



Configuring the ATLAS for a Primary Rate ISDN (PRI) to T1 Robbed Bit Signaling (RBS) Conversion

Introduction

The ADTRAN ATLAS 550/800/800^{PLUS} supports both Primary Rate ISDN (PRI) and T1 Robbed Bit Signaling (RBS) services. PRI provides up to 23 bearer (B) channels and one signaling channel (D channel). The ATLAS T1/PRI interface uses a standard RJ-48C connector. T1 connections provide up to 24 DS0 channels and use the RBS scheme to pass call signaling status information. ATLAS can be used to connect PRI circuits to Customer Premise Equipment (CPE) such as PBXs, Key Systems, Video Conferencing Systems, or FAX servers, that only have T1 interfaces or require costly upgrades for PRI connections.

In switching applications, the ATLAS uses a simple configuration scheme known as the **Dial Plan**. There are two parts to the **Dial Plan: Network Term** and **User Term**. Typically, the **Network Term** will be the service line provided by the telco or the line that interfaces with the public network. The **User Term** is most often the interface used to connect other customer premise equipment to the ATLAS.

Before You Begin

Before you begin configuration of the ADTRAN ATLAS, you need some basic information.

1. Information needed from the PRI service provider:
 - a. Switch Type of the PRI line (Ex: National ISDN, DMS-100, 5ESS, or 4ESS)
 - b. Number of B channels in service and on which DS0s the B-channels reside
 - c. Phone number(s) assigned to the PRI line
 - d. Number of digits being provided
2. Information needed from the end user/customer:
 - a. Signaling Type(s) supported by the end user equipment (Loop Start, Ground Start, E&M Wink, E&M Immediate, or Feature Group D). If using Feature Group D, Tone Type is also needed.
 - b. Actual phone numbers to be used on the PBX or other equipment (in the range of the PRI numbers).
 - c. Number of digits to be transferred to the end user equipment.

Configuration of the ATLAS

To create the network shown in Figure 1, configure the PRI side of the network in the **Network Term** portion of the **Dial Plan**. Then, configure the T1 side of the network in the **User Term** portion. The procedures for both steps are found on the following page.

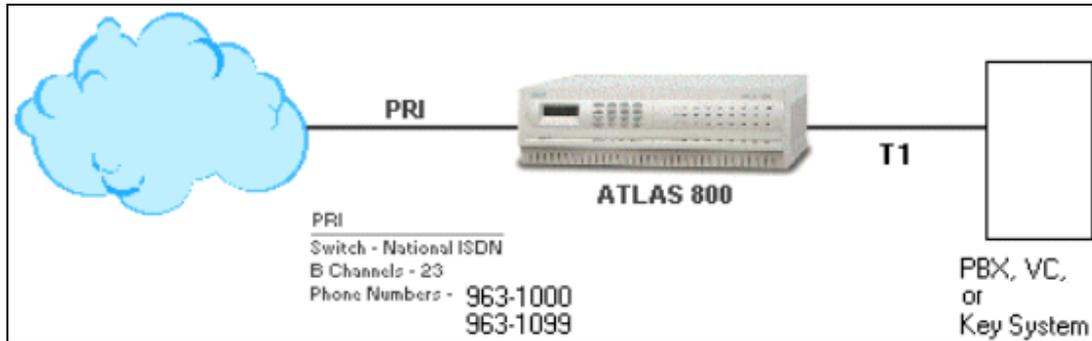


Figure 1

Configuring the PRI

The PRI is configured in the **Network Term** portion of the **Dial Plan**. The **Network Term** configuration consists of the following fields:

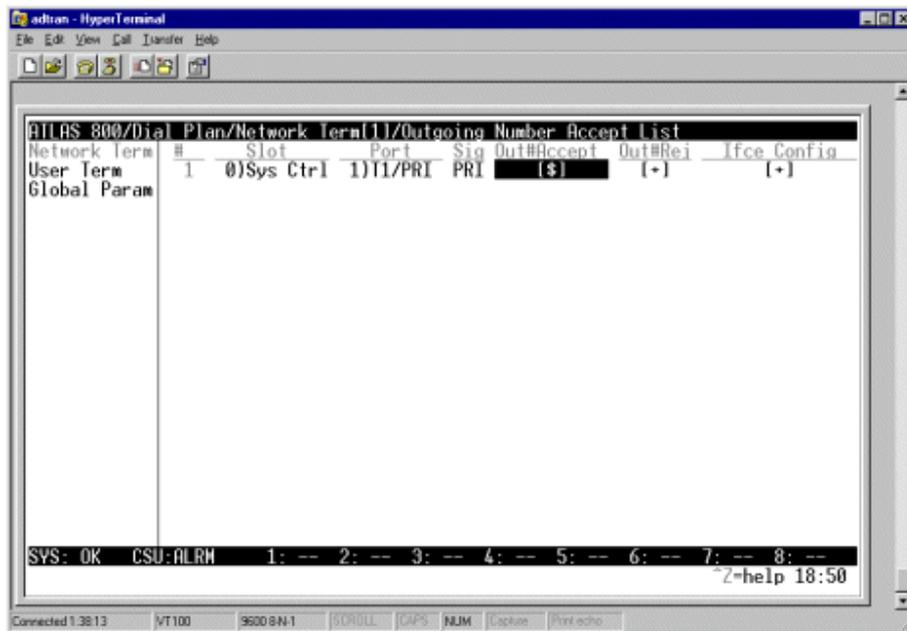
1. **Out # Accept**
2. **Out # Rej**
3. **Signaling**
4. **Ifce Config**
 - o **Switch Type**
 - o **First DS0**
 - o **Number of DS0s**

NOTE: This is not a complete list of the **Ifce Config** features. For simplicity, any field not mentioned in this document remains in the default state.

1. **Out # Accept** -- typically '\$', which represents 'all calls'. This feature can be used to restrict outbound calls. All calls meeting the criteria entered in this field are allowed to pass through. For example, an entry of 'N\$' allows only local calls to be sent out the PRI. (A full description of N, X, and [] number entry characters are available while in this field by pressing Ctrl A)
2. **Out Number Reject** -- normally left blank. This feature can also be used to restrict outbound calls. In contrast to the Accept List, the Reject List blocks all calls meeting the criteria entered in this field. For example, an entry of '1\$' blocks all long distance calls on the PRI.
3. **Signaling** - For this application, signaling should be PRI.

4. **Interface Configuration** -- contains provisioning information of the PRI given by the service provider. Figure 1 shows the switch type to be National ISDN, and the number of active B channels as 23, which signifies a full PRI. This would be configured as follows:
- Switch Type:** National ISDN
 - First DS0:** 1
 - Number of DS0s:** 23

Figures 2 and 3 display the setup of the **Network Term** and **Interface Configuration** respectively.



The screenshot shows a HyperTerminal window titled 'adrian - HyperTerminal'. The terminal output displays a table with the following columns: ATLAS 800/Dial Plan/Network Term, Outgoing Number, and Accept List. The table contains one row of data for Network Term 1.

ATLAS 800/Dial Plan/Network Term	Outgoing Number	Accept List
1 0)Sys Ctrl 1)T1/PRI	PRI	[\$] [-] (-)

Below the table, the terminal shows 'User Term' and 'Global Param' sections. At the bottom of the terminal, there is a status bar with the text 'SYS: OK CSU:ALRM 1: -- 2: -- 3: -- 4: -- 5: -- 6: -- 7: -- 8: --' and a timestamp 'Z=help 18:50'. The status bar at the very bottom of the window indicates 'Connected 1.38:13 VT100 9600 B,N,1 SCROLL: CAPS: NUM: Capture Port Echo'.

Figure 2

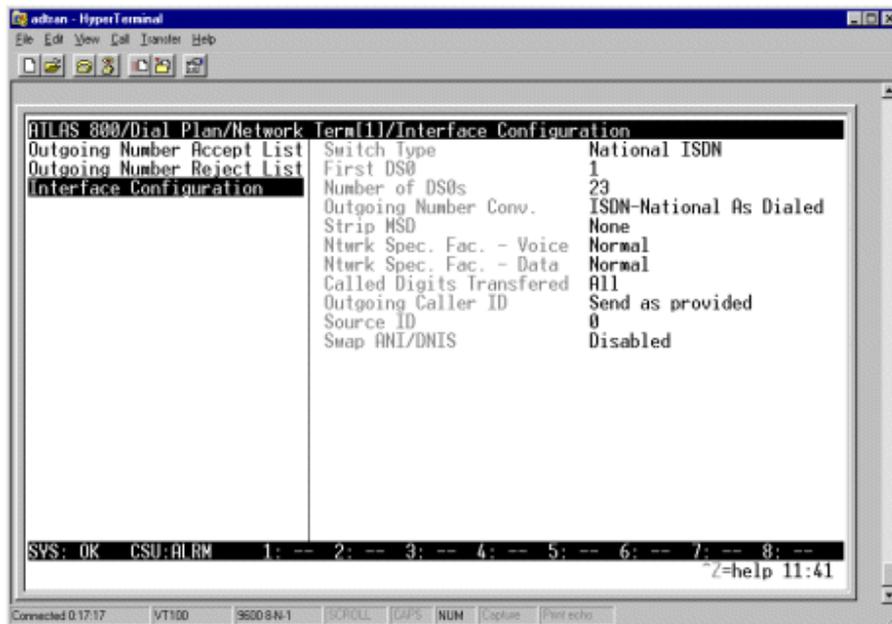


Figure 3

NOTE: The ATLAS automatically uses channel 24 as the D channel. The D channel may not be provided on any other DS0.

Configuring the T1

The T1 is configured in the **User Term** portion of the **Dial Plan**. The **User Term** configuration consists of the following fields:

1. **In # Accept**
2. **Out # Rej**
3. **Signaling**
4. **Infce Config**
 - o **First DS0**
 - o **Number of DS0s**
 - o **Signaling Method**
 - o **Direct Inward Dialing**

NOTE: This is not a complete list of the **Infce Config** features. For simplicity, any field not mentioned in this document remains as default. The **Network Term** (Figure 4) and **Infce Config** (Figure 5) are included for this example configuration.

1. **In # Accept** -- represents the phone numbers associated with the T1 DS0s. Remember that the telco provides these numbers on the PRI. Calls coming into the ATLAS matching the In # Accept list are routed to this port. For example, if all calls to phone numbers 963-1000 through 963-1099 should be routed to the T1 on Sys Ctrl, Port 2 (0.2), the In # Accept list for 0.2 will contain the entry 963-10XX.
2. **Out Number Reject List** -- typically left blank. This feature can also be used to restrict outbound calls. In contrast to the Accept List, the Reject List blocks all calls meeting the criteria entered in this field. For example, an entry of '1\$' blocks all long distance calls going out the PRI.
3. **Signaling** - Signaling for the T1 User Term is RBS
4. **Interface Configuration** -- contains user defined provisioning information for the T1. The user-defined information is local to the ATLAS and the end user equipment. Do not contact your telco for this information; this is completely independent of the PRI provisioning.
 - a. **First DS0** - For most cases this will be the first DS0 or 1. If fewer than 23 B Channels are provided on the PRI or some are used for data, this setting may vary to suit the configuration of the T1 end-user equipment.
 - b. **Number of DS0s** - Normally 23 corresponding to a full PRI, but may be less as previously described. The ATLAS will also permit overbooking to 24 DS0s, additional T1's, or to Basic Rate Interfaces all with the understanding that only 23 calls can go out through the network PRI at one time.
 - c. **Signaling Method** - The signaling method is set for the option corresponding to the method used on the T1 end-user equipment. Ground Start, Loop Start, E&M Wink, and E&M Immediate provide signaling options for most equipment. The Feature Group D selection is used with PBX or similar equipment specially designed for this ANSI standard. When using Feature Group D, a **Global Tone Type** setting for DTMF or MF tones (default is DTMF) must be set under the **Dial Plan**.
Note: The **Global Tone Type** setting affects all trunks.
 - d. **Direct Inward Dial** - DID is enabled to allow presentation of digits to the user equipment. The number of digits sent are selected in the DID Digits Transferred field. This is normally set to the number of incoming digits provided by the telco, such as 7.

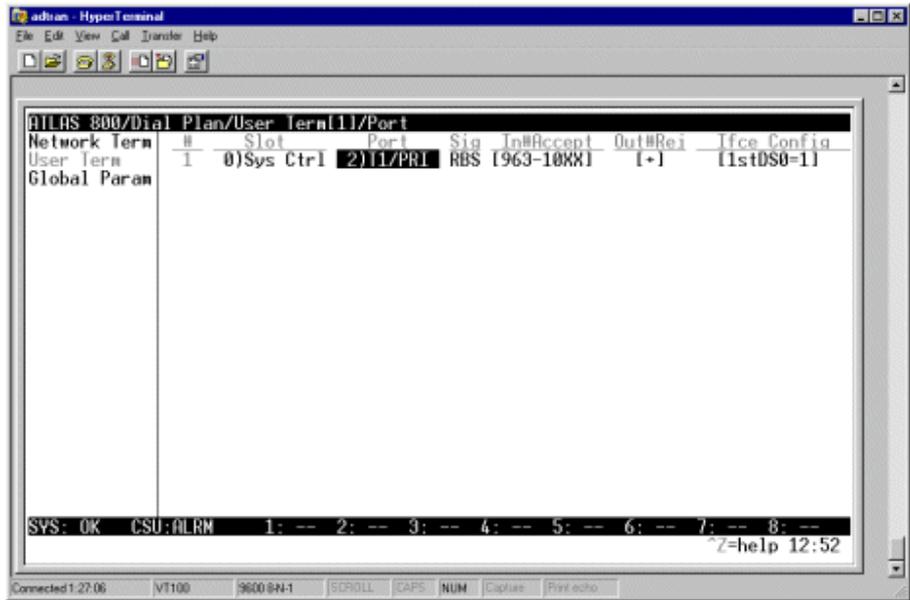


Figure 4

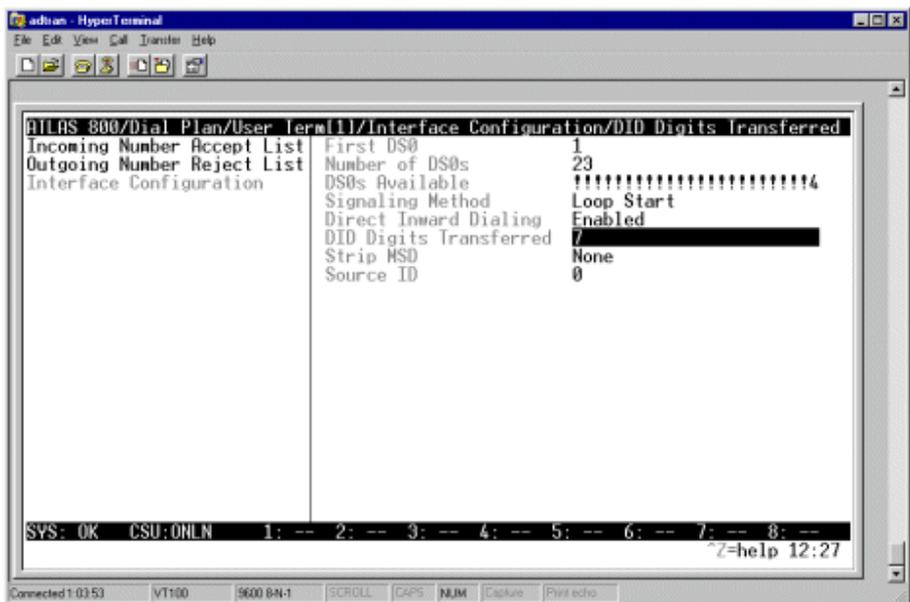


Figure 5

Sample Configuration Files

The sample configuration files (see below) are examples of the application described in this note. These files may not contain all the configuration options needed for your specific application and are not meant to be used as a working configuration for a live network.

WARNING: Loading these sample configuration files will overwrite any existing configuration on your ATLAS product.

NOTE: Prior to loading a configuration file to the ATLAS, disengage any modules currently installed in the ATLAS. The configuration file may contain modules configured in certain slots which conflicts with modules installed in your ATLAS. If a configuration file is loaded onto an ATLAS in which the configured modules do conflict with installed modules, then the portion of the configuration relating to those modules ports will not be loaded.

Download the configuration

1. Download the appropriate configuration file in the right-hand pane of this webpage under Attachments according to which ATLAS product you have.

ATLAS 550	p_r550.cfg
ATLAS 800	p_r800.cfg
ATLAS 800PLUS	p_r800p.cfg
ATLAS 810PLUS	p_r810p.cfg

NOTE: If you don't see the right-hand pane click the "Show Info" button in the top right hand portion of this webpage.

2. Refer to the following section entitled "Loading a Configuration File to an ATLAS Base Unit" for full instructions on downloading the configuration file to the ATLAS unit.

Loading a Configuration File to an ATLAS Base Unit

TFTP downloads require Ethernet connectivity between the ATLAS 10BaseT port and a PC or workstation running TFTP server software. Note that a Windows-based TFTP server is included as a part of ADTRAN Utilities which comes with each ATLAS base unit.

1. Launch the TFTP Server on the PC being used to connect to the ATLAS by going to Start, Programs, ADTRAN Utilities, TFTP Server. Note the server's IP Address that is displayed.
2. Establish a telnet session between the PC and the ATLAS. (Telnet is provided with Windows or ADTRAN Utilities).
3. Select the System Utility menu then press <Enter> on the Config Transfer option.
4. In the TFTP Server IP Address field, enter the IP address of the TFTP server which was noted in step 1.
5. In the TFTP Server Filename field, enter the file name of the configuration file. This .CFG file should be located in the ADTNUTIL folder on the PC's hard drive. NOTE: If the file name of the configuration file is incorrect or the file is not located in the ADTNUTIL folder, then the Config Transfer will fail.
6. Press <Enter> on the Load And Use Config to begin the transfer. The current configuration of the ATLAS will now be overwritten with the contents of this new configuration file. The ATLAS will perform a quick reboot once the transfer is complete.