was purchased, the number of channels can be obtained from the TELCO.
9. Down arrow to select **TX YELLOW ALARM**; then press **<ENTER>**. Use the arrow keys to select **YES** or **NO**; press enter.
10. Use the down arrow to select **LOCAL LOOPBACK**; then press **<ENTER>**. Use the arrow keys to select **NONE**, **PAYLOAD**, or **LINE**; press enter. For normal operation, the local loopback should be left at **NONE**. For troubleshooting, **PAYLOAD** or **LINE** may be selected.

11. Down arrow to select **TRANSMIT PRM**; then press **<ENTER>**. Choices of **NO** and **YES** will appear. Enabling the performance report messages (PRM) allows the unit to send messages across the facility data link (FDL) per ANSI T1.403. The terminating device at the TELCO may use this information for management of the T1 loop. The IQ 310 supports PRM messages per AT&T Pub 54016 which is a poll/response type protocol. Because of this poll/response nature, the transmit PRM option does not disable the IQ 310 from processing or responding to 54016-type messages.
12. Press the left arrow until the screen shown in Figure 12 appears.

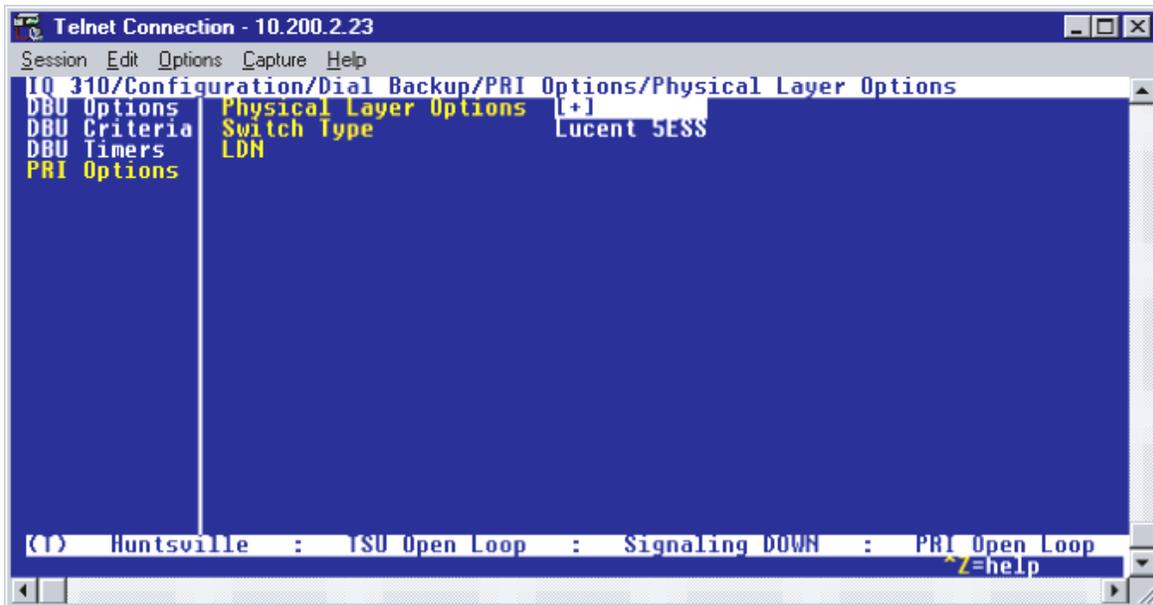


Figure 12. Physical Layer Options Menu

13. Down arrow to select **SWITCH TYPE**; then press **<ENTER>**. A list of available switch types is displayed. *The switch type selected here must match the TELCO CO switch providing the ISDN service.* Select **LUCENT 5ESS**, **DMS 100**, or **NATIONAL**. For the example network in Figure 1, we will assume the switch type for all units is **NATIONAL**. Down arrow to select **NATIONAL**; press **<ENTER>**.
14. Down arrow to select **LDN**; press **<ENTER>**. Insert the Local Directory Number provided by the Telephone Company and press **<ENTER>**. In our example the LDN is 5551000.

## Configuring PVC Options for the Host IQ 310 (Huntsville)

1. Press the left arrow key until the menu shown in Figure 13 appears.

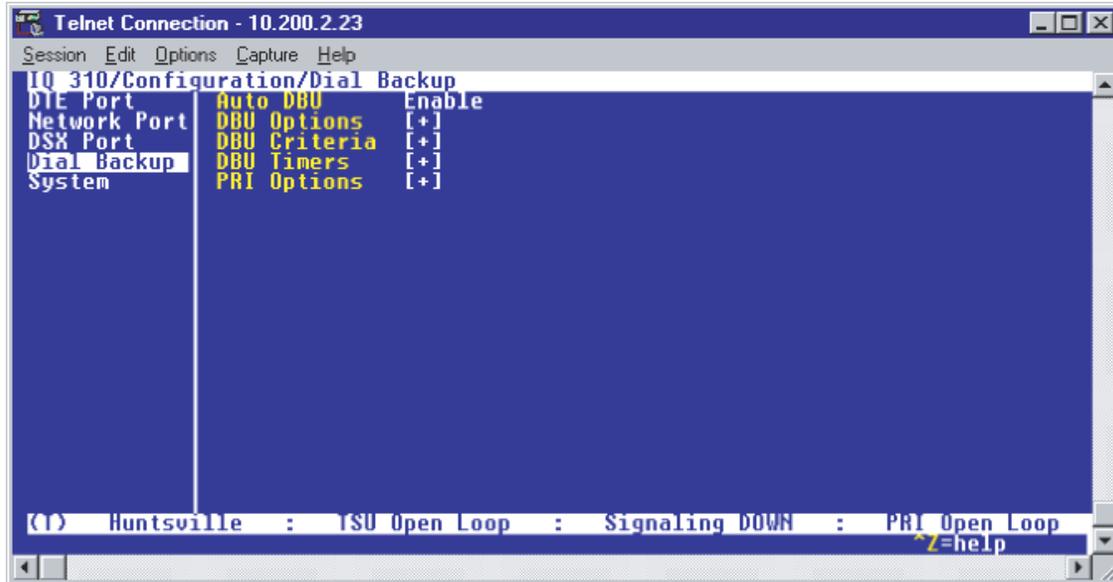


Figure 13. Configuration Menu

2. Use the up arrow key to select **NETWORK PORT**; then press <ENTER>. The screen shown in Figure 14 will appear.

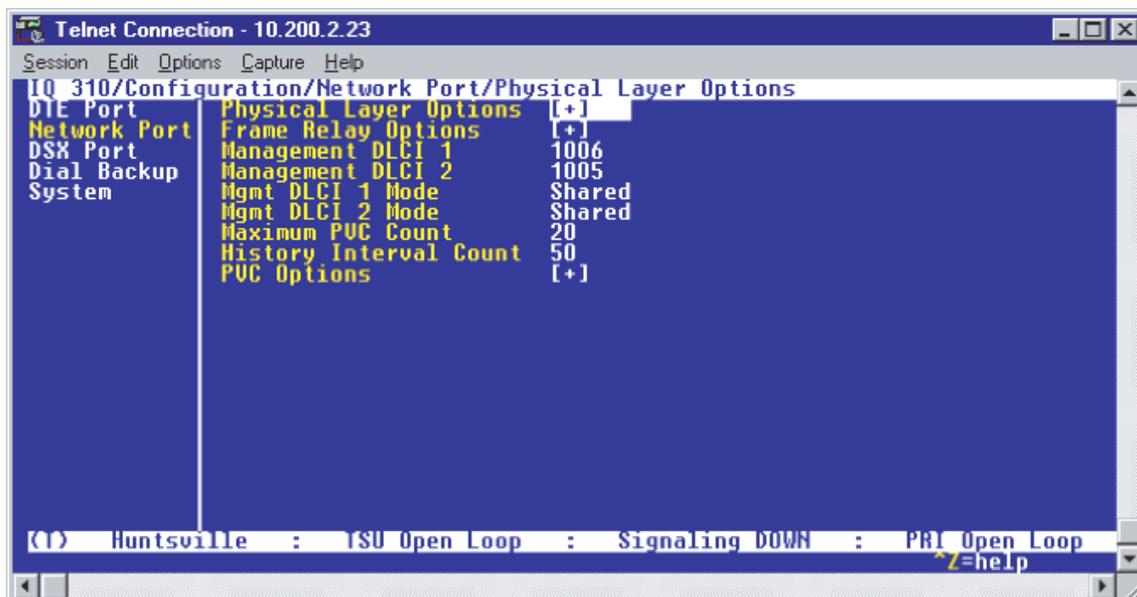
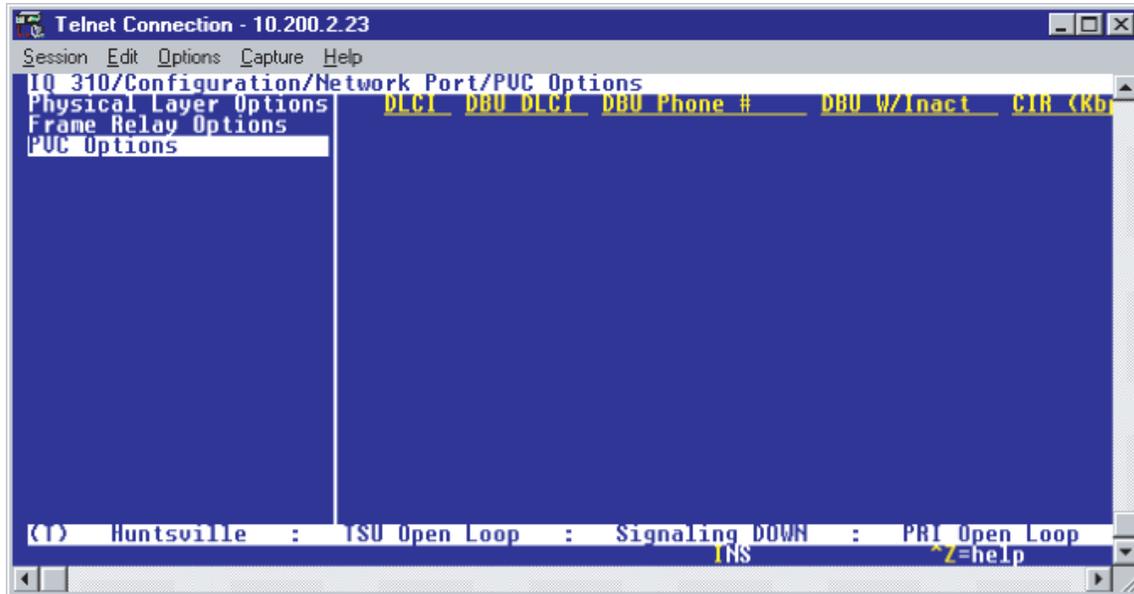


Figure 14. Network Port Menu

- Down arrow until **PVC OPTIONS** is selected. Press **<ENTER>** and the screen shown in Figure 15 is shown.



**Figure 15. PVC Options Menu**

- The Huntsville Unit will have 23 entries in its PVC configuration table to correspond to the 23 remote sites.
- For the first entry, use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 16 and press **<ENTER>**.
- Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 20 and press **<ENTER>**.
- Notice that the Telco-assigned DLCI of 16 for Huntsville's Frame Relay link to Atlanta is programmed in the **DLCI** field. The Telco-assigned DLCI of 20 for Atlanta's Frame Relay link to Huntsville is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
- Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565552000 and press **<ENTER>**. The phone number that the Huntsville IQ 310 will dial to reach the Atlanta IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **DBU ON INACTIVE**; then press **<ENTER>**.
- Down arrow to select **ENABLED**; then press **<ENTER>**. This allows the Huntsville IQ 310 to dial out to the IQ 310 in Atlanta in the event that DLCI 16 is advertised as Inactive by the Frame Relay switch.

At this point all PVC options have been configured for basic Frame Relay dial backup to Atlanta. The PVC entry for DLCI 16 on the Huntsville IQ 310 should look like the screen shown in Figure 16. The remaining options may be left at their default values. The **CIR**, **SEQ NUM CHECKING**, **DELAY MEASUREMENT**, and **STATS OPTION** are features not related to dial backup. For an explanation of these features please refer to the User Interface Guide section of this manual.

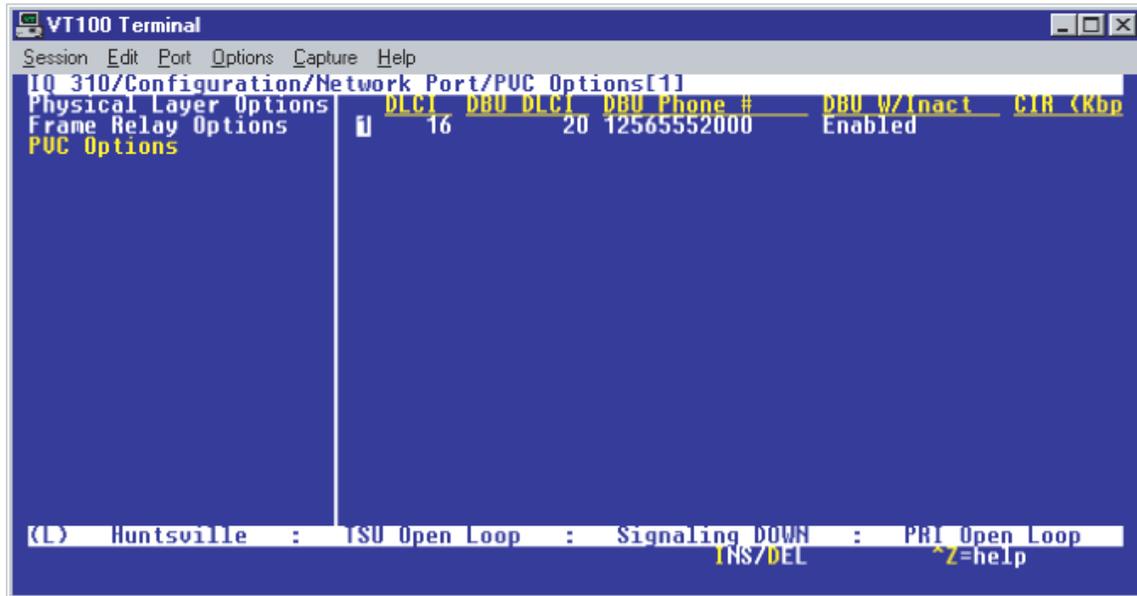


Figure 16. Huntsville IQ 310 (DLCI 16) Screen

- To add the additional entries, use the arrow keys to place the cursor over the number 1 (indicating entry 1) to the left of the DLCI field and hit the letter I for insert. This creates a new entry in the PVC Options table. The screen shown in Figure 17 should now appear.

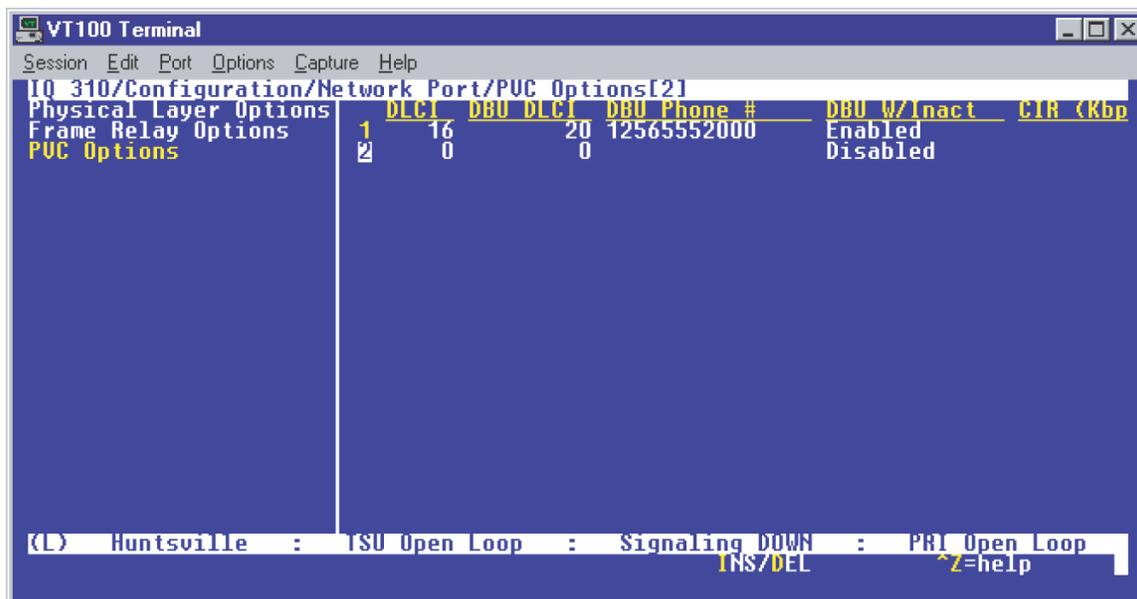


Figure 17. New Entry Screen

12. Continue to add entries until all 23 entries have been added and the screen appears as shown in Figures 18 and 19. Since the screen only displays a total of 20 entries at a time, use the down arrow to show entries 21-23 as seen in Figure 19.

```

VT100 Terminal
Session Edit Port Options Capture Help
IQ 310/Configuration/Network Port/PUC Options
Physical Layer Options
Frame Relay Options
PUC Options
  1      16      20  12565552000  Enabled
  2      17      20  12565552001  Enabled
  3      18      20  12565552002  Enabled
  4      19      20  12565552003  Enabled
  5      20      20  12565552004  Enabled
  6      21      20  12565552005  Enabled
  7      22      20  12565552006  Enabled
  8      23      20  12565552007  Enabled
  9      24      20  12565552008  Enabled
 10     25      20  12565552009  Enabled
 11     26      20  12565552010  Enabled
 12     27      20  12565552011  Enabled
 13     28      20  12565552012  Enabled
 14     29      20  12565552013  Enabled
 15     30      20  12565552014  Enabled
 16     31      20  12565552015  Enabled
 17     32      20  12565552016  Enabled
 18     33      20  12565552017  Enabled
 19     34      20  12565552018  Enabled
 20     35      20  12565552019  Enabled
(L) Huntsville : ISU Open Loop : Signaling DOWN : PRI Open Loop
^Z=help

```

Figure 18. Huntsville DLCI Entries

```

VT100 Terminal
Session Edit Port Options Capture Help
IQ 310/Configuration/Network Port/PUC Options[23]
Physical Layer Options
Frame Relay Options
PUC Options
  4      19      20  12565552003  Enabled
  5      20      20  12565552004  Enabled
  6      21      20  12565552005  Enabled
  7      22      20  12565552006  Enabled
  8      23      20  12565552007  Enabled
  9      24      20  12565552008  Enabled
 10     25      20  12565552009  Enabled
 11     26      20  12565552010  Enabled
 12     27      20  12565552011  Enabled
 13     28      20  12565552012  Enabled
 14     29      20  12565552013  Enabled
 15     30      20  12565552014  Enabled
 16     31      20  12565552015  Enabled
 17     32      20  12565552016  Enabled
 18     33      20  12565552017  Enabled
 19     34      20  12565552018  Enabled
 20     35      20  12565552019  Enabled
 21     36      20  12565552020  Enabled
 22     37      20  12565552021  Enabled
 23     38      20  12565552022  Enabled
(L) Huntsville : ISU Open Loop : Signaling DOWN : PRI Open Loop
INS/DEL ^Z=help

```

Figure 19. Huntsville DLCI Entries

## Configuring the Dial Backup Parameters for Remote Site 1 TSU IQ (Atlanta)

1. From the Main menu terminal screen (Figure 20) of the TSU IQ, select option 1 for **CONFIGURATION** and press **<ENTER>**. Next, select option 3 for **DIAL BACKUP** from the **CONFIGURATION** menu shown in Figure 21, and press **<ENTER>**. The resulting screen is displayed in Figure 22.

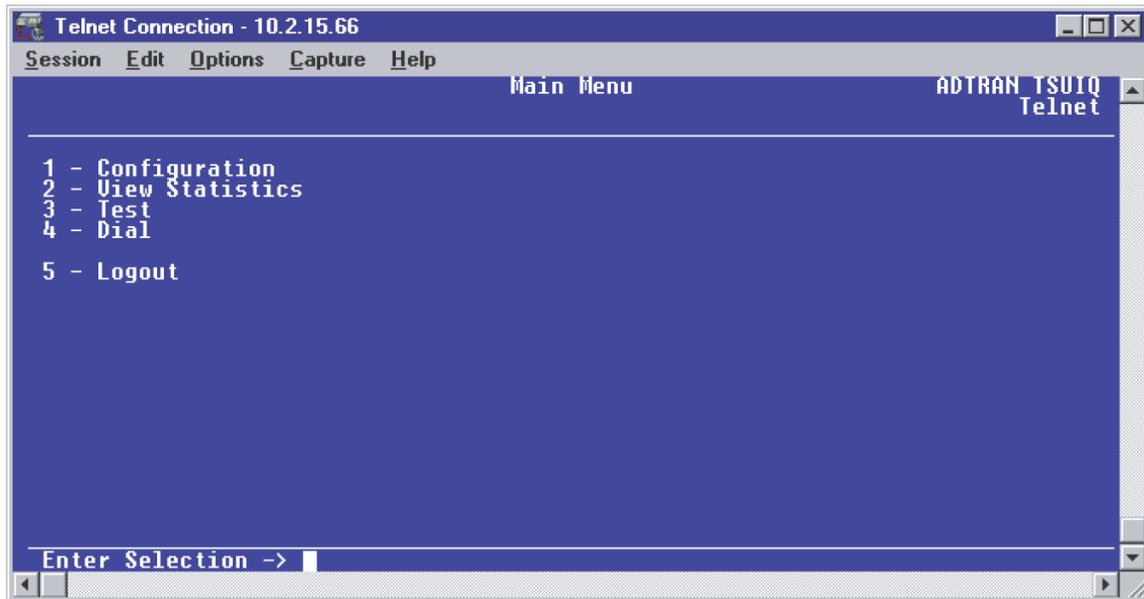


Figure 20. Main Menu

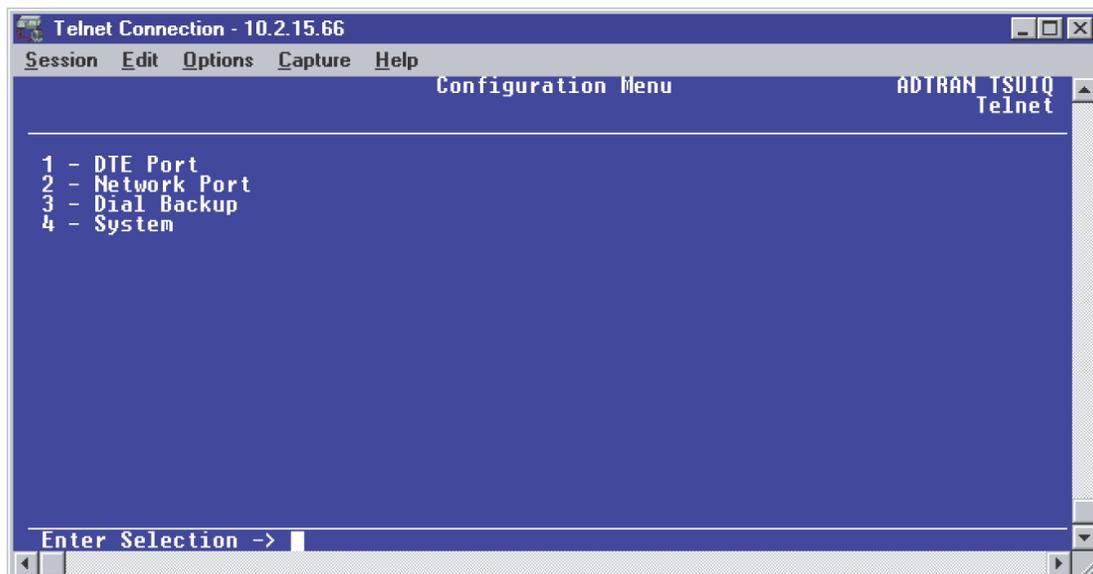
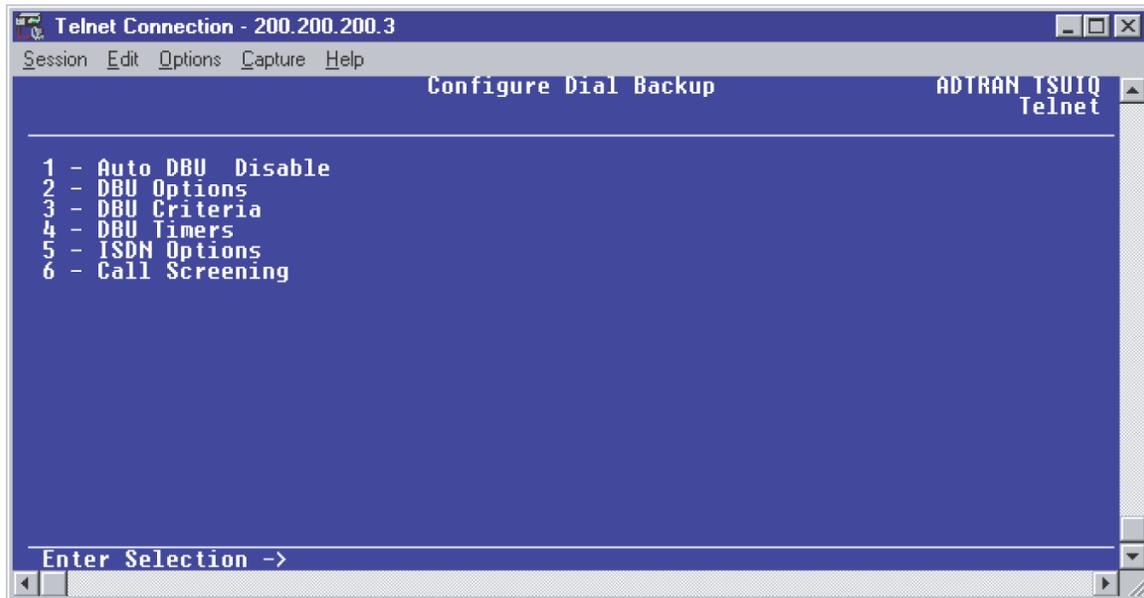


Figure 21. Configuration Menu



**Figure 22. Configure Dial Backup Screen**

By default, **AUTO DBU** is disabled. This parameter must be changed to **ENABLE** for the TSU IQ to automatically dial the remote end once any of the DBU criteria are met. This setting must also be enabled in order for the IQ unit to automatically answer inbound calls from other units.

2. From the **CONFIGURE DIAL BACKUP SCREEN** (Figure 22), press 1 and <Enter> to select **AUTO DBU**; select 2 for **ENABLE** and press <ENTER>.

## DBU Options

- From the **CONFIGURE DIAL BACKUP** screen (Figure 22), select option 2, **DBU OPTIONS**; then press **<ENTER>**. The screen similar to Figure 23 will appear. The default parameter values for this screen are shown.

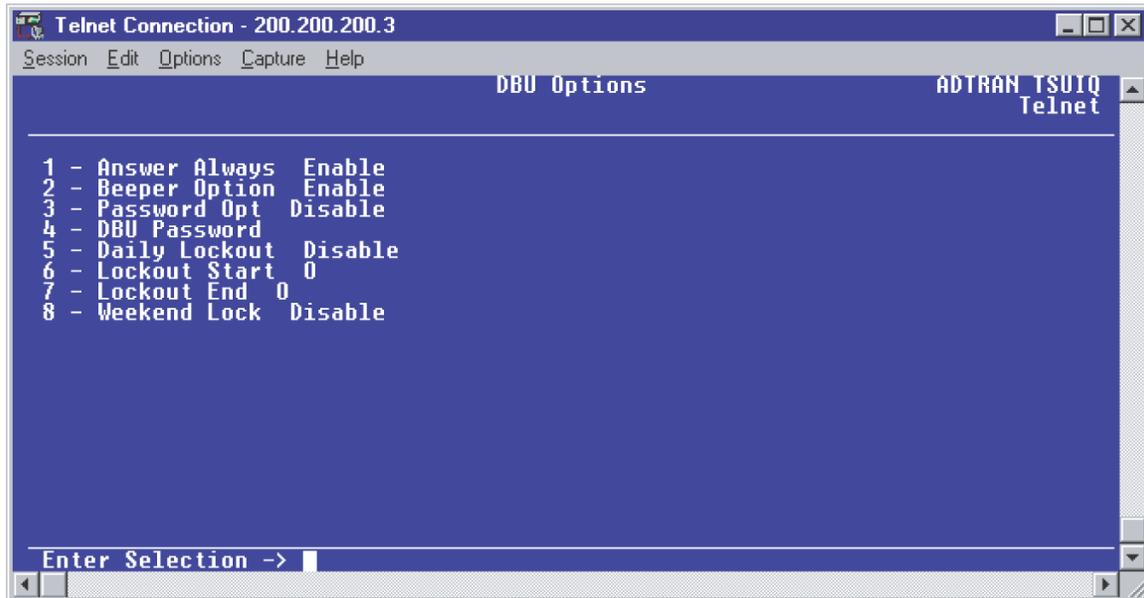


Figure 23. DBU Options Menu

For basic dial backup operation, these parameters do not need to be altered from their default values.

The **ANSWER ALWAYS** option must work in conjunction with the **AUTO DBU** option. The **AUTO DBU** option is still the controlling option. If **AUTO DBU** is disabled, the unit will not answer the call regardless of how **ANSWER ALWAYS** is set. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Answer Always	Result
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Enabled	Unit will answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Disabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Enabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Disabled	Unit will not answer an incoming call.

In addition, the **ANSWER ALWAYS** feature must work in conjunction with the **ORIGINATE/ANSWER** feature. The **ORIGINATE/ANSWER** feature only appears when the unit is programmed for a non frame-relay circuit (signaling none). If **ANSWER ALWAYS** is enabled (and **AUTO DBU** enabled), the unit will answer the call even if it is set to **ORIGINATE**. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Originate/Answer	Answer Always	Result
None	Enabled	Originate	Enabled	Unit will answer an incoming call.
None	Enabled	Originate	Disabled	Unit will not answer an incoming call.
None	Enabled	Answer	Enabled	Unit will answer an incoming call.
None	Enabled	Answer	Disabled	Unit will not answer an incoming call.
None	Disabled	Originate	Enabled	Unit will not answer an incoming call.
None	Disabled	Originate	Disabled	Unit will not answer an incoming call.
None	Disabled	Answer	Enabled	Unit will not answer an incoming call.
None	Disabled	Answer	Disabled	Unit will not answer an incoming call.

The **BEEPER OPTION** allows the user to control the intermittent beep issued during dial backup. **PASSWORD OPTION** and **DBU OPTION** are security features that can be used to prevent the IQ from establishing dial backup with unknown units. **DAILY LOCKOUT** enabled prevents the IQ 310 from going into dial backup between the timeframes specified by **LOCKOUT START** and **LOCKOUT END**. With **WEEKEND LOCK** enabled, no dial backup will occur from midnight Friday to midnight Sunday.

## DBU Criteria

1. Press **<ESCAPE>** once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 22. Select option 3, **DBU CRITERIA** and press **<ENTER>**. The menu screen shown in Figure 24 is displayed. The default values for the parameters on this screen are shown.

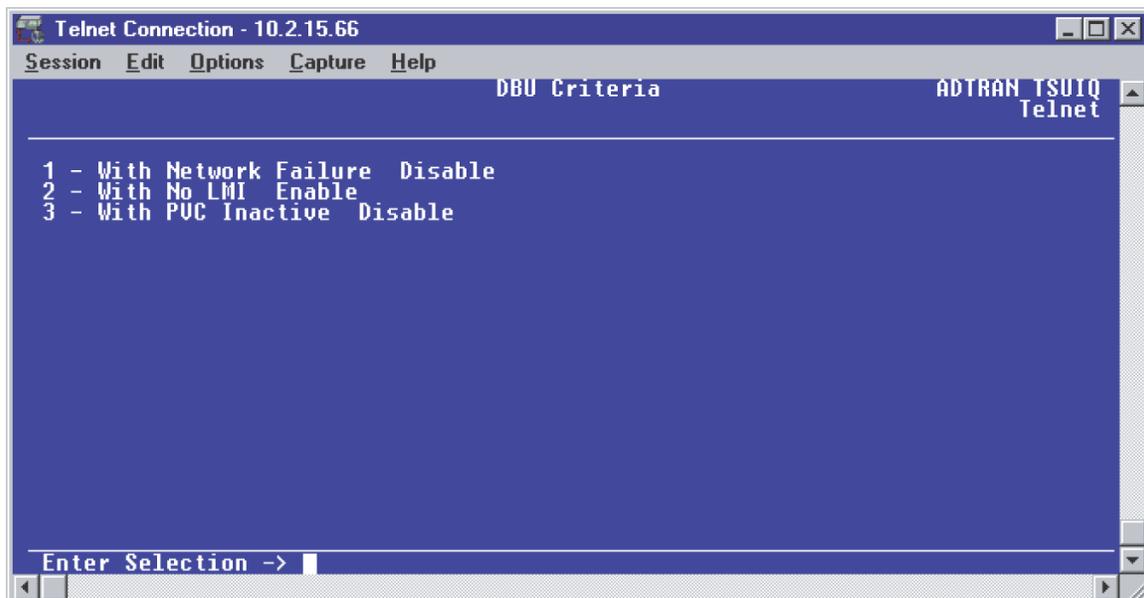


Figure 24. DBU Criteria Menu

2. Press 1 to select **WITH NETWORK FAILURE**; then press **<ENTER>**. Press 2 and press **<ENTER>** to select **ENABLE**. This allows the IQ unit to enter dial backup in the event that the network T1 line goes into alarm.
3. **WITH NO LMI** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when the **FRAME RELAY SIGNALING STATE** is down.
4. Press 3 to select **WITH PVC INACTIVE**; then press **<ENTER>**. Press 2 and press **<ENTER>** to select **ENABLE**.

This is a global setting that affects all of the PVCs in the IQ's DLCI table. A PVC is advertised as Inactive by the frame switch in the CO when there is a problem at the remote end of the frame circuit. With this option enabled, the IQ will attempt to establish a dial backup call with the remote unit when its corresponding DLCI is advertised as Inactive.

Once these parameters have been configured properly, the **DBU CRITERIA** screen should look exactly like Figure 25.



Figure 25. DBU Criteria Menu with Options Enabled

## DBU Timers

1. Press **<ESCAPE>** once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 22. Select option 4, **DBU TIMERS** and press **<ENTER>**. The menu screen shown in Figure 26 is displayed. The default values for the parameters on this screen are shown.

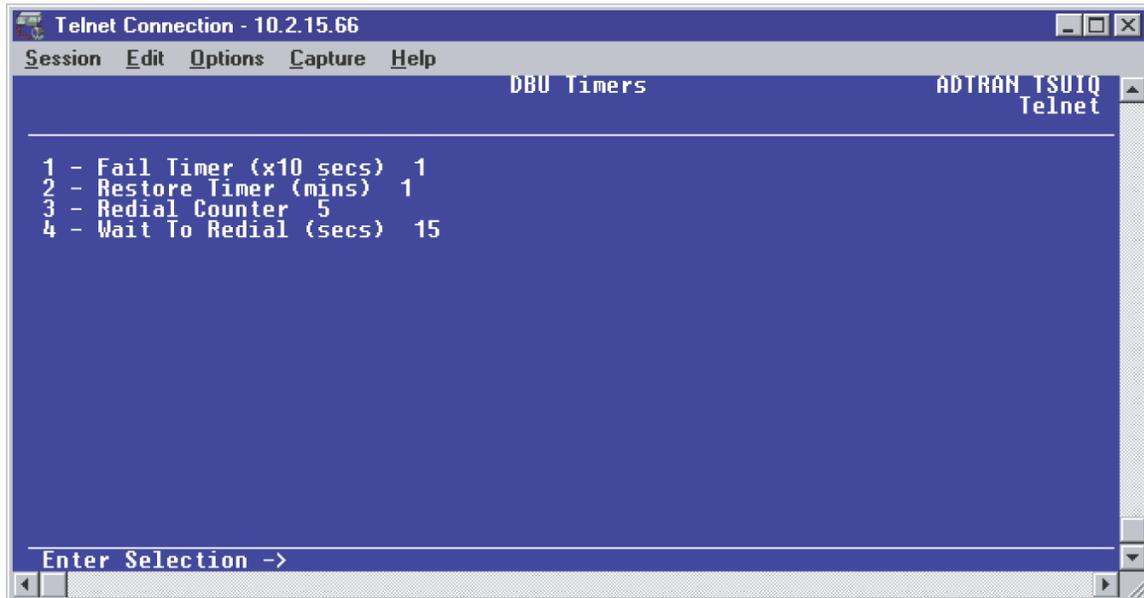


Figure 26. DBU Timers Menu

For basic dial backup operation, these parameters do not need to be altered from their default values. The **FAIL TIMER** programs the amount of time the IQ 310 will wait once any of the DBU criteria have been met before entering dial backup. Once the Frame Relay link has been reestablished on the network line, the **RESTORE TIMER** sets the amount of time the IQ 310 will wait before disconnecting the dial backup call. The **REDIAL COUNTER** programs the number of redial attempts performed if dial backup is not established on the first call. **WAIT TO REDIAL** defines the amount of time between redial attempts.

## ISDN Options

1. Press **<ESCAPE>** once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 22. Select option 5, **ISDN OPTIONS** and press **<ENTER>**. The menu screen shown in Figure 27 is displayed. The default values for the parameters on this screen are shown.

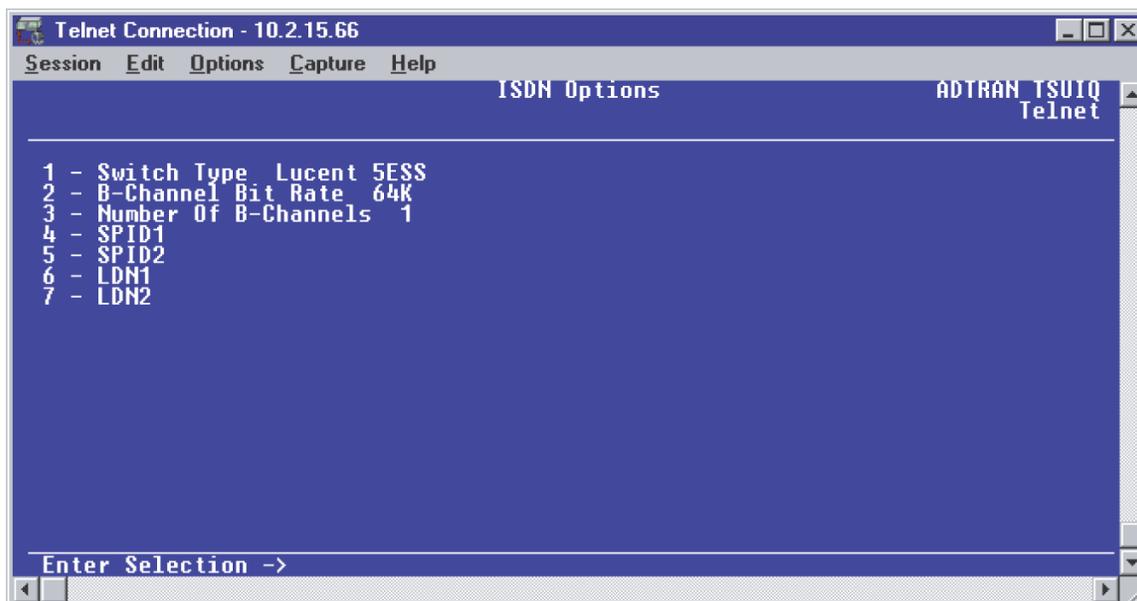


Figure 27. ISDN Options Menu

2. Press 1 to select **SWITCH TYPE**; then press **<ENTER>**. A list of available switch types is displayed. *The switch type selected here must match the TELCO CO switch providing the ISDN service.* Select option 1 for **LUCENT 5ESS**, 2 for **DMS 100**, 3 for **NATIONAL**, or 4 for **NEC**; press **<ENTER>**. For the example network in Figure 1, we will assume the switch type for all units is **NATIONAL**, so press 3 and press **<ENTER>**.
3. Press 2 to select **B-CHANNEL BIT RATE**; then press **<ENTER>**. Select option 1 for **56kbps** or option 2 for **64kbps**; then press **<ENTER>**. Generally leave this value to its default of **64kbps** unless your ISDN service only provides 56kbps.
4. To configure the **NUMBER OF B-CHANNELS** on the BRI line, press option 3 and press **<ENTER>**. Enter 1 for single channel service or 2 for dual channel service and press **<ENTER>**. When connecting to a host unit with a PRI module, the **NUMBER OF B-CHANNELS** should always be 1.
5. Select option 4 and press **<ENTER>** to program the SPID for the first B-channel. Enter the SPID assigned by the Telephone Company for the first B-channel and press **<ENTER>**. For the example network in Figure 1, the proper SPID is 25655520000101.
6. If the **NUMBER OF B-CHANNELS** is set to 1, leave SPID2 blank.
7. Select option 6, LDN1, and press **<ENTER>**. Insert the Local Directory Number provided by the Telephone Company for the first B-Channel and press **<ENTER>**. For the example network shown in Figure 1, the proper LDN is 5552000.
8. If the **NUMBER OF B-CHANNELS** is set to 1, leave LDN2 blank.
9. A sample screen shot of the ISDN Options screen for the Atlanta TSU IQ is shown in Figure 28.



Figure 28. ISDN Options Screen for Atlanta TSU IQ

## Call Screening

1. Press <ESCAPE> once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 22. Select option 6, **CALL SCREENING** and press <ENTER>. The menu screen shown in Figure 29 is displayed. The default values for the parameters on this screen are shown.

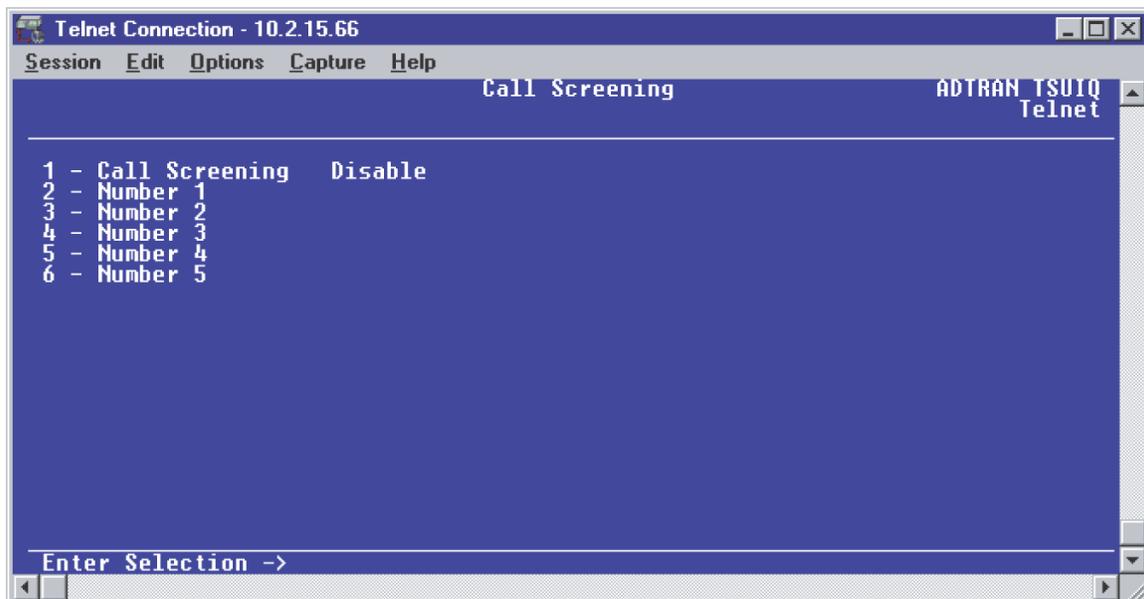


Figure 29. Call Screening Menu

It is not necessary to adjust these parameters from their default values for basic Frame Relay dial backup. With **CALL SCREENING** enabled, the IQ unit will only accept incoming calls from calling parties matching one of the phone numbers configured for Number 1 through Number 5.

### Configuring PVC Options for Remote Site 1 TSU IQ (Atlanta)

1. From the Main menu terminal screen (Figure 20) of the TSU IQ, select option 1 for **CONFIGURATION** and press **<ENTER>**. From the **CONFIGURATION** menu (Figure 21), select option 2 for **NETWORK PORT** and press **<ENTER>**. The **CONFIGURE NETWORK PORT MENU** is displayed.
2. From this menu, select 9, **PVC OPTIONS**. Press **<ENTER>** and the screen shown in Figure 30 is shown.

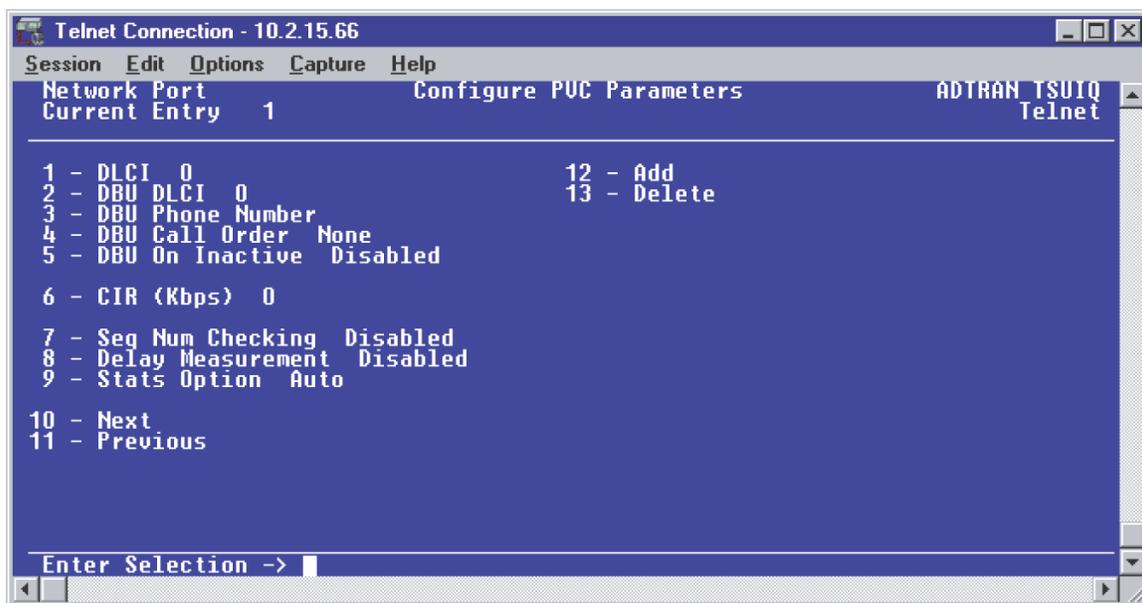


Figure 30. Configure PVC Parameters Menu

3. Press 1 for **DLCI**. Press **<ENTER>**. Type in 20 and press **<ENTER>**. This is the DLCI that Atlanta uses for communication with Huntsville.
4. Press 2 for **DBU DLCI**. Press **<ENTER>**. Type in 16 and press **<ENTER>**. This is the DLCI that the Huntsville IQ 310 uses to communicate with Atlanta.
5. Press 3 for **DBU PHONE NUMBER**. Press **<ENTER>**. Type in 12565551000 and press **<ENTER>**.
6. Press 5 for **DBU ON INACTIVE**. Press **<ENTER>**. Press 2 for **ENABLED**. Press **<ENTER>**. The **GROUP** parameter will be discussed in a different example.

7. Since there is only one PVC for Atlanta, there is no need to enter another entry into the PVC table. At this point the Atlanta TSU IQ is configured for basic dial backup to Huntsville. The **CONFIGURE PVC PARAMETERS** screen is shown in Figure 31. The remaining options may be left at their default values. These features are not related to dial backup. For an explanation of these features, please refer to the the User Interface Guide of this manual.



Figure 31. Configure PVC Parameters Screen for Atlanta TSU IQ

### Configuring the Dial Backup Parameters for Remote Site 2 IQ 310 (Montgomery)

1. From the **CONFIGURATION** menu terminal screen (Figure 32) of the IQ 310, use the arrow keys to select **CONFIGURATION**; press **<ENTER>**.

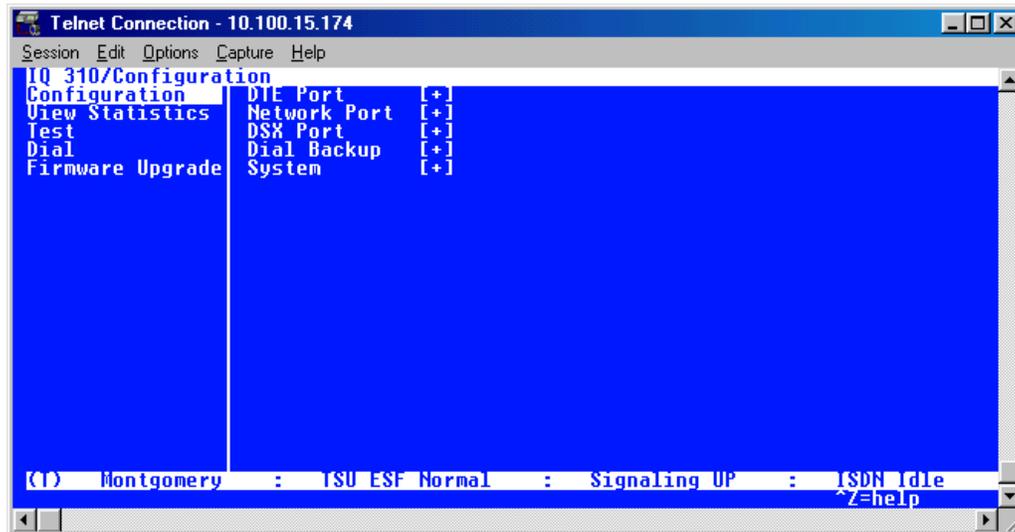


Figure 32. Configuration Menu

2. Using the arrow keys, select **DIAL BACKUP** from the **CONFIGURATION** menu shown in Figure 32; then press **<ENTER>**. The resulting screen is displayed in Figure 33.

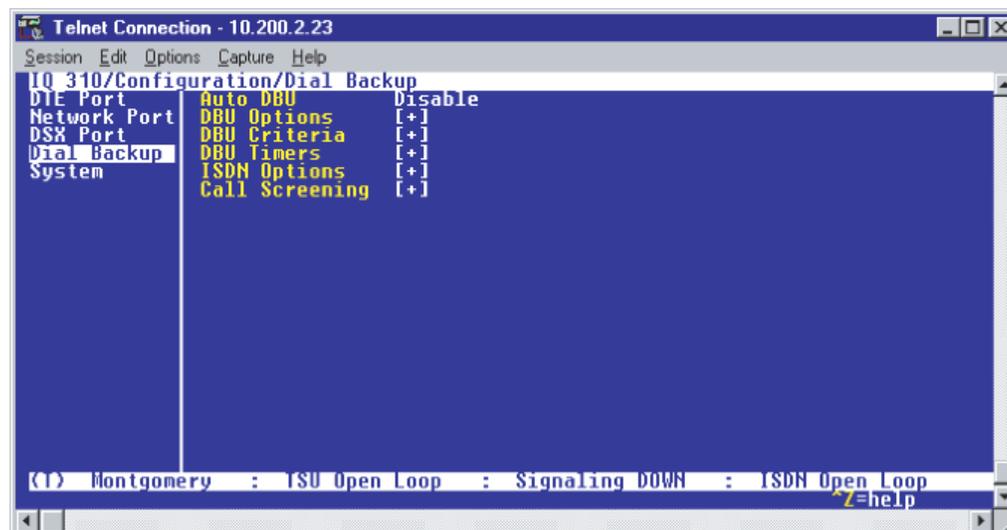


Figure 33. Dial Backup Menu

By default, **AUTO DBU** is disabled. This parameter must be changed to **ENABLE** for the IQ 310 to automatically dial the remote end once any of the DBU criteria are met. This setting must also be enabled in order for the IQ unit to automatically answer inbound calls from other units.

3. Use the right arrow key to select **AUTO DBU**; press **<ENTER>**. The screen shown in Figure 34 will appear.

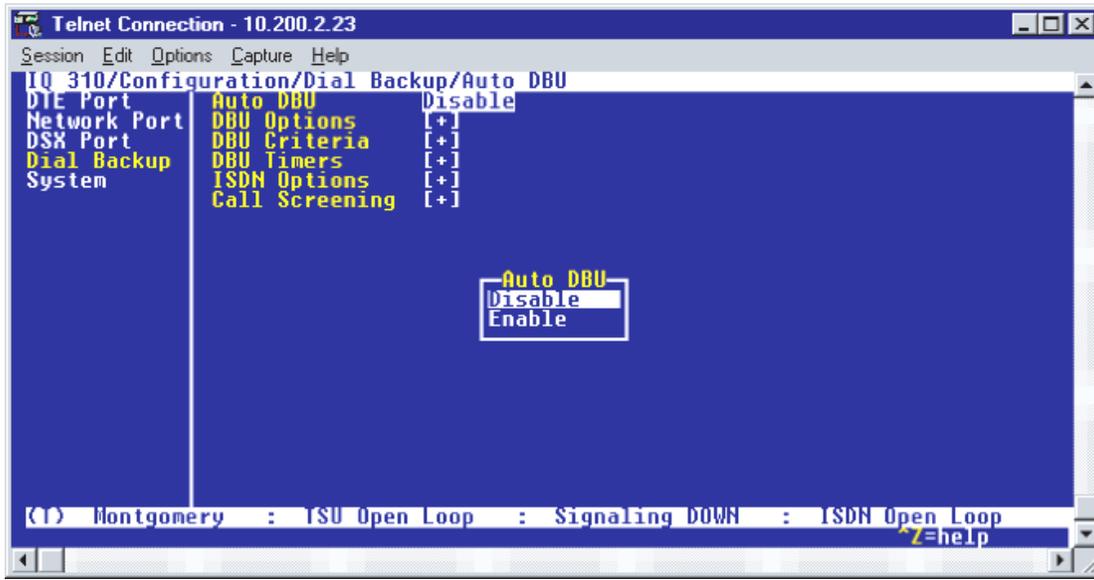


Figure 34. Auto DBU Menu

4. Use the down arrow to select **ENABLE**; then press **<ENTER>**. At this point, the **AUTO DBU** parameter will change to **ENABLE** and the screen shown in Figure 35 will appear.

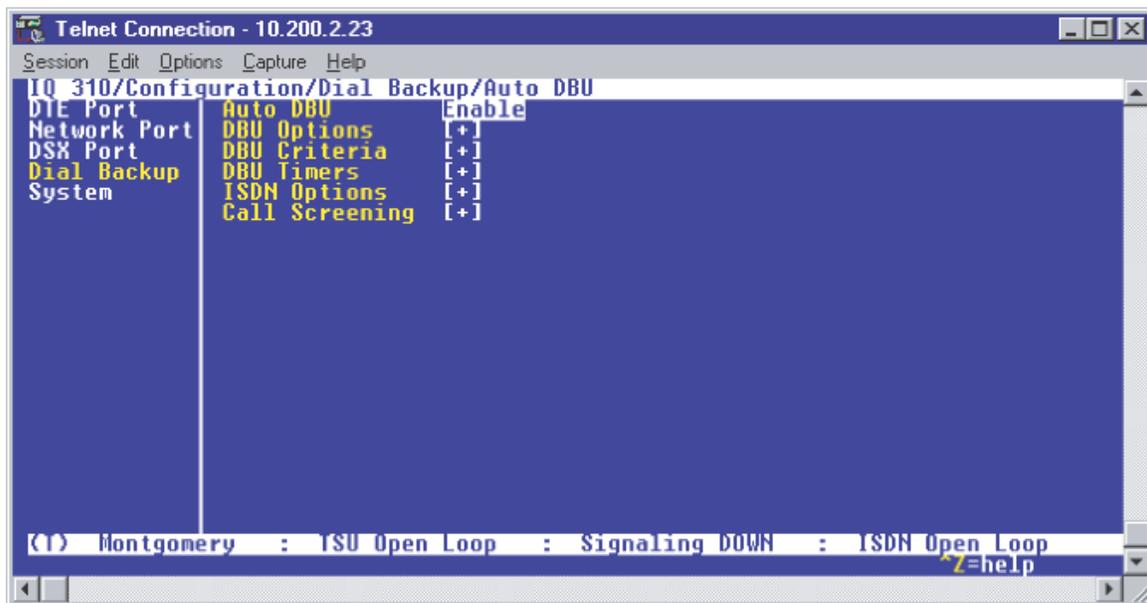


Figure 35. Auto DBU Enabled

### DBU Options

1. Press the down arrow to select **DBU OPTIONS**; then press **<ENTER>**. The screen shown in Figure 36 will appear. The default parameter values for this screen are shown.

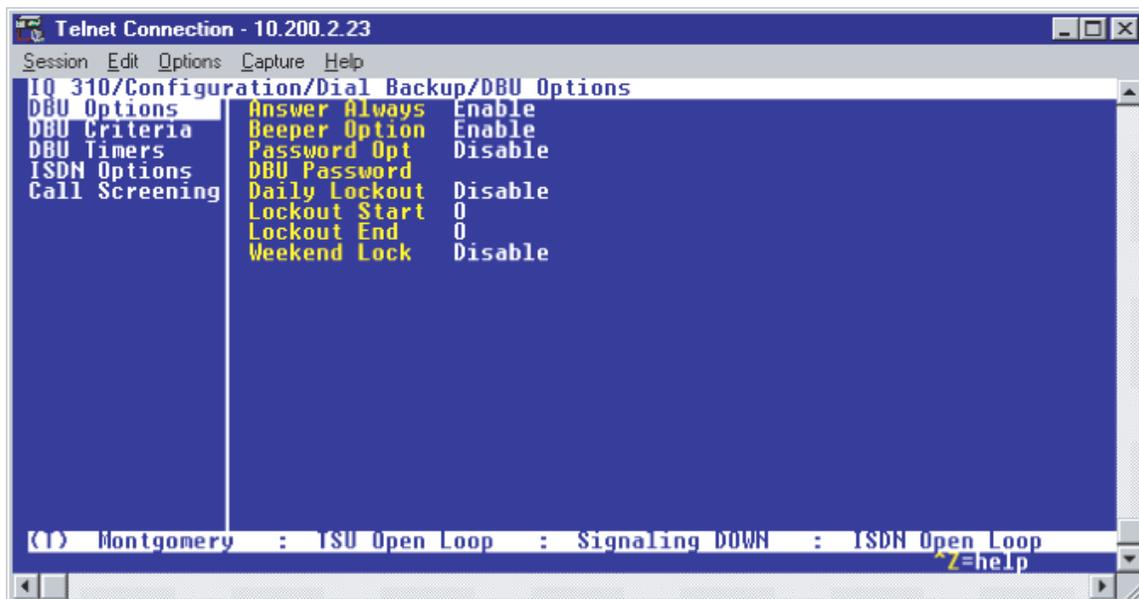


Figure 36. DBU Options Menu

For basic dial backup operation, these parameters do not need to be altered from their default values.

The **ANSWER ALWAYS** option must work in conjunction with the **AUTO DBU** option. The **AUTO DBU** option is still the controlling option. If **AUTO DBU** is disabled, the unit will not answer the call regardless of how **ANSWER ALWAYS** is set. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Answer Always	Result
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Enabled	Unit will answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Disabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Enabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Disabled	Unit will not answer an incoming call.

In addition, the **ANSWER ALWAYS** feature must work in conjunction with the **ORIGINATE/ANSWER** feature. The **ORIGINATE/ANSWER** feature only appears when the unit is programmed for a non frame-relay circuit (signaling none). If **ANSWER ALWAYS** is enabled (and **AUTO DBU** enabled), the unit will answer the call even if it is set to **ORIGINATE**. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Originate/Answer	Answer Always	Result
None	Enabled	Originate	Enabled	Unit will answer an incoming call.
None	Enabled	Originate	Disabled	Unit will not answer an incoming call.
None	Enabled	Answer	Enabled	Unit will answer an incoming call.
None	Enabled	Answer	Disabled	Unit will not answer an incoming call.
None	Disabled	Originate	Enabled	Unit will not answer an incoming call.
None	Disabled	Originate	Disabled	Unit will not answer an incoming call.
None	Disabled	Answer	Enabled	Unit will not answer an incoming call.
None	Disabled	Answer	Disabled	Unit will not answer an incoming call.

The **BEEPER OPTION** allows the user to control the intermittent beep issued during dial backup. **PASSWORD OPTION** and **DBU OPTION** are security features that can be used to prevent the IQ from establishing dial backup with unknown units. **DAILY LOCKOUT** enabled prevents the IQ 310 from going into dial backup between the timeframes specified by **LOCKOUT START** and **LOCKOUT END**. With **WEEKEND LOCK** enabled, no dial backup will occur from midnight Friday to midnight Sunday.

## DBU Criteria

1. From the screen shown in Figure 36, press the down arrow to select **DBU CRITERIA**. The menu screen shown in Figure 37 is displayed. The default values for the parameters on this screen are shown.

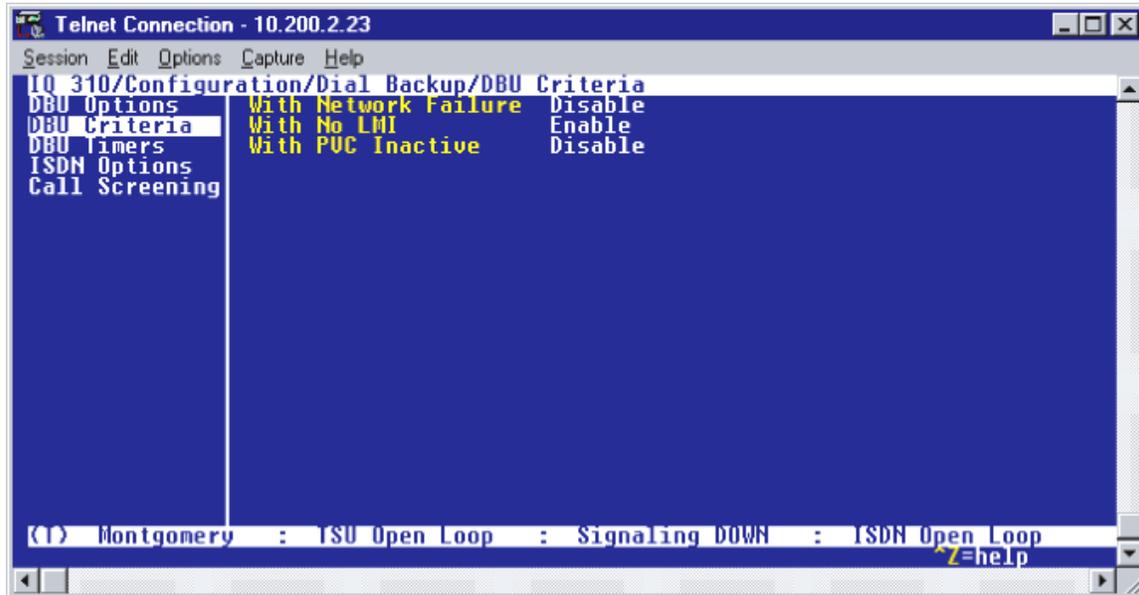


Figure 37. DBU Criteria Menu

2. Use the right arrow to select **WITH NETWORK FAILURE**; then press **<ENTER>**. Use the down arrow to select **ENABLE**; then press **<ENTER>**. This allows the IQ unit to enter dial backup in the event that the network T1 line goes into alarm.
3. **WITH NO LMI** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when the **FRAME RELAY SIGNALING STATE** is down.
4. Use the down arrow to select **WITH PVC INACTIVE**; then press **<ENTER>**. Use the down arrow to select **ENABLE**; then press **<ENTER>**.

This is a global setting that affects all of the PVCs in the IQ 310 DLCI table (under **NETWORK PVC OPTIONS**). If this option is disabled, the unit will not enter DBU based on inactive DLCI regardless of how the **DBU ON INACTIVE** parameter is set for each DLCI in the network PVC options. A PVC is advertised as Inactive by the frame switch in the CO when there is a problem at the remote end of the frame circuit. With this option enabled, the IQ 310 will attempt to establish a dial backup call with the remote unit when its corresponding DLCI is advertised as Inactive.

Once these parameters have been configured properly, the **DBU CRITERIA** screen should look exactly like Figure 38.

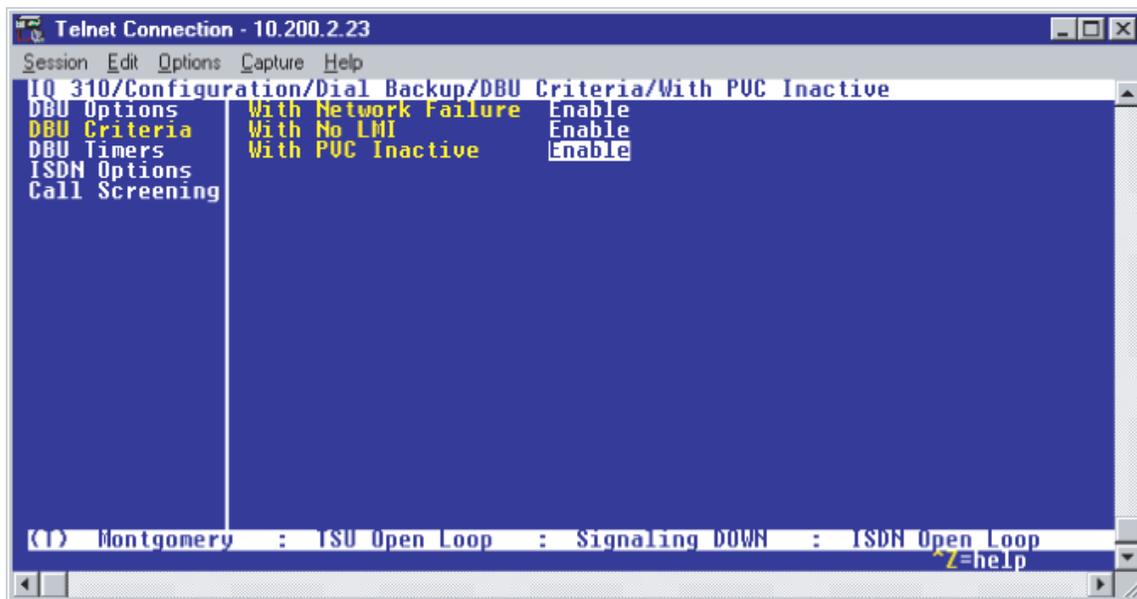


Figure 38. DBU Criteria Menu with Options Enabled

### DBU Timers

1. Press the left arrow key once and the down arrow key once to select **DBU TIMERS**. The menu screen shown in Figure 39 is displayed. The default values for the parameters on this screen are shown.

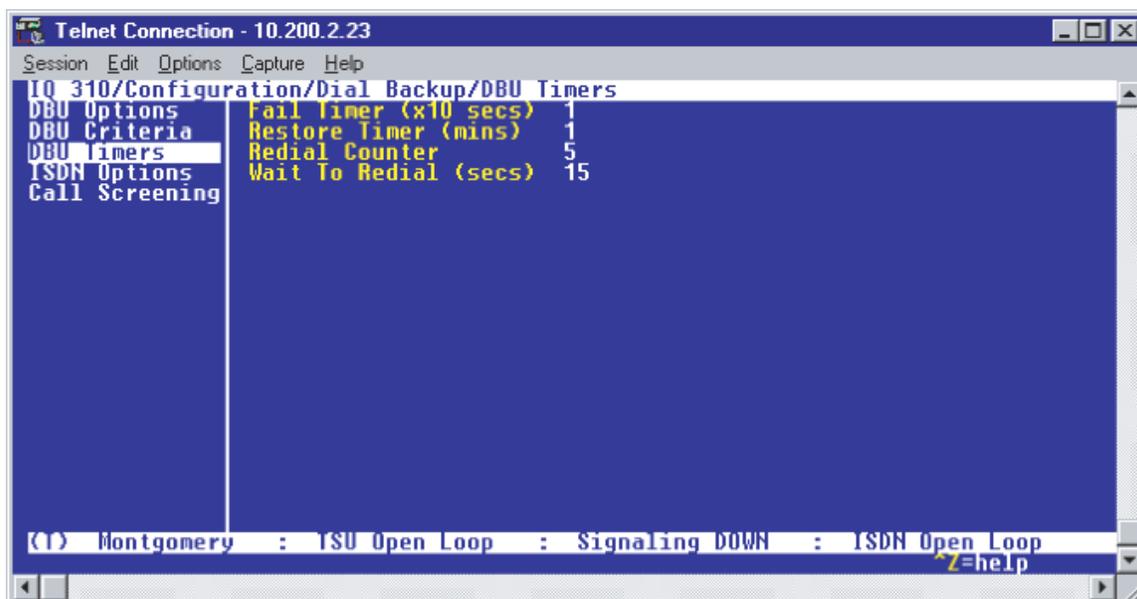


Figure 39. DBU Timers Menu

For basic dial backup operation, these parameters do not need to be altered from their default values. The **FAIL TIMER** programs the amount of time the IQ 310 will wait once any of the DBU criteria have been met before entering dial backup. Once the Frame Relay link has been reestablished on the network line, the **RESTORE TIMER** sets the amount of time the IQ 310 will wait before disconnecting the dial backup call. The **REDIAL COUNTER** programs the number of redial attempts performed if dial backup is not established on the first call. **WAIT TO REDIAL** defines the amount of time between redial attempts.

### ISDN Options

1. Use the down arrow to select **ISDN OPTIONS**; press **<ENTER>**. The menu screen shown in Figure 40 is displayed. The default values for the parameters on this screen are shown.

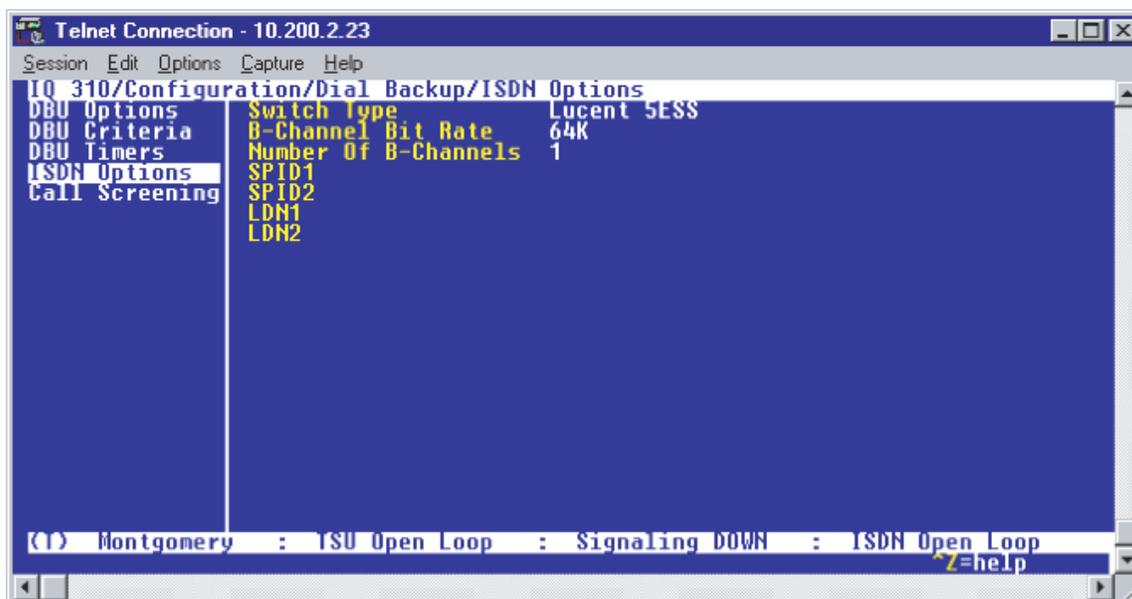


Figure 40. ISDN Options Menu

2. Use the right arrow to select **SWITCH TYPE**; then press **<ENTER>**. A list of available switch types is displayed. *The switch type selected here must match the TELCO CO switch providing the ISDN service.* Use the arrow keys to select **LUCENT 5ESS**, **DMS 100**, **NATIONAL**, or **NEC**; press **<ENTER>**. For the example network in Figure 1, we will assume the switch type for all units is **NATIONAL**, so use the arrow keys to select **NATIONAL**; press **<ENTER>**.
3. Press the down arrow to select **B-CHANNEL BIT RATE**; then press **<ENTER>**. Use the arrow keys to select **56kbps** or **64kbps**; then press **<ENTER>**. Generally leave this value to its default of **64kbps** unless your ISDN service only provides 56kbps.
4. Down arrow to select **NUMBER OF B-CHANNELS**; press **<ENTER>**. Enter 1 for single channel service or 2 for dual channel service and press **<ENTER>**. When connecting to a host unit with a PRI module, the **NUMBER OF B-CHANNELS** should always be 1. Select 1 and press **<ENTER>**.
5. Down arrow to select **SPID1** for the first B-Channel. Enter the SPID assigned by the Telephone Company for the first B-channel and press **<ENTER>**. For the example network in Figure 1, the proper SPID is 25655520000101.

6. If the **NUMBER OF B-CHANNELS** is set to 1, leave **SPID2** blank.
7. Down arrow to select **LDN1**; press **<ENTER>**. Insert the Local Directory Number provided by the Telephone Company for the first B-Channel and press **<ENTER>**. For the example network shown in Figure 1, the proper LDN is 5552001.
8. If the **NUMBER OF B-CHANNELS** is set to 1, leave **LDN2** blank.
9. A sample screen shot of the ISDN Options screen for the Montgomery IQ 310 is shown in Figure 41.

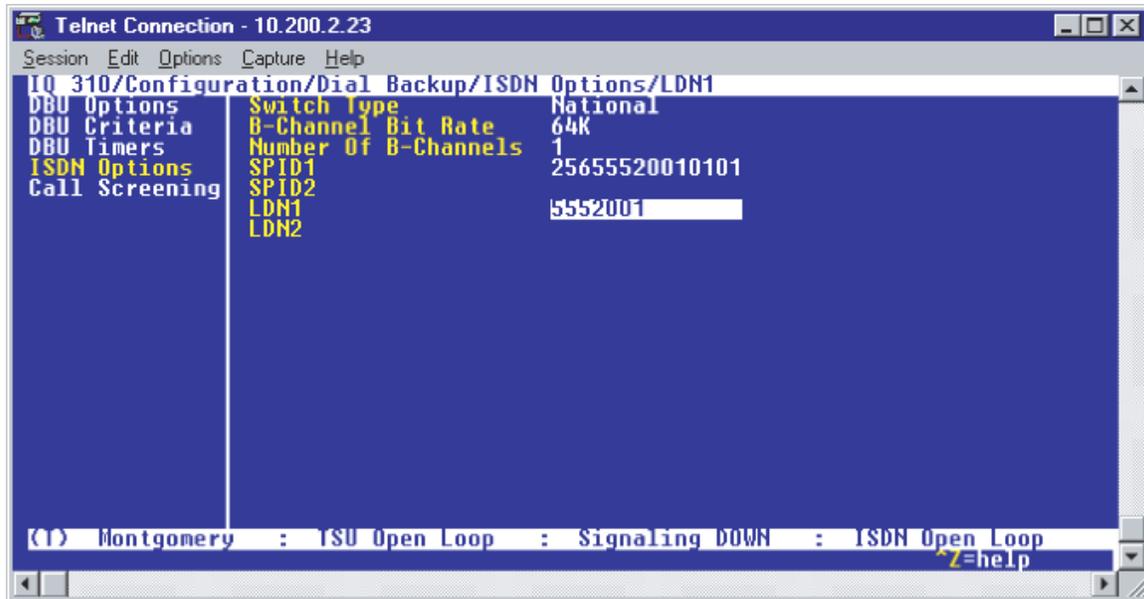


Figure 41. ISDN Options Screen for Montgomery IQ 310

## Call Screening

1. Use the arrow keys to select **CALL SCREENING**; press **<ENTER>**. The menu screen shown in Figure 42 is displayed. The default values for the parameters on this screen are shown.

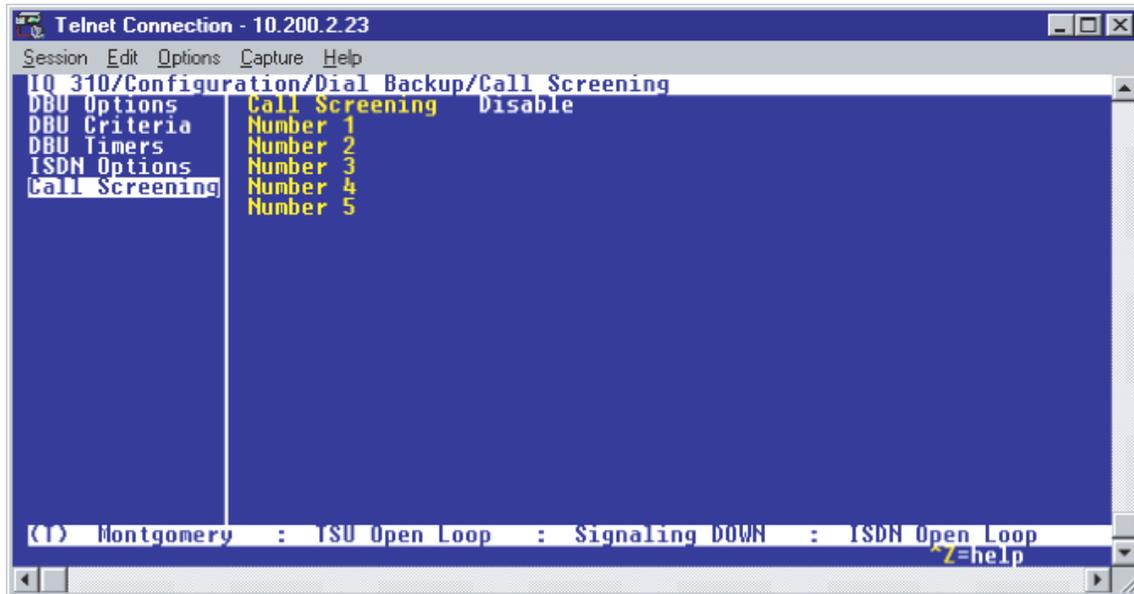


Figure 42. Call Screening Menu

It is not necessary to adjust these parameters from their default values for basic Frame Relay dial backup. With **CALL SCREENING** enabled, the IQ unit will only accept incoming calls from calling parties matching one of the phone numbers configured for Number 1 through Number 5.

## Configuring PVC Options for Remote Site 2 IQ 310 (Montgomery)

1. Press the left arrow key until the menu shown in Figure 43 appears.

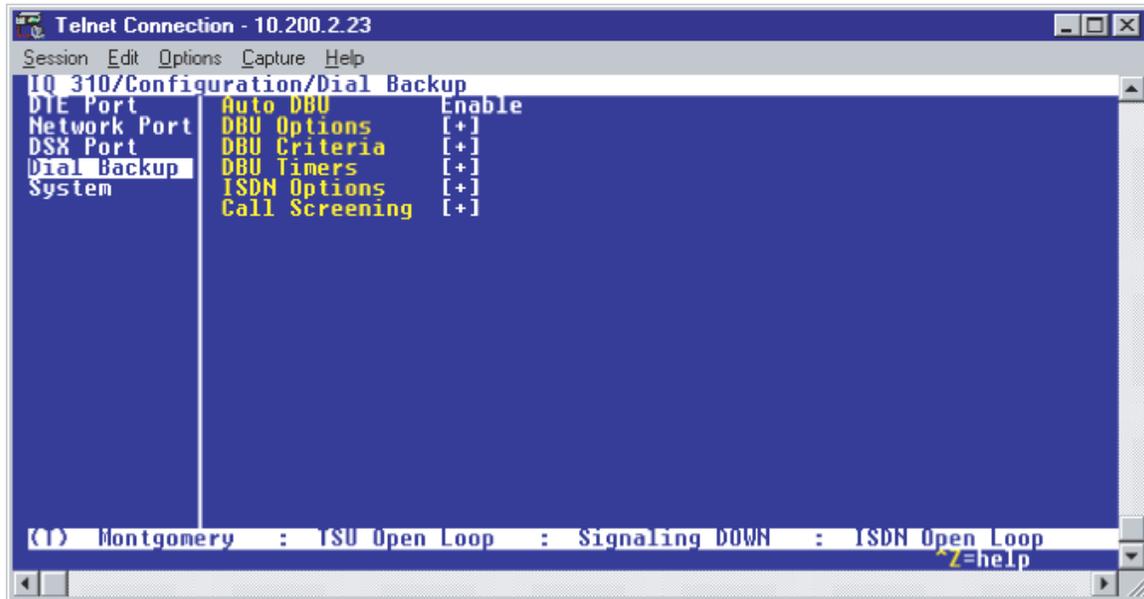


Figure 43. Configure Dial Backup Menu

2. Use the up arrow key to select **NETWORK PORT**; press **<ENTER>**. The screen shown in Figure 44 appears.

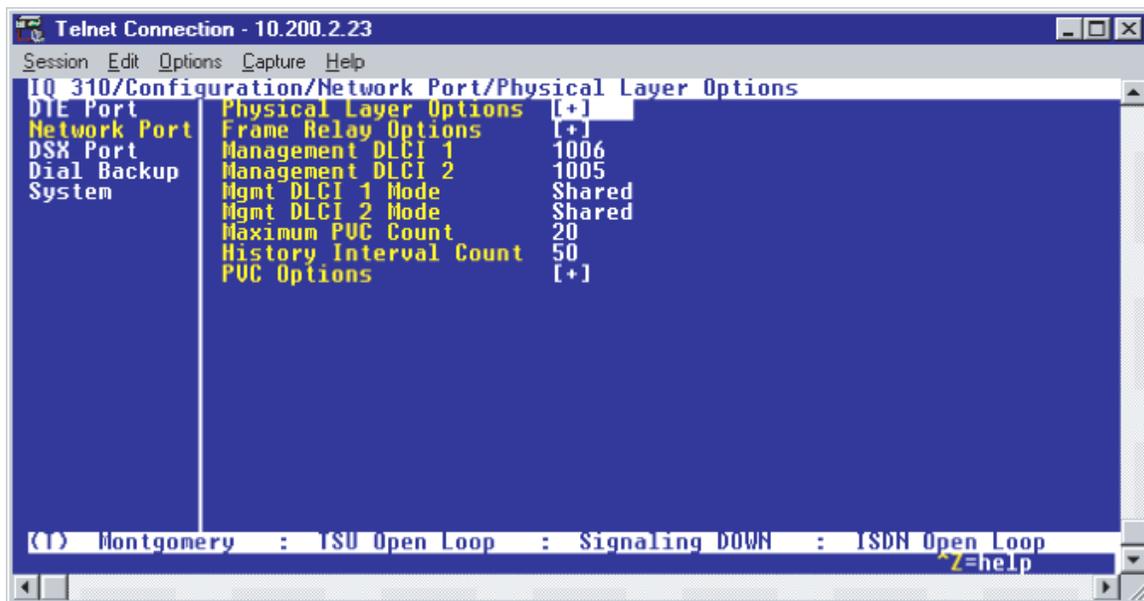


Figure 44. Configure Network Port Menu

- Down arrow until **PVC OPTIONS** is selected. Press <ENTER> and the screen shown in Figure 45 is shown.

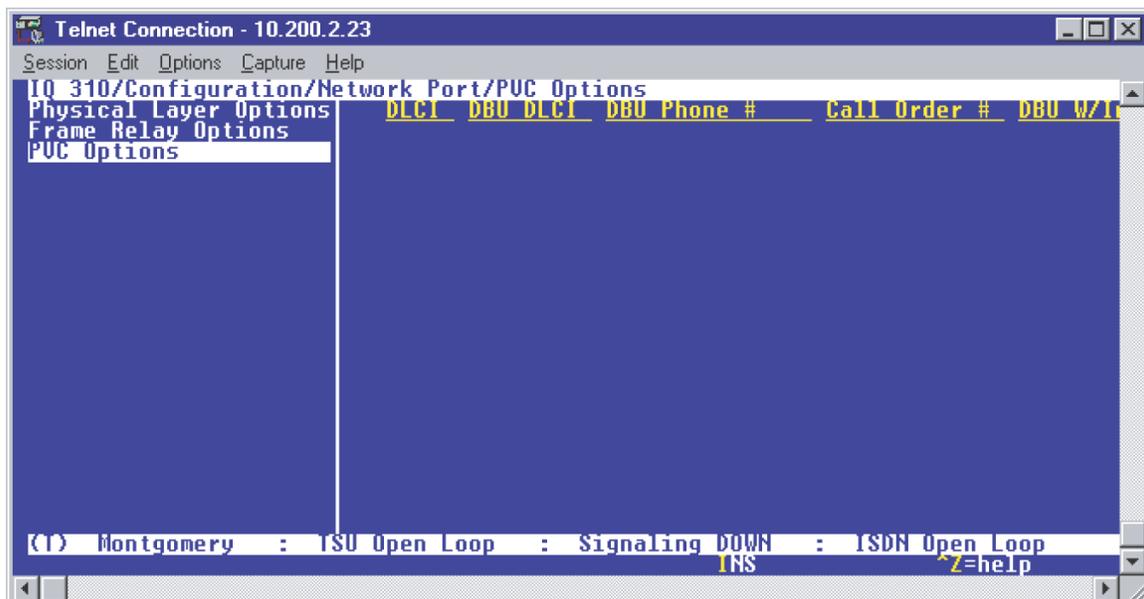


Figure 45. PVC Options Menu

- Use the right arrow key to select **DLCI**. Press <ENTER>. Type in 20 and press <ENTER>. This is the DLCI that Montgomery uses for communication with Huntsville.

5. Select **DBU DLCI**. Press **<ENTER>**. Type in 17 and press **<ENTER>**. This is the DLCI that the Huntsville IQ 310 uses to communicate with Montgomery.
6. Select **DBU PHONE NUMBER**. Press **<ENTER>**. Type in 12565551000 and press **<ENTER>**.
7. Select **DBU ON INACTIVE**. Press **<ENTER>**. Select **ENABLED**. Press **<ENTER>**.

Since there is only one PVC for Montgomery, there is no need to enter another entry into the PVC table. At this point the Montgomery IQ 310 is configured for basic dial backup to Huntsville. The **CONFIGURE PVC OPTIONS** screen is shown in Figure 46. The remaining options may be left at their default values. These features are not related to dial backup. For an explanation of these features, please refer to the User Interface Guide of this manual.

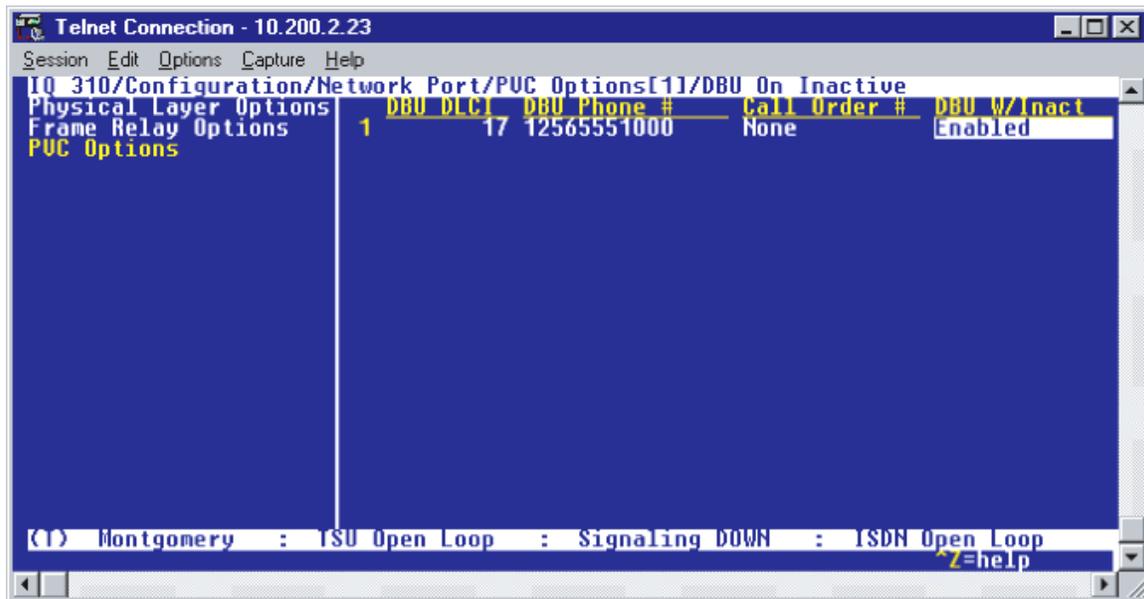


Figure 46. Configure PVC Options Screen

## Configuring the Dial Backup Parameters for Remote Site 3 DSU IQ (Birmingham)

1. From the Main menu terminal screen (Figure 47) of the DSU IQ, select option 1 for **CONFIGURATION** and press **<ENTER>**. Next, select option 3 for **DIAL BACKUP** from the **CONFIGURATION** menu shown in Figure 48, and press **<ENTER>**. The resulting screen is displayed in Figure 49.

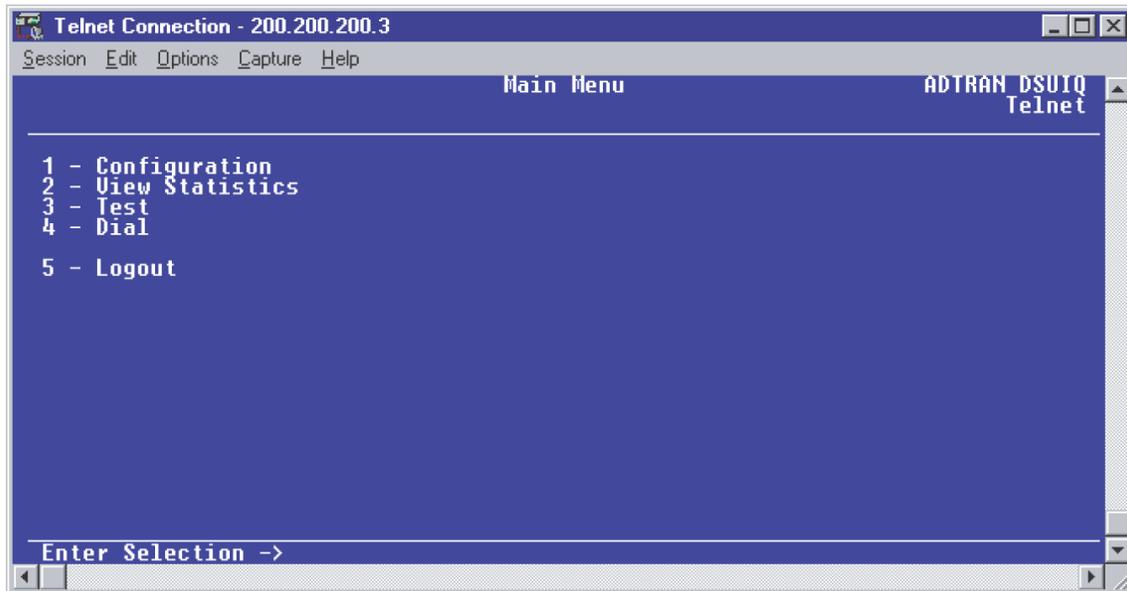
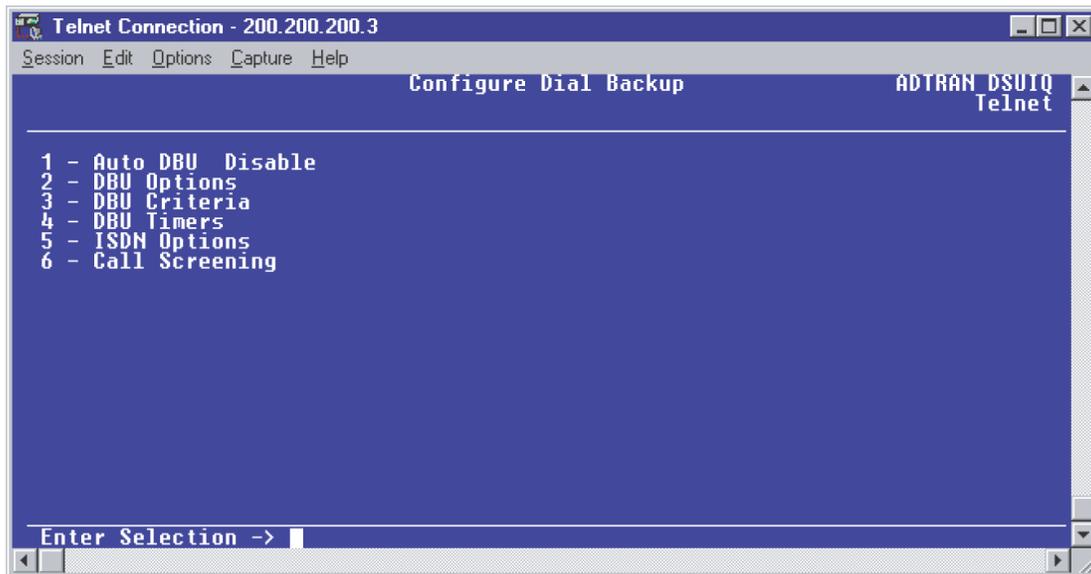


Figure 47. Main Menu



Figure 48. Configuration Menu



**Figure 49. Dial Backup Menu**

By default, **AUTO DBU** is disabled. This parameter must be changed to **ENABLE** for the DSU IQ to automatically dial the remote end once any of the DBU criteria are met. This setting must also be enabled in order for the IQ unit to automatically answer inbound calls from other units.

2. Press 1 and <ENTER> to select **AUTO DBU**; select 2 for **ENABLE** and press <ENTER>.

## DBU Options

1. From the **CONFIGURE DIAL BACKUP** screen, select option 2, **DBU OPTIONS**; then press **<ENTER>**. The screen similar to Figure 50 will appear. The default parameter values for this screen are shown.

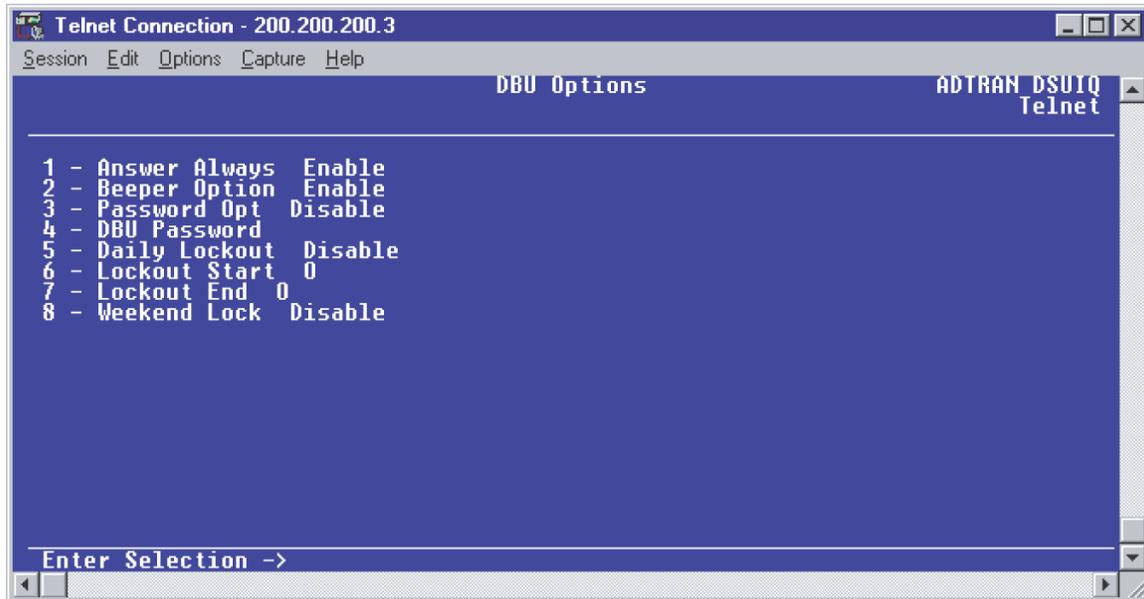


Figure 50. DBU Options Menu

For basic dial backup operation, these parameters do not need to be altered from their default values.

The **ANSWER ALWAYS** option must work in conjunction with the **AUTO DBU** option. The **AUTO DBU** option is still the controlling option. If **AUTO DBU** is disabled, the unit will not answer the call regardless of how **ANSWER ALWAYS** is set. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Answer Always	Result
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Enabled	Unit will answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Disabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Enabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Disabled	Unit will not answer an incoming call.

In addition, the **ANSWER ALWAYS** feature must work in conjunction with the **ORIGINATE/ANSWER** feature. The **ORIGINATE/ANSWER** feature only appears when the unit is programmed for a non frame-relay circuit (signaling none). If **ANSWER ALWAYS** is enabled (and **AUTO DBU** enabled), the unit will answer the call even if it is set to **ORIGINATE**. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Originate/Answer	Answer Always	Result
None	Enabled	Originate	Enabled	Unit will answer an incoming call.
None	Enabled	Originate	Disabled	Unit will not answer an incoming call.
None	Enabled	Answer	Enabled	Unit will answer an incoming call.
None	Enabled	Answer	Disabled	Unit will not answer an incoming call.
None	Disabled	Originate	Enabled	Unit will not answer an incoming call.
None	Disabled	Originate	Disabled	Unit will not answer an incoming call.
None	Disabled	Answer	Enabled	Unit will not answer an incoming call.
None	Disabled	Answer	Disabled	Unit will not answer an incoming call.

The **BEEPER OPTION** allows the user to control the intermittent beep issued during dial backup. **PASSWORD OPTION** and **DBU OPTION** are security features that can be used to prevent the IQ from establishing dial backup with unknown units. **DAILY LOCKOUT** enabled prevents the IQ 310 from going into dial backup between the timeframes specified by **LOCKOUT START** and **LOCKOUT END**. With **WEEKEND LOCK** enabled, no dial backup will occur from midnight Friday to midnight Sunday.

### DBU Criteria

1. Press **<ESCAPE>** once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 49. Select option 3, **DBU CRITERIA** and press **<ENTER>**. The menu screen shown in Figure 51 is displayed. The default values for the parameters on this screen are shown.



Figure 51. DBU Criteria Menu

**WITH OOS** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when it receives and out of service alarm from the network.

**WITH NO RX** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when it detects no receive signal from the network.

**WITH NO SC** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when it detects no sealing current on the network.

**WITH NO LMI** is enabled by default. With this option enabled, the IQ 310 unit will go into dial backup when the **FRAME RELAY SIGNALING STATE** is down.

2. Press 5 to select **WITH PVC INACTIVE**; then press **<ENTER>**. Press 2 and press **<ENTER>** to select **ENABLE**.

This is a global setting that affects all of the PVCs in the IQ's DLCI table. A PVC is advertised as Inactive by the frame switch in the CO when there is a problem at the remote end of the frame circuit. With this option enabled, the IQ will attempt to establish a dial backup call with the remote unit when its corresponding DLCI is advertised as Inactive.

Once these parameters have been configured properly, the **DBU CRITERIA** screen should look exactly like Figure 52.



Figure 52. DBU Criteria Menu with Options Enabled

## DBU Timers

1. Press **<ESCAPE>** once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 49. Select option 4, **DBU TIMERS** and press **<ENTER>**. The menu screen shown in Figure 53 is displayed. The default values for the parameters on this screen are shown.

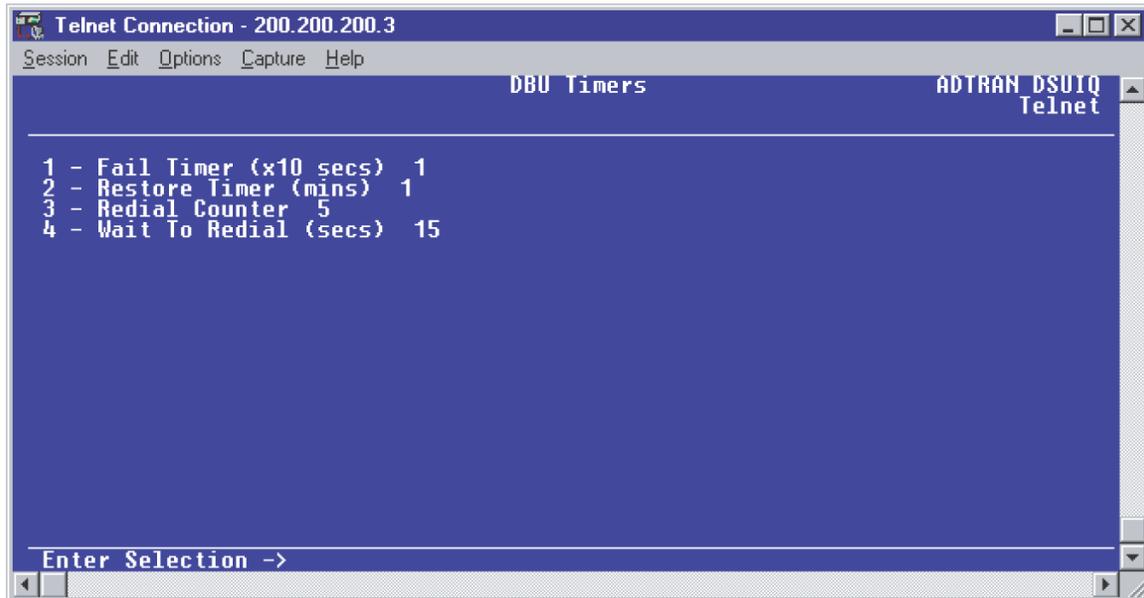


Figure 53. DBU Timers Menu

For basic dial backup operation, these parameters do not need to be altered from their default values. The **FAIL TIMER** programs the amount of time the IQ 310 will wait once any of the DBU criteria have been met before entering dial backup. Once the Frame Relay link has been reestablished on the network line, the **RESTORE TIMER** sets the amount of time the IQ 310 will wait before disconnecting the dial backup call. The **REDIAL COUNTER** programs the number of redial attempts performed if dial backup is not established on the first call. **WAIT TO REDIAL** defines the amount of time between redial attempts.

## ISDN Options

1. Press **<ESCAPE>** once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 49. Select option 5, **ISDN OPTIONS** and press **<ENTER>**. The menu screen shown in Figure 54 is displayed. The default values for the parameters on this screen are shown.

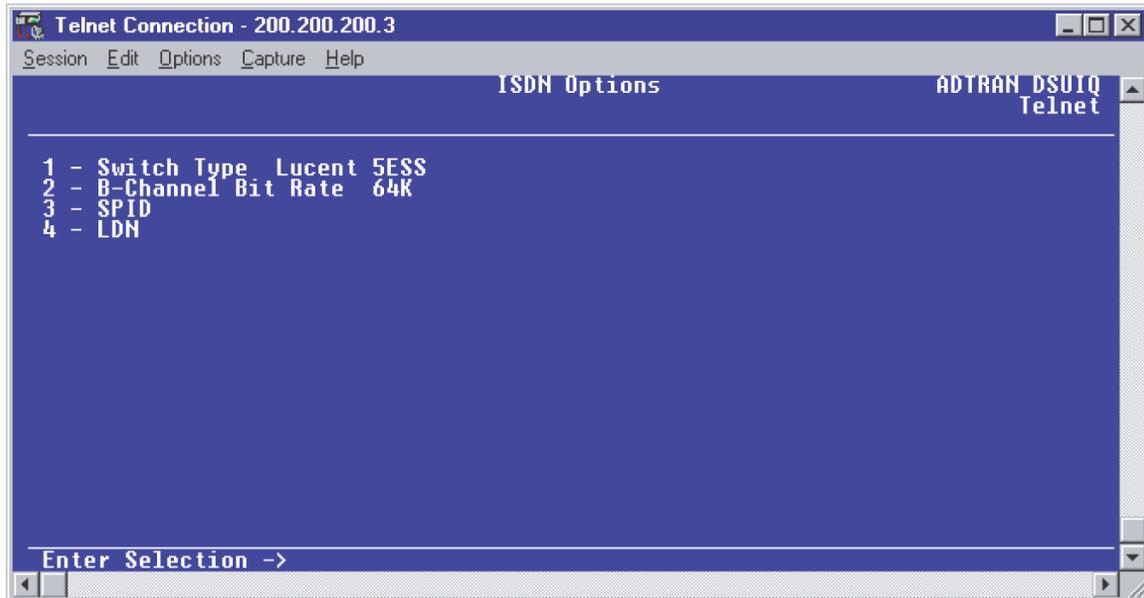


Figure 54. ISDN Options Menu

2. Press 1 to select **SWITCH TYPE**; then press **<ENTER>**. A list of available switch types is displayed. *The switch type selected here must match the TELCO CO switch providing the ISDN service.* Select option 1 for **LUCENT 5ESS**, 2 for **DMS 100**, 3 for **NATIONAL**, or 4 for **NEC**; press **<ENTER>**. For the example network in Figure 1, we will assume the switch type for all units is **NATIONAL**, so press 3 and press **<ENTER>**.
3. Press 2 to select **B-CHANNEL BIT RATE**; then press **<ENTER>**. Select option 1 for **56kbps** or option 2 for **64kbps**; then press **<ENTER>**. Generally leave this value to its default of **64kbps** unless your ISDN service only provides 56kbps.
4. Select option 3 and press **<ENTER>** to program the SPID. Enter the SPID assigned by the Telephone Company and press **<ENTER>**. For the example network in Figure 1, the proper SPID is 25655520220101.
5. Select option 4, **LDN**, and press **<ENTER>**. Insert the Local Directory Number provided by the Telephone Company and press **<ENTER>**. For the example network shown in Figure 1, the proper LDN is 5552022.

A sample screen shot of the ISDN Options screen for the Birmingham DSU IQ is shown in Figure 55.



Figure 55. ISDN Options Screen for Birmingham DSU IQ

### Call Screening

1. Press <ESCAPE> once to get back to the **CONFIGURE DIAL BACKUP** screen shown in Figure 49. Select option 6, **CALL SCREENING** and press <ENTER>. The menu screen shown in Figure 56 is displayed. The default values for the parameters on this screen are shown.



Figure 56. Call Screening Menu

It is not necessary to adjust these parameters from their default values for basic Frame Relay dial backup. With **CALL SCREENING** enabled, the IQ unit will only accept incoming calls from calling parties matching one of the phone numbers configured for Number 1 through Number 5.

### Configuring PVC Options for Remote Site 3 DSU IQ (Birmingham)

1. From the Main menu terminal screen (Figure 47) of the DSU IQ, select option 1 for **CONFIGURATION** and press **<ENTER>**. From the **CONFIGURATION** menu (Figure 48), select option 2 for **NETWORK PORT** and press **<ENTER>**. The **CONFIGURE NETWORK PORT MENU** is displayed.
2. From this menu, select 9, **PVC OPTIONS** is selected. Press **<ENTER>** and the screen shown in Figure 57 is shown.

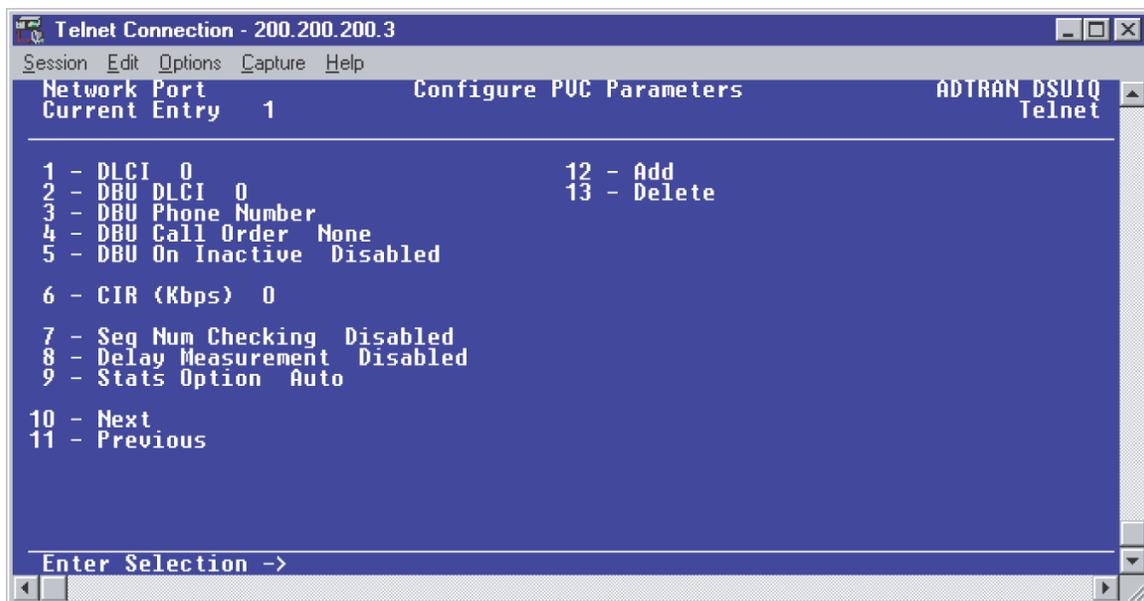


Figure 57. Configure PVC Parameters Menu

3. Press 1 for **DLCI**. Press **<ENTER>**. Type in 20 and press **<ENTER>**. This is the DLCI that Birmingham uses for communication with Huntsville.
4. Press 2 for **DBU DLCI**. Press **<ENTER>**. Type in 38 and press **<ENTER>**. This is the DLCI that the Huntsville IQ 310 uses to communicate with Birmingham.
5. Press 3 for **DBU PHONE NUMBER**. Press **<ENTER>**. Type in 12565551000 and press **<ENTER>**.
6. Press 5 for **DBU ON INACTIVE**. Press **<ENTER>**. Press 2 for **ENABLED**. Press **<ENTER>**. The **GROUP** parameter will be discussed in a later example.

Since there is only one PVC for Birmingham, there is no need to enter another entry into the PVC table. At this point the Birmingham DSU IQ is configured for basic dial backup to Huntsville. The **CONFIGURE PVC PARAMETERS** screen is shown in Figure 58. The remaining options are fine left at their default values. These features are not related to dial backup. For an explanation of these features, please refer to the User Interface Guide section of this manual.

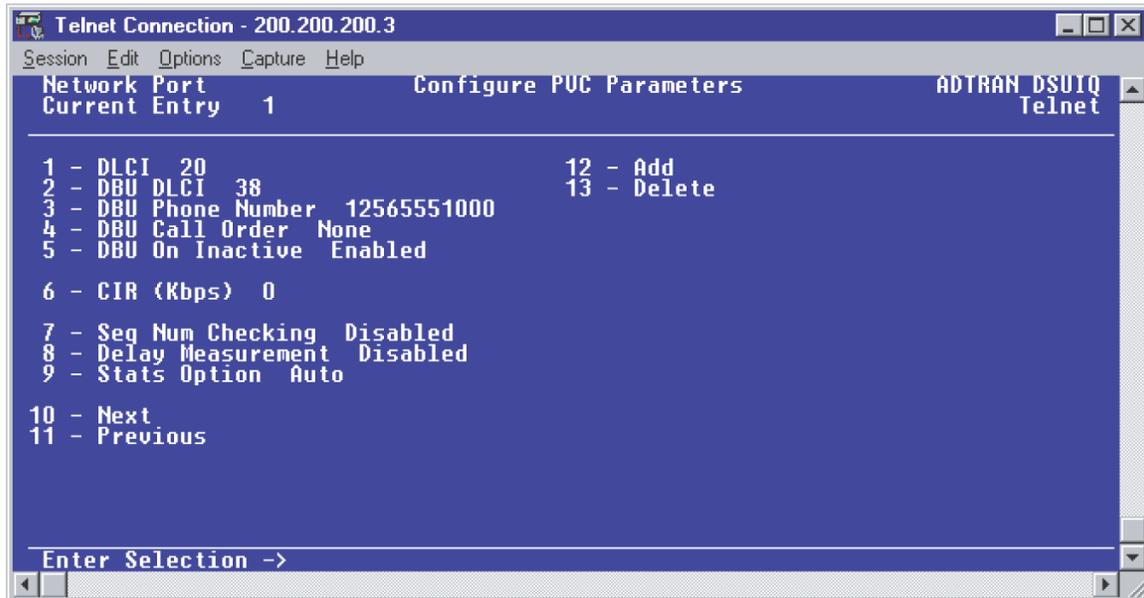


Figure 58. Configure PVC Parameters Screen for Birmingham DSU IQ

## CFG-4 Example of the IQ 310 Call Order Parameter

### ***Introduction***

The ADTRAN IQ 310 provides disaster recovery protection for Frame Relay circuits. This configuration guide will describe how the **CALL ORDER** parameter works. The units used in this example are IQ 310s with ISDN BRI DBU and T1/DSX modules.

### ***Before You Begin***

For this example, each IQ 310 unit will require an ISDN BRI DBU module (P/N 1204004L2) and a T1/DSX module (P/N 1202803L1).

### ***Network Description***

Figure 1 on page 228 is a diagram of the Frame Relay example network used in this configuration guide. In this example, the host site is Huntsville. Four Permanent Virtual Circuits (PVCs) originate from Huntsville. They are connected to remote sites at Atlanta, Birmingham, Montgomery, and Mobile via DLCIs 200, 400, 600, and 800, respectively. The local DLCIs for the remote sites are 100 for Atlanta, 300 for Birmingham, 500 for Montgomery, and 700 for Mobile. Please remember that DLCIs have local significance and are assigned by the Telephone Company (TELCO) when the Frame Relay network is built; therefore the DLCIs for your Frame Relay network will most likely be different from the ones used in this example.

The remaining parameters described in Figure 1 provide a description of the BRI lines that terminate into the IQ 310s. The Telephone Company will provide you with the Local Directory Numbers (LDNs) and Service Profile Identifiers (SPIDs) for each of your BRI lines. In addition, you must know which type of Central Office (CO) switch is providing the ISDN service.

The **CALL ORDER** parameter determines the order in which a list of backup locations will be dialed. If all the IQ 310 call order entries are set to none, the IQ 310 will use the first entry with a DBU phone number.

To configure the sample network, perform the steps given in the following pages.

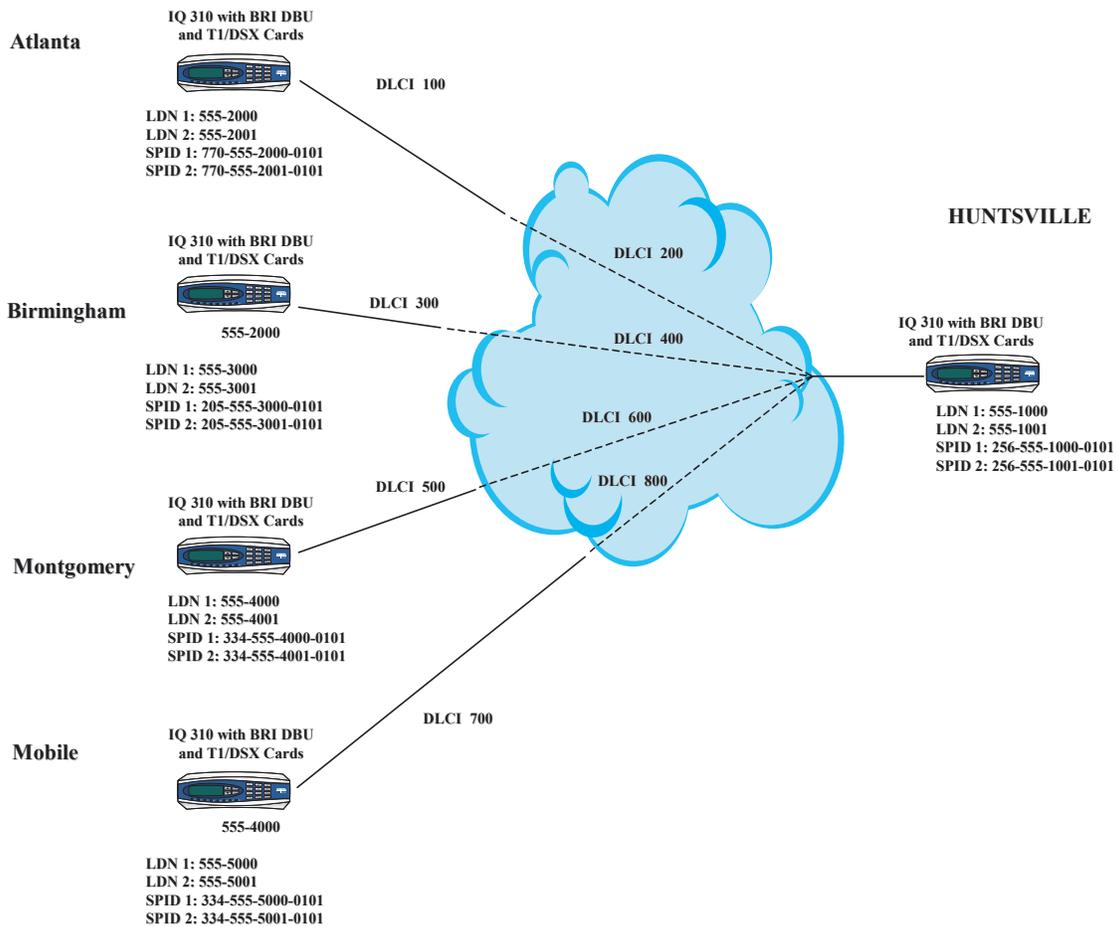


Figure 1. IQ 310 Frame Relay Dial Backup Call Order Example

## Configuring the Dial Backup Parameters

1. From the **CONFIGURATION** menu terminal screen (Figure 2) of the IQ 310, select **CONFIGURATION** and press **<ENTER>**.

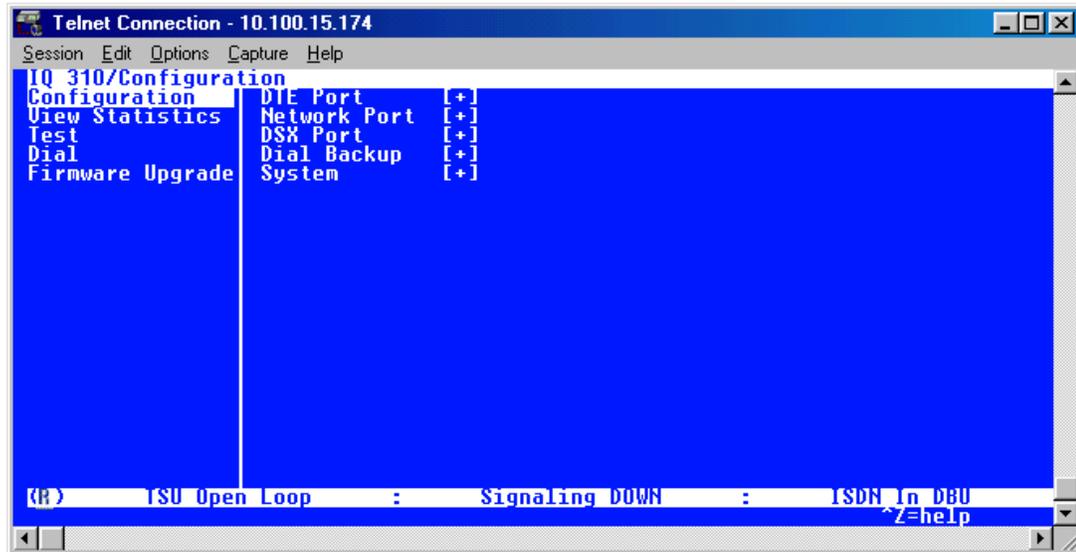


Figure 2. Main Menu

2. Using the arrow keys, select **DIAL BACKUP** from the **CONFIGURATION** menu shown in Figure 2; then press **<ENTER>**. The resulting screen is displayed in Figure 3.

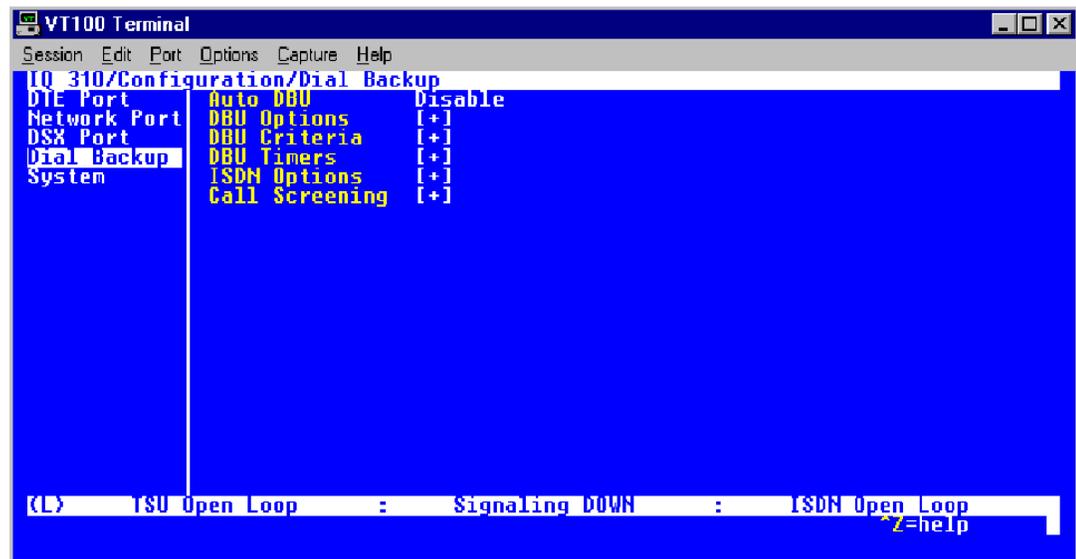


Figure 3. Dial Backup Menu

By default, **AUTO DBU** is disabled. This parameter must be changed to **ENABLE** for the IQ 310 unit to automatically dial the remote end once any of the DBU criteria are met. This setting must also be enabled in order for the IQ unit to automatically answer inbound calls from other units.

3. Use the right arrow key to select **AUTO DBU**; press **<ENTER>**. The screen shown in Figure 4 will appear.

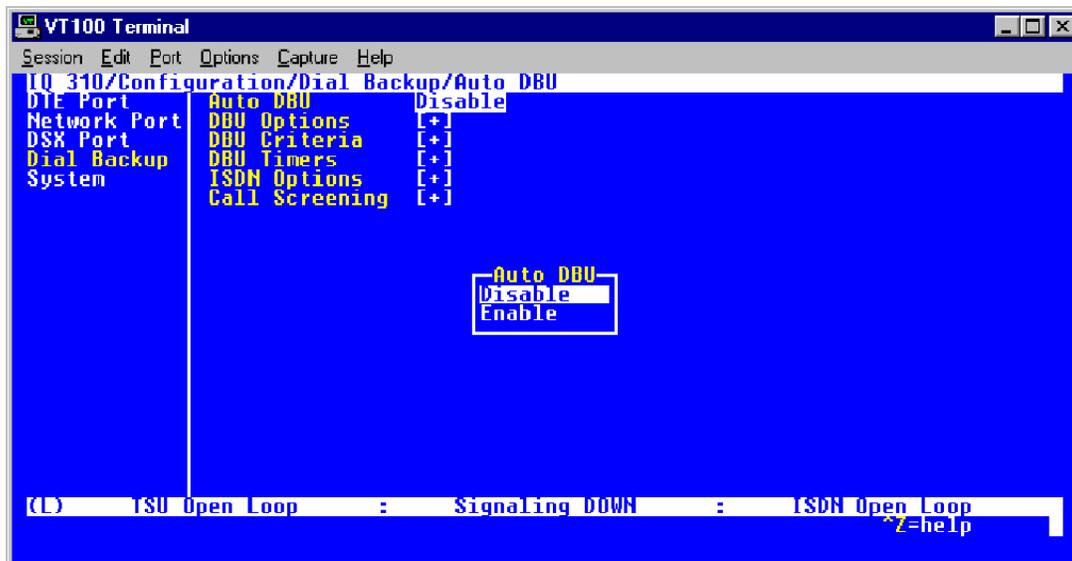


Figure 4. Auto DBU Selections

4. Use the down arrow to select **ENABLE**; then press **<ENTER>**. At this point, the **AUTO DBU** parameter will change to **ENABLE** and the screen shown in Figure 5 will appear.

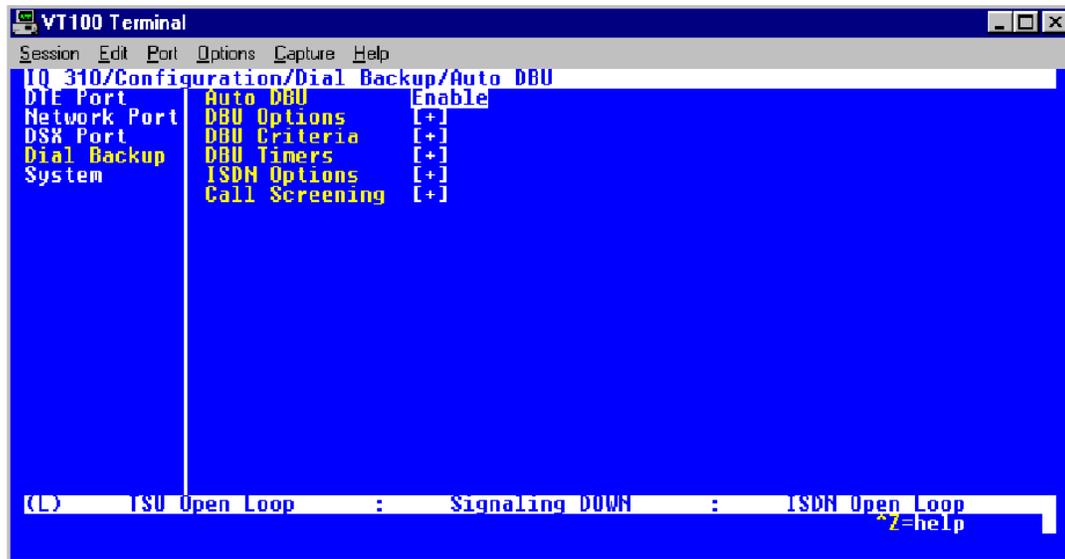


Figure 5. Auto DBU Enabled

### DBU Options

1. Press the down arrow to select **DBU OPTIONS**; then press **<ENTER>**. The screen shown in Figure 6 will appear. The default parameter values for this screen are shown.

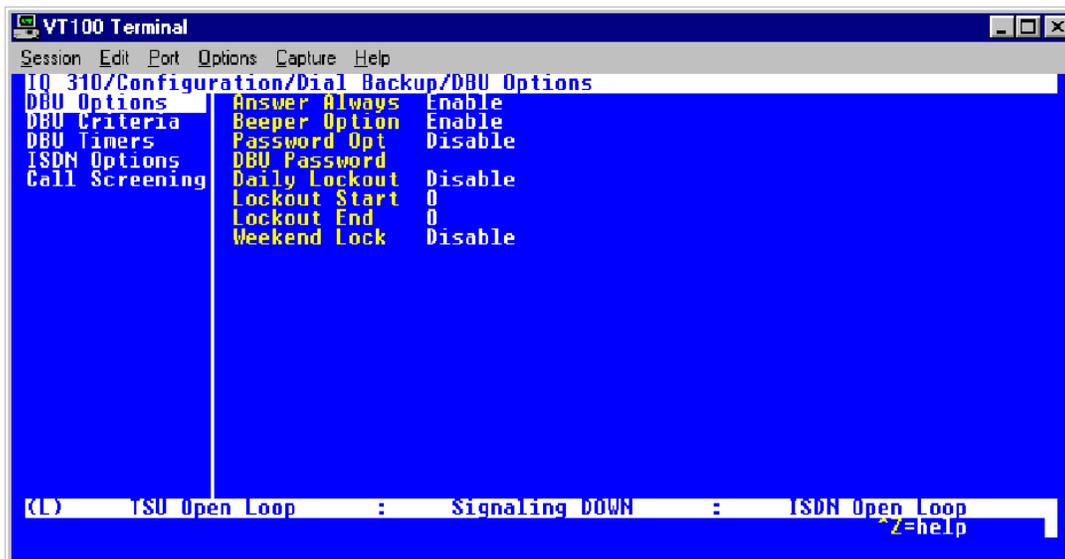


Figure 6. DBU Options Menu

For basic dial backup operation, these parameters do not need to be altered from their default values.

The **ANSWER ALWAYS** option must work in conjunction with the **AUTO DBU** option. The **AUTO DBU** option is still the controlling option. If **AUTO DBU** is disabled, the unit will not answer the call regardless of how **ANSWER ALWAYS** is set. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Answer Always	Result
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Enabled	Unit will answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Enabled	Disabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Enabled	Unit will not answer an incoming call.
ANSI T1.617-D/LMI/ITU-T Q.933-A	Disabled	Disabled	Unit will not answer an incoming call.

In addition, the **ANSWER ALWAYS** feature must work in conjunction with the **ORIGINATE/ANSWER** feature. The **ORIGINATE/ANSWER** feature only appears when the unit is programmed for a non frame-relay circuit (signaling none). If **ANSWER ALWAYS** is enabled (and **AUTO DBU** enabled), the unit will answer the call even if it is set to **ORIGINATE**. Examples of the various combinations and expected results are shown below.

Signaling Type	Auto DBU	Originate/Answer	Answer Always	Result
None	Enabled	Originate	Enabled	Unit will answer an incoming call.
None	Enabled	Originate	Disabled	Unit will not answer an incoming call.
None	Enabled	Answer	Enabled	Unit will answer an incoming call.
None	Enabled	Answer	Disabled	Unit will not answer an incoming call.
None	Disabled	Originate	Enabled	Unit will not answer an incoming call.
None	Disabled	Originate	Disabled	Unit will not answer an incoming call.
None	Disabled	Answer	Enabled	Unit will not answer an incoming call.
None	Disabled	Answer	Disabled	Unit will not answer an incoming call.

The **BEEPER OPTION** allows the user to control the intermittent beep issued during dial backup. **PASSWORD OPTION** and **DBU PASSWORD** are security features that can be used to prevent the IQ 310 unit from establishing dial backup with unknown units. **DAILY LOCKOUT** enabled prevents the IQ 310 unit from going into dial backup between the timeframes specified by **LOCKOUT START** and **LOCKOUT END**. With **WEEKEND LOCK** enabled, no dial backup will occur from midnight Friday to midnight Sunday.

## DBU Criteria

1. From the screen shown in Figure 6, press the down arrow to select **DBU CRITERIA**. The menu screen shown in Figure 7 is displayed. The default values for the parameters on this screen are shown.

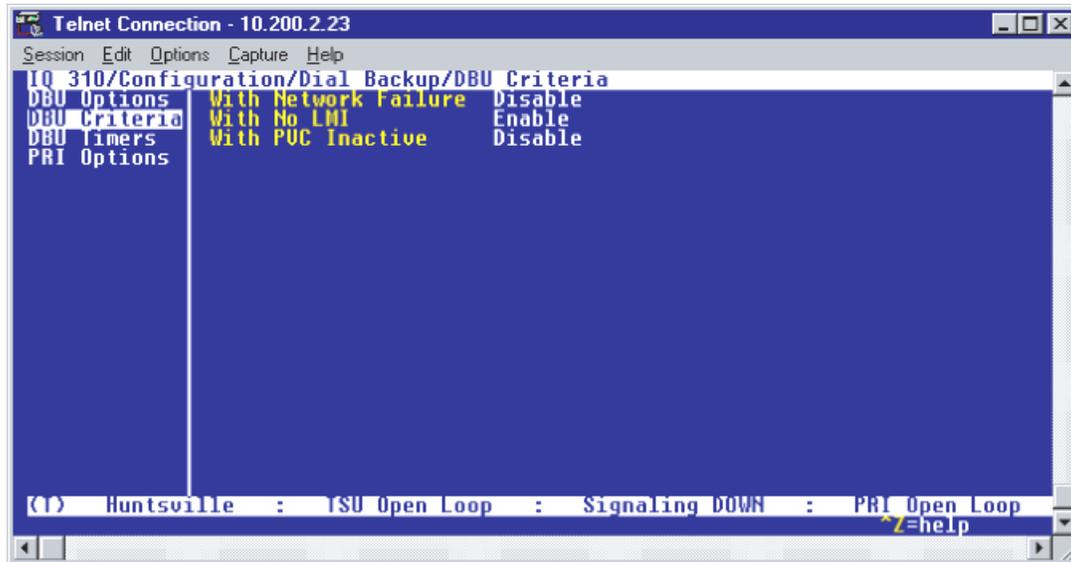


Figure 7. DBU Criteria Menu

### Huntsville IQ 310

**WITH NETWORK FAILURE** is disabled by default.

1. Use the arrow keys to select the **WITH NETWORK FAILURE**; then press **<ENTER>**.
2. Use the down arrow to select **ENABLE**; then press **<ENTER>**.
3. The **WITH NO LMI** parameter is enabled by default. Leave this option enabled.
4. Press the down arrow to select **WITH PVC INACTIVE**; then press **<ENTER>**.
5. Use the down arrow to select **ENABLE**; then press **<ENTER>**.

This is a global setting that affects all of the PVCs in the IQ 310 DLCI table (under **NETWORK PVC OPTIONS**). A PVC is advertised as Inactive by the frame switch in the CO when there is a problem at the remote end of the frame circuit. With this option enabled, the IQ 310 unit will attempt to establish a dial backup call with the remote unit when its corresponding DLCI is advertised as Inactive.

### Atlanta IQ 310, Birmingham IQ 310, Montgomery IQ 310, and Mobile IQ 310

All **DBU CRITERIA** should be disabled on all these units. Again, this is only to clarify this example of how the **CALL ORDER** parameter works. This ensures that only the host unit (Huntsville IQ 310) will initiate dial backup. Under normal circuit conditions, these parameters would be enabled.

Once these **DBU CRITERIA** parameters have been configured properly, the Huntsville, Atlanta, Birmingham, Montgomery, and Mobile DBU criteria screens should look like Figures 8-12, respectively.

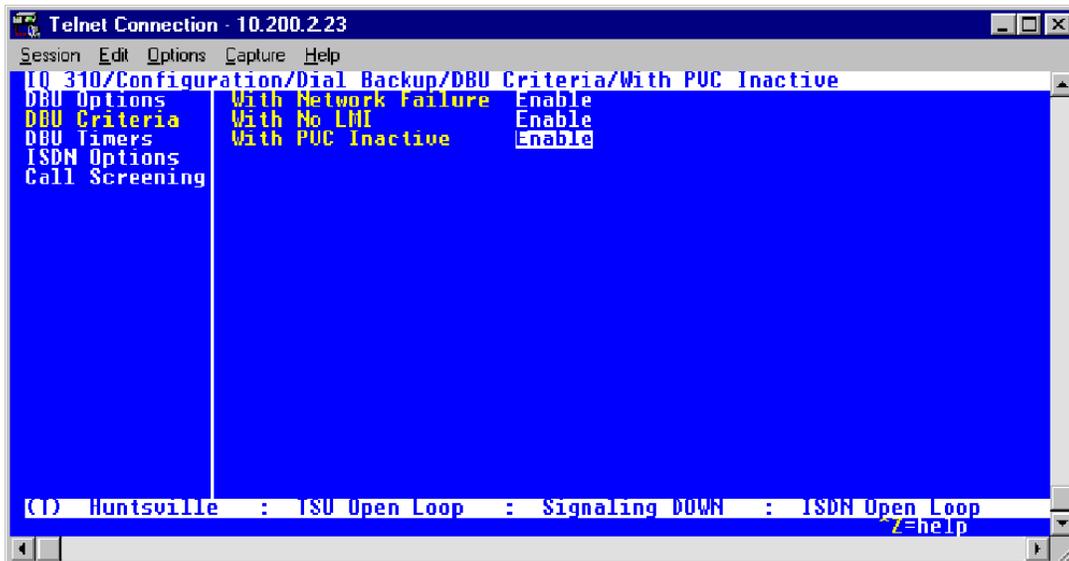


Figure 8. Huntsville DBU Criteria Menu

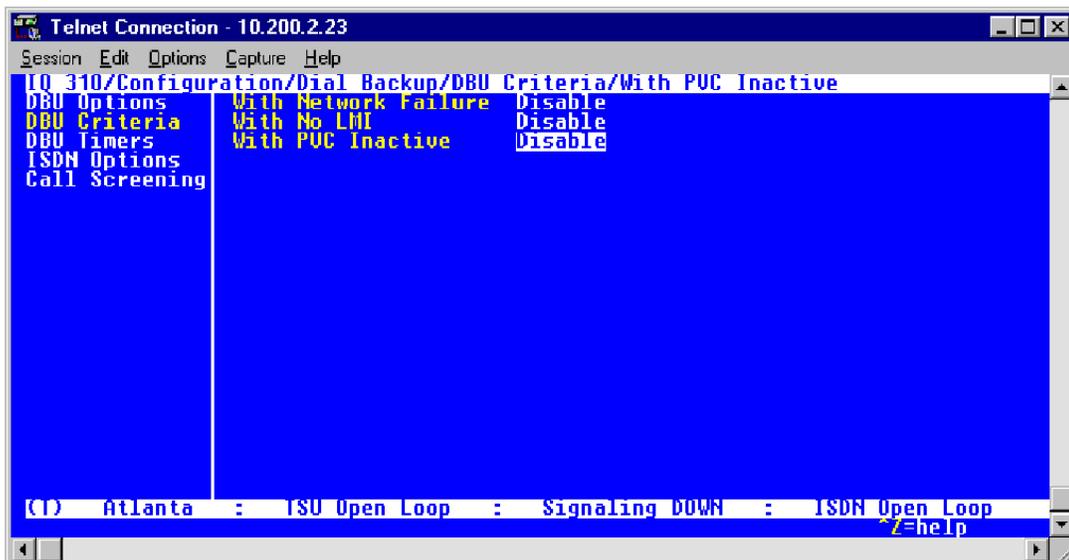


Figure 9. Atlanta DBU Criteria Menu

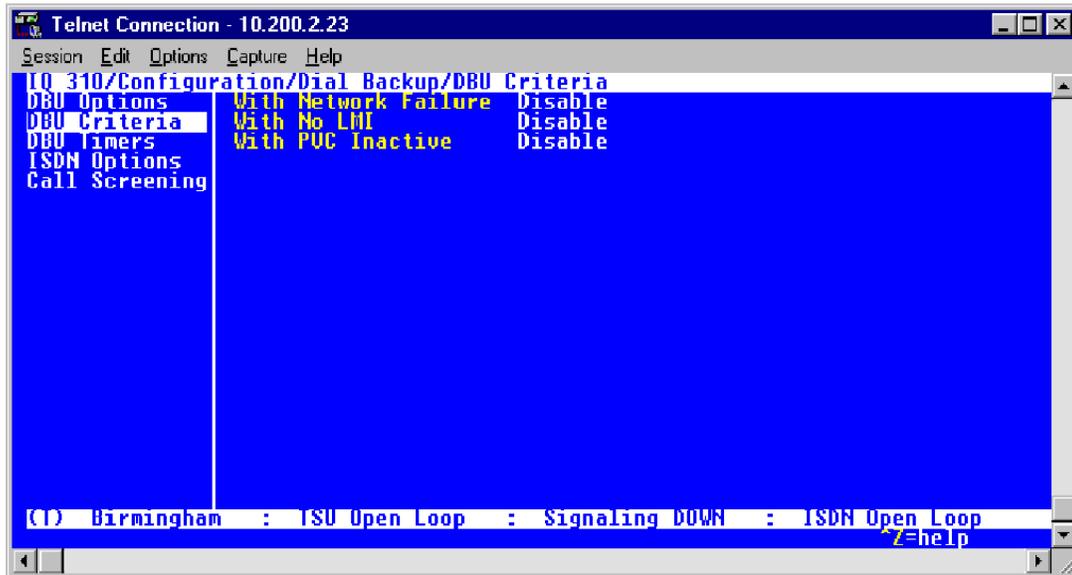


Figure 10. Birmingham DBU Criteria Menu

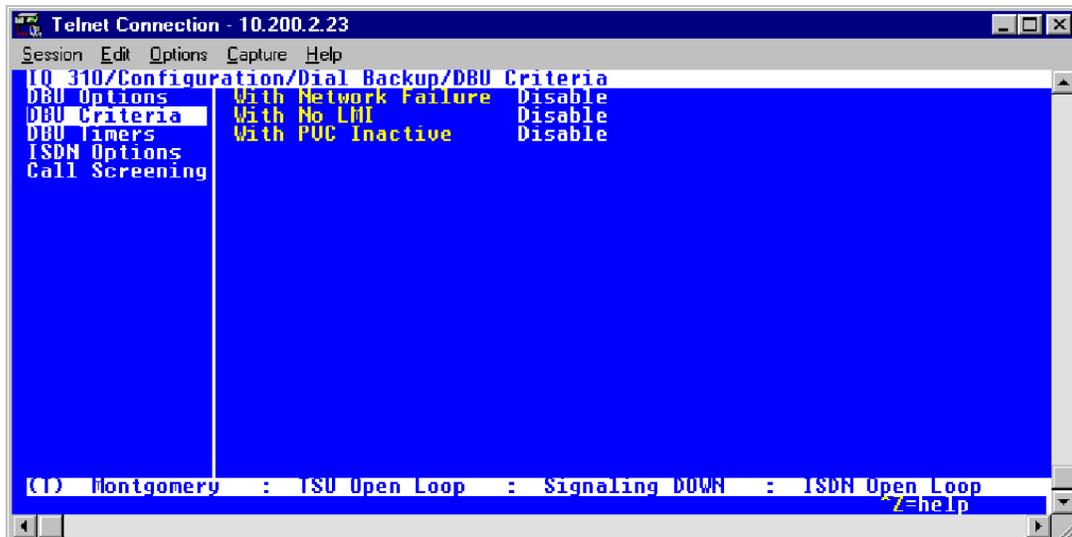


Figure 11. Montgomery DBU Criteria Menu

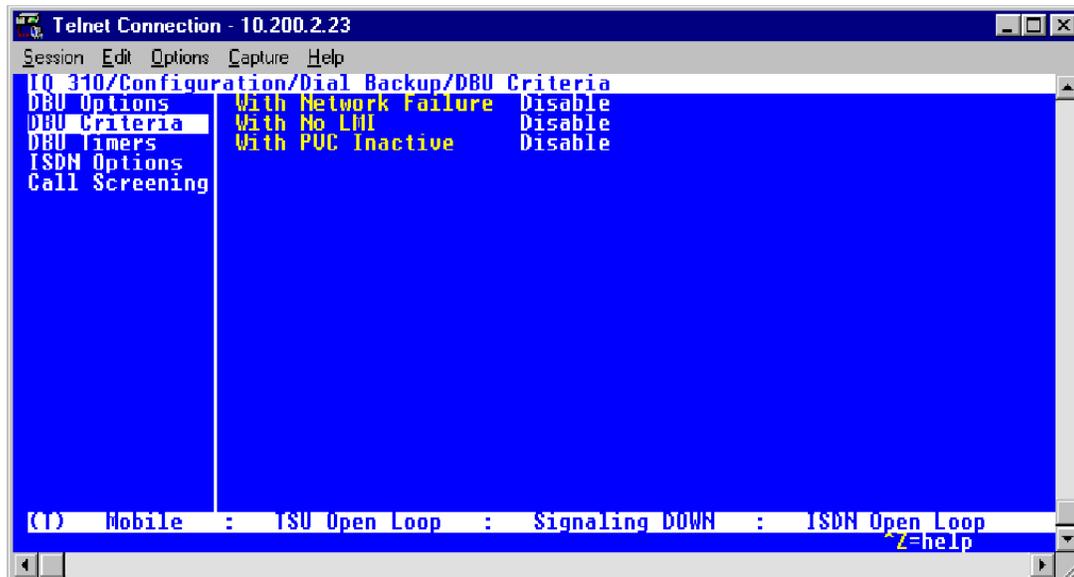


Figure 12. Mobile DBU Criteria Menu

### DBU Timers

1. Press the left arrow key once and the down arrow key once to select **DBU TIMERS**. The **DBU TIMERS** screen shown in Figure 13 is displayed. The default parameter values are shown below.

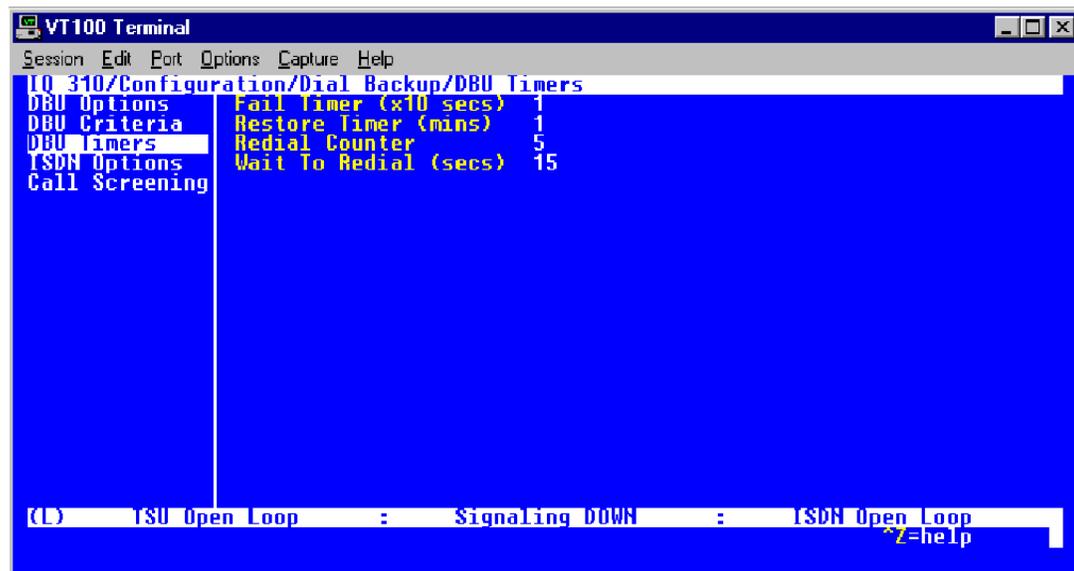


Figure 13. DBU Timers Menu

For basic dial backup operation, these parameters do not need to be altered from their default values. The **FAIL TIMER** programs the amount of time the IQ 310 will wait once any of the DBU criteria have been met before entering dial backup. Once the Frame Relay link has been reestablished on the network line, the **RESTORE TIMER** sets the amount of time the IQ 310 will wait before disconnecting the dial backup call. The **REDIAL COUNTER** programs the number of redial attempts performed if dial backup is not established on the first call. **WAIT TO REDIAL** defines the amount of time between redial attempts.

## ISDN Options

1. From the screen shown in Figure 13, press the down arrow to select **ISDN OPTIONS**. The screen shown in Figure 14 is now displayed. The default values for the parameters on this menu are shown.

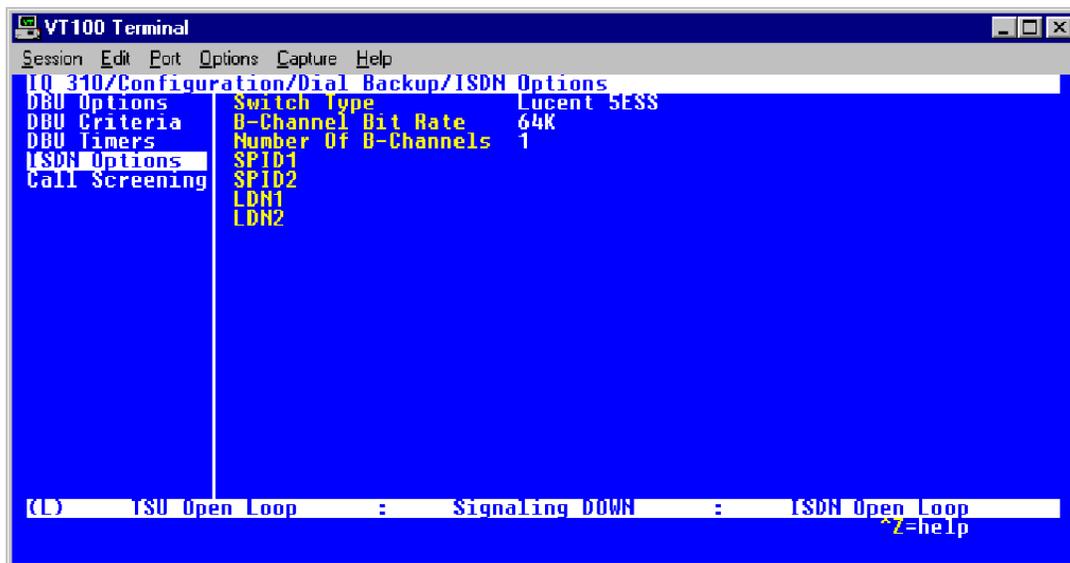


Figure 14. ISDN Options Menu

2. Use the right arrow to select **SWITCH TYPE**; then press **<ENTER>**. A list of available switch types is displayed. *The SWITCH TYPE selected here must match the TELCO CO switch providing the ISDN service.* Select **LUCENT 5ESS**, **DMS 100**, **NATIONAL**, or **NEC** and press **<ENTER>**. For the example network in Figure 1, we will assume the switch type for all IQ 310 DBU units is **NATIONAL**. Down arrow to select **NATIONAL**; then press **<ENTER>**.
3. Down arrow to select **B-CHANNEL BIT RATE**; then press **<ENTER>**. Select **54KBPS** or **64KBPS** and press **<ENTER>**. Generally leave this value to its default of **64KBPS** unless your ISDN service only provides 56kbps.
4. Down arrow to select the **NUMBER OF B-CHANNELS** on the BRI line; then press **<ENTER>**. Enter 1 for single channel service or 2 for dual channel service and press **<ENTER>**. If your Telephone Company has given you two SPIDs, you should set the **NUMBER OF B-CHANNELS** to 2.
5. Down arrow to select **SPID1**; then press **<ENTER>**. Enter the SPID assigned by the Telephone Company for the first B-channel and press **<ENTER>**. For the example network in Figure 1, the proper SPID is entered here depending upon which IQ 310 is being configured.

6. Down arrow to select **SPID2**; then press **<ENTER>**. Enter the SPID assigned by the Telephone Company for the second B-channel and press **<ENTER>**. Again, for the example network in Figure 1, the proper SPID is entered here depending upon which IQ 310 is being configured. If the **NUMBER OF B-CHANNELS** is set to 1, leave this entry blank.
7. Down arrow to select **LDN1**; then press **<ENTER>**. Insert the Local Directory Number provided by the Telephone Company for the first B-Channel and press **<ENTER>**. For the example network shown in Figure 1, the proper LDN is entered here depending upon which IQ 310 is being configured.
8. Down arrow to select **LDN2**; then press **<ENTER>**. Enter the Local Directory Number assigned to the second B-Channel by the Telephone Company and press **<ENTER>**. Again, for the example network shown in Figure 1, the proper LDN is entered here depending upon which IQ 310 is being configured. If the **NUMBER OF B-CHANNELS** is set to 1, leave this entry blank.

Sample screen shots of the **ISDN OPTIONS** screen for the Huntsville, Atlanta, Birmingham, Montgomery, and Mobile IQ 310s are shown in Figures 15-19, respectively.

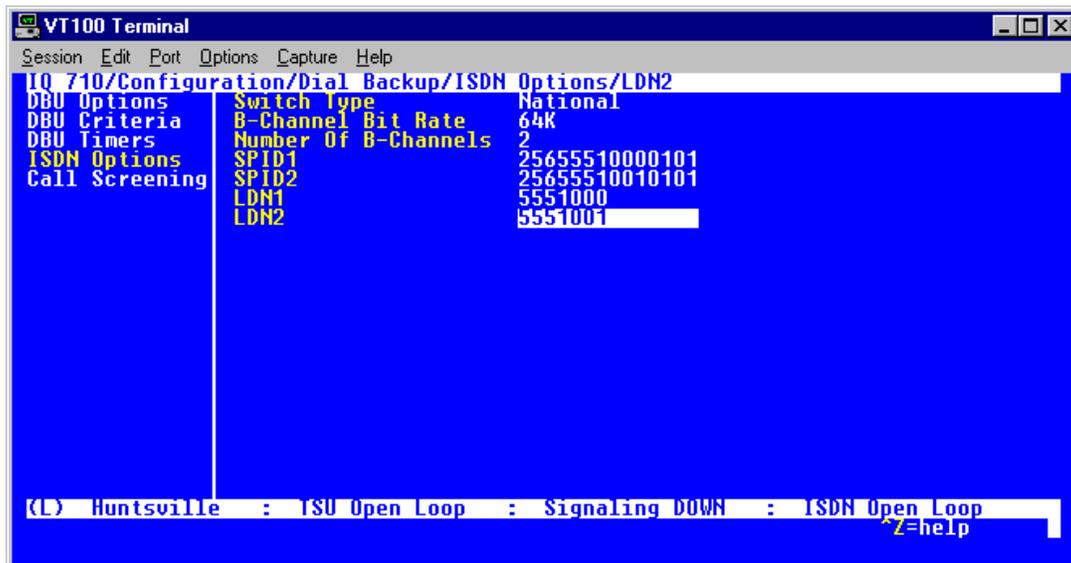


Figure 15. Huntsville ISDN Options Menu

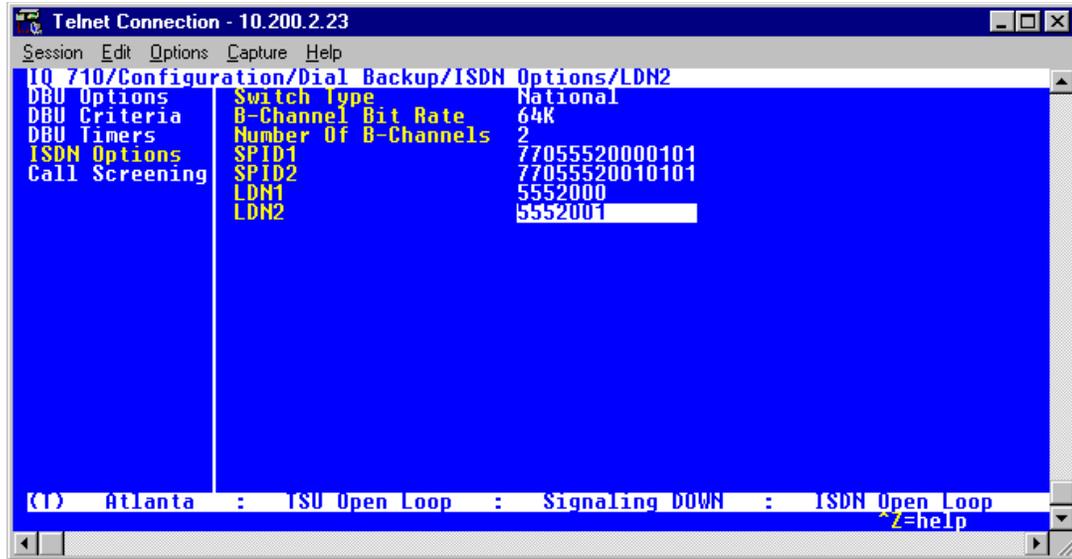


Figure 16. Atlanta ISDN Options Menu

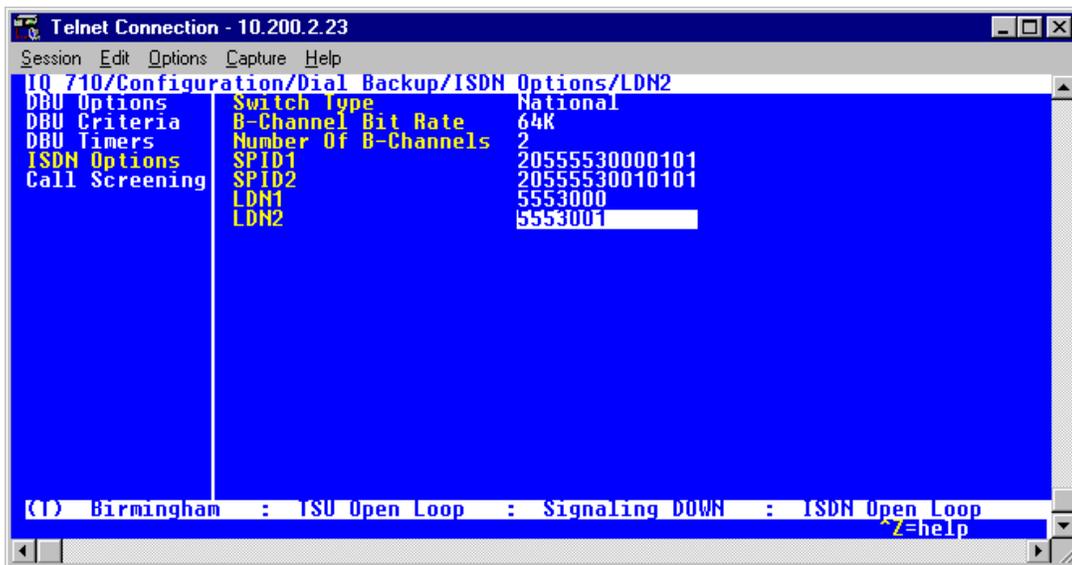


Figure 17. Birmingham ISDN Options Menu

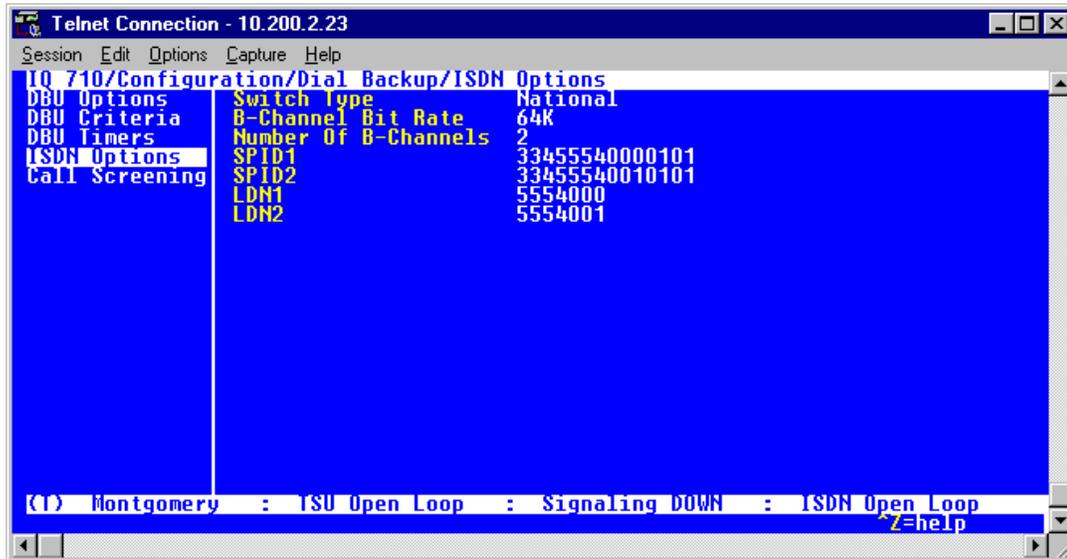


Figure 18. Montgomery ISDN Options Menu

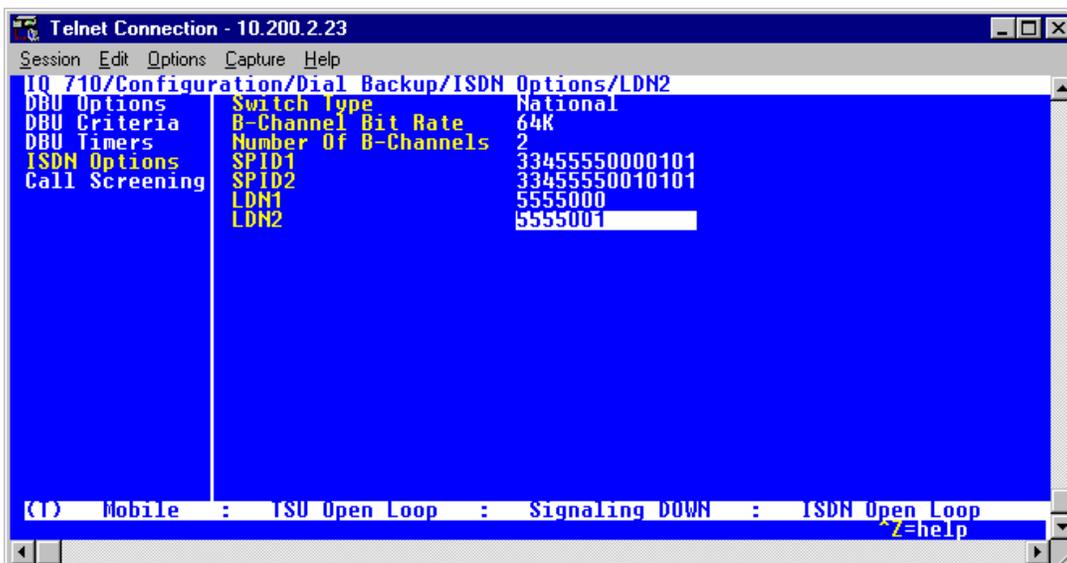
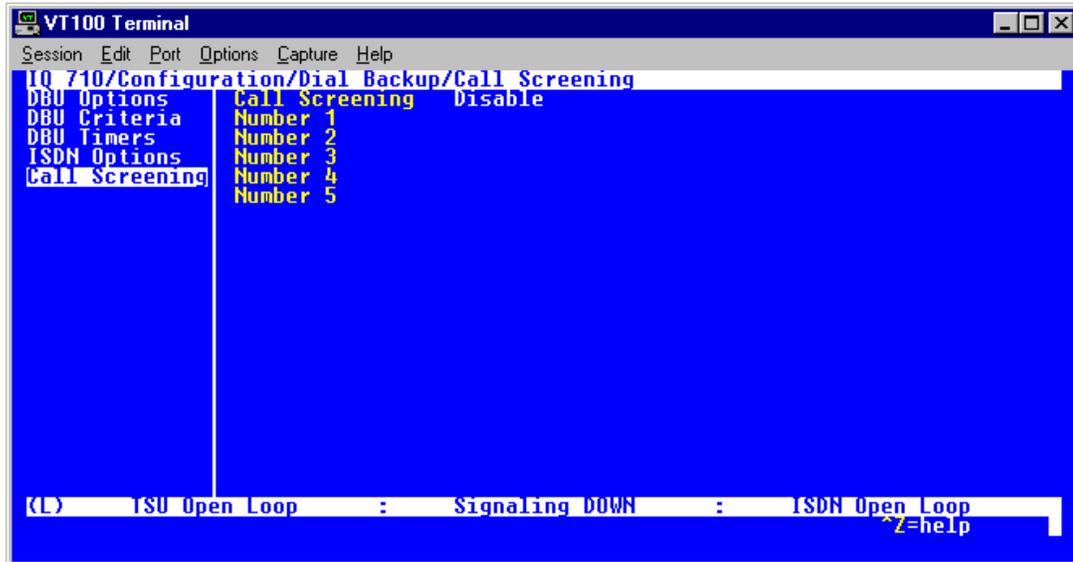


Figure 19. Mobile ISDN Options Menu

## Call Screening

1. Press the left arrow key and then the down arrow key to select **CALL SCREENING**. The menu shown in Figure 20 will be displayed. The default values for the parameters listed on this menu are shown.



**Figure 20. Call Screening Menu**

It is not necessary to adjust these parameters from their default values for basic Frame Relay dial backup. With **CALL SCREENING** enabled, the IQ unit will only accept incoming calls from calling parties matching one of the phone numbers configured for Number 1 through Number 5.

## Configuring PVC Options

1. Press the left arrow key until the menu shown in Figure 21 appears.

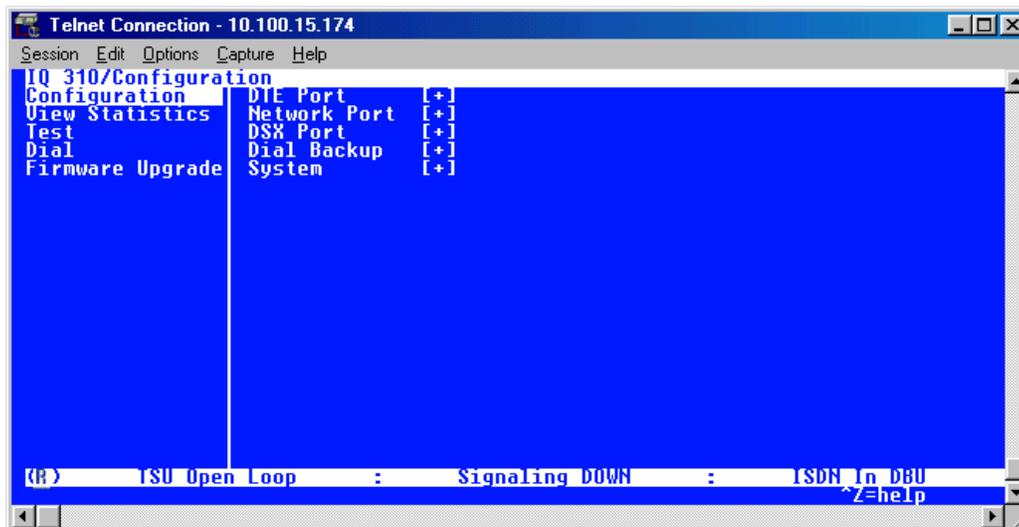


Figure 21. Configuration Menu

2. Use the arrow keys to select **NETWORK PORT**; then press <ENTER>. The screen shown in Figure 22 will appear.

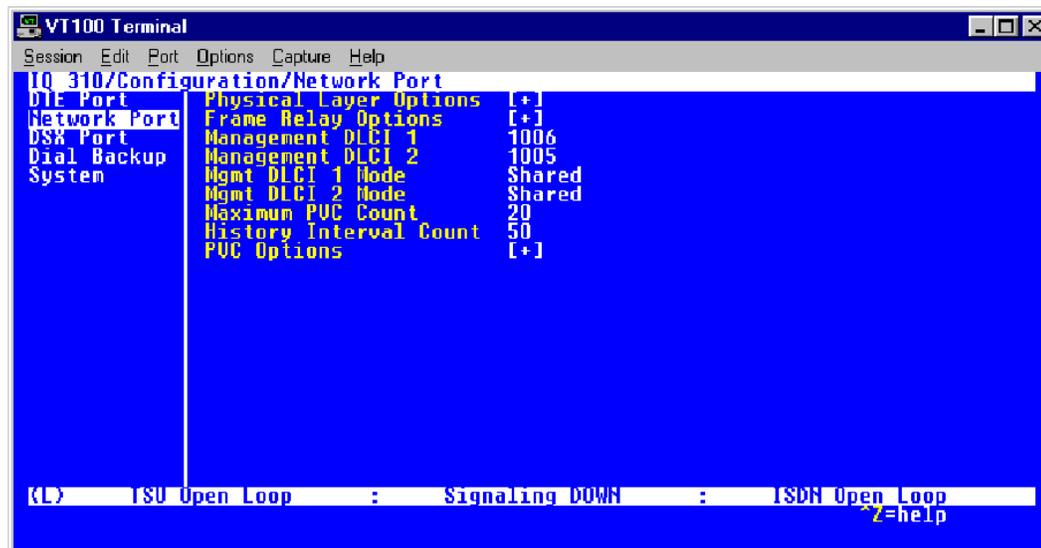


Figure 22. Network Port Menu

3. Press the right arrow once and then down arrow until **PVC OPTIONS** is selected. Press <ENTER> and the screen shown in Figure 23 is shown.

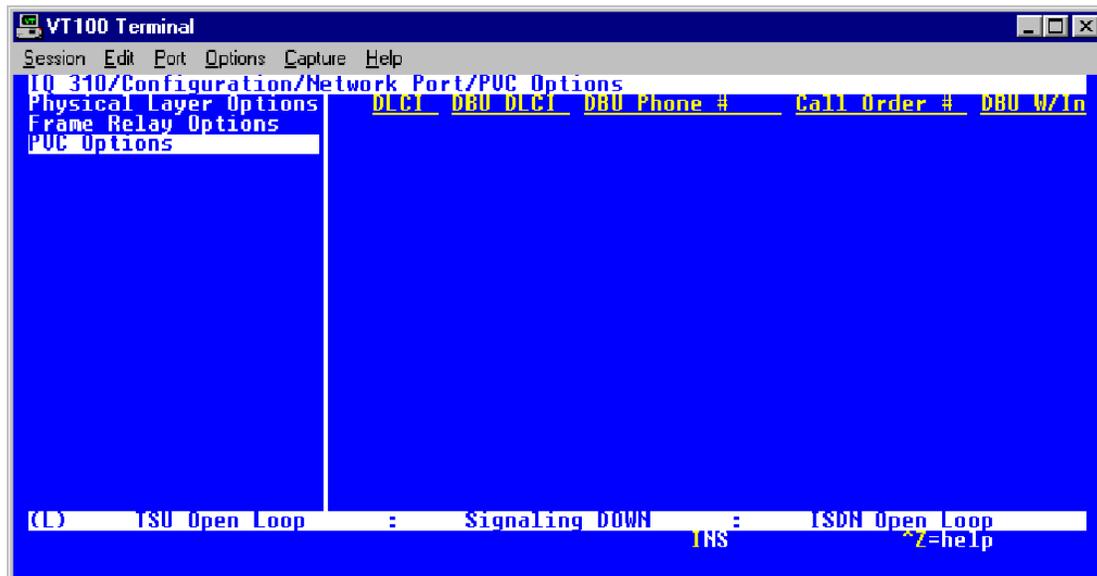


Figure 23. PVC Options Menu

### Huntsville IQ 310 (DLCI 200)

1. Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 200 and press **<ENTER>**.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 100 and press **<ENTER>**.
3. Notice that the Telco-assigned DLCI of 200 for Huntsville's Frame Relay link to Atlanta is programmed in the **DLCI** field. The Telco-assigned DLCI of 100 for Atlanta's Frame Relay link to Huntsville is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
4. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 17705552000 and press **<ENTER>**. The phone number that the Huntsville IQ 310 will dial to reach the Atlanta IQ 310 to establish a dial backup connection has now been programmed.
5. Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Set this Call Order to 1.
6. Use the right arrow to select **DBU ON INACTIVE**; then press **<ENTER>**. Select **ENABLED** and press **<ENTER>**.

### Huntsville IQ 310 (DCLI 400)

- Using the left arrow, place the cursor over the number 1 (indicating entry 1) to the left of the **DLCI** field; then press <I> for insert. This should add an entry as shown in Figure 24.

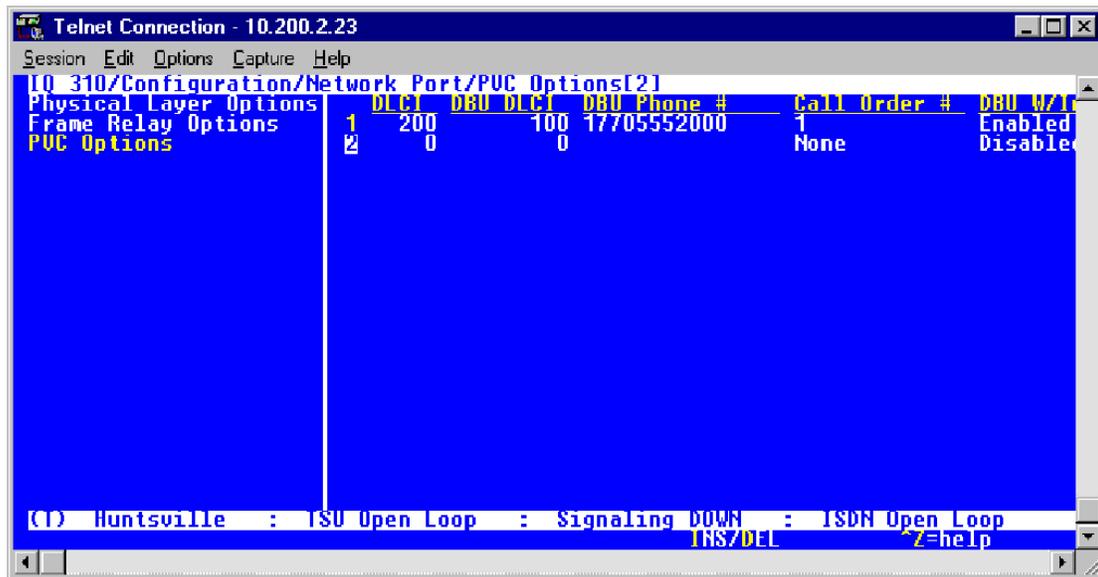


Figure 24. New Entry Screen

- Now add the DLCI to the Birmingham site. Use the right arrow to select **DLCI**; then press <ENTER>. Type in 400 and press <ENTER>.
- Use the right arrow to select **DBU DLCI**; then press <ENTER>. Type in 300 and press <ENTER>.
- Notice that the Telco-assigned DLCI of 400 for Huntsville's Frame Relay link to Birmingham is programmed in the DLCI field. The Telco-assigned DLCI of 300 for Birmingham's Frame Relay link to Huntsville is programmed in the DBU DLCI field. These two entries are critical for proper dial backup operation.
- Use the right arrow to select **DBU PHONE NUMBER**; then press <ENTER>. Type in 12055553000 and press <ENTER>. The phone number that the Huntsville IQ 310 will dial to reach the Birmingham IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Set this Call Order to 3.
- Use the right arrow to select **DBU ON INACTIVE**; then press <ENTER>. Down arrow to select **ENABLED**; then press <ENTER>.

### Huntsville IQ 310 (DCLI 600)

- Using the left arrow, place the cursor over the number 2 (indicating entry 2) to the left of the **DLCI** field; then press **<I>** for insert. This should add an entry as shown in Figure 25.

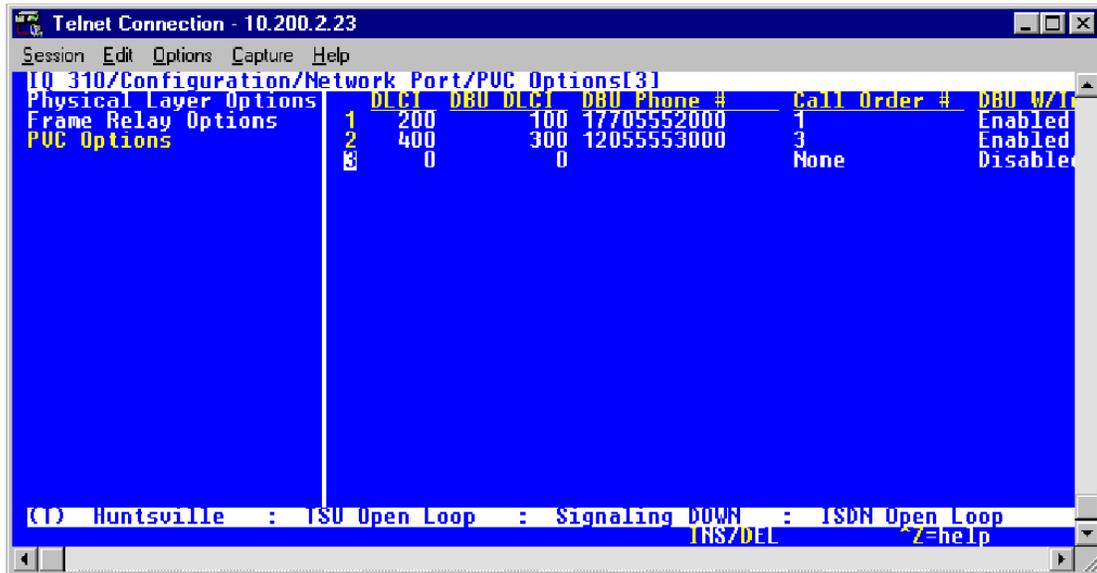


Figure 25. New Entry Screen

- Now add the DLCI to the Montgomery site. Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 600 and press **<ENTER>**.
- Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 500 and press **<ENTER>**.
- Notice that the Telco-assigned DLCI of 600 for Huntsville's Frame Relay link to Montgomery is programmed in the **DLCI** field. The Telco-assigned DLCI of 500 for Montgomery's Frame Relay link to Huntsville is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
- Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 13345554000 and press **<ENTER>**. The phone number that the Huntsville IQ 310 will dial to reach the Montgomery IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Set this Call Order to 2.
- Use the right arrow to select **DBU ON INACTIVE**; then press **<ENTER>**. Down arrow to select **ENABLED**; then press **<ENTER>**.

### Huntsville IQ 310 (DLCI 800)

- Using the left arrow, place the cursor over the number 3 (indicating entry 3) to the left of the **DLCI** field; then press <I> for insert. This should add an entry as shown in Figure 26.

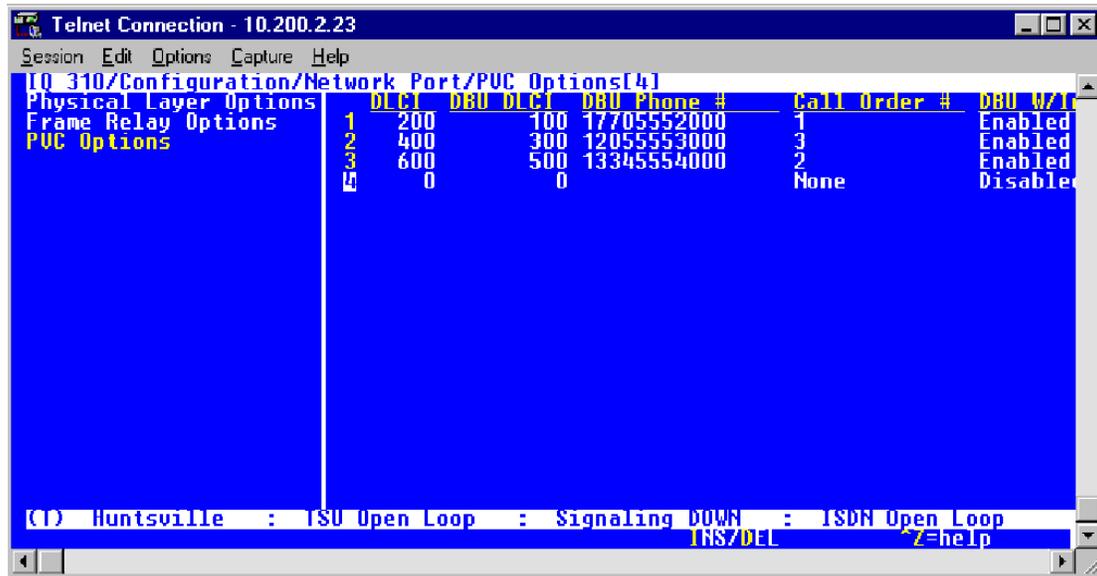


Figure 26. New Entry Screen

- Now add the DLCI to the Mobile site. Use the right arrow to select **DLCI**; then press <ENTER>. Type in 800 and press <ENTER>.
- Use the right arrow to select **DBU DLCI**; then press <ENTER>. Type in 700 and press <ENTER>.
- Notice that the Telco-assigned DLCI of 800 for Huntsville's Frame Relay link to Mobile is programmed in the **DLCI** field. The Telco-assigned DLCI of 700 for Mobile's Frame Relay link to Huntsville is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
- Use the right arrow to select **DBU PHONE NUMBER**; then press <ENTER>. Type in 13345555000 and press <ENTER>. The phone number that the Huntsville IQ 310 will dial to reach the Mobile IQ 310 to establish a dial backup connection has now been programmed.
- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Set this Call Order to 4.
- Use the right arrow to select **DBU ON INACTIVE**; then press <ENTER>. Down arrow to select **ENABLED**; then press <ENTER>.

At this point all PVC options have been configured for basic Frame Relay dial backup between Huntsville and the four remote sites. The PVC entries on the Huntsville IQ 310 should look like the screen shown in Figure 27. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide of this manual.

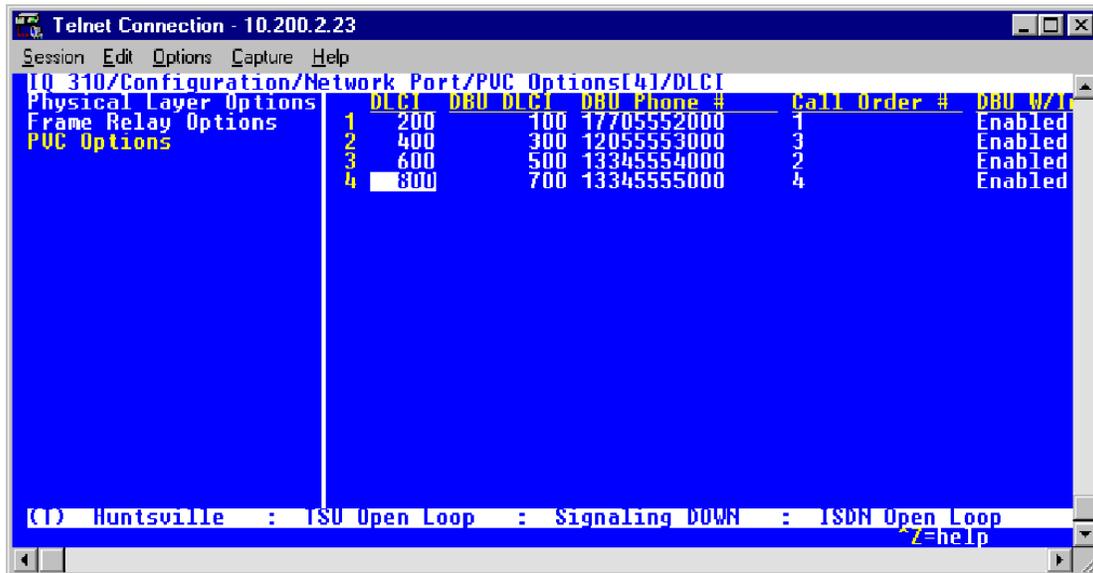


Figure 27. Huntsville PVC Options Screen

### Atlanta IQ 310 (DLCI 100)

1. From the **PVC OPTIONS** screen shown in Figure 23, use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 100 and press **<ENTER>**.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 200 and press **<ENTER>**.
3. Notice that the Telco-assigned DLCI of 100 for Atlanta's Frame Relay link to Huntsville is programmed in the DLCI field. The Telco-assigned DLCI of 200 for Huntsville's Frame Relay link to Atlanta is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
4. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Atlanta IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
5. Use the right arrow to select **CALL ORDER NUMBER**; then press **<ENTER>**.

**DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Leave this parameter at the default value of none.

The **DBU ON INACTIVE** parameter is disabled by default. For this example, leave it disabled in order to ensure that the host unit will initiate the dial backup.

At this point all PVC options have been configured for basic Frame Relay dial backup from Atlanta to Huntsville. The PVC entry on the Atlanta IQ 310 should look like the screen shown in Figure 28. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide of this manual.

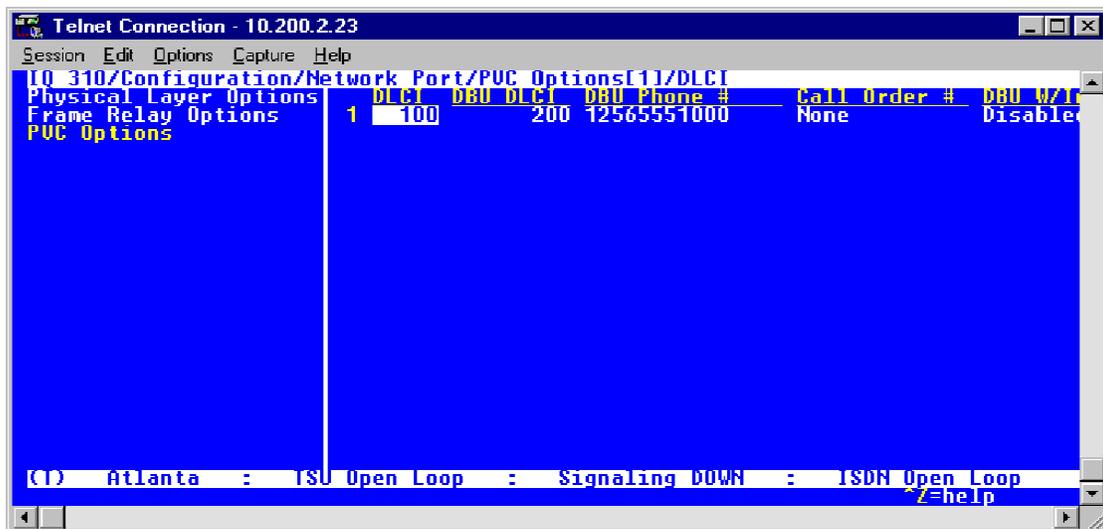


Figure 28. Atlanta IQ 310 (DLCI 100) Screen

Again, for this example only, the dial backup will only originate from the Huntsville site (in order to demonstrate the call order parameter). In a normal circuit, the parameters programmed for the Atlanta unit in this example in conjunction with enabling the **DBU CRITERIA** and **DBU ON INACTIVE** would be all the programming required for normal dial backup from Atlanta.

### ***Birmingham IQ 310 (DCLI 300)***

1. Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 300 and press **<ENTER>**.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 400 and press **<ENTER>**.
3. Notice that the Telco-assigned DLCI of 300 for Birmingham's Frame Relay link to Huntsville is programmed in the DLCI field. The Telco-assigned DLCI of 400 for Huntsville's Frame Relay link to Birmingham is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
4. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Birmingham IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.

- Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Leave this parameter at the default value of none.

The **DBU ON INACTIVE** parameter is disabled by default. For this example, leave it disabled in order to ensure that the host unit will initiate dial backup.

At this point all PVC options have been configured for basic Frame Relay dial backup from Birmingham to Huntsville. The PVC entries on the Birmingham IQ 310 should look like the screen shown in Figure 29. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide of this manual.

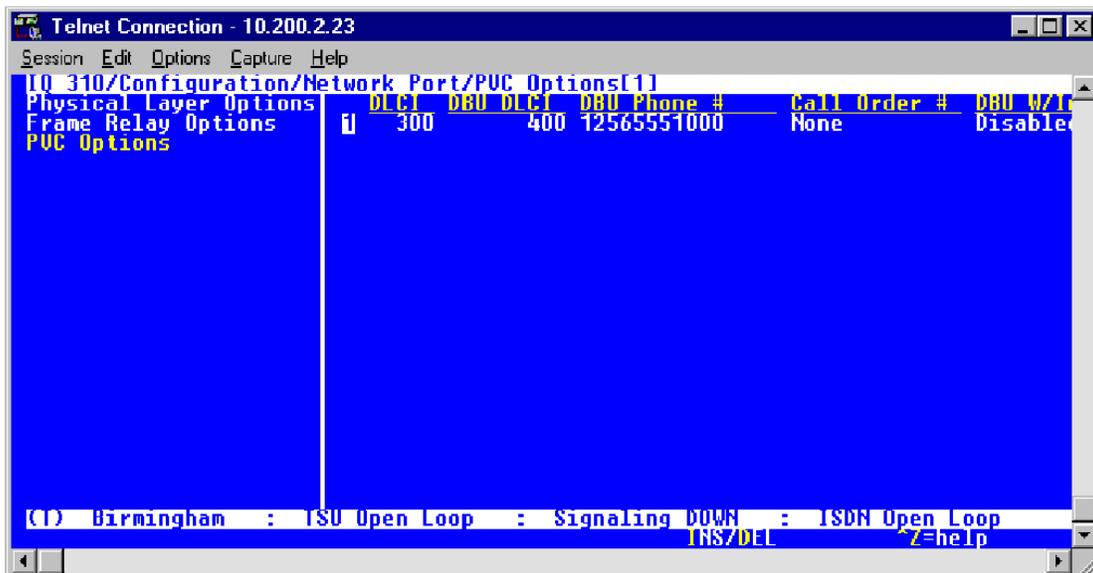


Figure 29. Birmingham IQ 310 (DLCI 300) Screen

Again, for this example only, the dial backup will only originate from the Huntsville site (in order to demonstrate the call order parameter). In a normal circuit, the parameters programmed for the Birmingham unit in this example in conjunction with enabling the **DBU CRITERIA** and **DBU ON INACTIVE** would be all the programming required for normal dial backup from Birmingham.

### Montgomery IQ 310 (DLCI 500)

1. Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 500 and press **<ENTER>**.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 600 and press **<ENTER>**.
3. Notice that the Telco-assigned DLCI of 500 for Montgomery's Frame Relay link to Huntsville is programmed in the **DLCI** field. The Telco-assigned DLCI of 600 for Huntsville's Frame Relay link to Montgomery is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
4. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Montgomery IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
5. Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Leave this parameter at the default value of none.

The **DBU ON INACTIVE** parameter is disabled by default. For this example, leave it disabled in order to assure the **GROUP** parameter on the host unit will initiate dial backup.

At this point all PVC options have been configured for basic Frame Relay dial backup from Montgomery to Huntsville. The PVC entries on the Montgomery IQ 310 should look like the screen shown in Figure 30. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide of this manual.

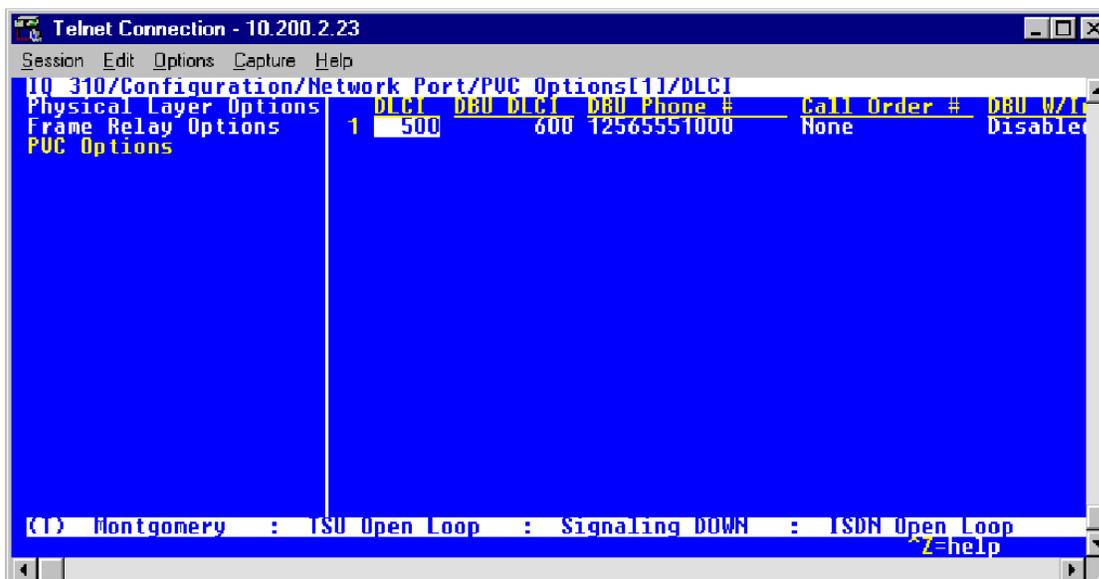


Figure 30. Montgomery IQ 310 (DLCI 500) Screen

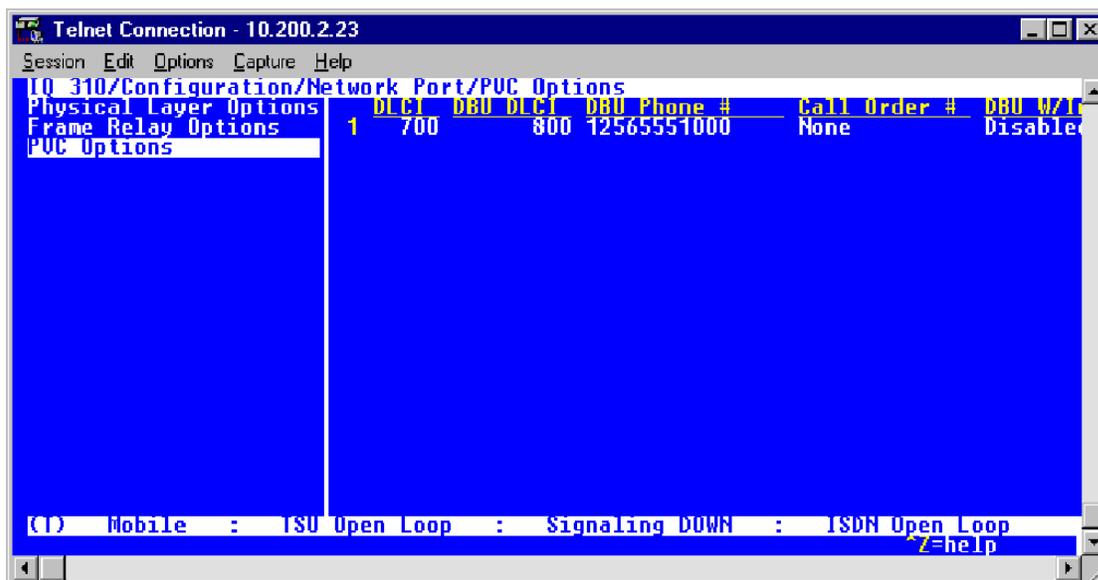
Again, for this example only, the dial backup will only originate from the Huntsville site (in order to demonstrate the call order parameter). In a normal circuit, the parameters programmed for the Montgomery unit in this example in conjunction with enabling the DBU criteria and DBU on Inactive would be all the programming required for normal dial backup from Montgomery.

### **Mobile IQ 310 (DLCI 700)**

1. Use the right arrow to select **DLCI**; then press **<ENTER>**. Type in 700 and press **<ENTER>**.
2. Use the right arrow to select **DBU DLCI**; then press **<ENTER>**. Type in 800 and press **<ENTER>**.
3. Notice that the Telco-assigned DLCI of 700 for Mobile's Frame Relay link to Huntsville is programmed in the DLCI field. The Telco-assigned DLCI of 800 for Huntsville's Frame Relay link to Mobile is programmed in the **DBU DLCI** field. These two entries are critical for proper dial backup operation.
4. Use the right arrow to select **DBU PHONE NUMBER**; then press **<ENTER>**. Type in 12565551000 and press **<ENTER>**. The phone number that the Mobile IQ 310 will dial to reach the Huntsville IQ 310 to establish a dial backup connection has now been programmed.
5. Use the right arrow to select **CALL ORDER NUMBER**. **DBU CALL ORDER** allows each DLCI listed in the table to be prioritized in the event that multiple PVCs are lost at once. Dial backup will first be attempted on the PVC with the lowest Call Order that meets the DBU criteria settings. Leave this parameter at the default value of none.

The **DBU ON INACTIVE** parameter is disabled by default. For this example, leave it disabled in order to assure the **GROUP** parameter on the host unit will initiate dial backup.

At this point all PVC options have been configured for basic Frame Relay dial backup from Mobile to Huntsville. The PVC entries on the Mobile IQ 310 should look like the screen shown in Figure 31. The remaining options may be left at their default values. The **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options are features not related to dial backup. For an explanation of these features, please refer to the User Interface Guide of this manual.



**Figure 31. Mobile IQ 310 (DLCI 700) Screen**

Again, for this example only, the dial backup will only originate from the Huntsville site (in order to demonstrate the call order parameter). In a normal circuit, the parameters programmed for the Mobile unit in this example in conjunction with enabling the **DBU CRITERIA** and **DBU ON INACTIVE** would be all the programming required for normal dial backup from Mobile.

If the network fails at the Huntsville site, the Huntsville IQ 310 will first attempt to dial the Atlanta IQ 310 since it is configured as call order one. However, if it fails to connect, the Huntsville IQ 310 will attempt to dial the Montgomery site which is configured as call order two. If that fails to connect, the Huntsville IQ 310 will attempt to dial the Birmingham site which is configured as call order three. Finally, if that fails to connect, the Huntsville IQ 310 will attempt to dial the Mobile site which is configured as call order four.

If all the Huntsville IQ 310 call order entries had been set to none, the Huntsville IQ 310 would have used the first entry with a DBU phone number. In this example, it would have attempted to call the Atlanta IQ 310. If that had failed to connect, the Huntsville IQ 310 would have moved to the next entry with a DBU phone number (Birmingham site) and so on.

# N-FORMANT

The IQ 310 uses a Java applet for displaying both menu options and data fields. This section of ADTRAN's IQ 310 System Manual describes how to navigate this Java applet (the N-Formant). (Refer to DLP-12 or instructions on connecting to the IQ 310 using the N-Formant.)

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## 1. OVERVIEW

N-Formant is a remote access management applet served from the IQ 310 to a browser. It allows the user access to the unit from any work station via the Internet or local LAN access. N-Formant is similar to Telnet in that it allows unit-specific management for purposes of configuration, status monitoring, and diagnostics. However, N-Formant provides better navigation and visualization capabilities for complex data than are available with Telnet. The applet can show an entire tree of application information at once without having to navigate up and down one level at a time and can present multiple views of information simultaneously without requiring multiple connections to the unit. N-Formant presents strip charts of continuously changing information, without having to infer activity by looking at each traffic class individually. Because the applet is downloaded and runs on the client hardware, N-Formant performs this data interpretation, reduction, and manipulation without requiring the IQ 310 to do the intensive processing required for such presentations.

## 2. NAVIGATING THE N-FORMANT

Once connected to the IQ 310 using the N-Formant, the screen shown in Figure 1 is displayed. To connect to the N-Formant applet, open a browser on your computer and enter the IP address of the IQ 310 unit in the Address field. On the login screen, enter the password for the unit (the default is **adtran**, all lower case). Click the **LOGIN** button, and the N-Formant window will appear. (For detailed instructions, refer to DLP-12.)

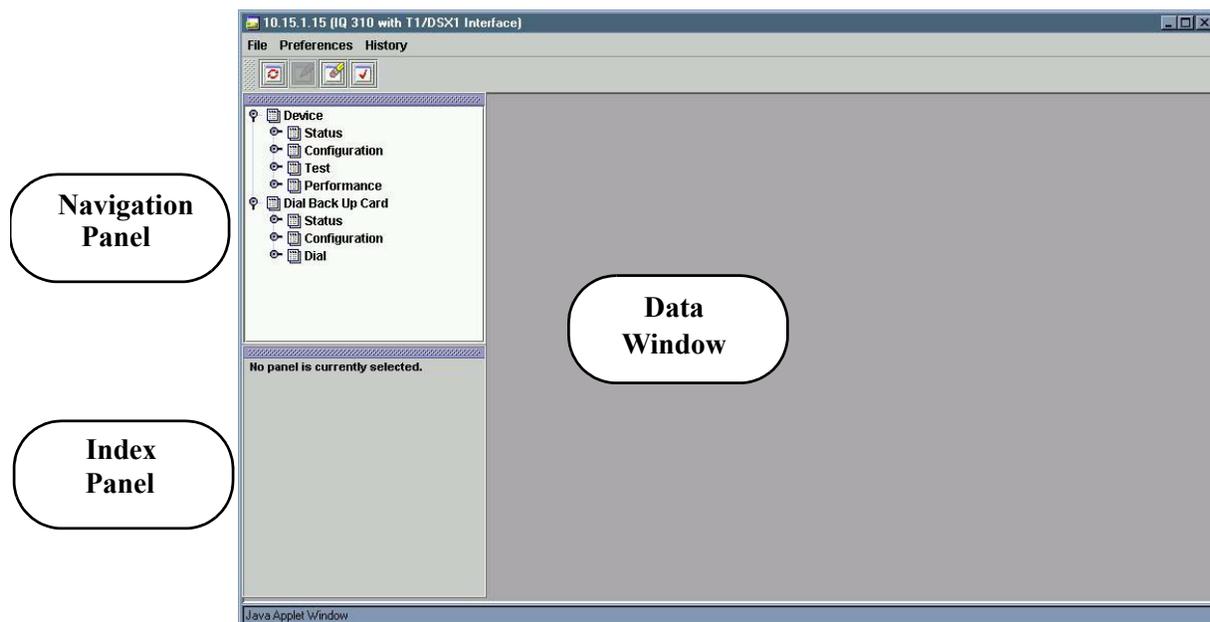


Figure 1. Top-Level Menu Window

The N-Formant options are displayed in an expanding tree structure in the navigation panel at the upper left. As selections are made in the navigation panel, the corresponding data windows are displayed in the area on the right. If the resulting data window requires the user to specify additional indices, such as selecting a specific port or PVC, the required list is displayed in the index panel located below the navigation panel. The data in the index panel can appear as either a tree structure or a table, determined by selecting the desired tab at the bottom of the panel.

The location of the navigation and index panels can be set by choosing from the **PREFERENCES > CONFIGURATION** menu, or the panels can be dragged anywhere within the N-Formant window.

By default the data windows being displayed on the right will stack on top of each other. This appearance can be changed by selecting another standard appearance such as tiling, cascading, or other arrangement from the **PREFERENCES > WINDOWS** menu. The windows can also be dragged and resized anywhere within the N-Formant window.

The data windows present a variety of configuration, status monitoring, and diagnostic information about the unit. Changes made in a particular window can be applied to the unit by clicking the buttons on the button bar at the top of the window. Click the **APPLY** button or choose the **FILE > APPLY** menu option to apply the desired change to the unit and continue editing in the same window. Choose **DONE** to apply the changes and close the current window, or choose **CANCEL** to ignore the changes and close the window.

### 3. MENU DESCRIPTIONS

As shown in the previous figure, menus are available for the basic IQ 310 device and for a dial backup module. A brief discussion of each area and the menu options available follows.

## DEVICE MENUS

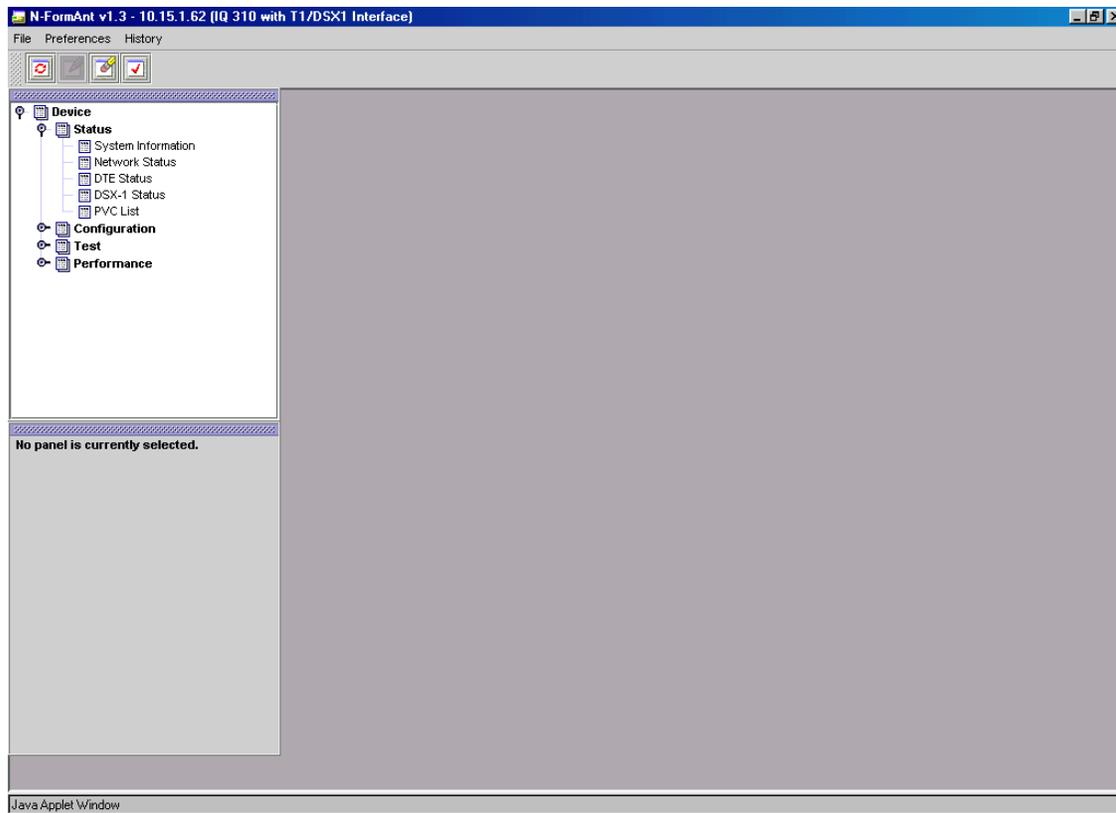
The IQ 310 **DEVICE** menu is divided into four main areas: **STATUS**, **CONFIGURATION**, **TEST**, and **PERFORMANCE**. Each of these menus may be expanded by clicking on the desired option.

### DEVICE > STATUS

The **STATUS** menu contains statistics for the following five categories: **SYSTEM INFORMATION**, **NETWORK STATUS**, **DTE STATUS**, **DSX-1 STATUS**, and **PVC LIST** (as shown in Figure 2).



*The **DSX-1 STATUS** option appears only if the T1/DSX-1 module is installed.*



**Figure 2. Device > Status Menu**

- The **SYSTEM INFORMATION** menu contains items such as **ADTRAN PRODUCT NAME**, **PART NUMBER**, **CLEI CODE**, **SERIAL NUMBER**, **REVISION**, **SOFTWARE REVISION** and **PHYSICAL ADDRESS**.
- The **NETWORK INFORMATION** menu contains **PHYSICAL LAYER NETWORK STATUS** and **NETWORK SIGNAL STATE** information.
- The **DTE STATUS** menu contains a status of the DTE LEDs and the DTE signal state.

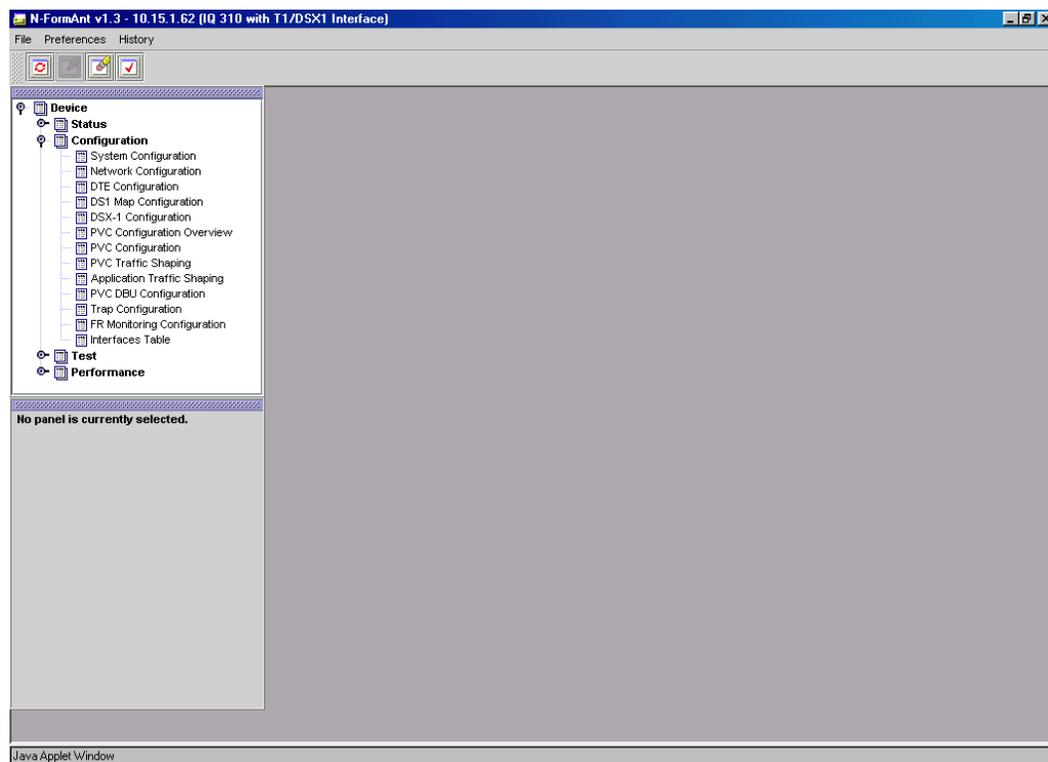
- The **DSX-1 STATUS** menu contains a status of the DSX-1 port.
- The **PVC LIST** menu contains a list of DLCIs, their states, and an indication of whether statistics are currently available for that PVC.

## DEVICE > CONFIGURATION

The **CONFIGURATION** menu contains basic configuration parameters for the following items: **SYSTEM CONFIGURATION**, **NETWORK CONFIGURATION**, **DTE CONFIGURATION**, **DS1 MAP CONFIGURATION**, **DSX-1 CONFIGURATION**, **PVC CONFIGURATION OVERVIEW**, **PVC CONFIGURATION**, **PVC DBU CONFIGURATION**, **TRAP CONFIGURATION**, **FR MONITORING CONFIGURATION**, and the **INTERFACES TABLE** (as shown in Figure 3).



*The **DS1 MAP CONFIGURATION** and **DSX-1 CONFIGURATION** options appear only if the **T1/DSX-1** module is installed.*



**Figure 3. Device > Configuration Menu**

- The **SYSTEM CONFIGURATION** menu contains items such as **SYSTEM NAME**, **PASSWORD**, **TIME**, **DATE**, **IP ADDRESS**, **IP SUBNET MASK**, **GATEWAY IP ADDRESS**, and **CONTROL PORT BAUD RATE**.
- The **NETWORK CONFIGURATION** menu is dependent on the network interface module installed. It will contain some parameters common to all network interface modules, such as **SIGNALING TYPE**, **MANAGEMENT DLCI** and **MODE**, and the standard frame relay timers and counters.
- The **DTE CONFIGURATION** menu contains items such as **LED STATUS**, **FLOW CONTROL**, **MANAGEMENT DLCI**, and the **STANDARD FRAME RELAY TIMEOUT**, **ERROR THRESHOLD**, and **ERROR WINDOW**.

- The **DS1 MAP CONFIGURATION** menu allows the user to map each of the 24 DS0s to either the **DSX-1 PORT**, the **DTE PORT**, or set to **IDLE**.
- The **DSX-1 CONFIGURATION** menus includes the basic T1 parameters such as **FRAMING FORMAT**, **LINE CODE**, **LINE LENGTH**, **ROBBED BIT SIGNALING**, and **YELLOW ALARM**.
- The **PVC CONFIGURATION OVERVIEW** menu contains a one-screen view of the PVC Configuration table. When using the **PVC CONFIGURATION** menu, you have to select the PVC to view one at a time. The overview contains the **DLCI**, **CIR**, **LOST PACKET DETECTION** (Sequence Number Checking), **DELAY PACKET** (Delay Measurement), and **DBU DLCI**.
- The **PVC CONFIGURATION** menus contain **DLCI**, **CIR**, **SEQUENCE NUMBER CHECKING**, **DELAY MEASUREMENT**, and **STATS** options.
- The **PVC DBU CONFIGURATION** menu contains the **DBU DLCI**, **DBU PHONE NUMBER**, **DBU CALL ORDER**, and **DBU ON INACTIVE** criteria.
- The **TRAP CONFIGURATION** menu allows the user to select the conditions which will generate traps, enter the trap manager information, and enable/disable traps.
- The **FR MONITORING CONFIGURATION** menu contains items such as number of PVCs monitored and history interval size. It also shows the number of intervals/days completed.
- The **INTERFACE TABLE** contains a table of all of the interfaces on the current unit as well as the **TYPE** (Ethernet or frame), **SPEED**, **PHYSICAL ADDRESS** (internal port # on the unit), **ADMIN STATUS** (up or down), and **OPER STATUS** (up or down).

## DEVICE > TEST

The **TEST** menu allows certain tests to be executed, such as PVC loopback, and displays the test results. The expanded **TEST** menu is shown in Figure 4.

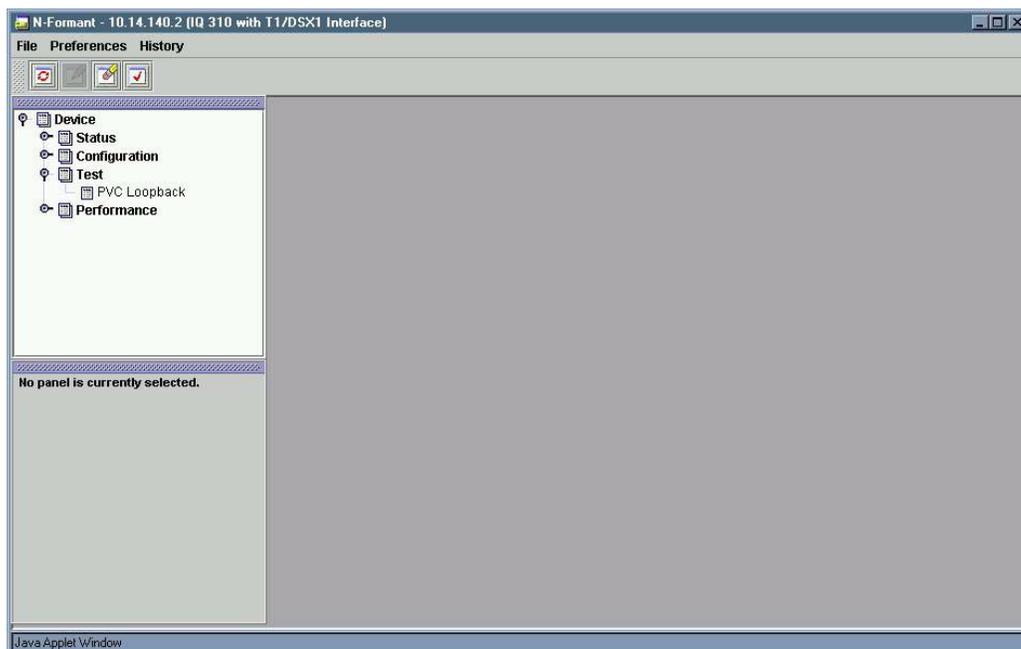
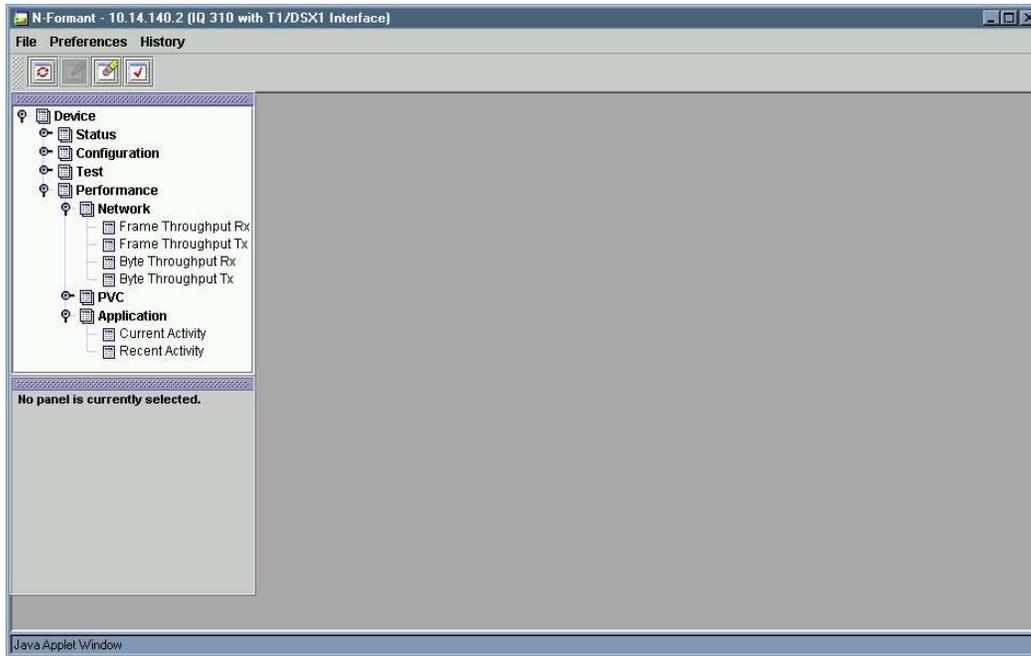


Figure 4. Device > Test Menu

## DEVICE > PERFORMANCE

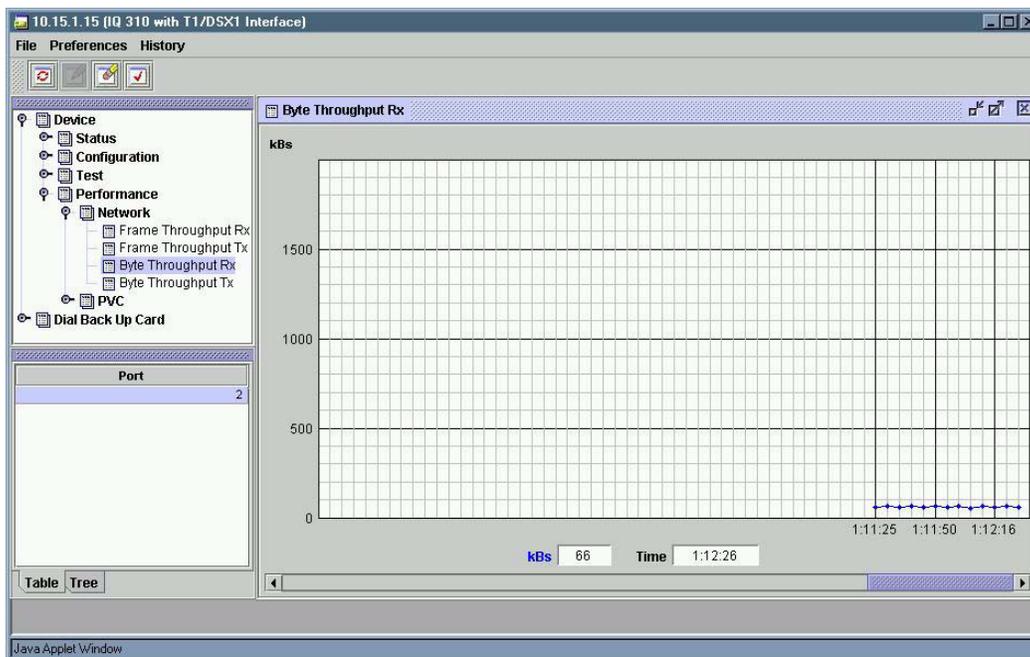
The **PERFORMANCE** option gives the user access to various performance-related data stored in the unit. This data is group under three options: **NETWORK**, **PVC**, and **APPLICATION**.



**Figure 5. Device > Performance Menu**

The **NETWORK** option contains 4 real-time charts: **FRAME THROUGHPUT RX**, **FRAME THROUGHPUT TX**, **BIT THROUGHPUT RX**, and **BIT THROUGHPUT TX**. These charts show frame throughput and bytes throughput in both receive and transmit directions for a specific network port. As a chart is selected, a list of ports appears in the index panel. Data is plotted for a single port at a time. The user may click on the desired port in the index panel to display the data for that port.

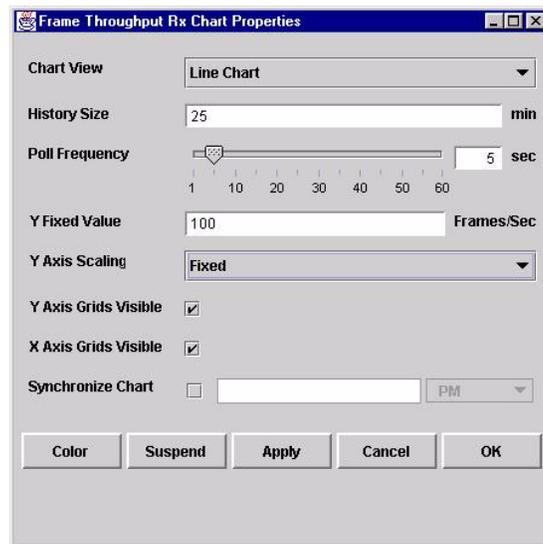
The **PVC** option presents the previous four charts, except that the throughput is shown for an individual PVC. As a chart is selected, a list of PVCs appears in the index panel. The user may click on the desired PVC in the index panel to display the data for that PVC.



**Figure 6. Network Port Throughput Data**

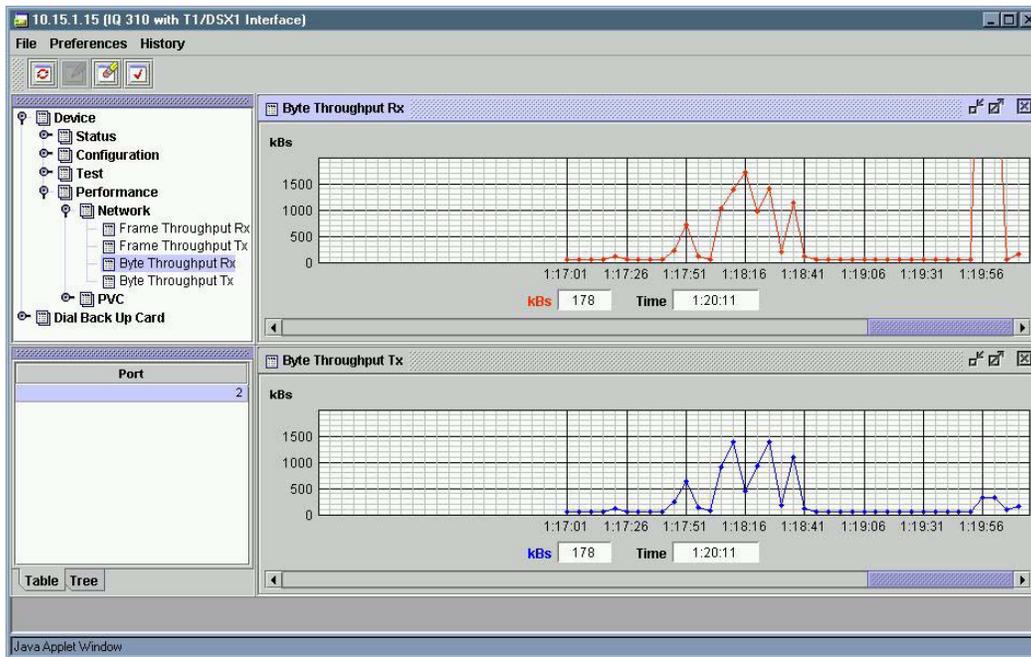
By default, the unit is polled at five second intervals. The most recent data point is displayed on the right side of the chart, and the older data scrolls to the left as the chart is updated. As the mouse is moved over the chart, the value and timestamp of the closest datapoint are shown in the boxes at the bottom of the chart. A scroll bar at the bottom of the chart allows the user to scroll the chart right or left in order to see the entire history.

The **CHART PROPERTIES** menu panel is accessed by right clicking anywhere in the chart area. This panel allows the user to customize both the appearance and configuration of the chart. The appearance of the chart can be customized by changing properties such as the chart type, grid lines, color, and Y axis scaling. The configuration of the chart can be customized by changing properties such as the polling frequency, history size, and synchronization.



**Figure 7. Chart Properties Menu Panel**

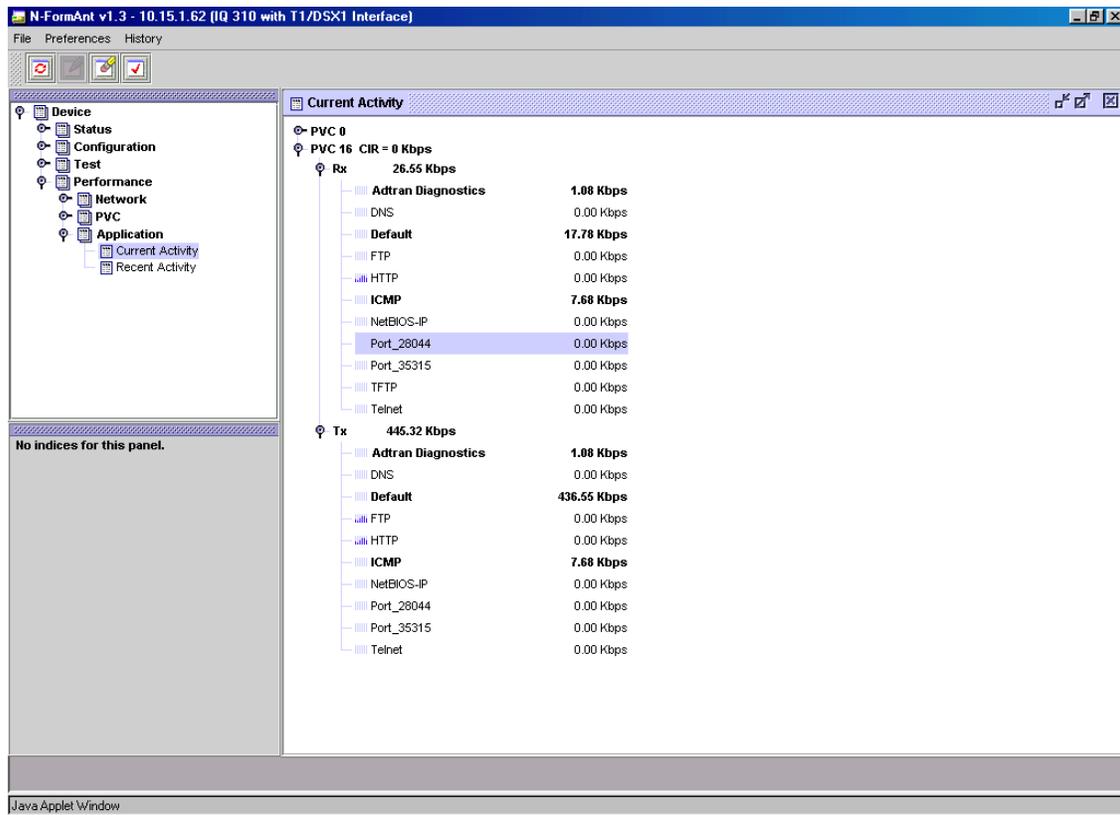
The **SYNCHRONIZATION** option allows the user to synchronize two or more charts shown in different windows. The windows can be arranged such that both charts are visible. The user must select the properties for the first chart and select the **SYNCHRONIZE CHART** option and enter a future time for synchronization to begin. Then the user must select the properties for the second chart and enter the same synchronization time. When the desired synchronization time is reached, both charts will begin being updated simultaneously. If the synchronization time passes before both charts are configured, the charts will not be synchronized.



**Figure 8. Synchronized Charts**

The **APPLICATIONS** option is used to display the unit performance for each application for which the unit has seen activity. This information is color coded based on activity. The most recent activity is viewed by selecting the **CURRENT ACTIVITY** option.

The activity tree is organized by PVC. Each PVC can be expanded to show activity for both receive and transmit directions. Each direction can be expanded to show the activity for each application. The throughput for each application is shown on the right. The sums of the individual applications are shown for each direction and the sum of both directions is shown at the PVC level.



**Figure 9. Current Activity Tree**

The current activity tree is polled every 10 seconds. The colors are based on the activity over the most recent 10 second interval.

<b>Gray</b>	No Activity
<b>Black</b>	Active -- Normal Activity
<b>Red</b>	Active -- Over CIR

## DIAL BACKUP MODULE MENUS

The IQ 310 Dial Backup Module menus are divided into three main areas: **STATUS**, **CONFIGURATION**, and **DIAL**. Each of these menus may be expanded by clicking on the desired option.

### DIAL BACKUP > STATUS

The **STATUS** menu contains statistics for the DBU status as shown in Figure 10. These statistics show the state of the DBU line.

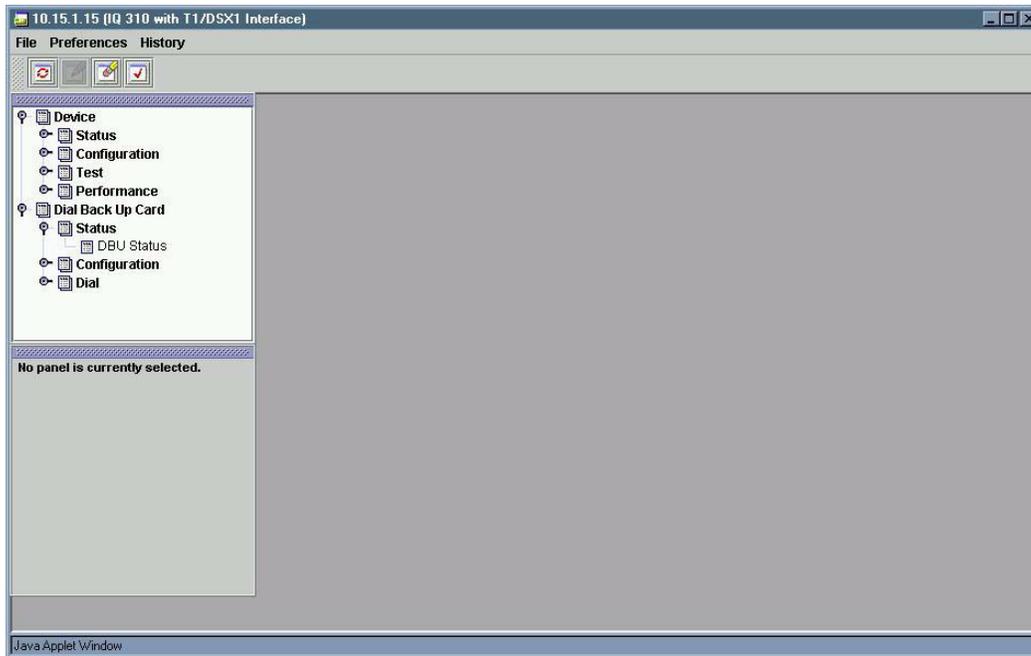
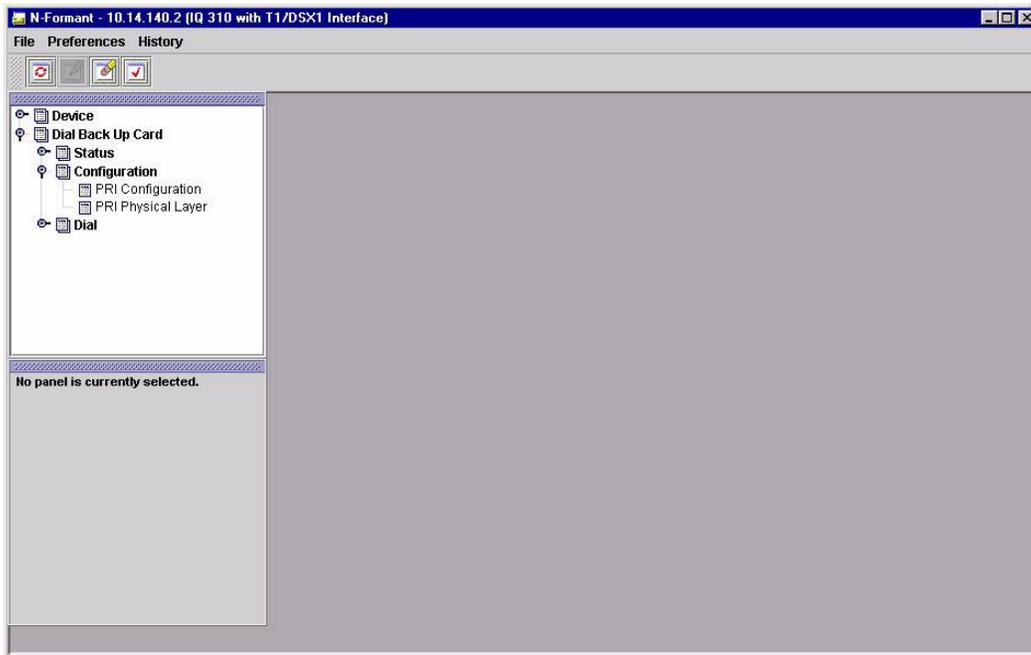


Figure 10. Dial Backup > Status Menu

### DIAL BACKUP > CONFIGURATION MENU

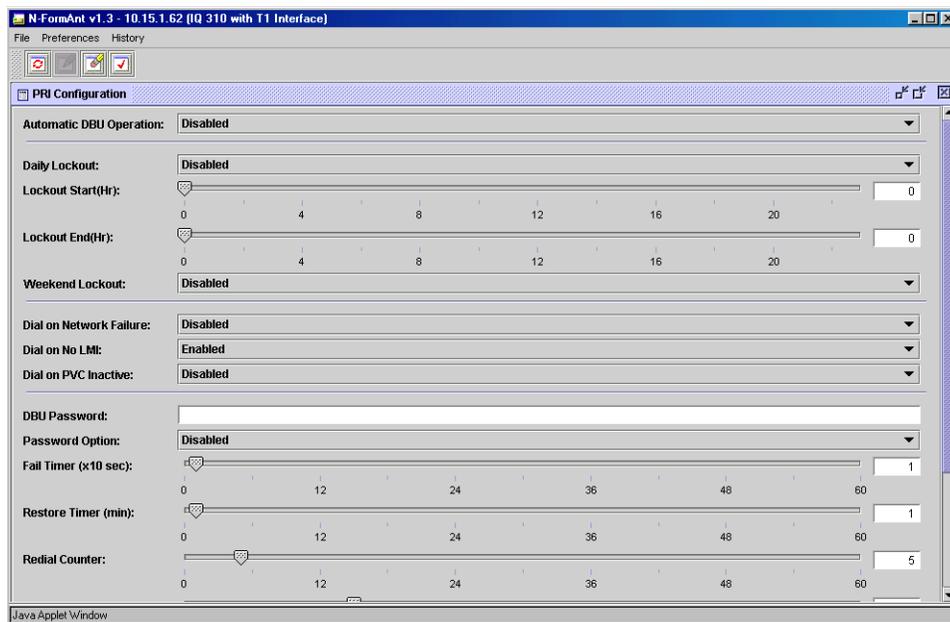
The **CONFIGURATION** menu contains basic configuration parameters unique to each dial backup module. The expanded **CONFIGURATION** menu shown in Figure 11 is for the PRI DBU module.



**Figure 11. Dial Backup > Configuration Menu (PRI DBU module)**

The **PRI DBU CONFIGURATION** menu contains basic configuration parameters for the following items: **PRI CONFIGURATION** and **PRI PHYSICAL LAYER**. The **PRI CONFIGURATION** menu contains some parameters that are not applicable for other DBU modules, such as **SWITCH TYPE** and **LOCAL DIRECTORY NUMBER**. It also contains some parameters common to all DBU modules, such as **AUTO DBU**, **TIMERS**, **BEEPER OPTION**, and the **LOCKOUT** feature.

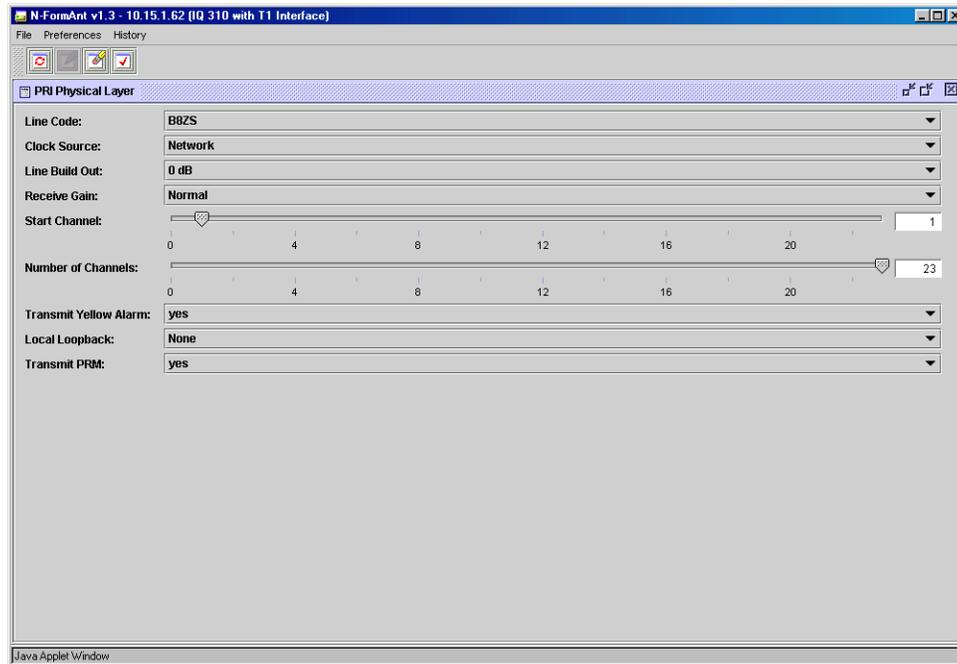
Figure 12 shows the first page of these options. Other options are visible by using the scroll bar.



**Figure 12. Dial Backup > Configuration > PRI Menu**

The **PRI PHYSICAL LAYER** menu contains typical T1 physical layer parameters such as **LINE CODE**, **LINE BUILD OUT**, **CLOCK SOURCE**, **RECEIVE GAIN**, **START CHANNEL**, **NUMBER OF CHANNELS**, **TRANSMIT YELLOW ALARM**, **LOCAL LOOPBACK**, and **TRANSMIT PRM**.

Figure 13 shows the **PRI PHYSICAL LAYER** menu.



**Figure 13. Dial Backup > Configuration > PRI Physical Layer Menu**

### **DIAL BACKUP > DIAL MENU**

The **DIAL** menu is the area where the phone number is entered for manual dial backup. The menu is shown in Figure 14.

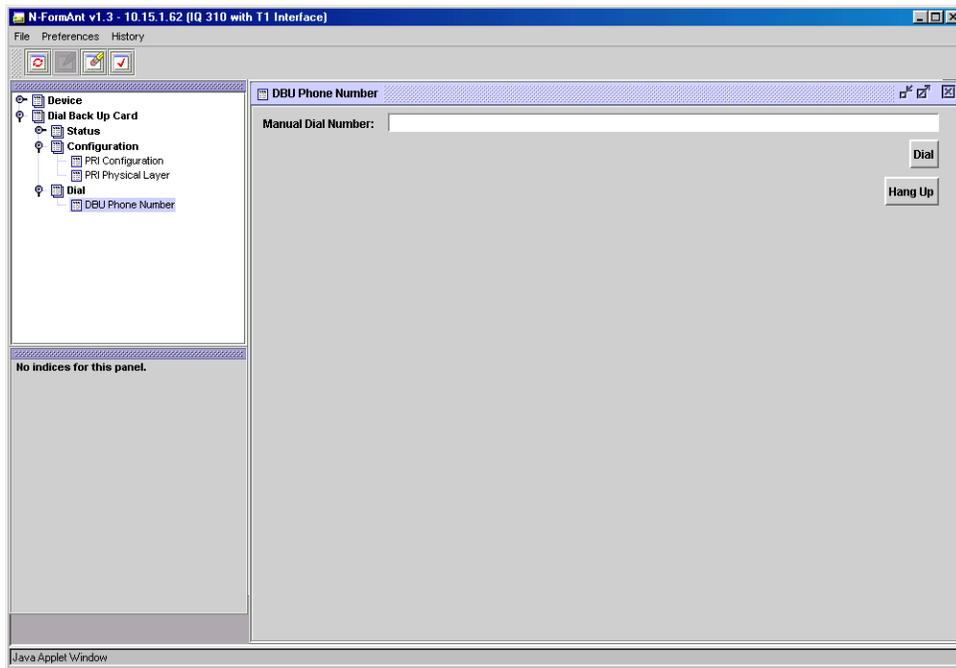


Figure 14. Dial Backup > Dial Menu

# ADTRAN UTILITIES

Provides instructions for configuring and using the ADTRAN Utilities software programs including Telnet, VT100, Syslog, and TFTP.



*Review the readme file (Readme.txt) for the latest information about the utilities.*

ADTRAN delivers several PC software utilities along with the IQ 310. These utilities are located on the CD-ROM that came with your shipment. They also include MIB files (located in the MIB directory). The utilities make it easier to interface with the terminal menu and transfer configuration files to and from TFTP servers. The utilities all run on Microsoft Windows 3.1 or higher. The following sections describe the Syslog, Telnet, VT100, and TFTP Server utilities.

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## 1. TELNET UTILITY

The Telnet utility delivered with the IQ 310 provides enhancements to standard Telnet programs that make it easier to work with IQ 310 options.

Access the Telnet program remotely through the 10BaseT **ETHERNET** port. For a detailed description of how to work with the Telnet program, refer to *Navigating the Terminal Menus* in the User Interface Guide section of this manual. If you need help setting up the IQ 310 for a Telnet session, refer to the Detailed Level Procedures section of this manual.

The Telnet menus include **SESSION**, **EDIT**, **OPTIONS**, **CAPTURE**, and **HELP** (see the menu tree in Figure 1).

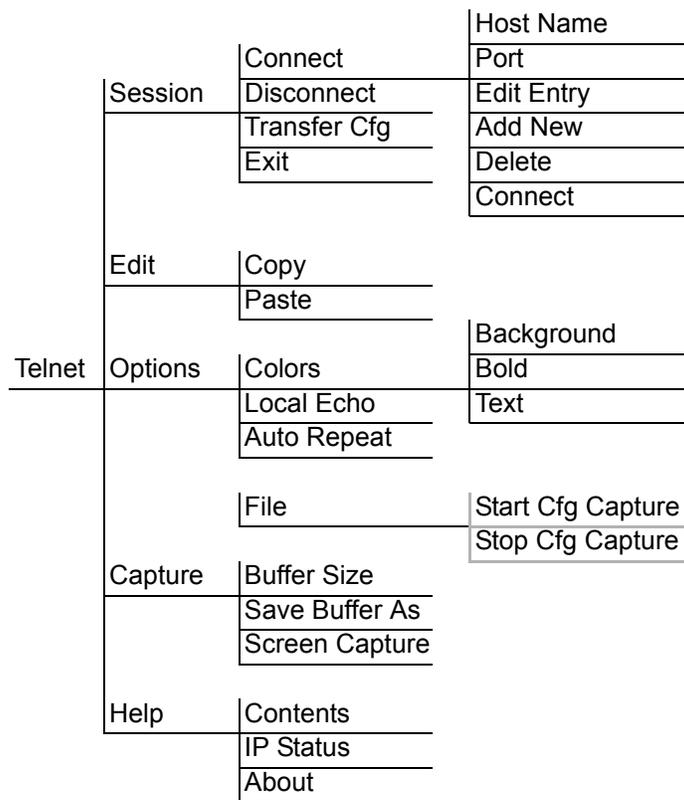


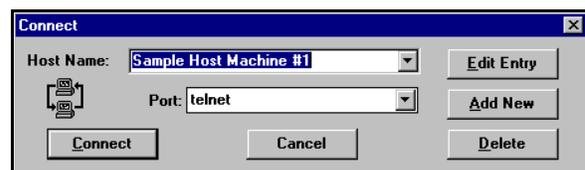
Figure 1. Telnet Menu Tree

### Session Menu

Click on **SESSION** to open the Telnet session.

#### Connect

Opens dialog box for setting **HOST NAME** and **PORT** parameters for a Telnet session. Also lets you **EDIT ENTRY**, **ADD NEW** entry, and **DELETE** stored entries. When the parameters are set, click **CONNECT** to make the connection. Click **CANCEL** to end the session.



**Host Name**

Accepts and stores host names. You may either enter a name, an IP address, or a domain name directly from this field. Click on the drop-down arrow to display a complete list of previously stored host names.

**PORT**

Provides several port options. You may enter port numbers directly into this field to connect to non-standard ports or select the drop-down combo-box to display the following options:

<b>TELNET</b>	establishes a Telnet session
<b>ECHO</b>	provides a loopback for troubleshooting
<b>DISCARD</b>	bit bucket; discards data
<b>DAYTIME</b>	returns the time
<b>CHARGEN</b>	displays as a unique character stream; used for self-tests

**Edit Entry**

Changes either the unit name or the IP address of each host. Press either **Tab**, **Return**, or a **period (.)** after each number in the IP address to move to the next field. If you press **Return** or **(.)** while the cursor is located in each IP field, that field entry is deleted.

**Add New**

Prompts you for the same information as the **EDIT ENTRY** dialog box for new host. When enabled, the **USE DNS** (Domain Name Server) feature allows users to request **DOMAIN LOOK UP** via a DNS server on the network, rather than specifying an IP address. The name then appears in the **HOST NAME** field.

**Delete**

Removes a host name from the list; simply select the host name you want to remove, and, at the prompt, click **DELETE**.

**Connect**

Establishes the Telnet session.

**Disconnect**

Terminates the Telnet session.

To re-establish the session, select **CONNECT** from **SESSION MENU** or press **ENTER** three times. This action restores the previous connection.

**Transfer Cfg**

This feature is used with ADTRAN products primarily for sending configuration files to the unit.

**Exit**

Ends the Telnet session and closes the Telnet screen.

**Edit Menu**

Provides **COPY** and **PASTE** commands.

**Options Menu**

Provides viewing alternatives for the terminal screen.

**Colors**

Three options change the color of the background window (**BACKGROUND**), bold highlights (**BOLD**), and text (**TEXT**).

**Local Echo**

Echoes each character that you enter.

**Auto Repeat**

Repeats characters you select from the keyboard, if you hold down the key.

**Capture Menu**

Provides options for capturing screen images.

**File**

Sends screen options data to a file in the format options listed below:

**Start Cfg Capture**

Used with the ADTRAN product line to start sending the scrolling screen capture to a file storage location.

**Stop Cfg Capture**

Used with the ADTRAN product line to stop sending the scrolling screen capture to a file storage location.

**Buffer Size**

Disables terminal window scroll bars when set to zero. (This is the normal setting for IQ 310.) This number represents the number of lines to capture in the memory buffer.

**Save Buffer As**

Save screen capture to a file.

**Screen Capture**

Copies the text on the current Telnet screen to the clipboard. You can open any word processor and paste the clipboard contents into the program. This option is helpful when debugging.

**Help Menu**

Provides on-line help for using the ADTRAN Utilities.

**Contents**

Opens the on-line help.

**IP Status**

Displays the local port address and the status of the connection.

**About**

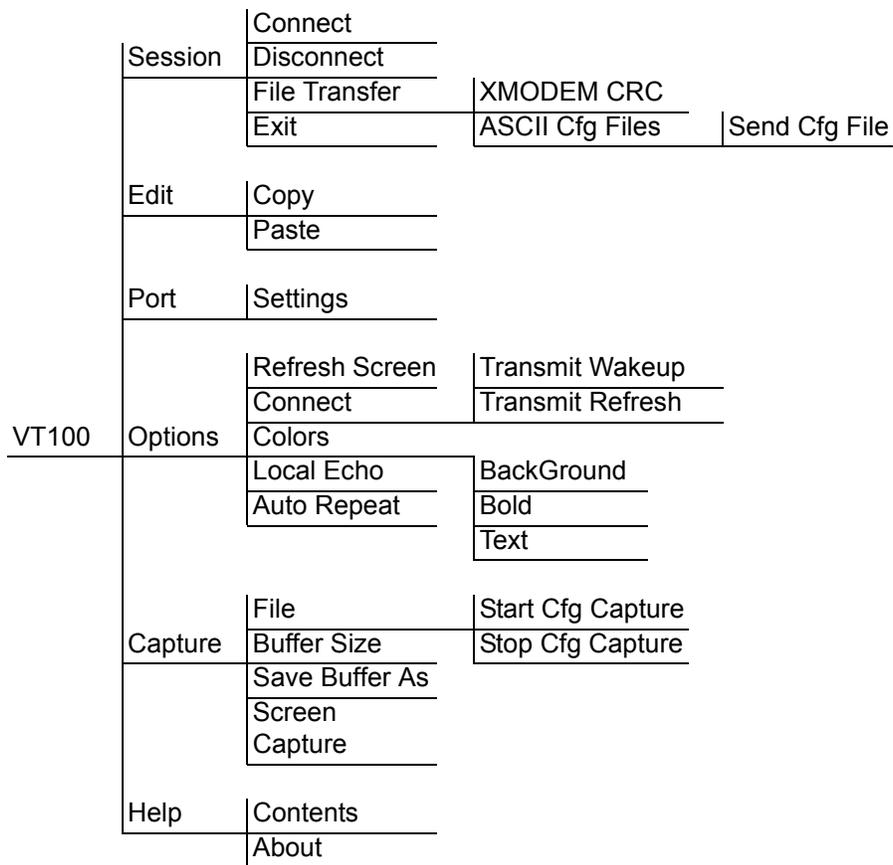
Displays version and owner information.

**2. VT100 UTILITY**

Use the VT100 to configure an IQ 310 which is directly connected to a PC. The VT100 display is almost identical to the Telnet display.

For a detailed description of how to work within the terminal menu, refer to *Navigating the Terminal Menus* in the User Interface Guide section of this manual. If you need help setting up the IQ 310 for a VT100 session, refer to the Detailed Level Procedures section of this manual.

VT100 menus include **SESSION**, **EDIT**, **PORT**, **OPTIONS**, **CAPTURE**, and **HELP** (see the menu tree in Figure 2).



**Figure 2. VT100 Menu Tree**

## Session Menu

Opens VT100 terminal emulation session.

### Connect

Opens a specified serial port for a VT100 session.

### Disconnect

Closes a specified serial port at the end of a VT100 session.

### File Transfer

Uploads and downloads files to and from an IQ 310.

### XMODEM CRC

Selects the XMODEM file transfer protocol.

### ASCII Cfg Files

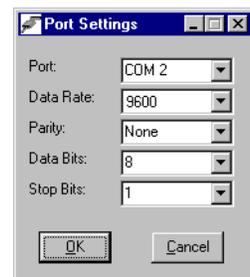
Selects ASCII transfer mode. Primarily useful for configuration transfers for the ADTRAN products.

## Edit Menu

Identical to the Telnet **EDIT MENU** (see *Edit Menu* on page 272).

## Port Menu

Changes serial COM port **SETTINGS**. Provides data rate settings from 300—57600 bps.



## Options Menu

Provides terminal screen commands.

### Refresh Screen

Redraws the screen.

### Connect

Provides the options **TRANSMIT WAKEUP** and **TRANSMIT REFRESH**.

### Transmit Wakeup

Provides a control sequence that puts the IQ 310 Control port online in terminal mode.

### Transmit Refresh

Provides a control sequence to refresh the screen automatically when connecting. (This is the default setting for the IQ 310.)

### Colors

Identical to Telnet **COLORS MENU** (see *Colors* on page 272).

### Local Echo

Echoes each character that you enter.

### Auto Repeat

Repeats characters you select from the keyboard if you hold down the key.

**Capture Menu**

Identical to the Telnet **CAPTURE** menu (see *Capture Menu* on page 272).

**Help Menu**

Provides on-line help and information about the version number.

**Contents**

Opens on-line help.

**About**

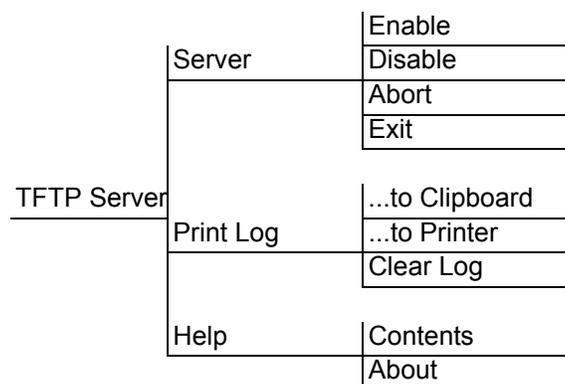
Displays version and owner information.

**3. TFTP SERVER**

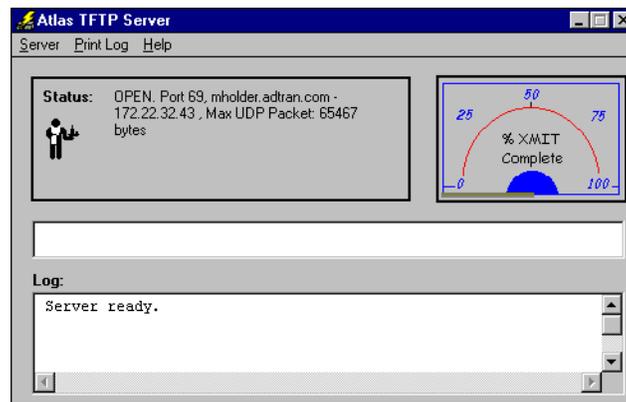
The TFTP Server utility transfers IQ 310 configuration files to and from a TFTP server (see Figure 3 for the menu tree). You can install this program on a PC running any version of Microsoft Windows. The configuration of an IQ 310 can be saved offline as a backup file. The saved file may also be used to send the same configuration to multiple IQ 310 units. Transfer configuration files using the TFTP protocol (a TCP/IP user protocol) via the 10BaseT **ETHERNET** port. The IQ 310 must have a valid IP address, subnet mask, and default gateway (if required), and be connected to an Ethernet network before proceeding. Figure 4 shows the TFTP server interface. For information on transferring and saving configurations using TFTP, refer to the Detailed Level Procedures section of this manual.



*Files must be placed in the Application directory where you installed the product.  
Received files are also placed here.*



**Figure 3. TFTP Server Interface Menu Tree**



**Figure 4. TFTP Server Interface**

Only one configuration transfer session (upload or download) may be active at a time. The TCP/IP parameters are not saved or overwritten as part of an IQ 310 unit's transferred configuration to allow sending identical configurations to multiple units. When you start this program, a port is automatically opened.

### **Server Menu**

Provides enable, disable, abort, and exit options.

#### **Enable**

Enables the TFTP server. The IP address displays in the Status field and Server Ready displays in the Log field.

#### **Disable**

Disables the TFTP server. When you select this option, the message PORT CLOSED displays in the Status field and in the Log field.

#### **Abort**

Terminates a transfer that is in progress.

#### **Exit**

Terminates active transfers and closes the TFTP window.

### **Print Log**

Provides print options.

#### **...to Clipboard**

Copies the information in the Log field to the clipboard. You can then open any word processor and paste the information into the program for review.

#### **...to Printer**

Sends the information in the Log field to the default printer.

#### **Clear Log**

Deletes the information stored in the Log field.

**Help**

Provides on-line help and version information.

**Contents**

Opens on-line help.

**About**

Displays version and owner information.

**4. STATUS FIELD**

This field displays general information about port and transfer status. This field is read-only. The unlabeled field in the center of the screen displays prompts about the status of active transfers, such as bytes transferred and received.

**5. METER FIELD**

The **XMIT** meter provides a visual record of the transfer process.

**6. LOG FIELD**

This field displays a record of all of the events that occur during the time the TFTP Server is enabled. Use the scroll bar to move up and down the list. To clear the information in this field, select **CLEAR LOG** from the **PRINT LOG** menu. Save this information to a file before deleting it with the **...TO CLIPBOARD** command.

