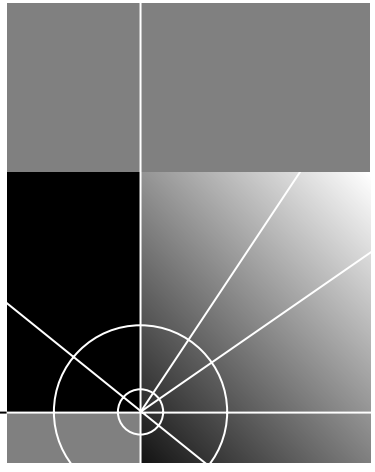
Total Control System Application Guide

PPP Dial-in / IP Network / PRI NETServer / Quad Modems

Part No. 1.024.1847-00
Version Number 1.0

Total Control System Application Guide

Point-to-Point Protocol (PPP) Dial-in Access To an Internet Protocol (IP) Network Over Primary Rate Interface (PRI) Lines: NETServer and Quad Modems



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Part No. 1.024.1847-00

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YEAR 2000 INFORMATION:

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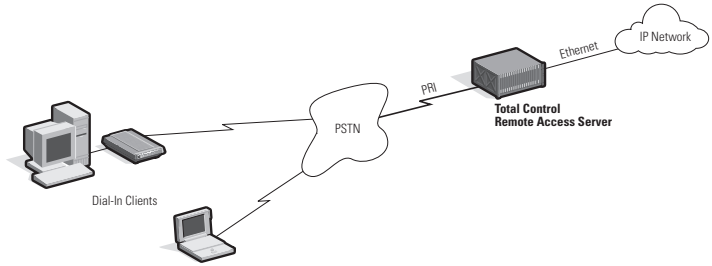
CONFIGURATION INSTRUCTIONS

This document explains how to configure the Total Control remote access server to allow dial-in PPP clients access to an IP network. It assumes that the Total Control server is connected to the public switched telephone network (PSTN) by an ISDN primary rate interface (PRI) line.

The following diagram and tables show the components of this application.



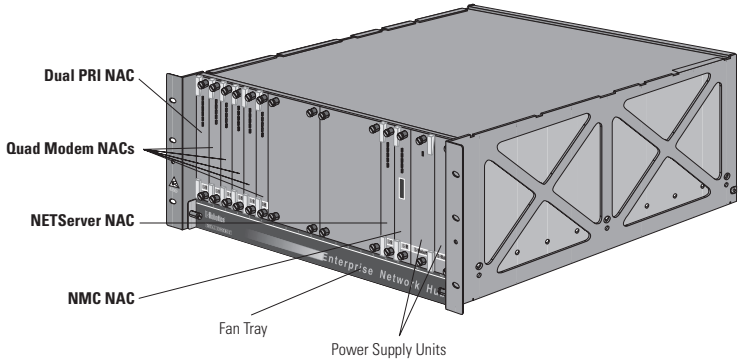
Clients	Analog modem or ISDN
WAN protocols	IP over PPP
WAN connection	ISDN PRI
LAN protocols	IP over Ethernet

Cards / Software	**Software/Firmware Version**
Dual PRI NAC & Dual T1 NIC	3.0.2
Quad Modem NACs	5.10.9 (ss), 5.9.9 (ds)
NETServer/PRI NAC & Ethernet NIC	3.7.24
NMC & Ethernet NIC	5.4.1 (386/4; 486/4), 5.5.2 (486/16)
Total Control Manager/SNMP for Windows	5.5.1
NETServer Manager for Windows	3.4.2

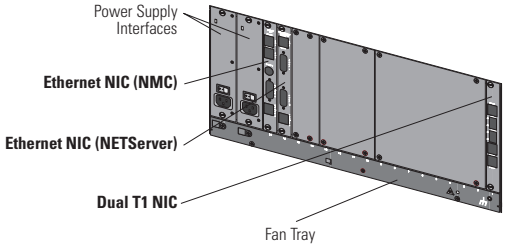
Chassis Configuration

In this application, the Total Control chassis contains the following network application cards (NACs), which are loaded from the front, and network interface cards (NICs), which are loaded from the back.

Cards	Functions
Dual PRI NAC & Dual T1 NIC	Terminates the PRI line and passes analog calls to modems in the Quad Modem cards; digital calls directly to the NETServer
Quad Modem NACs	Terminates modem connections from dial-in clients and communicates with NETServer
NETServer NAC & Ethernet NIC	Routes data between dial-in clients and an Ethernet network
NMC & Ethernet NIC	Handles SNMP management and software updates on behalf of the other cards and components of the Total Control system



Front view of the Total Control chassis in this application



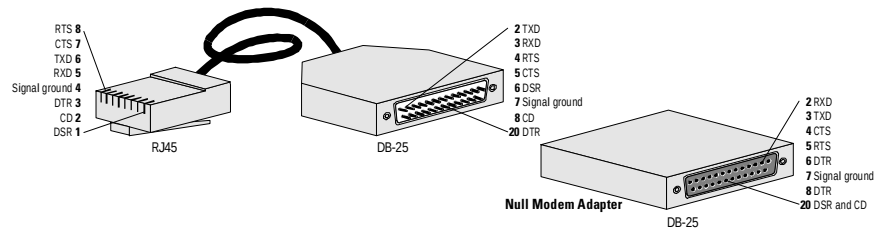
Back view of the Total Control chassis in this application

Preparing the System to Be Managed

This section explains how to make a local serial connection to the NMC and then the NETServer and set IP parameters. This enables you to manage the chassis remotely using an SNMP-based management application, such as Total Control Manager.

Communicating with the Console Interface

1. Connect the DB-25 end of the cable shown in the following diagram to a serial port of your computer.
2. Connect the RJ-45 end of the cable shown in the following diagram to the console port of the NMC's Ethernet NIC. The console port is the topmost port of the NIC.



Pinouts for the serial cable [8-pin RJ-45 jack, DB-25 (male), DB-25 (female) with adapter]

3. On your computer, start any communications application that is capable of sending commands to your computer's serial port. An example is HyperTerminal for Windows.
4. Configure your communications application to use the COM port to which the serial cable is connected, plus the following settings:

Settings for serial communication with the NMC's console port

Port speed	9600 bps (default)
Terminal type	VT100
Data bits	8
Parity	None
Stop bits	1
Flow control	None

5 Press **<Enter>** several times, until the NMC's console interface appears. Then continue with *Configuring the NMC*.

If garbled messages appear on the screen, try changing the serial port speed from 9600 to 57600, 38400, or 19200 bps.

Configuring the NMC

Follow this procedure to configure the NMC.

1 Set IP parameters for the NMC.

```
Main Menu
 1 Configuration
    1 Local LAN IP Address
       1 LAN IP Address
          Enter New LAN IP Address:
             x.x.x.48 <Enter>
       2 LAN IP Subnet Mask
          Enter New LAN IP Subnet Mask:
             255.255.255.x <Enter>
          <Esc>

    3 Local Gateway IP Address
       Enter New Gateway IP Address:
          x.x.x.62 <Enter>

    5 Local SNMP Community Strings
       1 SNMP Read-Only (Public) Community String
          Enter New SNMP Read-Only (Public) Community Stri
             your_read-only_access_password <Enter>
       2 SNMP Read-Write (Private) Community String
          Enter New SNMP Read-Write (Private) Community St
             your_read-write_access_password <Enter>
    <Esc>
```

2 Save the configuration.

```
 Configuration
    9 Save Configuration To Non-Volatile Memory
    <Esc>
 <Esc>
```

3 Reset the NMC.

```
Main Menu
 2 Command
    1 Reset
       Enter (Y) to Reset NMC:
          y <Enter>
```

Configuring the NETServer

Follow this procedure to configure the NETServer.

1 Unplug the serial cable from the NMC's Ethernet NIC and connect it to the topmost serial port in the NETServer's Ethernet NIC. Use the same communications program with the same settings.

If garbled messages appear on the screen, try changing the serial port speed from 9600 to 57600, 38400, or 19200 bps.

2 Log in to the NETServer.

```
NETServer Console login: !root
Password: <Enter>
Command>
```

3 Set IP parameters.

```
Command> set net0 address x.x.x.49
Local (net0) address changed from 192.77.203.194 to x.x.x

Command> set net0 netmask 255.255.255.0
net0 netmask changed from 255.255.255.192 to 255.255.255.

Command> set gateway x.x.x.62
Gateway changed from 0.0.0.0 to x.x.x.62, metric = 1
```

4 Save the configuration.

```
Command> save all

Defragmenting flash filesystem...
Saving global configuration
[...]
MPIP Clients Table Saved

Commiting configuration to FLASH.
Command>
```

5 Reboot the NETServer.

```
Command> reboot
Rebooting NETServer Card....
Command>
```

Preparing the Management Workstation

At a workstation, install Total Control Manager and NETServer Manager (if they are not already installed). Connect to the same IP network as the chassis. Ping the chassis from the workstation to make sure you can reach it. If not, solve your IP-connectivity problem before continuing.

These are the code versions for the software and firmware used in this application. All except NETServer Manager are part of Total Control system release 3.1.1.

Software versions in this application

Program	Code version
Total Control Manager/SNMP for Windows	5.5.1
NETServer Manager for Windows	3.4.2

Table 1 Firmware versions used in this example

Card	Code version
NETServer/PRI for Ethernet	3.7.24
Quad V.34 Modem NAC, single-sided	5.10.9
Quad V.34 Modem NAC, dual-sided	5.9.9
Dual PRI NAC	3.0.2
NMC, 386 MHz / 4 MB RAM; 486 MHz / 4 MB RAM	5.4.1
NMC, 486 MHz / 16 MB RAM	5.5.2

NETServer hardware revision must be 5.0.0 or higher to run 3.7.24 code.

If Total Control Manager is already installed, start it, then from the **Help** menu, click **About Total Control Manager**. The software version should read 5.5.1.

Getting and Installing Total Control Manager and NETServer Manager

You can get both Total Control Manager and NETServer Manager from the TOTALservice web site, if you are a contract customer. Refer to **http://totalservice.3com.com/** for details.

To find the software, first log in to TOTALservice. Go to **Latest Code**. Total Control Manager is in the **Total Control Hub** section and NETServer Manager is in the **NETServer 8/16** section.

Installing Total Control Manager

1. Unzip the file into a temporary directory. Four subdirectories are created:
   - \accounti (Accounting Server)
   - \alarms (Alarm Server)
   - \tcm (Total Control Manager)
   - \view (View)
2. Run **Setup** from the \tcm directory. Total Control Manager installs itself.

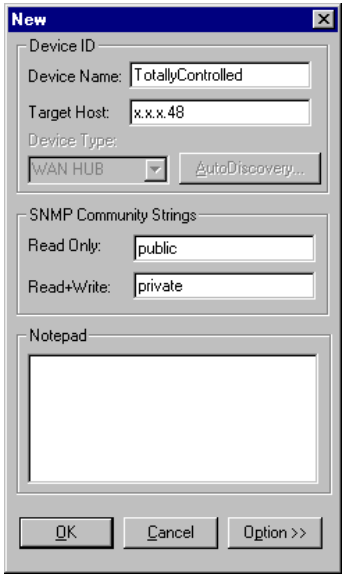
Installing NETServer Manager

1. Unzip the file into a temporary directory.
2. Run **Setup**. Be sure that NETServer Manager installs within the \usrsuite directory (where Total Control Manager is installed).

Inventorying the Chassis

Inventory the chassis to determine the firmware versions of all the cards. If they are not current, get and install new firmware.

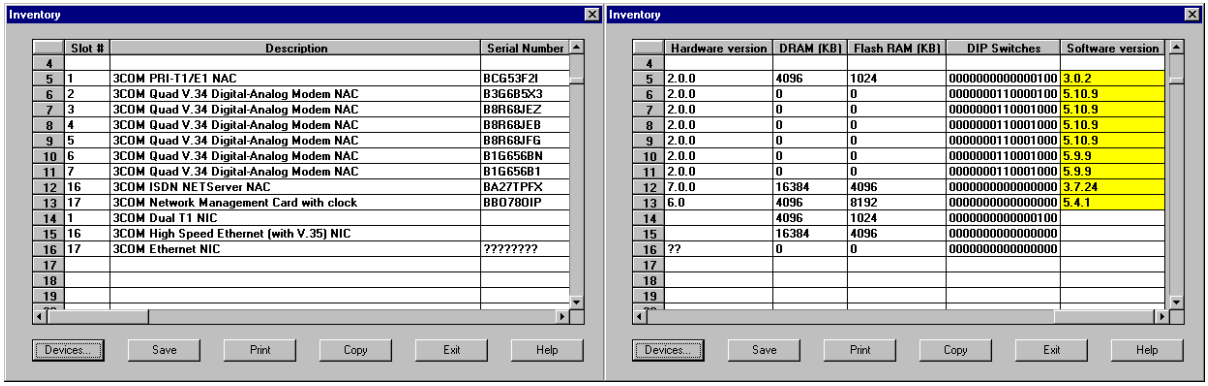
1. Start Total Control Manager.
2. From the **File** menu, click **New...**



3 Enter a name for the chassis (this name is used for identification purposes within Total Control Manager) the IP address you assigned to the NMC, and SNMP community strings (passwords), if you entered them. Click **OK**.

4 When the chassis appears, from the **Configure** menu, click **Inventory**.

5 Select the chassis from the list, then click **OK**. The inventory appears.



6 Scroll to the far right and find the Software Version column. Compare the versions against those in Table 1. Then click **Exit**.

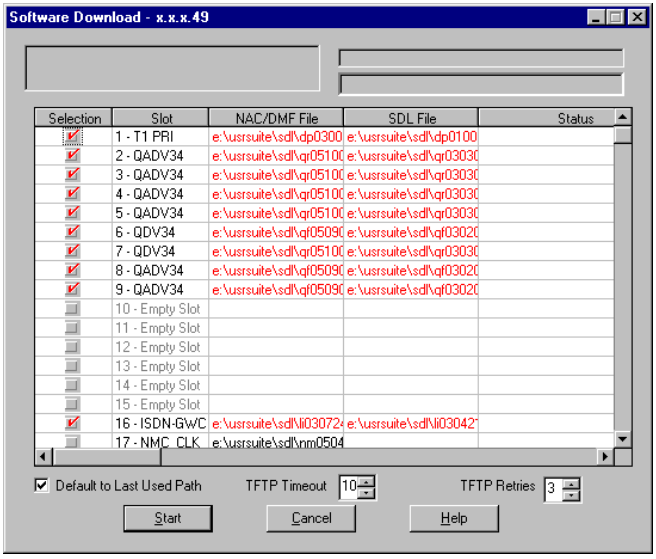
If you need new firmware, you can get it from the TOTALservice web site (if you are a contract customer). Refer to **http://totalservice.3com.com/** for details. To find the firmware, log in to TOTALservice. Go to **Latest Code** for the **Total Control Hub**.

Updating the Firmware

Firmware from the TOTALservice web site is in compressed ZIP files.

1 Unzip the SDL and NAC files to the \usrsuite\sdl directory.

2 From the **Configure** menu, click **Software Download**. Total Control Manager associates the files with the correct cards.



3 Select the cards you want to update, then click **Start**.

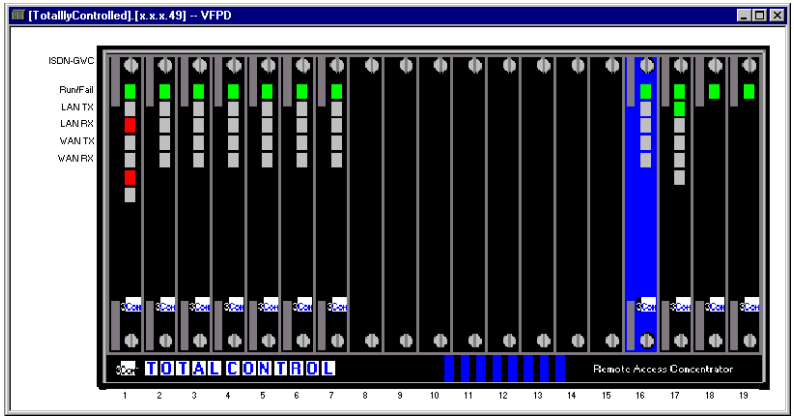
4 When the box in the upper left reads *Software download completed*, click **Done**.

Software download is complete. Continue with Configuring the NETServer Card.

Configuring the NETServer Card

Use this procedure to set up dial-in ports and users in the NETServer card.

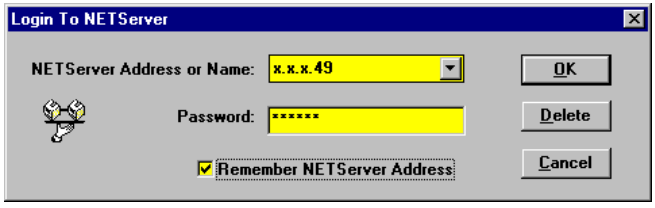
1 Select the NETServer (indicated as ISDN-GWC in the far left of the window).



2 From the **Configure** menu, click **Programmed Settings**.

3 From the **Parameter Group** list, select **NETServer Configuration**.

NETServer Manager launches.

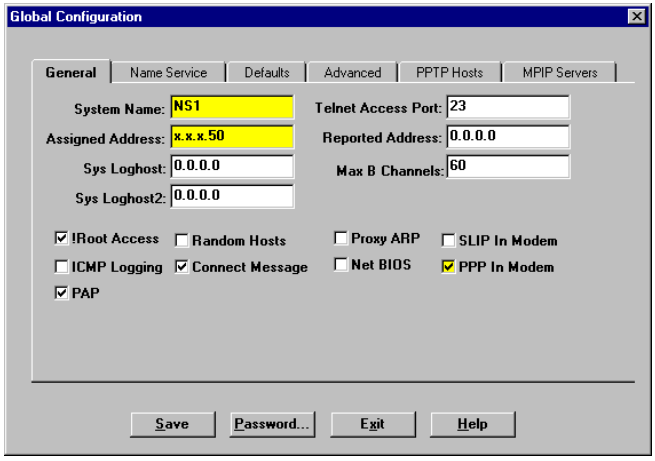


4 Log in to the NETServer. Type the IP address of the NETServer. If you set a password previously, type it. Select **Remember NETServer Address**.

The window that appears displays the current status of the NETServer. Perform all configuration using the Tables menu.

Configuring Global Settings

1 From the **Tables** menu, click **Global**. The Global Configuration window appears.

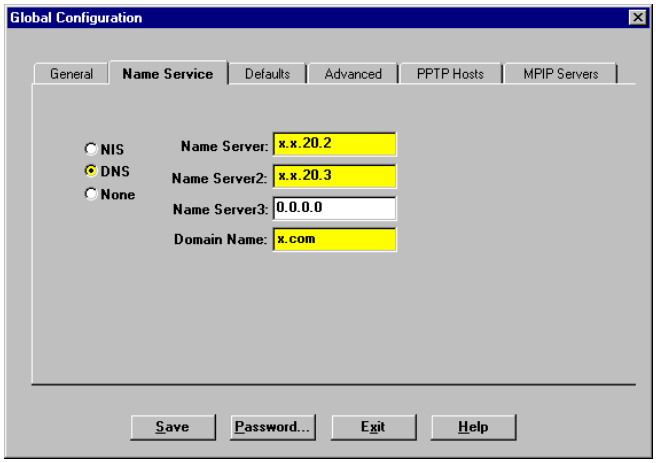


2 Fill in the following fields:

- In the System Name field, type the name of the NETServer as it will be used for DNS.
- In the Assigned Address field, type the first address in the pool of addresses to assign to dial-in users.

3 Click **PPP in Modem**.

4 Click the **Name Service** tab.

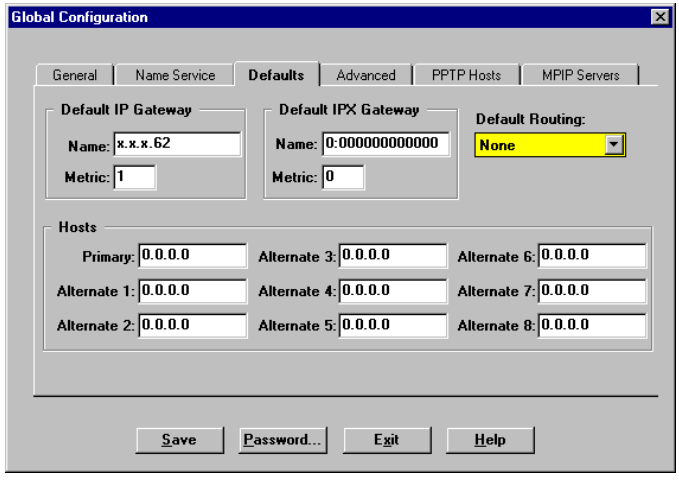


5 Choose the type of name service to use. DNS is used in this example.

6 Fill in the following fields:

- In the Name Server field, type the IP address of your primary name server.
- In the Name Server2 field, type the IP address of your secondary name server [optional].
- In the Domain Name field, type the NETServer's domain name (for this to work, you must also register your host with a DNS server).

7 Click the **Defaults** tab.

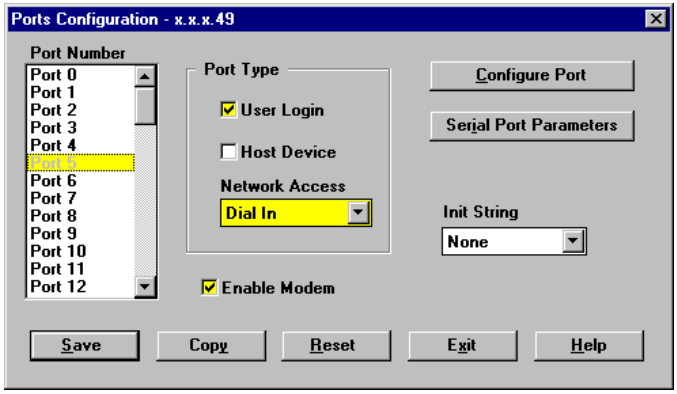


- Select a Default Routing option: None, Broadcast, Broadcast & Listen, or Listen.
- Default IP Gateway should already be entered.

8 Click **Save**. A success message appears. Click **OK**, then click **Exit**.

Configuring Ports

1 From the **Tables** menu, click **Ports**.



- Port 0 is the serial console port on the NETServer's Ethernet NIC.
- Ports 1–4 are statically assigned to slot 1, which is being occupied by the Dual PRI NAC. Skip them.
- Port 5 (the first port in slot 2) is the first modem port, assuming that there is a Quad Modem card in slot 2.

2 Select Port 5, then select Port Type: **User Login**, Network Access: **Dial In**, and **Enable Modem**.

3 Click **Save**, then **Save Selected - Port 5**, and then **OK**. A success message appears. Click **OK**.

4 Click **Reset**, then **Reset Selected - Port 5**, and then **OK**.

5 Copy Port 5's configuration to the rest of the ports:

a Click **Copy**. A Copy Ports window appears.

b Select **Port 5** in the Copy From section.

c Select **Port 6** in the Copy To section, hold [Shift], scroll down to Port 64 and then click **Port 64**.

d Click **Copy**. A success message appears. Click **OK**, and then click **Exit**.

6 Select **Save**, then **Save All**, and then **OK**. When the message *Port save completed* appears, click **OK**.

7 Select **Reset**, then **Reset All Ports**, and then **OK**. A success message appears. Click **OK**, and then click **Exit**.

Configuring RADIUS [Optional]

NETServer can either manage its own user lists or act as a RADIUS client to your RADIUS server. As a RADIUS client, when NETServer receives a call, it prompts the user for a username and password. If the user data is not in NETServer's database, it passes the user data to the RADIUS server, which it knows by the IP address you enter in this section.

1 From the **Tables** menu, click **RADIUS**.

2 Under Primary Server Address, type the IP address of your primary RADIUS security server.

3 Under Alternate Server Address, type the IP address of your alternate RADIUS security server [optional].

4 Click **RADIUS Secret**. Type in the secret, then type it again to verify it. Click **OK**.

5 Click the **Accounting** tab.

6 Under Primary Server Address, type the IP address of your primary RADIUS accounting server.

7 Under Alternate Server Address, type the IP address of your alternate RADIUS accounting server [optional].

8 Click **RADIUS Secret**. Type in the secret, then type it again to verify it. Click **OK**.

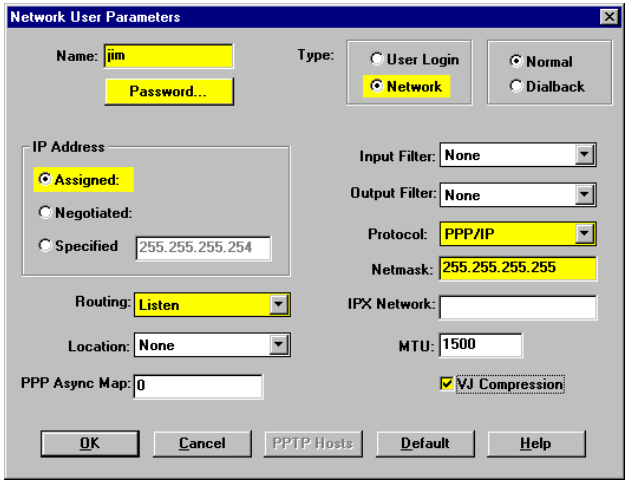
9 Click **Save**. A success message appears. Click **OK**, and then click **Exit**.

Adding users to NETServer

Even if you are using RADIUS for authentication, add a user to the NETServer for test purposes.

1 From the **Tables** menu, click **Users**.

2 Click **New**.



3 In the Network User Parameters dialog:

   a Type a user name.

   b Click **Password**. Enter a password for the user. Verify the password. Click **OK**.

   c For Type, select **Network**; IP Address: **Assigned**; Routing: **Listen**; Protocol: **PPP/IP**; Subnet Mask: **255.255.255.255** (with this subnet mask NETServer figures out the correct one itself); **VJ Compression**

   d Click **OK**. A success message appears, click **OK**.

4 Add additional users as needed. Click **Exit** when finished.

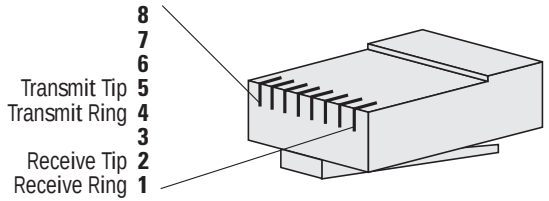
5 From the **File** menu, click **Save to FLASH**. A success message appears, and asks if you want to save the configuration to disk. Click **Yes**.

6 From the **File** menu, click **Reboot NETServer**. An *Are you sure?* message appears. Click **Yes**.

NETServer configuration is complete. Continue with Configuring the Dual PRI Card.

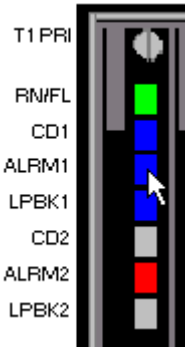
Configuring the Dual PRI Card

1 Connect a PRI line to the SPAN 1 jack. Use a straight-through cable with an RJ-48C (RJ-45) 8-pin modular jack with the following pinout:



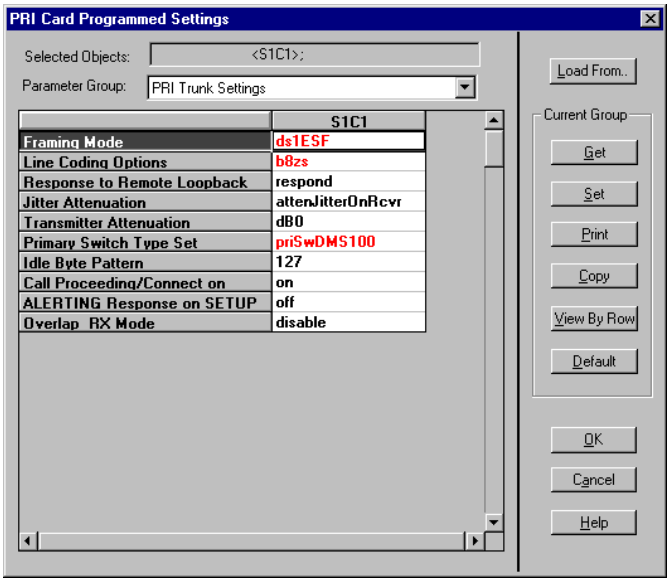
If the physical layer connection is good, the Alarm light [red] goes off and the CD light [green] goes on.

2 From Total Control Manager, click the *LEDs* (when you click one, the others are also selected) for the span you want to configure.



3 From the **Configure** menu, click **Programmed Settings**.

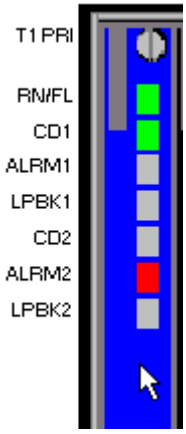
4 Select the **PRI Trunk Settings** parameter group.



5 Double-click each parameter to change. Set Framing Mode: usually **ESF**, Line Coding Options: usually **B8ZS**, Primary Switch Type Set (depends on the switch from which your PRI line originates; here, it's Nortel DMS-100).

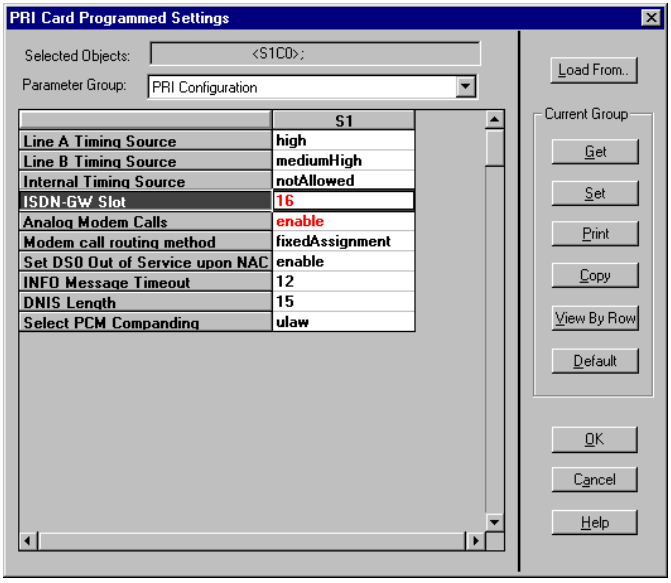
6 Click **Set**, then click **OK**.

7 Click the *face* of the T1/PRI card (not the LEDs).



8 From the **Configure** menu, click **Programmed Settings**.

9 Select the **PRI Configuration** parameter group.



10 Make the following settings:

- ISDN-GW Slot: **16** (the number of the NETServer's slot)
- Analog modem calls: **Enabled**

11 Click **Set**, then click **OK**.

12 Select the body of the PRI card, then, from the **Configure** menu, click **Actions/Commands**.

13 Under **Command to execute**, select **Software**, then **Save to NVRAM**.

14 Select **Execute** to save the configuration.

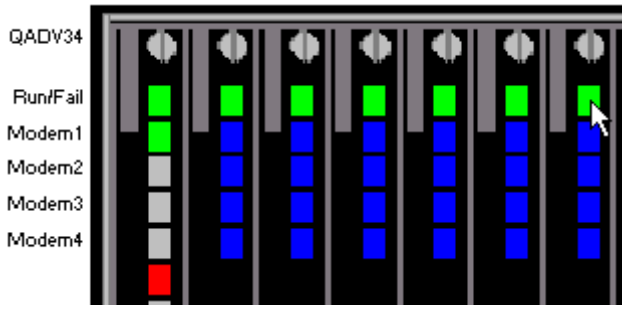
15 Under **Command to execute**, select **Software Reset**.

16 Select **Execute** to reset the PRI card. Then select **Close**.

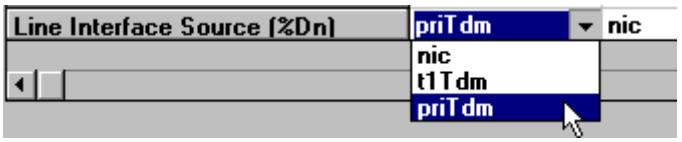
Dual PRI card configuration is complete. Continue with Configuring the Quad Modem Cards.

Configuring the Quad Modem Cards

1. Click the top LED of the one of the Quad Modems, then press and hold [Ctrl], then click each top LED of the other Quad Modem cards.



2. From the **Configure** menu, click **Programmed Settings**.
3. Under **Parameter Group**, select **Line Interface Options**.



4. Under **Line Interface Source**, change each to **priTdm**. Click **Set**, then click **OK**.
5. Select the top LED of each card.
6. From the **Configure** menu, click **Actions/Commands**.
7. Under **Command to execute**, select **Software**, then **Save to NVRAM**.
8. Select **Execute** to save the configuration.
9. Under **Command to execute**, select **Software Reset**.
10. Select **Execute** to reset the Quad Modem card. Then select **Close**.

The system is now configured to accept calls.

Making a Test Call

This section explains how to make a test call from a Windows 95 PC using Dial-Up Networking.

1. From the **Start** menu, click **Programs**, then click **Accessories**, then click **Dial-Up Networking**.
2. Double-click **Make New Connection**.
3. Type a name for the new connection and select a modem to use for the call.
4. For the **Telephone number**, type the number assigned to the PRI line. Click **Next**, then click **Finish**.
5. Right-click on the icon for your new connection. From the menu that appears, click **Properties**.
6. Click the **Server Types** tab. Deselect everything except **Enable software compression** and **TCP/IP**. Click **OK**.
7. Double-click your new connection icon. Type the username and password of the account you created on the NETServer. Then click **Connect**.

The modem should answer.

8. From the Windows **Start** menu, click **Run**.
9. In the **Open** field, type **ping**, then press [Enter]. A PING dialog appears.
10. Type the IP address of the NETServer, then press [Enter].

You should see *Reply from* messages.

The configuration is verified.

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