Compact T1
USER MANUAL

Supporting Software Version:

Controller 6.1

IP Router 1.6

CMG Router 2.0

PREFACE

Compliance

FCC Requirements for Telephone-Line Equipment

1. The Federal Communications Commission (FCC) has established rules which permit this device to be directly connected to the telephone network with standardized jacks. This equipment should not be used on party lines or coin lines.

2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until the repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. If you have problems with your telephone equipment after installing this device, disconnect this device from the line to see if it is causing the problem. If it is, contact your supplier or an authorized agent.

4. The telephone company may make changes in its technical operations and procedures. If any such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.

5. If the telephone company requests information on what equipment is connected to their lines, inform them of:

   a. The telephone number that this unit is connected to.
   b. The ringer equivalence number.
   c. The USOC jack required: RJ-11C.
   d. The FCC registration number.

Items (b) and (d) can be found on the unit's FCC label. The ringer equivalence number (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the RENs of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

6. In the event of an equipment malfunction, all repairs should be performed by your supplier or an authorized agent. It is the responsibility of users requiring service to report the need for service to the supplier or to an authorized agent.

Certification Notice for Equipment Used in Canada

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications-network protective, operation, and safety requirements. The Department 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 (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—in this case, your 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 water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION! USERS SHOULD NOT ATTEMPT TO MAKE SUCH CONNECTIONS THEMSELVES, BUT SHOULD CONTACT THE APPROPRIATE ELECTRIC INSPECTION AUTHORITY, OR 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 requirement that the total of the load numbers of all the devices does not exceed 100.

Federal Communications Commission and Canadian Department of Communications Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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

 This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

Normas Oficiales Mexicanas (NOM) Electrical Safety Statement Instrucciones de Seguridad

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

A: El cable de poder o el contacto ha sido dañado; u

B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

C: El aparato ha sido expuesto a la lluvia; o

D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

E: El aparato ha sido tirado o su cubierta ha sido dañada.

Safety Information

CAUTION! **ALWAYS USE CAUTION WHEN INSTALLING TELEPHONE LINES. READ THE CAUTIONS BELOW FOR DETAILS ON SAFETY GUIDELINES TO PREVENT INJURY.**

- **Never touch uninsulated telephone wires and terminals** unless the telephone line has been disconnected at the Network Interface (NI) as voltage potentials as high as 300 VAC may be present across the transmit and receive pairs

- **Only use No. 26 AWG or larger** telecommunication line cord, to reduce the risk of fire

- **Never install telephone wiring during a lightning storm**

- **Never install telephone jacks in wet locations** unless the jack is specifically designed for wet locations

- Refer to the installation section of this manual for a safe and proper installation procedure. All wiring external to this equipment should follow the current provision of the National Electrical Code

Notices

This manual contains important information and warnings that must be followed to ensure safe operation of the equipment.

DANGER! A *DANGER* NOTICE INDICATES THE PRESENCE OF A HAZARD THAT CAN OR WILL CAUSE DEATH OR SEVERE PERSONAL INJURY IF THE HAZARD IS NOT AVOIDED.

CAUTION! A *CAUTION* NOTICE INDICATES THE POSSIBILITY OF INTERRUPTING NETWORK SERVICE IF THE HAZARD IS NOT AVOIDED.

WARNING! A *WARNING* NOTICE INDICATES THE POSSIBILITY OF EQUIPMENT DAMAGE IF THE HAZARD IS NOT AVOIDED.

NOTE: A *Note* indicates information to help you understand how to perform a procedure or how the system works. Notes should be read before performing the required action.

Electrostatic Discharge (ESD) Precautions

ESD can damage processors, circuit cards, and other electronic components. Always observe the following precautions before installing a system component.

1. Do not remove a component from its protective packaging until ready to install.

2. Wear a wrist grounding strap and attach it to a metal part of the system unit before handling components. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

WARNING! INTEGRATED CIRCUITS (ICS) ARE EXTREMELY SUSCEPTIBLE TO ELECTROSTATIC DISCHARGE. UNLESS YOU ARE A QUALIFIED SERVICE TECHNICIAN WHO USES TOOLS AND TECHNIQUES THAT CONFORM TO ACCEPTED INDUSTRY PRACTICES, DO NOT HANDLE ICS.

The ESD warning label appears on packages and storage bags that contain static-sensitive products and components.

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Glossary

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CHAPTER 1

Base Platform

In this Chapter

- Overview
- Features
- Dual T1 Controller
- Service Cards
- Local and Remote Management
- Technical Specifications
- Chassis

Overview

The Compact T1 Multi-service Delivery Terminal is the ideal solution for delivering carrier-quality broadband voice and data services to small- and medium-sized businesses. It enables ISPs, ILECs, MSOs, IXCs, CLECs, and wireless mobility carriers to offer their customers a wide variety of voice and high-speed data services using the most economical broadband transport. The Compact T1 defines a new class of equipment that combines multi-network access and multi-service delivery into one platform. The result is an extremely cost-effective, compact, flexible solution that enables service providers to deliver business voice, IP, high-speed data, and private line services using the most economical broadband access available over wireline and wireless networks.

The modular Compact T1 platform supports the needs of service providers faced with a changing array of network technologies, transport media, and customer service interfaces. Its expandable architecture allows service providers to scale across service types, network architectures, and bandwidth requirements to fit a dynamic service delivery environment. Hot-swappable service cards provide the physical, electrical, and logical connections for customer service demarcations, PBX interfaces, LAN to WAN connectivity, and network access. Customer interface types include Routed Ethernet, FXS, FXO/DPT, V.35, V.35/V.54, OCU-DP, ISDN BRI and T1. Any service card can be placed in any of the six available slots. New revenue-generating services can be added easily by installing a new card. In addition, the Customer Media Gateway (CMG) Service Card enables the unit to provide a cost-effective migration path to packet-based softswitching infrastructures using the MGCP protocol for both existing TDM-based infrastructures and Greenfield VoIP applications.

Features

- Allows any service connection or network access line to be deployed in any slot
- Provides integrated 18 T1 port digital cross-connect for service grooming and restoration
- Flexibly provisions a broad variety of services within a single chassis occupying just 2 rack units of equipment space:
  - 18 T1s, or 12 V.35 connections, or 24 OCU-DP terminations, or 12 synchronous RS-232 connections
  - 6 10/100Base-TX IP routers, or 24 10/100Base-TX Ethernet ports, or asynchronous RS-232 remote management ports
- - 48 analog FXS or FXO lines, or 40 ISDN BRI channels
- Supplies integrated dual T1 CSU/DSUs and SNMP management on the Controller
- Support for VoIP services through the Customer Media Gateway (CMG) Service Card
- Enables remote SNMP and Telnet provisioning, monitoring, and testing of services and network conditions
- NEBS certified

Dual T1 Controller

The Controller manage all service cards installed in the unit and have an integrated Dual T1 CSU/DSU functionality and an integrated 1/0 DS0 digital cross-connect for service grooming.

Power Supply

115 VAC/-48 VDC Power Supply/Charger

Enables the Unit to be powered from either 115 VAC or -48 VDC sources, and includes an integral battery charger and ringing generator.

Service Cards

All Service cards are hot-swapable and can be installed in any of the 6 service slots of the chassis.

FXS Service card

The FXS service card is an 8 port Foreign Exchange Station line card. Delivers either outside phone lines or on-premise customer business line services from T1 access circuits.

FXO Service card

The FXO service card is an 8 port Foreign Exchange Office (FXO) or Dial Pulse Termination (DPT) line card. Delivers high-density provisioning of Direct Inward Dialing (DID) or FX0 telephone services from T1 access circuits.

ISDN BRI Service card

The ISDN Basic Rate Interface (BRI) service card is available in a Dual, Quad or Octal port option. The ISDN BRI service delivery interfaces enable delivery of high-density, standards based, ISDN BRI services of T1 access circuits.

OCU-DP Service card

The OCU-DP service card is available in a Single or Quad port option. The OCU-DP interface service allows Digital Data Service (DDS) circuit terminations on the Compact T1 platform. Provides the electrical and physical termination of a 4-wire DDS baseband connection which interfaces with a remote CSU/DSU.

Quad T1 Service card

The 4 port T1 service card enables cost-effective provisioning and expansion of T1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Adit service card. This card requires an Adit system with an T1 Controller.

V.35 and V.35/54 Service cards

The Dual port V.35 interface service card provides connectivity to high-speed serial synchronous Data Terminal Equipment (DTE) devices.

IP Router Service card

The Single port Router card that provides up to 60 DS0s of bandwidth or up to 24 WANS connections per Router card.

CMG Router Service card

The CMG Router card provides all IP Router card functions and features, along with VoIP features.

Local and Remote Management

The Controller cards have several local and remote management options available. Front-panel LEDs quickly communicate alarm, system and line status. The cards can be configured and managed locally through the RS-232 or Ethernet management connections using a Command Line Interface (CLI).

A number of remote management options are available to reduce truck roll costs for most maintenance and troubleshooting activities. The in-band DS0 management channel on the controller delivers 64 Kbps remote access to the Compact T1 without incurring additional facilities costs. Alternatively, as separate Ethernet facility can be deployed to support out-of-band SNMP network management.

Technical Specifications

Platform Features

- Wide selection of service cards
- Hot-swapable service cards
- Integrated 1:0 Digital Cross Connect Switching with 18 full T1s

Basic System

The basic configuration has the following:

- Two T1 network interfaces
- Maximum capacity of 48 voice channels, on 6 eight-channel cards
- 6 x universal service cards
- Status and alarming LEDs

Management

- SNMP management over 10Base-T or dedicated DS0
- Remote management over T1 ESF Facility Data Link or dedicated DS0

Management Ports

- RS-232 Craft Port for connection through any VT100 terminal, PC, or modem for remote management using Command Line Interface (CLI)
- 10Base-T Ethernet Port for management of the Controller card

Network Interface

- T1
- Framing: SF (D4) or ESF
- Line code for T1: B8ZS and AMI
- Framing for T1: SF (D4) or ESF

Network Standards

- ANSI/TIA T1.403 ESF FDL

Clocking

- T1 loop timing with hold-over
- Internal 4E Stratum clock with hold-over

Alarms

- External Alarm: 6-pin connector (rear), 1 input, 2 outputs for major/minor alarms
- T1: LOS, BPV, Yellow, LOF/AIS

Testing and Diagnostics

- T1 loop code
- V.54 loop codes, QRSS, 2047, 220-1, 215-1 test patterns

Power

- Standard 115VAC/-48VDC Power Supply/Charger features
  - Power supply with integrated battery charger
  - AC power: 90 to 130 VAC, 60 Hz
  - DC power: -42 to -60 VDC @ 3.5 A max
  - DC power: 24 VDC @ 6 A max
  - Maximum power: 115 W

Rear Chassis Interfaces

- 1 x RS-232 DB-9 female jack
- 1 x 2 pin modular plug for AC or DC power feeds (depending on power supply installed)
- 1 x 2 pin modular plug for -48 V/Battery (with 115V Power Supply installed)
- 1 x 10/100Base-T Ethernet RJ-45 jack
- 2 x RJ-48C jacks
- 2 x 6 pin modular receptacle for alarm relay output
- 2 x 25 pin Telco connectors
- 2 x 3/16 inch threaded stud for grounding

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- FCC Part 68
- NEBS Level 3 certified for type 2 and 4 equipment
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A
- CS-03

Physical Information

- Dimensions: 3.5 in. (H-2 RU) x 8.5 in. (W) x 12 in. (D)
                8.9 cm (H) x 21.6 cm (W) x 30.5 cm (D)

- Weight: 7 lbs. (3.2 kg) base unit (with Power Supply and Controller)

Chassis

Controller   **Service Card Slots**   **Power Supply**

3.5 in (2 RU)

Mounting Bracket

8.5 in (1/2 RU)

Power Input

Alarm Management Port

-48 VDC/Battery Power Input

10Base-T Management Port

2 T1/E1 Interfaces on Controller

Tip & Ring Telco Connector (Lines 25-48)

Tip & Ring Telco Connector (Lines 1-24)

RS-232 Management Port
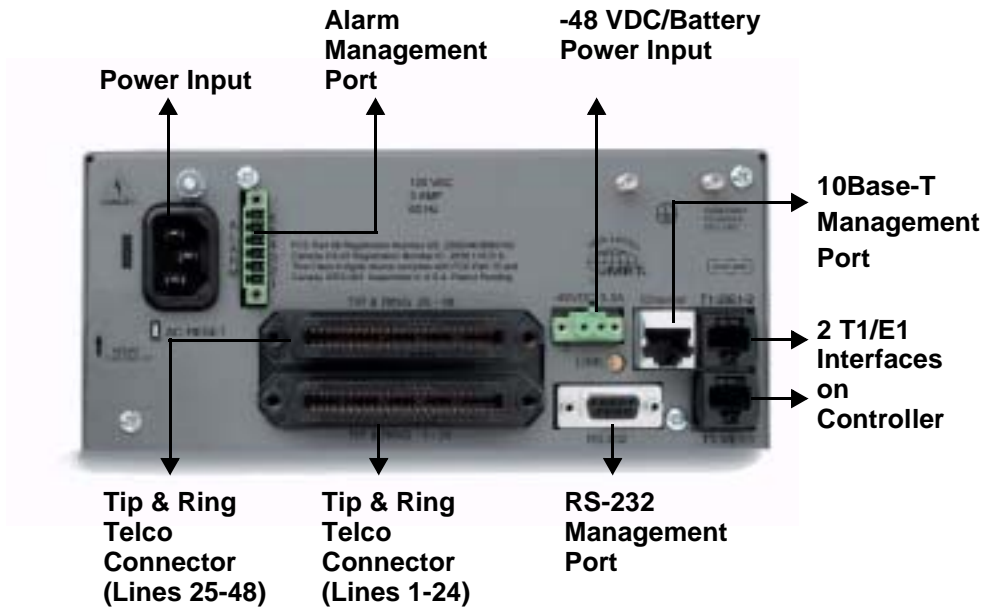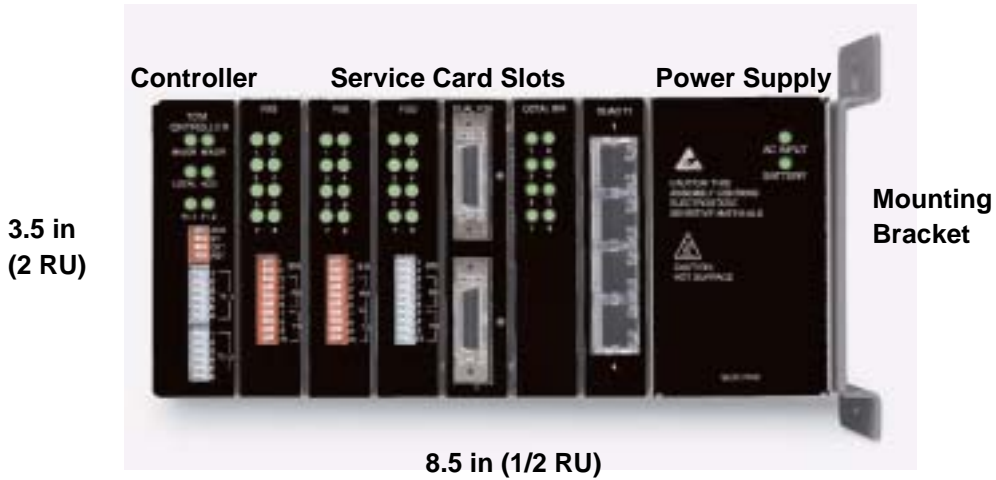
RS-232 Craft Port (Female DB-9)

The RS-232 craft port connects via a female DB-9 connector on the back of the unit.
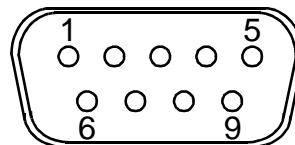
The pinouts are as follows:

Pin Number	Direction	Description
1	Outbound	Carrier Detect
2	Outbound	Receive Data
3	Inbound	Transmit Data
4	Inbound	Data Terminal Ready
5		Signal Ground
6	Outbound	Data Set Ready
7	Inbound	Request to Send
8	Outbound	Clear to Send
9		Not Connected

T1 and 10Base-T Ethernet

The T1 and the 10Base-T Ethernet are female RJ-45 connectors on the back of the unit.

```
1          8
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The pinouts are as follows:

Ethernet (RJ-48C)

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4	N/C	Not connected
5	N/C	Not connected
6	Transmit -	Transmit to network
7 - 8	N/C	Not connected

T1 (RJ-45)

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	N/C +	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 - 8	N/C	Not connected

CHAPTER 2

Physical Installation

In this Chapter

- Unpacking and Inspection

- Installation Environment

- Assembly of Unit

- Wall Mounting

- Rack Mounting (Optional Feature)

Unpacking and Inspection

WARNING! OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC DEVICES.

1. Inspect containers for damage during shipment. Report any damage to the freight carrier for possible insurance claims.

2. Compare packing list with office records. Report any discrepancies to the office.

3. Open shipping containers, be careful not to damage contents.

4. Inspect contents and report any damage.

5. If equipment must be returned for any reason, carefully repack equipment in the original shipping container with original packing materials if possible.

6. If equipment is to be installed later, replace equipment in original shipping container and store in a safe place until ready to install.

Installation Environment

The environment in which you are installing the unit must meet the following conditions:

- Operating temperature range: 32° to 104° F (0° to 40° C)

- Storage temperature range: -40° to 158° F (-40° to 70° C)

- Cooling method is by free air convection, requires long axis of unit to be mounted horizontally

- Maximum operating altitude: 10,000 ft. (3,048 m)

- Maximum non-operating altitude: 40,000 ft. (12,192 m)

- Relative humidity (non-condensing) range: 0 to 95%

For operation outside the defined environment requirements, the unit must be placed in an environmentally controlled enclosure.

Assembly of Unit

The cards should be positioned in the chassis as follows:
Note: Slots are labeled on the top and the bottom of the chassis.

- Power Supply in the POWER Slot

- T1 Controller in Slot A

- Service Cards can be in any slot 1 through 6.
  Note: When an Unit is mounted to the wall, cards that use the front cable connections should be loaded from Slot 6 to 1. This will minimize card access issues due to cable interference.

- Always install blank faceplates in any unused slots.
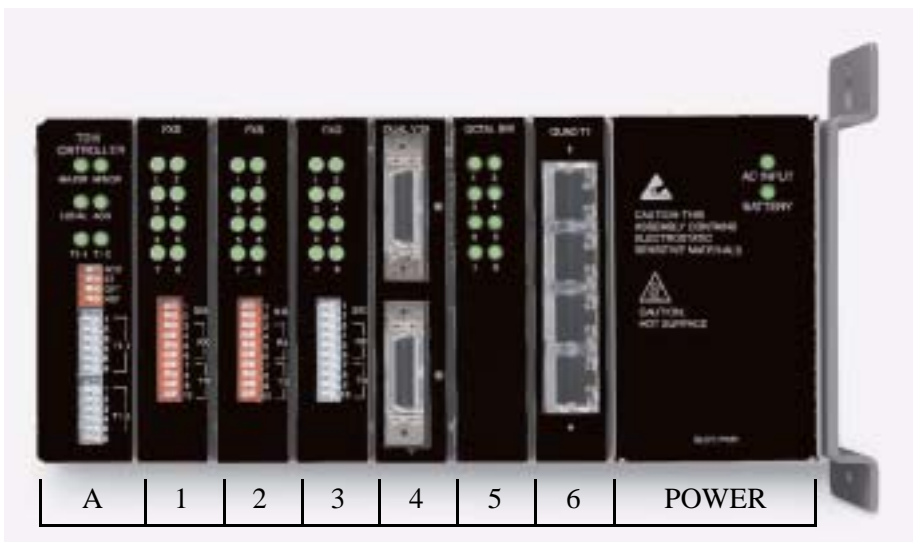
Service Card Slots

Wall Mounting

Before beginning the mounting process, verify that the area meets the following requirements:

● A stable environment, clean and free from extremes of temperature, shock, vibration and EMI, that meets the all installation environment requirements, see *Installation Environment on page 2-2*.

Leave adequate clearance at the back for access to connectors

Mounting Bracket

Leave at least 14" at the front of the unit for access to cards and DIP switches

Leave at least 3.5" above and below the Unit for adequate ventilation

The Unit is delivered with a mounting bracket attached for quick and easy wall mounting, as shown in the illustration above.

To install the unit to the wall, attach the unit using the four screws provided, one at each bracket foot.

NOTE: Do not mount the Unit in any other orientation as show above.

Rack Mounting (Optional Feature)

Rack mounting kits are available for both 19 and 23 inch racks.

To rack mount the Unit, follow the instructions below:

1. Attach bracket ears to rack mounting bracket using four #8-32 x 3/16" screws on each side.
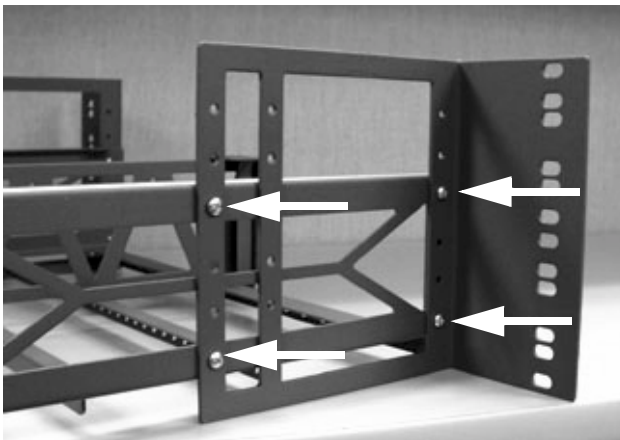
**Bracket Ear
Left Side View**

2. Attach heat baffle to bracket ears using two #8-32 x 5/16" screws on each side.

**Heat Baffle
Left Side View**
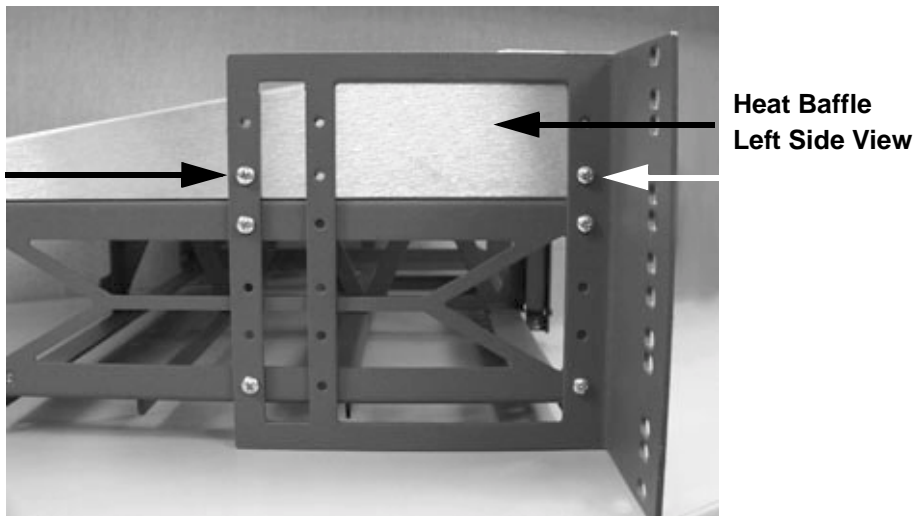
3. Attach rack mounting bracket ears to rack using two #12-24 x 5/8" rack mounting screws on each side.

Front View
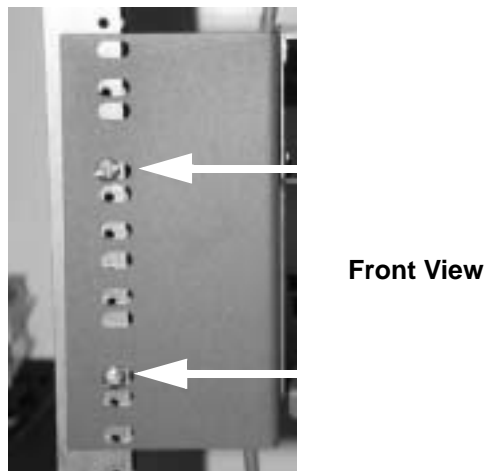
4. Remove wall mount and screws from Unit.

5. Slide the Unit into rack mounting bracket.

Thumbscrew

6. Swing the front latch up to secure the Unit(s), and tighten thumbscrew.

As many as 20 Units can be mounted on a single 7 foot rack, as shown in the following illustration (2 Adits are mounted side-by side and 10 high).

Compact T1 Chassis
occupies 2 RUs

1 RU free space

1 RU free space

1 RU free space

1 RU free space
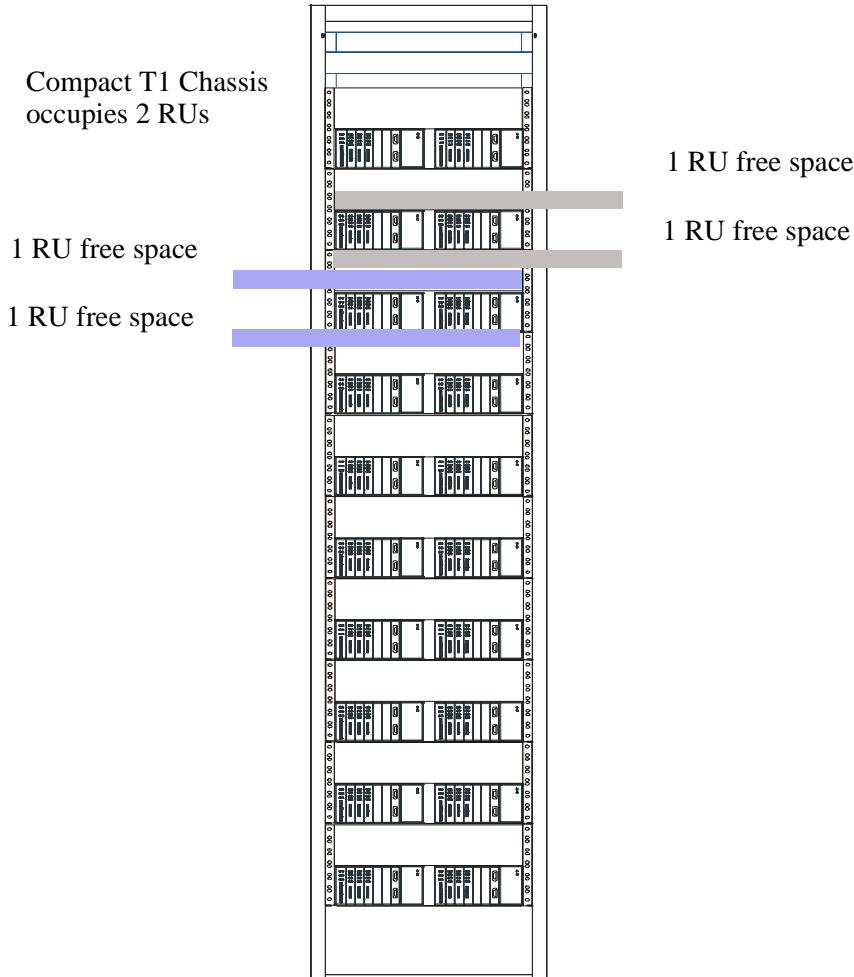
Compact T1 Chassis = 2 RUs (3.5 in) Spacing = 1 RU above and below for **each** unit.

NOTE: the mounting brackets are 7 inches high and will not allow units to be mounted closer than recommended.

CHAPTER 3

Electrical Installation and Cabling

In this Chapter

- Compliant Installation
- Chassis Connectors and Buttons
- Interface Connectors

Compliant Installation

Power Cables

Ferrite Beads
are in red

Ferrite Bead
with cable loop

Power Cord

Grounding Cable

Alarm Wiring

-48 VDC Battery Power

25-pair telco connector

25-pair telco connector
RS-232 craft port
10Base-T Ethernet
T1/E1 connectors
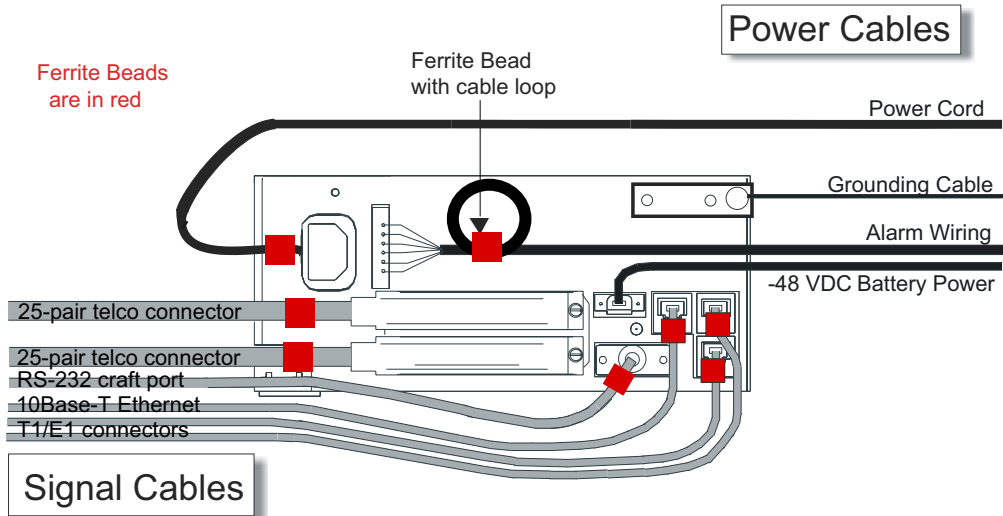
Signal Cables

1. Connect all of the signal cables as shown in the illustration above, and secure them with a plastic tie. Dress the signal cables toward the left of the unit.

2. If using the 115V Power Supply, connect the -48 VDC battery power cable

3. Secure the ground lugs to the terminals using the nuts provided.

4. Secure the power cable and the ground cable with a plastic tie (not included). Keep these cables separate from the signal cables.

5. Terminate each signal cable to its appropriate connector.

6. Secure the signal cables using the small holes along the bottom of the rack and plastic ties (not included).

NOTE: It is important that the Signal Cables are secured separately from the Power Cables, for proper equipment operation.

Ferrite Beads

To be compliant with Part 15A of the FCC and for NEBS compliant facilities, the following beads are included with each chassis, as well as additional ferrite bead(s) with the Service cards listed below.

Ferrite Beads shipped with Adit chassis:

Ferrite Provided	Intended For
1 large	(1) Power (AC or DC) cable
3 small	(2) One on each T1 cable (1) Ethernet (10Base-T) cable

Service Card Cables that Require Additional Ferrite Beads:

Card	Ferrites Shipped with Card	Intended For
ISDN BRI	2 large	(1) 25-pair Telco cable (ISDN BRI card in slot 1-3 top telco, 4-6 bottom) (1) Alarm cable (requires a loop through the bead, see drawing above)
OCU-DP	1 large	Alarm cable (requires a loop through the bead, see drawing above)
Quad T1	2 large	T1 cables from front of Quad T1card (1 bead can hold 1-4 cables) **or,** (2) One on each 25-pair Telco cable
IP Router	1 small	Ethernet Cable (from front of card)
CMG Router	1 small	Ethernet Cable (from front of card)

For additional information on Ferrite beads and their installation on the unit, please contact Customer Support.

Chassis Connectors and Buttons

The following illustrations show all connectors on the back of the unit.
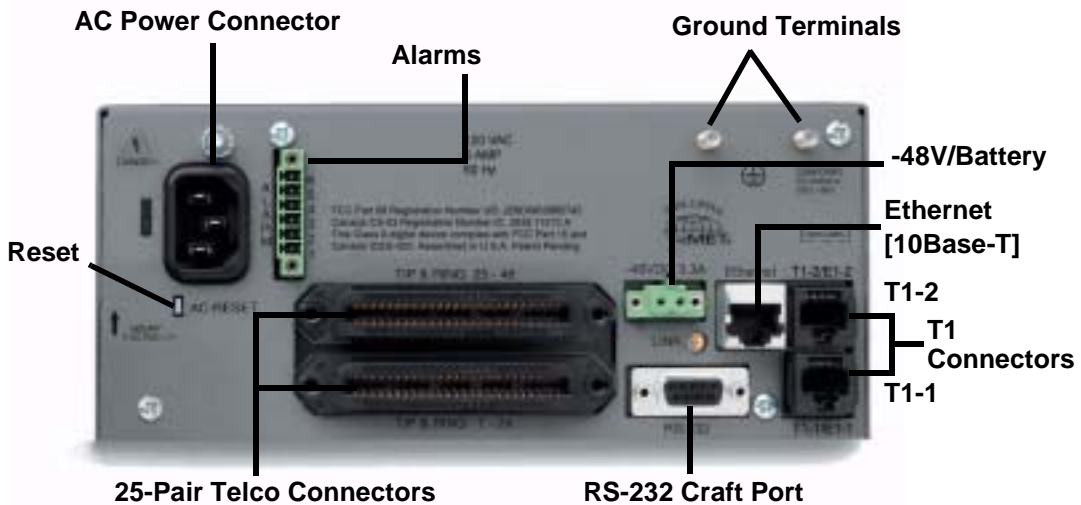
Interface Connectors

The following are the Compact T1 chassis interface connectors:

- T1-1 and T1-2 line connection ports each equipped with standard RJ-48C 8-pin connector jack

- RS-232 craft port connector

- Tip and Ring Analog Interfaces equipped with standard 25-pair Telco Connectors

- 10Base-T Ethernet port to be connected to a remote management tool such as Telnet or an SNMP-based Network Management System with an RJ-45 8-pin connector jack

- External Alarm Connector

- Ground Lugs

Chassis Ground Connector

Ground Terminals

1. Route wire (#6 or #8 AWG copper) from building ground to lug on Unit.
2. Strip insulation off wire end, if necessary.

Compression Screen

Ground Lug
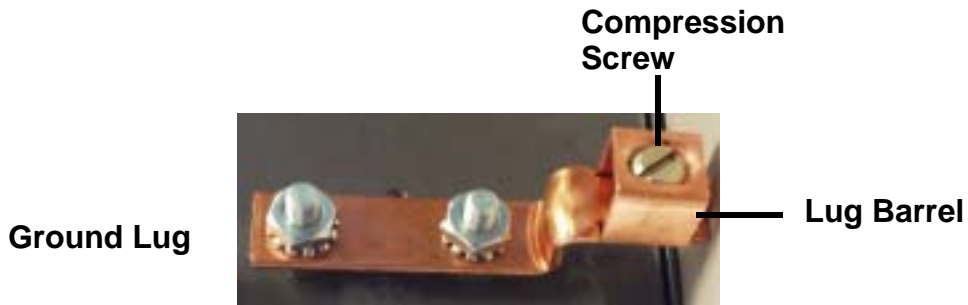
Lug Barrel

3. Loosen compression screw until opening is large enough to accept ground wire.
4. Insert ground wire into lug barrel, beneath compression plate and tighten compression screw.
5. Attach ground lug to chassis

Power Reset

This is a resetable circuit breaker. If at any time there is a short or power surge on the incoming AC/DC line, the breaker will trip to protect the Power supply from damage.
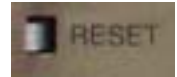
Power Connections

AC Power

The AC Power cord is a standard AC Power cord and is provided with a 115 VAC Power Supply.

AC Power Connector

To connect the Power Cord:

1. Insert power cord (male-end) to AC power source.

2. Plug connector into the Unit.

3. A green light should appear on the DC Input LED on the front of the Power Supply.

-48V Battery

The -48 VDC input connector on the Unit is used for either direct DC powering of the Unit or for a Battery Backup connection when AC is used. There is no power cable provided for this connector, however the connector is provided.

1(+)   2(-)

Connector on back of Unit (male)

The pinouts are as follows:

Pin #	Description
1 (+)	Battery return
2 (-)	-48VDC

WARNING!   **POSSIBLE SHOCK HAZARD EXISTS, PLEASE FOLLOW INSTRUCTIONS CAREFULLY.**

To connect -48 VDC power:

1. Ensure that no power is present on the two wires to be connected.

2. Strip the two wires from the power source so that approximately 5/16 inch of bare wire is exposed. 16 or 18 AWG insulated copper wire is recommended for power connections.

3. Insert the Battery Return and DC wires into the appropriate square holes, one at a time.

4. Tighten screws to clamp wires.

5. Ensure that no bare wire shows after the wires are installed.

6. Plug connector in the -48 VDC connector, as seen in the graphic and secure with set screws.

7. Apply power to connector from -48 VDC power source.

8. Verify with voltmeter that voltage is correct and polarity is correct.

9. Plug connector in the -48 VDC connector, as seen in the graphic and secure with set screws.

Provided connector (female)

Connector
on back
of Unit
(male)

1(+)   2(-)

Battery Return
1(+)

-48 VDC
2(-)

Battery
Return (+)

-48 VDC (-)

External Alarm Connector

The external alarm 6-pin connector with one input pair (pins 5 and 6) and two output pairs (pins 1 and 2 - major alarms; pins 3 and 4 - minor alarms).

```
A    ○ 6
L    ○ 5
A    ○ 4
R    ○ 3
M    ○ 2
     ○ 1
```
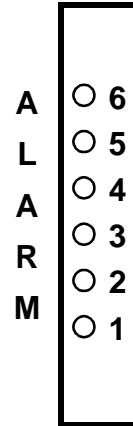
The pinouts are as follows:

Pin #	Description	Explanation
1 2	Major Alarm + Major Alarm -	The major alarm output is available for power supply or major alarm failure alerting. The maximum voltage across the contacts is 350 V, and the maximum current is 150 mA. This alarm is closed when power is off.
3 4	Minor Alarm + Minor Alarm -	The minor alarm output is available for power supply or minor alarm failure alerting. The maximum voltage across the contacts is 350 V, and the maximum current is 150 mA. This alarm remains open when power is off.
5 6	Alarm In + Alarm In -	The alarm inputs provide 5 VDC across the two contacts, and generate an alarm when a short circuit is detected between the contacts. The alarm generated is a minor severity alarm.

25-Pair Telco Connectors

Tip and Ring Analog Interfaces equipped with standard 25-pair Telco Connectors (female) for connection to key systems, fax machines, modems, and PBXs. These interfaces are also used for ISDN BRI ports and are jumper selectable on the Quad T1 card.

Circuit connections are made at the 25-pair telco connectors. A standard 25-pair telephone cable with RJ-21X wiring and a male D-type connector at the Unit end is required.
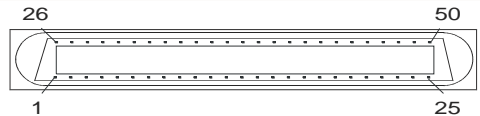
The pinouts are as follows:

Pair	Pin Location	Function	Color Code
1	26 1	Tip Channel 1 Ring Channel 1	White/Blue Blue/White
2	27 2	Tip Channel 2 Ring Channel 2	White/Orange Orange/White
3	28 3	Tip Channel 3 Ring Channel 3	White/Green Green/White
4	29 4	Tip Channel 4 Ring Channel 4	White/Brown Brown/White
5	30 5	Tip Channel 5 Ring Channel 5	White/Slate Slate/White
6	31 6	Tip Channel 6 Ring Channel 6	Red/Blue Blue/Red
7	32 7	Tip Channel 7 Ring Channel 7	Red/Orange Orange/Red
8	33 8	Tip Channel 8 Ring Channel 8	Red/Green Green/Red
9	34 9	Tip Channel 9 Ring Channel 9	Red/Brown Brown/Red
10	35 10	Tip Channel 10 Ring Channel 10	Red/Slate Slate/Red

Pair	Pin Location	Function	Color Code
11	36 11	Tip Channel 11 Ring Channel 11	Black/Blue Blue/Black
12	37 12	Tip Channel 12 Ring Channel 12	Black/Orange Orange/Black
13	38 13	Tip Channel 13 Ring Channel 13	Black/Green Green/Black
14	39 14	Tip Channel 14 Ring Channel 14	Black/Brown Brown/Black
15	40 15	Tip Channel 15 Ring Channel 15	Black/Slate Slate/Black
16	41 16	Tip Channel 16 Ring Channel 16	Yellow/Blue Blue/Yellow
17	42 17	Tip Channel 17 Ring Channel 17	Yellow/Orange Orange/Yellow
18	43 18	Tip Channel 18 Ring Channel 18	Yellow/Green Green/Yellow
19	44 19	Tip Channel 19 Ring Channel 19	Yellow/Brown Brown/Yellow
20	45 20	Tip Channel 20 Ring Channel 20	Yellow/Slate Slate/Yellow
21	46 21	Tip Channel 21 Ring Channel 21	Violet/Blue Blue/Violet
22	47 22	Tip Channel 22 Ring Channel 22	Violet/Orange Orange/Violet
23	48 23	Tip Channel 23 Ring Channel 23	Violet/Green Green/Violet
24	49 24	Tip Channel 24 Ring Channel 24	Violet/Brown Brown/Violet
25	50 25	Reserved	Violet/Slate Slate/Violet

RS-232 Craft Port (Female DB-9)

The RS-232 craft port connector (female) is for connection to an external PC or Hayes-compatible modem for local or remote configuration, management, and performance monitoring using the Command Line Interface (CLI).

The RS-232 craft port connects via a female DB-9 connector on the Unit.
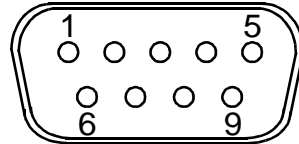
The pinouts are as follows:

Pin Number	Direction	Description
1	Outbound	Carrier Detect
2	Outbound	Receive Data
3	Inbound	Transmit Data
4	Inbound	Data Terminal Ready
5	N/A	Signal Ground
6	Outbound	Data Set Ready
7	Inbound	Request to Send
8	Outbound	Clear to Send
9	N/C	Not connected

T1 Connection Ports

The T1 connection ports are each equipped with a standard RJ-48C (female) on the Unit.

The pinouts are as follows:
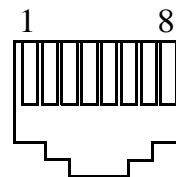
T1 (RJ-48C)

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	N/C	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 -8	N/C	Not connected

10Base-T Ethernet

The 10Base-T Ethernet (female) port to connect to a remote management tool such as Telnet or an SNMP-based Network Management System. **Note a LINK LED on the back of the unit displays green when the system has a good ethernet link.**
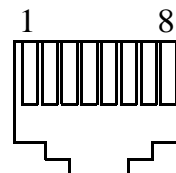
The pinouts are as follows:

Ethernet (RJ-45)

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4 - 5	N/C	Not connected
6	Transmit -	Transmit to network
7 - 8	N/C	Not connected

CHAPTER 4

Configuration

In this Chapter

- Setting up a CLI Connection

- System Information

- Basic System Setup

- Quick Configuration Reload

- Setup of DS0 Management Channel

Setting up a CLI Connection

NOTE: Default IP address of the Controller (T1) is 10.0.0.10.

To connect with CLI, set up the connection:

- If connecting via the ethernet 10Base-T connection, use a Telnet TCP/IP program to access the CLI. This requires an IP address of the Controller. The Controllers are shipped with the IP address set to 10.0.0.10, if this address has been changed and is not known, use Hyperterm to access the Controller and use the CLI command *show ip*. If an IP address needs to be set use the CLI command *set ethernet ip address*.

- If connecting via RS-232, the port settings should be set to:
  Bits per second: **9600**   Data bits: **8**
  Parity: **None**   Stop bits: **1**
  Flow control: **None**

- Set your Terminal Emulation to: VT100

NOTE: Note: When using Tera Term TCP/IP, CLI commands will not be recognized until the following setup is completed.

- In Tera Term go to **Setup/Terminal.**
- Set the **New-line/Transmit** value"CR+LF".

Local vs. Remote Configuration

- For remote configuration via the CLI, use the *set local off* command.

System Information

Once a management session has bee initiated (Telnet or Hyperterm) the system information will be displayed similar to the following:

```
00:00:38 01/01/2002
Status Equipment:
BootCode Version:   1.22
        CardType   Status       SW Vers    CLEI
SLOT A  T1x2       Present        6.0.0   SIC3DH0CAA
SLOT 1  FXS5Gx8    Not Present
SLOT 2  RTRx1      Present        1.41     NOT AVAIL
SLOT 3  FXS5Gx8    Present        1.06     NOT AVAIL
SLOT 4  CMGx1      Present        1.00    SIIX270DAA
SLOT 5  BRIx4      Not Present
SLOT 6  OCUDPx1    Present        1.01    SIIXA4DDAA

Alarms:

    Time        Date      Severity Description
  00:00:22  01/01/2002    Major     6:1-OCUDP Out of Service
  00:00:21  01/01/2002    Major     6:1-OCUDP Loss of Signal
  00:00:15  01/01/2002    Major     4:1-CMG Ethernet Link Down
  00:00:15  01/01/2002    Major     2:1-RTR Ethernet Link Down
  00:00:06  01/01/2002    Major     A:2-DS1 Loss Of Signal
  00:00:06  01/01/2002    Major     A:1-DS1 Loss Of Signal
Total=6

Status Sessions:
  Session     User           Login Port
 * TELNET1                    192.168.43.52
* indicates current session
Show Autoexit:
Autoexit is on; timeout is 20 minutes.
>
```

Basic System Setup

Following is a quick reference to some of the common tasks in configuring the Unit.

Initial Setup

Use the following commands for your initial setup, for further information see the specific command listed in *Chapter 5, CLI Commands* .

Command	Description
`set local off`	Disables DIP switches.
`set date {mm/dd/yyyy}`	Set the date used for event logging
`set time {hh:mm:ss}`	Set the time used for event logging
`set id {"id-name"}`	Set a system ID name
`set clock1 {slot:port} internal`	Set the primary clock source
`set clock2 {slot:port} internal`	Set the secondary clock source
`set ethernet ip address {ip-addr} {mask}`	Set the ethernet IP address, in the conventional IP address format
`set ip gateway {ip-addr}`	Set the IP gateway, in the conventional IP address format

Set Up Security

Use the following commands to set up the security on the Unit. See the *set user* command for details.

Command	Description
`set user {"user-name"} level {1-3}`	Specify the user name and the security level
`set user {"user-name"} password`	Set a password for the user

Set Up a DS1/T1

Use the following commands to set up a DS1. See the *set (ds1)* command for more details.

Command	Description
`set {ds1-addr} up`	Activate the port of the DS1 (slot:port)
`set {ds1-addr} id {"id-string"}`	Set the identification string
`set {ds1-addr} lbo {1 - 9}`	Set the line buildout value for the DS1
`set {ds1-addr} linecode {ami|b8zs}`	Set the linecode for the DS1
`set {ds1-addr} framing {d4|esf|tr8afdl|tr8anofdl| tr8b}`	Set the framing option for the DS1
`set {ds1-addr} loopdetect {on|off}`	Set the detection/reaction to CSU loopcodes

Set Up a DS0/Channel

Use the following commands to set up a DS0. See the *set (ds0)* command for details.

Command	Description
`set {slot:port:channel} up`	Activate the channel
`set {slot:port:channel} signal {ls|gs|emw|emdw|emicpd|dpt}`	Set the signaling option for the channel
`set {slot:port:channel} type {data|voice}`	Set the channel type

Set Up an Analog Port

Use the following commands to set up an analog port.

Command	Description
`set {slot:port} up`	Activate the port. See *set (ds1)* command for details
`set {slot:port} signal {dpt|gs|gsrb|gsw|gswrb|ls| lscpd|lsrb}`	Set the signaling option for the port. See the *set (fxs5G)* or *set (fxo)* command for details
`set {slot:port} rxgain {n}`	Set the receive gain/loss in dB. See the *set (fxs5G)* or *set (fxo)* command for details
`set {slot:port} txgain {n}`	Set the transmit gain/loss in dB. See the *set (fxs5G)* or *set (fxo)* command for details

Set Up the Router Card

The following is the basic setup, see the Adit Router User Manual or Quick Start Guide for the following configuration setups:

- PPP Internet Connection and Public IP Address Routing
- Frame Relay Internet Connection and Public IP Address Routing
- Internet Connection using PPP, NAT/PAT and Firewall Filters
- Internet Connection using NAT and Static NAT Addresses
- PPP Internet Connection and Public IP Address Routing
- Back-to-Back with PPP

Command	Description
set {ds0-addr} type data	Confirm DS0 is set to type data. ds0-addr = {slot:port:channel} of DS0 Example: set a:1:1-24 type data
connect {slot:port:trunk} {slot:port:channel}	Cross-connect T1 to router card. Example: connect a:1:1-24 6:1:1 (router in slot 6)
set {router-addr} proxy	Disable/enable router proxy. router-addr = {slot:port}| of router card. Example: set 6:1 proxy disable.
set {slot:port} up	Set Router LAN as In-Service. Example: set 6:1 up
telnet {router_card-addr}	Telnet to Router card. router_card-addr = {slot} location of router card Example: telnet 6 (if earlier than 3.0 release {slot:port} must be used)
Local and Remote Profile Setup	
reinitialize	To enable any configuration changes, the card must be reinitialized.

Establish a Static Channel Connection

Use the following commands to establish a static channel connection.

Command	Description
`set {slot:port:channel} type {voice|data}`	Set the channel type for the channel you want to map. See *set (ds0)* command for details
`set {slot:port:channel} signal {emdw|emi|emicpd|emw|gs|ls|plar|r2}`	Set the signaling option for the channel you want to map. See *set (ds0)* command for details
`connect {slot:port} {slot:port}`	Connect the channels. See the *show connect* command for details

Set Up a ISDN BRI Service

Use the following commands to set up a ISDN BRI Service. See the *set (bri)* command for details.

Command	Description
`set {slot:port} up`	Put the ISDN line In-Service
`set {slot} mode {lt3ds0|lt4to1tdm|nt3ds0}`	Set the ISDN mode
`set {slot:port} crv {1-768}`	Set the Call Reference Value.
`set {slot:port} threshold {day|hour} {es|ses}`	Set the threshold for the IDSN lines
`set {slot} pmsync {adit|switch}`	Set the source for performance monitoring synchronization
`set {slot:port} autoactivate {on|off}`	Only used in 4 to 1 mode. Establishes the D channel when the FDL link can not be used

Set Up the OCU-DP Card

The following is a basic setup for the OCU-DP card.

Command	Description
`set {ocudp-addr} baud {2400|4800|9600|19200|38400|56000*|64000}`	Set the OCU-DP Baud rate. Where ocudp-addr = {slot:port} of the OCU-DP card to apply settings to
`set {ocudp-addr} up`	Set the OCU-DP port 1 up
`show {ocudp_card-addr}`	Show the OCU-DP card settings. Where ocudp_card-addr = {slot} of the OCU-DP card
`disconnect a`	Disconnects all connections to slot a (controller)
`set {ds0-addr} type data`	Sets a DS0 data signaling type
`connect {ds0-addr} {ocudp-addr}`	Connects DS0 (in previous step) to OCU-DP port (in previous step)
`show connect (ocudp_card-addr}`	Displays connect information for OCU-DP card

Set Up a V.35 Port

Use the following commands to set up a V.35 port. See the *set (v35)* command for details.

Command	Description
`set {slot:port} cts {cd|high|low|rts}`	Set the Clear to Send operation mode
`set {slot:port} data {invert|normal}`	Set the data mode
`set {slot:port} clock {source|external}`	Set the clock mode
`set {slot:port} speed {56K|64K}`	Set the speed
`set {slot:port} txclkinv {invert|normal}`	Set the transmit clock inversion mode
`set {slot:port} rxclkinv {invert|normal}`	Set the receive clock inversion mode

Change the IP Address of the DS0 Management Channel

Use the following commands to change the IP over DS0 Management Channel for the Unit.

Command	Description
`set ipds0 down`	Set the DS0 management channel down
`set ipds0 ip address {ip-addr}`	Set the DS0 management channel IP address.
`set ipds0 up`	Set the DS0 management channel up

Upgrade the Controller Software

Use the following commands to determine the system software level, then upgrade the software to the latest version.

Command	Description
`status equipment`	Determine the system software level. The Slot A line (SW Vers) will display the current software level
`load tftp {ip-addr} {"file-name"} (or load xmodem)`	Load the new controller system software. See the *load tftp* and *load xmodem* command for more information. Note: must have TFTP running in the background

Upgrade the Router (IP or CMG) Software

Use the following commands to determine the Router card software level, then upgrade the software to the latest version.

Command	Description
`status equipment`	Determine the Router software level. The Router Slot line (SW Vers) will display the current software level
`load {router-slot} tftp {ip-addr} {"file-name"}`	Load the new Router software to the Adit Router card. See the *load tftp* command for more information. Note: must have TFTP running in the background

Quick Configuration Reload

The **print config** command can be used as a quick way to reload a configuration into an Adit unit, in the event that the configuration has been lost due to software reload problems or operator error.

The download of the file generated by the **print config** command can be done by direct connect to the RS-232 port or via Telnet, **BUT** the upload from the PC back to the Adit can only be done via direct RS-232 connection. The reason for this is that there will not be an IP address in the Adit because it is at the factory default at this time.

The procedure described below is based on using Hyperterm.

Download Config File:

1. Connect to the unit using Hyperterm via the RS-232 port.

2. Type **print config** (do not hit **[ENTER]**).

3. Select **Transfer/Capture Text...** from the menu bar.

4. Name the file so that is can be accessed when needed.
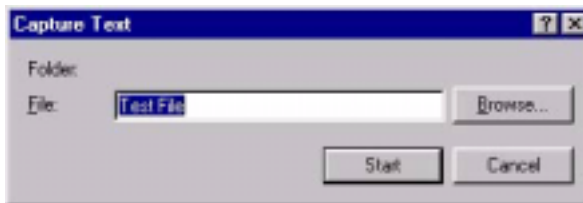
5. Select the **[START]** button, the window will close and the operator will be returned to the Adit command line.

6. Press **[ENTER]** to download. Adit will generate an executable file of all configurable commands and save it to the file location defined above.

7. The download is complete when the text has finished scrolling on the screen and the Adit ID prompt displays again.

Load Config File Back to Unit:

1. Select **File/Properties** from the menu bar.
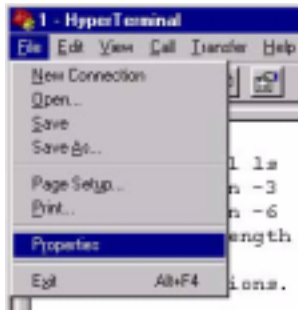
2. Select the **Settings** tab.
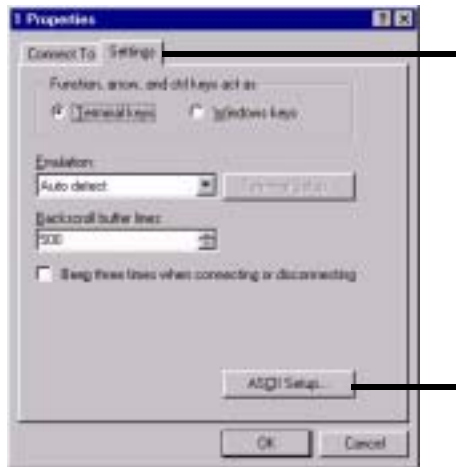
3. Select the **ASCII Setup** button.

4. Set the **Line delay** to 50 milliseconds and the **Character delay** to 5 milliseconds.
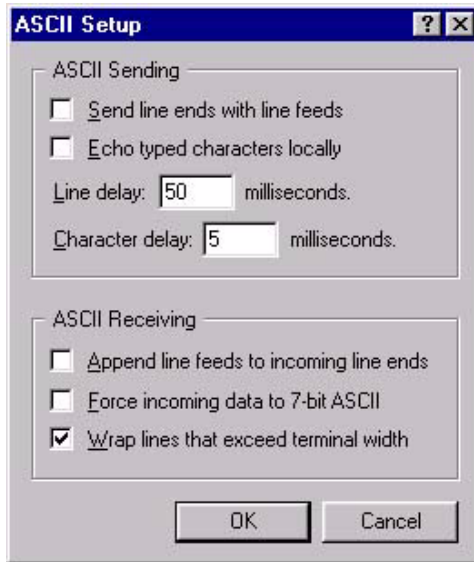
5. Select the **[OK]** button back to the Main HyperTerminal screen.

6. Select **Transfer/Send Text File..** from the menu bar.
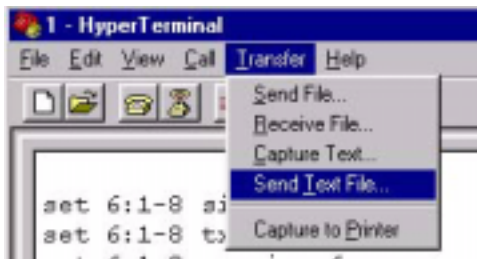
Hyperterm will now send the configuration to the Adit exactly as it was saved in the Download Config File process.

Setup of DS0 Management Channel

The DS0 Management Channel provides SNMP management and remote access. The IPDS0 feature allows for full Transmission Control Protocol/Internet Protocol (TCP/IP) connectivity to remote Compact T1 and can be used for Simple Network Management Protocol (SNMP) trap reporting and configuration, Trivial File Transfer Protocol (TFTP) upgrades of Controllers and Service cards, and remote telnet access.

The following procedure will walk you through the basic setup of a DS0 Management Channel.
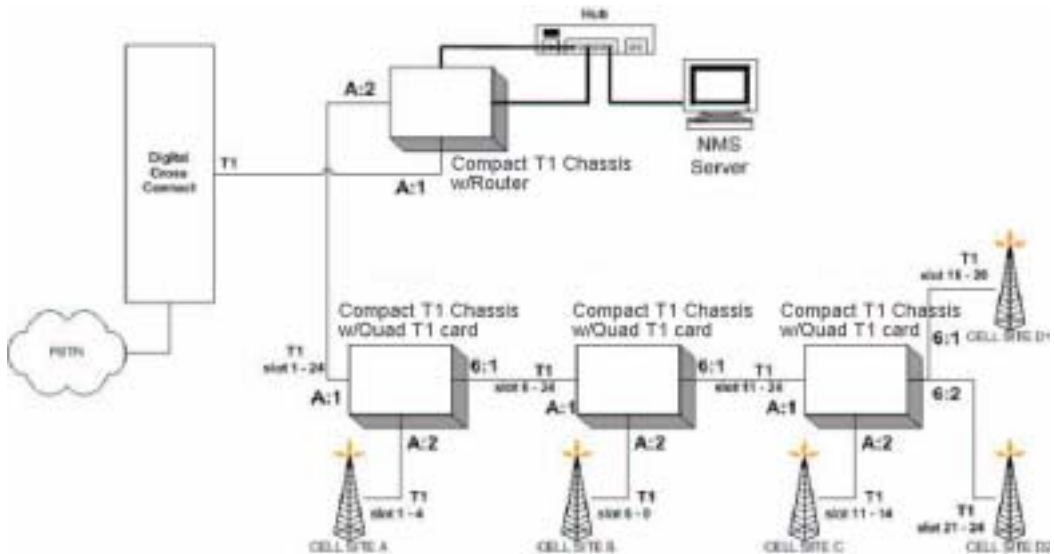
Equipment Required

- DCS
- (1) Collocated Router
  This example uses a Compact T1 (version 2.0 or later) with an Compact T1 Router card (version 1.10 or later)
- Remote Compact T1 (1-24) Units (version 2.0 or later)
- PC
- Cables, Ethernet, T1

Application Overview

- IPDS0 management provides a TCP/IP connection to an Compact T1 Controller via an unused DS0 on one of the DS1 ports in slot A. The DS0 is connected to a Router on a Frame Relay circuit with a default Data Link Connection Identifier (DLCI) number of 16. IP communication to the remote Units is made via the Ethernet port of the Router card.
- Remote Units are daisy-chained to the central site and are also configured to communicate with a Network Management Station (NMS) using SNMP.
- Central site Compact T1 and IP Router card are configured to communicate with the same NMP.

Operation

- Central Site Compact T1 - Incoming DS0s for cell services are delivered on the first T1 in slot A. The channels are then cross-connected to the second T1 span on the Controller, along with IPDS0 connections from the Router card.
- Compact T1 at remote locations - Available DS0s are delivered on the first T1 in slot A, and the channels are either connected to the IPDS0 management interface, the second T1 span of the Controller (for local cell services), or passed on to the next Remote Unit on the first T1 span of the Quad T1 card in slot 6. In the configuration for Site C, the 4 channels on the second T1 span in slot A and 4 channels of the first and second T1 spans in slot 6 are connected to cell sites.

Provision DS0s for data and cross-connect to the outgoing T1

Command	Description
`disconnect a`	Disconnects all connections to slot a (controller)
`set a:1:all type data`	Sets all DS0s on T1-1 to data signaling type
`set a:2:all type data`	Sets all DS0s on T1-2 to data signaling type
`connect a:1:1-4 a:2:1-4`	Connects first four DS0s of T1-1 of the controller to first four DS0s of T1-2.
`connect a:1:6-9 a:2:6-9`	Connects DS0s 6-9 of T1-1 of the controller to DS0s 6-9 of T1-2.
`connect a:1:11-14 a:2:11-14`	Connects DS0s 11-14 of T1-1 of the controller to DS0s 11-14 of T1-2.
`connect a:1:15-19 a:2:16-19`	Connects DS0s 16-19 of T1-1 of the controller to DS0s 16-19 of T1-2.
`connect a:1:21-24 a:2:21-24`	Connects DS0s 21-24 of T1-1 of the controller to DS0s 21-24 of T1-2.

Configure the Router

Command	Description
`set 6 default`	Sets the Router in slot 6 to it's default settings
`add 6 snmp trap "public" 192.168.0.254 "LocalUnit"`	Configure the Router card trap address
`set 6:1 ip address 192.168.0.1 255.255.255.0`	Configure the LAN IP address
`set 6 lmi disable`	Disable PVC management for Frame Relay connections
`connect a:2:5 6:1:1`	Connect the timeslot to the WAN port.

Setup the Profile for Site A

Command	Description
`rename 5 "RemoteUnit" "SITE-A"`	Configure the LAN IP address
`set 6:1:1 encapsulation fr`	Specify the encapsulation for the profile
`set 6 "SITE-A" trunk 1`	Specify the trunk number for the profile
`set 6 "SITE-A" dlci 16`	Specify the DLCI number for the profile
`set 6 "SITE-A" up`	Enable the profile
`add 6 "SITE-A" static ip network 192.168.1.101 255.255.255.255 1`	Specify the IP address of the Compact T1 at the far end

Setup the Profile for Site B

Command	Description
`connect a:2:10 6:1:2`	Connect the timeslot to the WAN port.
`add 6 remote "SITE-B"`	Add another WAN profile named SITE-B
`set 6:1:2 encapsulation fr`	Specify the encapsulation for the profile
`set 6 "SITE-B" trunk 2`	Specify the trunk number for the profile
`set 6 "SITE-B" dlci 16`	Specify the DLCI number for the profile
`set 6 "SITE-B" up`	Enable the profile
`add 6 "SITE-B" static ip network 192.168.1.102 255.255.255.255 1`	Specify the IP address of the Compact T1 at the far end

Setup the Profile for Site C

Command	Description
`connect a:2:15 6:1:3`	Connect the timeslot to the WAN port.
`add 6 remote "SITE-C"`	Add another WAN profile named SITE-C
`set 6:1:3 encapsulation fr`	Specify the encapsulation for the profile
`set 6 "SITE-C" trunk 3`	Specify the trunk number for the profile
`set 6 "SITE-C" dlci 16`	Specify the DLCI number for the profile
`set 6 "SITE-C" up`	Enable the profile
`add 6 "SITE-C" static ip network 192.168.1.103 255.255.255.255 1`	Specify the IP address of the Compact T1 at the far end
`set snmp nms 1 192.168.0.254`	Set up SNMP Trap address for the Compact T1

Remote Site A Configuration

Command	Description
`disconnect a`	Disconnects all connections to slot a (controller)
`set a:1:all type data`	Sets all DS0s on T1-1 to data signaling type
`set a:2:all type data`	Sets all DS0s on T1-2 to data signaling type
`disconnect 6`	Disconnects the router in slot 6
`set 6:1:all type data`	Sets all DS0s on slot 6 to data signaling type
`connect a:1:1-4 a:2:1-4`	Connect channels to cell site
`set ipds0 assign a:1:5`	Assign channel to IPDS0 management channel
`set ipds0 ip address 192.168.1.101 255.255.255.0`	Configure IPDS0 ip address
`set ipds0 up`	Enable IPDS0
`set ipds0 navalarm off`	Suppress IPDS0 alarm
`set snmp nms 1 192.168.0.254`	Set up SNMP Trap address for the Compact T1

Remote Site B Configuration

Command	Description
`disconnect a`	Disconnects all connections to slot a (controller)
`set a:1:all type data`	Sets all DS0s on T1-1 to data signaling type
`set a:2:all type data`	Sets all DS0s on T1-2 to data signaling type
`disconnect 6`	Disconnects the router in slot 6
`set 6:1:all type data`	Sets all DS0s on slot 6 to data signaling type
`connect a:1:6-9 a:2:1-4`	Connect channels to cell site
`connect a:1:11-24 6:1:11-24`	Connect channels for outgoing T1 port
`set ipds0 assign a:1:10`	Assign channel to IPDS0 management channel
`set ipds0 ip address 192.168.1.102 255.255.255.0`	Configure IPDS0 ip address
`set ipds0 up`	Enable IPDS0
`set ipds0 navalarm off`	Suppress IPDS0 alarm
`set snmp nms 1 192.168.0.254`	Set up SNMP Trap address for the Compact T1

Remote Site C Configuration

Command	Description
`disconnect a`	Disconnects all connections to slot a (controller)
`set a:1:all type data`	Sets all DS0s on T1-1 to data signaling type
`set a:2:all type data`	Sets all DS0s on T1-2 to data signaling type
`disconnect 6`	Disconnects the router in slot 6
`set 6:1:all type data`	Sets all DS0s on slot 6 to data signaling type
`connect a:1:11-14 a:2:1-4`	Connect channels to cell site C
`connect a:1:16-19 6:1:1-4`	Connect channels to cell site D1
`connect a:1:21-24 6:2:1-4`	Connect channels to cell site D2
`set ipds0 assign a:1:15`	Assign channel to IPDS0 management channel
`set ipds0 ip address 192.168.1.103 255.255.255.0`	Configure IPDS0 ip address
`set ipds0 up`	Enable IPDS0
`set ipds0 navalarm off`	Suppress IPDS0 alarm
`set snmp nms 1 192.168.0.254`	Set up SNMP Trap address for the Compact T1

Test

After configuring all the Compact T1, verify connectivity to the NMS from each Unit.

> Ping 192.168.0.254

Response should be:

>192.168.0.254 is reachable

CHAPTER 5

CLI Commands

In this Chapter

- Command Line Interface Help

- CLI Commands

Command Line Interface Help

During a CLI session, help is available at any time.

? or help

Type a **?** (or "help" before a command) at any time for quick command information

```
> add ?

 add ....................  Create users or profiles
    {rtr_card-addr} ......  Create profile, object or service on a router
    {rtr_lan-addr} .......  Create object or service on the router LAN
    user ................  Create user with manager level access.
```

NOTE: The scrolling feature, will always scroll through the command/ options in alphabetical order.

[TAB] usage for word or command completion

Use [TAB] for command word completion:

> sh [TAB]

> show

Use [TAB] to view command levels:

> [TAB]   will scroll through the base commands

> aco [TAB]

> add [TAB]

> alarms [TAB]

> clear [TAB]

> connect [TAB]

> delete   ... etc.

Use [TAB] to view command options, add a space after the base command with the use of the [TAB] feature, scroll through all available options for this command:

> set [TAB]   will scroll through the set commands, with each <TAB>

> set alarms [TAB]

> set autoexit [TAB]

> set clock1   ... etc.

If another space is placed after the command and [TAB] is pressed again, the next command level will display (if any):

> set snmp [TAB]   will scroll through all the set SNMP options

> set snmp contact [TAB]

> set snmp getcom [TAB]

> set snmp location [TAB]

> set snmp name   ... etc.

CLI Commands

For maneuverability through these commands, all command names in blue or italics are hyperlinked.

aco (Alarm Cut Off)	*ping*
add	*print*
alarms	*rename (router)*
clear	*reset*
connect	*restore*
delete	*rtrping*
disconnect	*set*
exit	*show*
install	*status*
load	*store*
log	*telnet*

aco (Alarm Cut Off)

Use the **aco** command to activate the Alarm Cut Off, which opens the alarm relay contacts on the back of the unit.

 Syntax: `aco`

 Example: `aco`

ACO LED

 Off   Normal mode. No alarms are being suppressed.

 Yellow   Alarm cutoff active. One or more active alarms suppressed.

To turn off ACO, all alarms must be cleared, or the operator can reset the controller, which will set the ACO back to the default (off) state.

add

Use the **add** command to create users, interfaces, services or profiles.

See the following sections for detailed information on the following **add** commands

add (router) dns proxy

add (router) remote

add (router) snmp community

add (router) snmp trap

add (router) static dns host

add (router) uploaduser

add (router-lan) filter

add (router-lan) secondary ip address

add (router-lan) static

add (router-wan) firewall

add (router-wan) gre network

add (router-wan) nat bypass

add (router-wan) static

add user

add (router) dns proxy

Use the **add (router) dns proxy** command to enable DNS proxy and add a remote DNS server address to the specified Router card.

Syntax: `add {rtr_card-addr} dns proxy {"domain-name"}`
`{ip-addr} {"profile-name"}`

Example: `add 2 dns proxy "Domain1" 192.168.100.245 "Texas"`
Example will add a DNS proxy server "Domain1" with address 192.168.100.245 to the WAN named "Texas" on the Router in slot 2.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"domain-name"}

The domain name for the external DNS server. Name must be enclosed in quotes, with a maximum length of 42 characters.

{ip-addr}

The IP address of the external DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

add (router) remote

Use the **add (router) remote** command to add a remote WAN profile to the WAN profile table on the specified Router card.

Syntax: `add {rtr_card-addr} remote {"profile-name"}`

Example: `add 6 remote "Texas"`
The example will add a remote WAN named "Texas" to the WAN profile table for the Router in slot 6.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"profile-name"}

The name of the remote WAN profile to add with a maximum length of 11 characters. This name must be enclosed in quotes.

add (router) snmp community

Use the **add (router) snmp community** command to add a SNMP community to an interface on the specified Router card.

> *Syntax:* `add {rtr_card-addr} snmp community {both|read|write}`
> `{"community-name"} {ip-addr}`

> *Example:* `add 2 snmp community both "commune" 192.168.100.245`
> The example will allow the host 192.168.100.245 read/write access to the Router card SNMP agent using the community name "commune". The Router is located in slot 2.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{both|read|write}

both	Will set the community to be read/write
read	Will set the community to be read-only
write	Will set the community to be write-only

{"community-name"}

Name of the community to add with a maximum length of 10 characters. Must be enclosed in quotes.

{ip-addr}

The IP address of the host that can access the SNMP agent via this community, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0" allows any host.

add (router) snmp trap

Use the **add (router) snmp trap** command to specify a destination to send SNMP trap messages for the specified Router card.

Syntax: `add {rtr_card-addr} snmp trap`
`{"community-name"} {ip-addr} {"profile-name"}`

Example: `add 3 snmp trap "commune" 192.168.100.245 "RemoteAdit"`
The example will add a trap destination of 192.168.100.245 on the interface "RemoteAdit" and use the community name "commune" in the messages. The Router is located in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"community-name"}

The community name to use in each trap message, with a maximum of 10 characters.

{ip-addr}

The IP address of the destination trap to add, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The profile name for the Router interface that is used to reach this destination. Maximum of 11 characters and this name must be enclosed in quotes.

add (router) static dns host

Use the **add (router) static dns host** command to add a static DNS host record for resolving a domain name to an IP address if the DNS server cannot provide the information. The DNS resolver will first attempt to resolve the name by querying the configured DNS servers. If this does not yield the information, the DNS resolver will consult this list of static entries. This command will fail if the DNS resolver is not enabled.

Syntax: `add {rtr_card-addr} static dns host`
`{ip-addr} {"domain-name"}`

Example: `add 2 dns host 192.168.100.245 "myhost.some.net"`
Example will add a static DNS host record with address 192.168.100.245 and domain named "myhost.some.net" on the Router in slot 2.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{ip-addr}

The IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"domain-name"}

The domain name of the host. Name must be enclosed in quotes, with a maximum length of 41 characters.

add (router) uploaduser

Use the **add (router) uploaduser** command to specify a host that is allowed to upload either the configuration or software files to the specified Router card.

>*Syntax:* `add {rtr_card-addr} uploaduser {both|code|config}`
>`{all|ip-addr} {"profile-name"}`

>*Example:* `add 3 uploaduser code all "LosAngeles"`
>The example will allow any user to upload the code file from the Router interface named "LosAngeles". The Router is located in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{both|code|config}

both	Will allow user to upload both the code file and the configuration file from the Router
code	Will allow user to upload the code file from the Router
config	Will allow user to upload the configuration file from the Router

{all|ip-addr}

all	Will allow upload from anywhere
ip-addr	The IP address to allow upload boot from. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255

{"profile-name"}

The name of the remote WAN or LAN profile that can be used for the upload. This name must be enclosed in quotes.

add (router-lan) filter

Use the **add (router-lan) filter** commands to add filters to the specified LAN interface.

add (router-lan) filter address

Use the **add (router-lan) filter address** command to add an address filter to the table of Layer 2 filters applied to the specified LAN interface.

Syntax: `add {rtr_lan-addr} filter address {both|dest|source} {mac-addr} {"filter-name"}`

Example: `add 2:1 filter address both 0x00e09700e9cd "Server1"`

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{both|dest|source}

both	Filter by both source and destination
dest	Filter by destination only
source	Filter by source only

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x.

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

add (router-lan) filter custom

Use the **add (router-lan) filter custom** command to add a custom filter to the table of Layer 2 filters applied to the specified LAN interface.

Syntax: `add {rtr_lan-addr} filter custom {pkt-offset} {mask} {match} {"filter-name"}`

Example: `add 2:1 filter custom 16 0xFFFF0000 0x45000000 "MyRule"`
The example will add a custom layer-2 filter that will match all packets that contain the hex value 4500 at the 16th octet past the MAC header.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{pkt-offset}

This field will designate where within a packet (past the MAC header) the system is to begin looking for a matching character string. The offset value range is 0 to 60 bytes. To create a filter for the data in the MAC header, use the address and Protocol filters.

{mask}

The 32-bit mask to indicate which bits to compare to the match value starting at the offset position. The mask is entered as a 32-bit hexadecimal value.

{match}

The 32-bit match value that is used to match the incoming packet. The match value is entered as a 32-bit hexadecimal value.

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

add (router-lan) filter protocol

Use the **add (router-lan) filter protocol** command to add a protocol filter to the table of Layer 2 filters applied to the specified LAN interface. Note that you only need to identify either an Ethernet or IEEE value, but not both. The other should be entered as 0.

Syntax: `add {rtr_lan-addr} filter protocol {ether-type}`
`{ieee-value} {"filter-name"}`

Example: `add 2:1 filter protocol 0x0807 0x0 "XNSrule"`
The example will add a custom layer-2 filter that will match all XNS packets.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ether-type}

This assigned Ethernet value for this protocol. The ether-type is entered as a 16-bit hexadecimal value, e.g. 0800 = IP and 0806 = ARP.

{ieee-value}

The assigned IEEE value for this protocol. The IEEE value is the same as the SDAP and SSAP values in a SNAP packet. The match value is entered as a 8-bit hexadecimal value.

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

add (router-lan) secondary ip address

Use the **add (router-lan) secondary ip address** command to add a secondary IP address and subnet to the specified LAN interface. The router will then be capable of routing between the various subnets on the LAN interface or between any of the LAN subnets and any WAN subnet. A maximum of 8 secondary IP addresses can be added to the LAN interface.

Syntax: `add {rtr_lan-addr} secondary ip address`
`{ip-addr [mask]|ip-addr/bits}`

Example: `add 4:1 secondary ip address 192.168.1.1 255.255.255.0`
The example will add a secondary IP address of 192.168.1.1 and a subnet mask of 255.255.255.0.

To view the secondary IP addresses, use the **show 4:1** command

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr [mask]|ip-addr/bits}

ip-addr	The IP address of the Host to query, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
mask	The mask of the secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

add (router-lan) static

Use the **add (router-lan) static** commands to add static elements on the specified LAN interface.

add (router-lan) static ip address

Use the **add (router-lan) static ip address** command to add a static IP address to the table of learned addresses on the specified LAN interface. This command is typically used in bridging.

Syntax: `add {rtr_lan-addr} static ip address {"addr-name"} {ip-addr}`

Example: `add 3:1 static ip address "JDoe" 195.168.201.140`

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{"addr-name"}

A symbolic name for this static ip address. This name must be enclosed in quotes, with a maximum of 8 characters.

{ip-addr}

The IP address of the learned address table for the LAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

add (router-lan) static ip network

Use the **add (router-lan) static ip network** command to add a static IP network (route) to the specified LAN interface.

Syntax: `add {rtr_lan-addr} static ip network {ip-addr} {mask} {next-hop-ip-addr} [metric]`

Example: `add 3:1 static ip network 195.168.201.0 255.255.255.0 194.120.20.15 3`

The example will add a static route to 192.168.201.0, with mask 255.255.255.0 and the next hop at 194.120.20.15 and a metric of 3 to the local LAN interface on the Router card in slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr}

The IP address of the static IP network to set, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{next-hop-ip-addr}

The IP address of the next hop gateway for this route, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[metric]

Enter a numeric value indicating the distance from your local network to the destination network. Although this value was originally measured by the number of gateways between the two networks, the number may be modified, either higher or lower, to indicate a desired priority. This field is only used on IP networks. Valid entries range from 1 to 15. (Please note that a value of 1 usually indicates a direct network.).

add (router-lan) static ipx network

Use the **add (router-lan) static ipx network** command to add a static IPX network (route) to the specified LAN interface.

Syntax: `add {rtr_lan-addr} static ipx network {network} {hops} {ticks} {next-hop-mac-addr}`

Example: `add 3:1 static ipx network 0x11 2 4 0x00e09700e9cd`
The example will add a static IPX route to network 0x11, a hop count 2, a tick count 4, a next hop Router at MAC address 00:e0:97:00:e9:cd.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{network}

The IPX network number in HEX (0x...). This number must be preceeded by 0x.

{hops}

The numeric value (of hops) indicating the distance from your Local (LAN) network to the destination network.

{ticks}

The distance between two networks as measured in time increments (1/18th of a second). Like hops, ticks may be used to designate primary and secondary routes to the same network.

{next-hop-mac-addr}

The MAC address of the next hop Router, in the form a 6-octet HEX value separated by colons, xxxxxxxxxxxx. This number must be preceeded by 0x.

add (router-lan) static mac address

Use the **add (router-lan) static mac address** command to add a static MAC address to the table of learned addresses on the specified LAN interface. This command is typically used in bridging.

Syntax: `add {rtr_lan-addr} static mac address {"network-name"} {mac-addr}`

Example: `add 3:1 static mac address "JDoe" 0x00e09700e9cd`
The example will add a static MAC address, 00:e0:97:00:e9:cd named "JDoe", to the tables for the LAN interface on the Router card in slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{"network-name"}

A symbolic name given to identify this static MAC address. This name must be enclosed in quotes, with a maximum of 7 characters.

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value separated by colons, 0xxxxxxxxxxxxx. This number must be preceeded by 0x.

add (router-wan) firewall

Use the **add (router-wan) firewall** command to add a firewall rule to a WAN.

Syntax: `add {rtr_card-addr} {"wan-name"} firewall`
`{rule-number} {drop|pass} {incoming|inout|outgoing}`
`{alarm|log|nolog} {service} {dest-ip-addr/bits} {src-`
`ip-addr/bits}`

Example: `add 3 "LosAngeles" firewall 1 pass incoming nolog http`
`203.1.21.17/32 0.0.0.0/0`
The example will add a firewall rule that allows HTTP (TCP port 80) access
from any outside host to an inside web server at 203.1.21.17 to the Router card
in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{rule-number}

Firewall rules are processed in sequence until the first matching rule is found.

{drop|pass}

drop	Do not allow the packet to be forwarded
pass	Allow the packet to be forwarded

{incoming|inout|outgoing}

incoming	Matches packets for sessions originated from an outside host
inout	Matches packets for sessions originated from either an inside or outside host
outgoing	Matches packets for sessions originated from an inside host

{alarm|log|nolog}

alarm	Add an entry to alarm log for packets that match this rule
log	Add an entry to event log for packets that match this rule
nolog	Do not add an entry to the logs for packets that match this rule

{service}

finger	Display information about users
ftp	File Transfer Protocol
gopher	Document search and retrieval
http	World Wide Web
icmp	Internet Control Message Protocol
nntp	Network News Transfer
ping	ICMP echo request/reply
pop3	Post Office Protocol Version 3
smtp	Simple Mail Transfer
snmp	Simple Network Management Protocol
tcp	Transmission Control Protocol
	port number (0 - 65535) or range
telnet	User interface to remote unit
udp	User Datagram Protocol
	port number (0 - 65535) or range
wais	Wide Area Information Services
protocol	Enter a protocol number {protocol-number}= number between 0-255 0= any protocol

{dest-ip-addr/bits}

The destination IP Address and number of significant bits. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0/0" matches any address.

dest-ip-addr	Enter the IP Address of the local device or network that this rule will affect. If you enter the address of a local device, this rule will affect only the session establishments of the local device and the destination address entered in the Remote IP Address/Network field, below. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

{src-ip-addr/bits}

The destination IP address and number of significant bits. The address "0.0.0.0/0" matches any address.

src-ip-addr	Enter the IP Address of the local device or network that this rule will affect. If you enter the address of a local device, this rule will affect only the session establishments of the local device and the destination address entered in the dest-ip-addr/bits command above. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

add (router-wan) gre network

Use the **add (router-wan) gre network** command to add a "by network" Generic Route
Encapsulation (GRE) tunnel to a WAN.

> *Syntax:* `add {rtr_card-addr} {"wan-name"} gre network`
> `{ip-addr mask|ip-addr/bits} {metric}`
> `{remote-ip-addr} {"tunnel-name"}`

> *Example:* `add 3 "LosAngeles" gre network 10.0.0.0/8 3 2.2.2.2`
> `"LATunnel"`
> The example will set the WAN interface named "LosAngeles" in slot 3 to pass
> all packets destined for a host on subnet 10.0.0.0 through a GRE tunnel to
> 2.2.2.2.
>
> Note: A **set 3 "LosAngeles" gre ip by network** command is required before
> this command.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr mask|ip-addr/bits}

ip-addr mask	The IP address and the subnet mask of the IP network to tunnel, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

{metric}

Enter a numeric value indicating the distance from your local network to the destination
network. Valid entries range from 1 to 15.

{remote-ip-addr}

The IP address of the far end of this tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is
between 0-255.

{"tunnel-name"}

A symbolic name for this tunnel. Maximum of 12 characters and must be enclosed in
quotes.

add (router-wan) nat bypass

Use the **add (router-wan) nat bypass** command to add subnets to the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface. This command applies to the IP Router only.

Syntax: `add {rtr_card-addr} {"wan-name"} nat bypass`
`{ip-addr mask|ip-addr/bits}`

Example:

The following example displays the configuration necessary to add two secondary IP subnets to the LAN that do not get NAT translation performed on them when their packets pass through the NAT on the WAN. In this example, packets leaving the "RemoteUnit" WAN whose source IP address in the 10.0.0.0 subnet will be NAT translated to 211.103.55.1 before transmission. Packets leaving the "RemoteUnit" WAN whose source IP address is in the 156.65.0.0 or 201.23.16.0 subnets will be transmitted unmodified.

```
set 1:1 ip address 10.0.0.1 255.0.0.0
add 1:1 secondary ip address 156.65.0.1 255.255.255.0
add 1:1 secondary ip address 201.23.16.1 255.255.255.0
set 1 "RemoteUnit" nat enable
set 1 "RemoteUnit" nat address 211.103.55.1 1
add 1 "RemoteUnit" nat bypass 156.65.0.0. 255.255.0.0
add 1 "RemoteUnit" nat bypass 201.23.16.0. 255.255.255.0
```

{rtr_card-addr}

The slot number (1-6) that contains the IP Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr mask|ip-addr/bits}

ip-addr mask   The IP address and subnet mask or host to bypass the NAT translation, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

bits   Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

add (router-wan) static

Use the **add (router-wan) static** commands to add static elements on the specified WAN interface.

add (router-wan) static ip address

Use the **add (router-wan) static ip address** command to add a static IP address to the table of learned addresses on the specified WAN interface. This command is typically used in bridging.

Syntax: `add {rtr_card-addr} {"wan-name"} static ip address {"name"} {ip-addr}`

Example: `add 3 "LosAngeles" static ip address "Pasadena" 195.168.201.140`
The example will add a static IP address, 192.168.201.140, named "Pasadena" to the tables for the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{"name"}

A symbolic name to help remember the purpose of this entry. Maximum of 7 characters and must be enclosed in quotes.

{ip-addr}

The IP address to add to the learned address table for the WAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

add (router-wan) static ip network

Use the **add (router-wan) static ip network** command to add a static IP network (route) to the specified WAN interface.

Syntax: `add {rtr_card-addr} {"wan-name"} static ip network {ip-addr} {mask} {metric}`

Example: `add 3 "LosAngeles" static ip network 195.168.201.0 255.255.255.0 3`

The example will add a static route to 195.168.201.0, with mask 255.255.255.0 and a metric of 3 to the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{metric}

A numeric value indicating the distance from your local network to the destination network. Valid entries range from 1 to 15. (Please note that a value of 1 usually indicates a direct network).

add (router-wan) static ipx network

Use the **add (router-wan) static ipx network** command to add a static IPX network (route) to the specified WAN interface.

Syntax: `add {rtr_card-addr} {"wan-name"} static ipx network {network} {hops} {ticks}`

Example: `add 3 "LosAngeles" static ipx network 0x11 2 4`
The example will add a static IPX Router to network 0x11, with a hop count of 2 and a tick count of 4 to the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{network}

The IPX network number in HEX (0x...)

{hops}

The numeric value (of hops) indicating the distance from your Local (LAN) network to the destination network.

{ticks}

The distance between two networks as measured in time increments (1/18th of a second). Like hops, ticks may be used to designate primary and secondary routes to the same network. Although both the hops and ticks values are considered when determining routing priority, for Novell networks, the tick value is considered first.

add (router-wan) static mac address

Use the **add (router-wan) static mac address** command to add a static MAC address to the table of learned addresses on the specified WAN interface. This command is typically used in bridging.

Syntax: `add {rtr_card-addr} {"wan-name"} static mac address {"name"} {mac-addr}`

Example: `add 3 "LosAngeles" static mac address "JDoe" x000e09700e9cd`

The example will add a static MAC address, 00:e0:97:00:e9:cd named "JDoe" to the tables for the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{"name"}

A symbolic name to help remember the purpose of this entry. This name is a maximum of 7 characters and must be enclosed in quotes.

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x

add (router-wan) static nat address

Use the **add (router-wan) static nat address** command to add a static NAT bi-directional mapping to the specified WAN interface. This command will fail if NAT is not enabled, if the NAT address specified is in the NAT pool, or if the local or NAT address is not unique within the complete group of static NAT mappings.

NOTE: Up to 16 Static NAT addresses may be added.

Syntax: `add {rtr_card-addr} {"wan-name"} static nat address {local-ip-addr} {nat-ip-addr}`

Example: `add 3 "LosAngeles" static nat address 10.0.0.5 34.56.102.222`
The example will add a static NAT mapping between local IP address 10.0.0.5 to the public IP address 34.56.102.222 on the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{local-ip-addr}

The IP address of the local IP host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{nat-ip-addr}

The NAT public IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

add user

Use the add user command to create users with management level access (the highest level) with no password. After adding a user, use the set user command to change the access level and set the password for the new user. See also,set user, delete user.

Syntax: `add user {"user-name"}`

Example: `add user "jsmith"`
The example has added a new user named jsmith.

{"user-name"}

The user-name is the a user ID to add to the system. Text is a single word, with no blank spaces and must be enclosed in quotes. Maximum of 10 characters.

alarms

Use the **alarms** command to display the active alarms. Each alarm is related to a particular address and has a severity category (major, minor, critical, alert). The report can be filtered by port address and/or severity.

Syntax: **alarms [slot|slot:port|slot:port:channel] [category]**
       [severity]

Example: **alarms**

```
    Time     Date     Severity Description
  07:35:45 01/04/2002 Major    Test Major Alarm
  07:35:21 01/04/2002 Minor    Test Minor Alarm
  07:34:57 01/04/2002 Critical Test Critical Alarm
  00:00:20 01/01/2002 Major    5:1-RTR Ethernet Link Down
  00:00:05 01/01/2002 Major    A:2-DS1 Loss Of Signal
Total=10
```

[slot|slot:port|slot:port:channel]

slot	A for the controller card, or 1 - 6 for service cards.
port	Port number.
channel	Channel number

[category]

bri	All BRI facility alarms
ds1	All DS1 facility alarms
env	Environmental Alarms
equipment	Equipment alarms not related to a DS1 interface
fxo	All FX0 facility alarms
fxs	All FXS facility alarms
rtr	All Router facility alarms
v35	All V.35 facility alarms

[severity]

alert	Alert alarms (threshold crossing)
critical	Critical alarms
info	Information alarms
major	Major alarms (service effecting)
minor	Minor alarms (non-service affecting)

clear

User the **clear** command to clear logs, performance data and tables.

clear (ds1)

clear log

clear (router) ip address table

clear (router) log

clear (router) mac address table

clear (router) mgcp stats

clear (router) performance

clear (ds1)

Use the **clear (ds1)** command to clear specified DS1 performance data.

> *Syntax:* `clear {ds1-addr} performance {setting}`

> *Example:* `clear a:1 performance all`
>> Clears all performance data on DS1 1 (port 1) on the Controller card (slot A).

{ds1-addr}

DS1 address in the format {slot:port}.

slot	A for the controller card, or 1-6 for service cards.
port	Port number range or all.

{setting}

all	Clear all performance data
bes	Clear bes (bursty errored seconds) performance data.
css	Clear css (controlled slip seconds) performance data.
dm	Clear dm (degraded minutes) performance data.
es	Clear es (errored seconds) performance data.
lcv	Clear lcv (line code violations) performance data.
les	Clear les (line errored seconds) performance data.
pcv	Clear pcv (path code violations) performance data.
sefs	Clear sefs (severely errored frame seconds) performance data.
ses	Clear ses (severely errored seconds) performance data.
uas	Clear uas (unavailable seconds) performance data.

clear log

Use the **clear log** command to clear the event log. This will clear the log without asking for confirmation.

> *Syntax:* `clear log`

clear (router) ip address table

Use the **clear (router) ip address table** command to flush the learned entries from the IP address table for the specified interface from the specified Router card.

> *Syntax:* `clear {rtr_card-addr} ip address table`
> `["profile-name"]`

> *Example:* `clear 2 ip address table`
> The example will clear all the entries on the IP address table.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

["profile-name"]

The name for the Router interface profile. This name must be enclosed in quotes, with a maximum of 11 characters. **Note: the profile-name is optional, if not specified the tables for all interfaces will be cleared.**

clear (router) log

Use the **clear (router) log** command to clear the CMG event log on the CMG card. This command applies to the CMG Router card only.

> *Syntax:* `clear {cmg_card-addr} log`

> *Example:* `clear 2 log`
> The example will clear the event log.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

clear (router) mac address table

Use the **clear (router) mac address table** command to flush the learned entries from the MAC address table for the specified interface from the specified Router card.

Syntax: `clear {rtr_card-addr} mac address table ["profile-name"]`

Example: `clear 2 mac address table "LosAngeles"`
The example will clear all the entries on the "LosAngeles" interface, MAC address table.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

["profile-name"]

The name for the Router interface profile. This name must be enclosed in quotes, with a maximum of 11 characters.

Note: the profile-name is optional, if not specified the tables for all interfaces will be cleared.

clear (router) mgcp stats

Use the **clear (router) mgcp stats** command to set all MGCP (Media Gateway Call Protocol) statistic counts to zero on the CMG card. This command applies to the CMG Router card only.

Syntax: `clear {cmg_card-addr} mgcp stats`

Example: `clear 2 mgcp stats`
The example will set all MGCP statistics counts to zero, on the CMG in slot 2.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

clear (router) performance

Use the **clear (router) performance** command to clear the runtime statistics that are displayed by the *status (router) performance* command. This command takes effect immediately.

> *Syntax:* `clear {rtr_card-addr} performance {all|lan|wan}`

> *Example:* `clear 4 performance all`
> The example will clear all of the runtime statistics on the router card in slot 4.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{all|lan|wan}

all	Clear both LAN and WAN statistics
lan	Clear the LAN statistics only.
wan	Clear the WAN statistics only.

connect

Use the **connect** command to create two-way connections between any DS0 channels of the service or controller cards.

> *Syntax:* `connect {slot:port|slot:port:channel}`
> `{slot:port|slot:port:channel}`
> Use the **disconnect** command to delete connections.

> *Example:* `connect A:2:1-24 3:1`
> Connects all 24 channels on port address #2 (DS1) on the controller card
> (slot A) to port address #1 V.35 in slot 3.

> **{slot:port|slot:port:channel}**
>
> | | |
> |---|---|
> | **slot** | A for the controller card, or 1 - 6 for service cards. |
> | **port** | Port number or range. |
> | **channel** | Channel number or range, for T1 ports. |

connect (bri) [4:1 mode]

Use the **connect (bri)** command to create two-way connections between DS0 channels of a BRI card and a controller card.

> *Syntax:* `connect {slot:port:channel|slot:port}`
> `{slot:port:channel|slot:port}`

> *Example:* `connect A:1:1 3:1 B1`
> `connect A:1:2 3:1 B2`
> `connect A:1:3 3:1 D`
> Where **B1**, **B2** or **D** indicate how the DS0 will be used.
> The **B1** and **B2** must be entered for each BRI port to be connected.

The **D** indicator applies to 4 BRI ports at a time. The groups are always ports 1-2 for a dual card, ports 1-4 for quad and octal and ports 5-8 for octal cards.

In the 3rd command in the example above, the connect command will connect BRI **D** channel for ports 1-4 (if an octal or quad card. Dual card, ports 1-2) to the DS0 specified by a A:1:3. The user will NOT need to enter the **D** channel connection for ports 2-4 on the BRI in slot 3.

In this case, **connect A:1:4 3:2 d** will fail.

Similarly **connect A:1:4 3:5 d** will connect BRI **D** channel for ports 5-8 to A:1:4.

Channel Associated Signaling (CAS) Conversions

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for the voice cards.

DS0	FXS Analog			FXO Analog			
	LS/LSRB	**GS/GSRB**	**GSW***	**LS**	**GS**	**DPT**	**LSCPD**
VoIP Port							
LS	Y	N	N	N	N	N	N
T1 DS0							
LS	Y	Y	N	Y	N	N	Y
GS	Y	Y	N	N	Y	N	N
EMDW	Y	Y	N	N	N	N	N
EMI	Y	N	N	N	N	Y	N
EMICPD	Y	Y	N	N	N	N	N
EMW	Y	Y	N	N	N	N	N
TR8LSGS	Y	Y	N	N	N	N	N

DPT = Dial Pulse Termination

EMDW = E&M Delayed Wink start

EMI = E&M Immediate start

EMICPD = E&M Immediate Start with Calling Party Disconnect

EMW = E&M Wink start

GS = Ground Start

GSRB = Ground Start with Reverse Battery

LS = Loop Start

LSCPD = Loop Start Calling Party Disconnect

LSRB = Loop Start with Reverse Battery

TR8LSGS = TR-08 Loop Start/Ground Start

VoIP = Voice over IP (CMG only)

* 5G Options

connect (router-trunk) (t1)

Use the **connect (router-trunk) (t1)** command to create two-way connections between the Router port trunk connections and any DS0 channels of the service card or controller.

Syntax: `connect {rtr_trunk-addr}`
`{slot:port|slot:port:channel}`
Use the **disconnect** command to delete connections.

Example: `connect A:2:1-12 5:1:1`
Connects 12 channels on port address #2 (DS1) on the controller card (slot A) to trunk 1 on the Router in slot 5.

{rtr_trunk-addr}

The Router (IP or CMG) trunk address is in the form {slot:port:trunk}.

slot   The slot number (1-6) that contains the Router (IP or CMG) card.

port   Port number is 1.

trunk   Trunk number for this port, 1-24.

{slot:port|slot:port:channel}

slot   A for the controller card, or 1-6 for service cards.

port   Port number or range (port must be a T1).

channel   Channel number or range, for T1 ports.

connect (card-trunk) (card-trunk)

Use the **connect (card-trunk) (card-trunk)** command for configuring card-to-card WAN cross-connects between two Router cards or between a Router card and a V.35 card.

Syntax: `connect {rtr_trunk-addr} {rtr_trunk-addr|v35-addr} {ds0-number}`

Use the **disconnect** command to delete connections.

Example: `connect 3:1:2 4:1:3 12`

Connects WAN trunk number 2 of a Router card in slot 3 to WAN trunk number 3 of a Router card in slot 4 using 12 DS0s.

Example: `connect 3:1:2 5:1 12`

Connects WAN trunk number 2 of a Router card in slot 3 to port 1 of V.35 card in slot 5 using 12 DS0s.

{rtr_trunk-addr}

The Router (IP or CMG) trunk address is in the form {slot:port:trunk}.

slot	The slot number (1-6) that contains the Router card.
port	Port number.
trunk	Trunk number for this port, 1-24.

{v35-addr}

The V.35 trunk address is in the form {slot:port}.

slot	The slot number (1-6) that contains a V.35 card.
port	Port number (1-2).

{ds0-number}

The number of DS0s to connect (1-60).

connect (router-voice) (t1|fxs)

Use the **connect (router-voice) (t1|fxs)** command to create two-way connections between the CMG voice channels and DS0 channels of an FXS or T1 service card or controller T1. The CMG only supports connections between CMG voice channels and FXS or T1 DS0s utilizing loop start signaling.

Syntax: `connect {cmg_voice-addr}`
`{slot:port|slot:port:channel}`

Use the **disconnect** command to delete connections.

Example: `connect A:2:1-12 5:1:1:1-12`

Connects 12 channels on port address #2 (DS1) on the controller card (slot A) to the first 12 voice channels on the CMG in slot 5.

{cmg_voice-addr}

In the form {slot:voip:port}

slot	The slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

{slot:port|slot:port:channel}

slot	A for the controller card, or 1 - 6 for service cards.
port	Port number or range (port must be a T1).
channel	Channel number or range, for T1 ports.

delete

Use the **delete** command to remove users, interfaces, services or profiles.

See the following sections for detailed information on the following **delete** commands

delete (router) dns proxy

delete (router) remote

delete (router) snmp community

delete (router) snmp trap

delete (router) static dns host

delete (router) uploaduser

delete (router-lan) filter

delete (router-lan) secondary ip address

delete (router-lan) static

delete (router-wan) firewall

delete (router-wan) gre network

delete (router-wan) nat bypass

delete (router-wan) static

delete user

delete (router) dns proxy

Use the **delete (router) dns proxy** command to remove a remote DNS server address from the specified Router card. If this command is directed to delete the only a DNS proxy server address then DNS proxy is disabled.

Syntax: `delete {rtr_card-addr} dns proxy {ip-addr} {"profile-name"}`

Example: `delete 2 dns proxy 192.168.100.245 "Texas"`
The example will delete a DNS proxy server address of 192.168.100.245 from the Router in slot 2.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{ip-addr}

The IP address of the external DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

delete (router) remote

Use the **delete (router) remote** command to delete a remote WAN profile from the WAN profile table on the specified Router card.

Syntax: `delete {rtr_card-addr} remote {"profile-name"}`

Example: `delete 6 remote "Texas"`
The example will delete a remote WAN named "Texas" from the WAN profile table for the Router in slot 6.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"profile-name"}

The name of the remote WAN profile to delete. This name must be enclosed in quotes, with a maximum of 12 characters.

delete (router) snmp community

Use the **delete (router) snmp community** command to delete an SNMP community entry on the specified Router card.

> *Syntax:* `delete {rtr_card-addr} snmp community {"community-name"} {ip-addr}`

> *Example:* `delete 2 snmp community "commune" 192.168.100.245`
> The example will delete the previously added SNMP community named "commune" from the Router in slot 2.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"community-name"}

The name of an existing community. This name must be enclosed in quotes, with a maximum of 12 characters.

{ip-addr}

The IP address of the host that can access the SNMP agent via this community, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0" allows any host.

delete (router) snmp trap

Use the **delete (router) snmp trap** command to delete a trap destination from the specified Router card.

> *Syntax:* `delete {rtr_card-addr} snmp trap {"community-name"} {ip-addr}`

> *Example:* `delete 2 snmp trap "commune" 192.168.100.245`
> The example will delete the previously added SNMP community named "commune" from the Router in slot 2.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"community-name"}

The name of an existing community. This name must be enclosed in quotes, with a maximum of 12 characters.

{ip-addr}

The IP address of the destination trap to delete, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router) static dns host

Use the **delete (router) static dns host** command to delete a static DNS host record.

Syntax: `delete {rtr_card-addr} static dns host`
`{ip-addr} {"domain-name"}`

Example: `delete 2 dns host 192.168.100.245 "myhost.some.net"`
Example will delete a DNS host entry with address 192.168.100.245 and
domain named "myhost.come.net" on the Router in slot 2.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{ip-addr}

The IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"domain-name"}

The domain name of the host. Name must be enclosed in quotes, with a maximum length
of 41 characters.

delete (router) uploaduser

Use the **delete (router) uploaduser** command to remove an existing host that is allowed to
upload either the configuration or software files to the specified Router card.

Syntax: `delete {rtr_card-addr} uploaduser`
`{all|ip-addr} {"profile-name"}`

Example: `delete 3 uploaduser "LosAngeles"`
The example will remove any user for upload of a code file from the Router
interface named "LosAngeles". The Router is located in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{all|ip-addr}

all   Will delete all upload users.

ip-addr   The IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is
between 0-255.

{"profile-name"}

The name of the remote WAN or LAN profile specified in the entry to be removed. This
name must be enclosed in quotes.

delete (router-lan) filter

Use the **delete (router-lan) filter** command to delete a single filter rule from the table of Layer 2 filters applied to the specified LAN interface.

> *Syntax:* `delete {rtr_lan-addr} filter`
> `        {address|custom|protocol|all} ["filter-name"]`

> *Example:* `delete 2:1 filter address "Server1"`
> This example will delete a previously created address filter names "Server1".

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card
port	Port number of the Router is 1
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{address|custom|protocol|all}

address	A previously created address filter
custom	A previously created custom filter
protocol	A previously created protocol filter
all	All filter rules. this options does not require a filter-name to follow

{"filter-name"}

A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

delete (router-lan) secondary ip address

Use the **delete (router-lan) secondary ip address** command to delete a secondary IP address and subnet to the specified LAN interface.

Syntax: `delete {rtr_lan-addr} secondary ip address`
`{ip-addr [mask]|ip-addr/bits}`

Example: `delete 4:1 secondary ip address 192.168.1.1`
The example will delete a secondary IP address of 192.168.1.1.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card
port	Port number of the Router is 1
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters

{ip-addr [mask]|ip-addr/bits}

ip-addr	The IP address of a current secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
mask	The mask of the secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255
bits	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

delete (router-lan) static

Use the **delete (router-lan) static** commands to delete static elements from the specified LAN interface.

delete (router-lan) static ip address

Use the **delete (router-lan) static ip address** command to delete a static IP address entry from the specified LAN interface.

Syntax: `add {rtr_lan-addr} static ip address {ip-addr}`

Example: `add 3:1 static ip address 195.168.201.140`

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card
port	Port number of the Router is 1
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters

{ip-addr}

The IP address of the learned address table for the LAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router-lan) static ip network

Use the **delete (router-lan) static ip network** command to delete a static IP network from the specified LAN interface.

Syntax: `delete {rtr_lan-addr} static ip network {ip-addr} {mask} {next-hop-ip-addr}`

Example: `delete 3:1 static ip network 195.168.201.0 255.255.255.0 194.120.20.15`
The example will delete the existing static IP network from the LAN interface of the Router card in slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{"profile-name"}

The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{ip-addr}

The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{next-hop-ip-addr}

The IP address of the next hop gateway for this route, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router-lan) static ipx network

Use the **delete (router-lan) static ipx network** command to delete a static IPX network (route) to the specified LAN interface.

Syntax: `delete {rtr_lan-addr} static ipx network {network} {next-hop-ip-addr}`

Example: `delete 3:1 static ipx network 0x11 0x00e09700e9cd`
The example will delete a static IPX route to network 0x11, using a next hop Router at MAC address 00:e0:97:00:e9:cd, from the LAN interface on the Router card in slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{network}

The IPX network number in HEX (0x...).

{next-hop-ip-addr}

The MAC address of the next hop Router, in the form a 6-octet HEX value, in the form 0xxxxxxxxxxxxx. Please note the address is preceeded by 0x.

delete (router-lan) static mac address

Use the **delete (router-lan) static mac address** command to delete a static MAC address entry to the specified LAN interface.

Syntax: `delete {rtr_lan-addr} static mac address {mac-addr}`

Example: `delete 3:1 static mac address 0x00e09700e9cd`
     The example will delete a static MAC address, 00:e0:97:00:e9:cd, from the LAN interface of the Router card in slot 5.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card
port	Port number of the Router is 1
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x.

delete (router-wan) firewall

Use the **delete (router-wan) firewall** command to delete a firewall rule from a WAN.

Syntax: `delete {rtr_card-addr} {"wan-name"} firewall {all|rule-number}`

Example: `delete 3 "LosAngeles" firewall all`
     The example will remove all firewalls rules on the Router in slot 3, for the profile "LosAngeles".

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{all|rule-number}

all	Delete all firewall rules on this WAN
rule-number	The specific firewall rule to delete

delete (router-wan) gre network

Use the **delete (router-wan) gre network** command to delete a "by network" GRE tunnel to a WAN.

Syntax: `delete {rtr_card-addr} {"wan-name"} gre network
         {ip-addr mask|ip-addr/bits}`

Example: `delete 3 "LosAngeles" gre network 10.0.0.0/8`
         The example will delete the "LosAngeles" GRE tunnel on 10.0.0.0/8.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr mask|ip-addr/bits}

ip-addr mask	The IP address and the subnet mask of the IP network to tunnel, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
ip-addr	The IP Address of the IP network to tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
bits	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

delete (router-wan) nat bypass

Use the **delete (router-wan) nat bypass** command to delete an IP subnet or host from the list of the source addresses that will not be subject to NAT Translation when passing through a NAT enabled WAN interface. This command applies to the IP Router only.

Syntax: `delete {rtr_card-addr} {"wan-name"} nat bypass {ip-addr}`

Example: `delete 1 "RemoteUnit" nat bypass 156.65.0.0`
The example will delete the NAT bypass record for the IP Address 156.65.0.0 from the WAN interface named "RemoteUnit" on the router card in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains the IP Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

IP address or host to delete, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router-wan) static

Use the **delete (router-wan) static** commands to delete a static element from the WAN interface.

delete (router-wan) static ip address

Use the **delete (router-wan) static ip address** command to delete a static IP address on the specified WAN interface.

Syntax: **delete {rtr_card-addr} {"wan-name"} static ip address {ip-addr}**

Example: **delete 3 "LosAngeles" static ip address 195.168.201.140**

The example will delete a static IP address, 192.168.201.140 from the WAN interface named "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

The IP address to delete from the WAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router-wan) static ip network

Use the **delete (router-wan) static ip network** command to delete a static IP network from the specified WAN interface.

Syntax: `delete {rtr_card-addr} {"wan-name"} static ip network {ip-addr} {mask}`

Example: `delete 3 "LosAngeles" static ip network 195.168.201.0 255.255.255.0`
The example will delete a static IP network at 195.168.201.0, with mask 255.255.255.0 from the WAN "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{mask}

Mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete (router-wan) static ipx network

Use the **delete (router-wan) static ipx network** command to delete a static IPX network (route) to the specified WAN interface.

Syntax: `delete {rtr_card-addr} {"wan-name"} static ipx network {network}`

Example: `delete 3 "LosAngeles" static ipx network 0x11`
The example will delete a static IPX Router to network 0x11 to the WAN "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{network}

The IPX network number in HEX (0x...)

delete (router-wan) static mac address

Use the **delete (router-wan) static mac address** command to delete a static MAC address entry from the specified WAN interface.

Syntax: `delete {rtr_card-addr} {"wan-name"} static mac address {mac-addr}`

Example: `delete 3 "LosAngeles" static mac address 0x00e09700e9cd`

The example will add a static MAC address, 00:e0:97:00:e9:cd to the WAN "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{mac-addr}

The MAC address to add to the learned address table for the LAN, in the form 0xxxxxxxxxxxxx. Please note the address is preceeded by 0x.

delete (router-wan) static nat address

Use the **delete (router-wan) static nat address** command to delete a static NAT mapping from the specified WAN interface.

Syntax: `delete {rtr_card-addr} {"wan-name"} static nat address {local-ip-addr} {nat-ip-addr}`

Example: `delete 3 "LosAngeles" static nat address 10.0.0.5 34.56.102.222`
The example will delete a static NAT mapping between 10.0.0.5 and 34.56.102.222 on the WAN "LosAngeles" on the Router card in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{local-ip-addr}

IP address of the local IP host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{nat-ip-addr}

The NAT public IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

delete user

The delete user command will remover a user created by the **add user** command.

Syntax: `delete user {"user-name"}`

Example: `delete user "jsmith"`

{"user-name"}

The user-name is an existing user ID in the system. This name must be enclosed in quotes.

disconnect

disconnect

Remove a connection created using the **connect** command.

Syntax: `disconnect`
`{slot|slot:port|slot:port:channel|slot:port:trunk}`

Example: `disconnect A:2:1-24 3:1`
Disconnects all 24 channels on port address #2 (DS1) on the controller card (slot A) to port address #1 V.35 in slot 3.

NOTE: The operator can remove connections for all of a slot {slot}, a port within a slot {slot:port}, or for specific channel {slot:port:channel}

{slot|slot:port|slot:port:channel|slot:port:trunk}

slot	A for the controller card, or 1 - 6 for service cards.
port	Port number or range.
channel	Channel number or range, for T1 ports.
trunk	Trunk number for this port, 1-24.

exit

Use the **exit** command to log out of the Command Line Interface (CLI).

Syntax: exit

Example: `> exit`

install

install (slot) router

The Compact T1 Controller card automatically creates a backup of the configuration of any Router cards in their respective slot. If a Router is removed and replaced with a another Router (same type) the backup of the configuration from the first occupying Router card is loaded onto the replacing Router card. This command will stop this function and the replacing Router will retain its configuration.

> *Syntax:* `install {slot} {cmg|router}`

> *Example:* `install 5 router`

> **{slot}**
>
> The slot number (1 - 6) of the card to download the software file to.

> **{cmg|router}**
>
> | cmg | Install a CMG Router card. |
> |---|---|
> | router | Install a IP Router card. |

To replace a router card in slot 5 and retain its loaded configuration file:

1. Remove current router card in slot 5 of the system.

2. With the CLI command enter:

   ```
   > install 5 router
   ok
   ```

3. When an "ok" is displayed the replacement router card may be inserted into slot 5.

load

load tftp

The **load tftp** command will download software via TFTP to the Controller or to the Router card or country ring tones to the CMG router card (CMG only). Note: A TFTP server must be running on the host system for this command to be successful.

Syntax: `load [rtr_card-addr] tftp {ip-addr} {"file-name"}`

Example: The following example will download the Controller software file "tdm6_1_z_all.mgm" to the Controller via TFTP. At the prompt enter Software Key or [Enter] to download non-keyed version.

```
> load tftp 192.168.43.52 "tdm6_1_z_all.mgm"
Filename:  tdm6_1_z_all.mgm
Host IP Address:    192.168.43.52
Target IP Address:  192.168.3.194
'load tftp' will be executed with the above parameters.
Download to Active controller:
Type ACTIVE Software Release Key, or Hit 'Enter' for Non-Keyed
Load:
>>>
```

Example: `load 5 tftp 172.26.100.25 "rt_1_20_all.mgm"`
The example will download the Router software file "rtr_1_20_all.mgm" to a Router card in slot 5 via TFTP. Note: see the above example, the load progress will look the same.

Example: `load 5 tftp 172.26.100.25 "brazil.tdb"`
The example will download tones for Brazil to the CMG Router card in slot 5 via TFTP.

[rtr_card-addr]

The Router (IP or CMG) card slot number (1 - 6) to download the software file to.
Note: If no slot number is entered, the software is downloaded to the Controller.

{ip-addr}

The host IP address in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255. If not supplied the host IP address from the database will be used.

{"file-name"}

The software file to load including path. Must be enclosed with quotes.
The file-type of the downloading files must be .mgm for software and .tdb for country tones

load xmodem

Use the **load xmodem** command to download software via Xmodem. This command is only available with RS-232 connections. If you are using Telnet, see *load tftp* command.

> *Example:* `load xmodem`

> Download to Active controller using xmodem.

> Type ACTIVE Software Release Key, or Hit 'Enter' for Non-Keyed Load:

> >>>

At the prompt enter Software Key or [Enter] to download non-keyed version.

> load xmodem command will be executed
> Do you really want to do this?

Enter `Y` at the prompt to continue, or `N` to cancel the download.

`Y` - the system will prompt you to select the appropriate local file. With the file selected, the system will complete the download, reboot, and run the installation for flash upgrade. Screen example following.

```
                    **** System Boot ****

XMODEM transfer started
Validating image(fast)..........................SUCCEEDED!
Erasing FLASH:..........................Finished Erasing FLASH!
Erasing FLASH:..........................Finished Erasing FLASH!
Programming Flash..........................SUCCEEDED!
In 5 seconds the system will boot from Flash
Press any key to stop boot . 5 . 4 . 3 . 2 . 1 . 0
Looking for valid application image in Flash...
Executing application image from Flash
Attached TCP/IP interface to cpm unit 0
Attaching interface lo0...done
ADIT startup
```

log

log

Displays the event log. Where the optional variables used to narrow down the log displayed. The log command without any options displays a full log.

> *Syntax:* `log [slot|slot:port] [category] [severity]`

> *Example:* `log`

```
   Time       Date     Severity Description
 00:00:15 01/01/2002 Major    4:1-CMG Ethernet Link Down
 00:00:12 01/01/2002 Info     3-FXOx8 Card Detected
 00:00:12 01/01/2002 Info     2-FXS5Gx8 Card Detected
 00:00:06 01/01/2002 Major    A:2-DS1 Loss Of Signal
 00:00:05 01/01/2002 Info     4-CMGx1 Card Detected
 00:00:02 01/01/2002 Info     A-T1x2 Card Detected
 00:00:02 01/01/2002 Info     System Powerup
Total=7
```

[slot|slot:port|slot:port:channel]

slot	A for the controller card, or 1 - 6 for service cards
port	Port number (not a range)
channel	Channel number or range

[category]

bri	All BRI facility events
ds1	All DS1 facility events
env	Environmental events
equipment	Equipment events not related to a DS1 interface
fxo	All FX0 facility events
fxs	All FXS facility events
rtr	All Router or CMG facility events
v35	All V.35 facility events

[severity]

alert	Alert events (threshold crossing)
critical	Critical events
info	Information events
major	Major events (service effecting)
minor	Minor events (non-service affecting)

ping

ping

Use the **ping** command to perform a ping test from the Controller and report the result. If the host is reachable, each individual response will be displayed.

Syntax: `ping {ip-addr} [count] [length]`

Example: `ping 192.168.3.196 7 5000`

```
Pinging 192.168.3.196 with 5000 bytes of data:

Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=144ms
Reply from 192.168.3.196: bytes=5000 time=186ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms

> ping 192.168.10.196 7 5000
PING 192.168.10.196: 5000 data bytes
no answer from 192.168.10.196

> ping 192.168.10.196 1
192.168.10.196 is alive
```

{ip-addr}

The host IP address of the device to query, in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255.

[count]

This optional parameter sets the number of pings to send. Range is 1 to 32, default is 5.

[length]

This optional parameter sets the number of bytes to send in the ICMP echo request payload. Range is 0 to 8000, default is 56.

print

Use the print command to display the help information or print the configuration file.

Syntax: `print {config|help}`

print config

Print the configuration file for the Compact T1. The operator may then save this to a text file, which can be sent to another Compact T1 to automatically configure the system at the original Compact T1.

Syntax: `print config [rtr_card-addr]`

[rtr_card-addr]

The slot number (1-6) that contains the Router (IP or CMG) card.

Example: `print config 5`
>   This example would produce a configuration file of the Router in slot 5.

```
Adit> print config 5
set verification off
-set 5 password view   {password}  is manual
-set 5 password config {password}  is manual
-set 5 password admin  {password}  is manual
-set 5 enhanced security enable     is manual
-set 5 password security {password} is manual
delete 5 remote "RemoteUnit"
set 5 stp enable
rename 5 "LocalUnit" "LocalAdit"
set 5:1 ip address 192.168.3.195 255.255.255.0
add 5:1 secondary ip address 192.168.3.194 255.255.255.0
set 5:1 up
set 5:1 collision threshold high 500
add 5 remote "RemoteAdit"
reset 5
```

Example: `print config`
>   This example would produce a configuration file of the Controller.

1. While in a Telnet session to an Compact T1 select Terminal/Start Logging.
2. Name the file.
3. Type the CLI command **`print config.`**
4. Select Terminal/Stop Logging.

See *Load Controller Configuration on page 16-8* for instructions to reload configuration to

Controller card.

print help

Print the complete help file to the screen.

Syntax: **print help**

Example: **print help**

This example would print the entire help text, which can be scrolled though with **Enter** or **Spacebar**.

rename (router)

Use the **rename (router)** command to change the name of a local LAN or remote WAN profile on the specified Router card. Profile names cannot contain spaces and must be unique on a particular Router card.

Syntax: **rename {rtr_card-addr} {"old-profile-name"} {"new-profile-name"}**

Example: **rename 6 "Chicago" "Milwaukee"**

This example will change the name of the WAN profile from "Chicago" to "Milwaukee", for the Router in slot 6.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"old-profile-name"}

The current LAN or WAN profile name. This name must be enclosed in quotes.

{"new-profile-name"}

The new profile name of a LAN or WAN profile. This name has a maximum length of 11 characters, and must be enclosed in quotes.

reset

reset

Use the **reset** command to reboot the system.

Syntax: `reset`

Example: `> reset`

```
 Do you really want to reset (y/n)? y

                  **** System Boot ****
```

reset (router)

Use the **reset (router)** command to reboot the Router. All new configuration since the last reset will be in use.

Syntax: `reset {rtr_card-addr}`

Example: `> reset 1`
`Do you really want to do this ?    y`
`OK`

The example will reboot the Router card in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

restore

Use the **restore** command to restore system properties.

Note: to restore Router defaults see *set (router) default*.

restore defaults

Loads factory defaults for all settings. This command will not take effect until the system is rebooted using the **reset** command.

> *Syntax:* `restore defaults`

> *Example:* `restore defaults`

```
For the restore default changes to take effect send a reset command.
Further configuration changes made before a reset will be lost.
```

rtrping

Use the **rtrping** command to request that the Router perform a ping test and report the result.

Syntax: **rtrping {rtr_card-addr} {dest-ip-addr} [count] [count length] [count length source-ip-addr]**

Example: **ping 4 192.168.100.97**

```
> rtrping 4 192.168.100.97
Pinging 192.168.100.97 with 56 bytes of data:

Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms

> rtrping 4 192.168.103.239
Pinging 192.168.103.239 with 56 bytes of data:

no answer from 192.168.103.239
```

{rtr_card-addr}
The slot number (1-6) that contains the Router (IP or CMG) card.

{dest-ip-addr}
The host IP address of the host to query, in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255.

[count]
This optional parameter sets the number of pings to send. Range is 1 to 32, default is 5.

[length]
This optional parameter sets the number of bytes to send in the ICMP echo request payload. Range is 0 to 8000, default is 56.

{source-ip-addr}
Override the IP address that will be used as the source IP address in the ICMP echo request, must be one of the router interface IP addresses. Default is to use the IP address of the interface from which the ping is sent. The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255.

set

set alarms	**set (router) autologout**
set autoexit	**set (router) cdr**
set (bri)	**set (router) compander**
set (bri) autoactivate	**set (router) default**
set (bri) mode	**set (router) dhcp**
set (bri) pmsync	**set (router) dns**
set clock	**set (router) enhanced security**
set date	**set (router) hookflash**
set (ds0)	**set (router) lmi**
set (ds1)	**set (router) lmi poll**
set ethernet ip address	**set (router) log**
set (fxo)	**set (router) login auth**
set (fxs5G)	**set (router) login prompt**
set id	**set (router) mgcp**
set ip gateway	**set (router) ntp**
set ipds0	**set (router) password**
set local	**set (router) ppp auth**
set login auth	**set (router) ppp security**
set login support	**set (router) priority tos**
set ntp	**set (router) proxy**
set (ocudp) baud	**set (router) reboot**
set (ocudp) loopback	**set (router) rip**
set (ocudp) loopdetect	**set (router) snmp**
set (ocudp) mvec	**set (router) stp**
set (ocudp) secondary	**set (router) syslog**
set (ocudp) selftest	**set (router) voip**
set (ocudp) up/down	**set (router-lan) collision**
set radius	**set (router-lan) filter forward**

set (router-lan) framing

set (router-lan) gateway

set (router-lan) ip address

set (router-lan) ipx network

set (router-lan) phy

set (router-lan) rip

set (router-lan) stp

set (router-lan) up/down

set (router-trunk) encapsulation

set (router-trunk) multilink group

set (router-trunk) up/down

set (router-trunk) voice bandwidth limit

set (router-voice) algorithm preference

set (router-voice) cpd

set (router-voice) default

set (router-voice) down

set (router-voice) dtmfrelay

set (router-voice) echo cancellation

set (router-voice) echo tail

set (router-voice) endpoint prefix

set (router-voice) endpoint suffix

set (router-voice) log start

set (router-voice) log stop

set (router-voice) rxgain

set (router-voice) silence

set (router-voice) slash

set (router-voice) tos

set (router-voice) txgain

set (router-voice) up

set (router-wan) dlci

set (router-wan) gre

set (router-wan) ip

set (router-wan) ip address

set (router-wan) ipx

set (router-wan) nat

set (router-wan) other

set (router-wan) ppp

set (router-wan) rip

set (router-wan) stp

set (router-wan) trunk

set (router-wan) up/down

set screen

set snmp

set syslog

set time

set user

set (v35)

set (v54)

set verification

set alarms

Use the **set alarms** command to manually set an alarm state for testing.

Syntax: `set alarms {critical|major|minor} {off|on}`

Example: `set alarms critical on`
The example set the alarm state of critical on.

{ciritical|major|minor}

critical	Sets a critical alarm
major	Sets a major alarm.
minor	Sets a minor alarm.

{off|on}

off	Disables the alarm state.
on	Enable the alarm state.

set autoexit

Use the **set autoexit** to set the autoexit feature.

Syntax: `set autoexit {off|on}`

Example: `set autoexit on`
The example will enable the auto-exit feature.

{off|on}

off	Turn off the automatic logout option.
on	Enable the automatic exit option. Users will be automatically logged off after 20 minutes of inactivity.

set (bri)

Use the **set (bri)** command to setup the ISDN BRI card.

Syntax: `set {bri-addr} {day|hour} {es|ses} {value}`

Example: `set 3:4 threshold day ses 30`

To set the daily threshold to 30 Severely Errored Seconds on port 4 of a BRI card in slot 3.

{bri-addr}

The {slot:port} address of the BRI card you want to apply the changes to.

slot   A for the controller card, or 1 - 6 for service cards.

port   Port number or range.

{setting}

crv

Set the Call Reference Value, when the BRI is set to 4:1 mode (lt4to1tdm). The CRV value is between 1-768.

down

Take the ISDN line Out-of-Service.

threshold

Set the defect thresholds for ISDN lines to one of the following:

day   Set the thresholds for the daily intervals.

      es   Set the threshold for Errored Seconds (ES)

      ses   Set the threshold for Severely Errored Seconds (SES)

hour   Set the thresholds for hourly intervals.

      es   Same as above

      ses   Same as above

value   range is 1 - 65535 seconds.

up

Put the ISDN line In-Service.

set (bri) autoactivate

Use the **set (bri) autoactivate** command to set the auto-activate option for the card. This option can only be enabled while in 4 to 1 TDM LT Mode.

This option is used to establish the D channel when the FDL link can not be used. If Auto-activation is enabled, all commands initiated by the Switch and normally processed over the FDL will be ignored, commands to control Loop Back or Corrupt CRC tests will also be ignored. The Compact T1 will not be capable of reporting to the Switch any changes in the ISDN line status, such as Loss of Signal, on an automatically activated line. Status changes and alarms will be available through Compact T1 CLI.

> *Syntax:* `set {bri_card-addr} autoactivate {off|on}`

> *Example:* `set 3 autoactivate on`
> To set the auto-activate on for the card in slot 3.

{bri_card-addr}

The slot number (1-6) that contains the BRI card.

{off|on}

off	Turn off the automatic-activation feature.
on	Enable the automatic-activation feature.

set (bri) mode

Use the **set (bri) mode** command to set the mode for the ISDN BRI Service.

> *Syntax:* `set {bri_card-addr} mode {setting}`

> *Example:* `set 4 mode nt3ds0`
> To set the BRI card in slot 4 to use 3 DS0 LUNT

{bri_card-addr}

The slot number (1-6) that contains the BRI card.

{setting}

lt3ds0	Set BRI card mode to 3 DS0 LULT, used primarily for a subscriber line
lt4to1tdm	Set the BRI card mode to 4 to 1 TDM LULT
nt3ds0	Set BRI card mode to 3 DS0 LUNT, used primarily for a central office connection

set (bri) pmsync

Use the **set (bri) pmsync** command to set the source for performance monitoring synchronization.

> *Syntax:* `set {bri_card-addr} pmsync {internal|switch}`

> *Example:* `set 4 pmsync internal`
>> To set the performance monitoring source to internal for the BRI in slot 4.

{bri_card-addr}

The slot number (1-6) that contains the BRI card.

{internal|switch}

Set the operating mode to one of the following:

internal	Set source to the internal to the system
switch	Set source to the switch

set clock

Use the **set clock** command to set the master transmit clock. The primary master clock source may be used to clock each DS1 transmitter. The clock circuit automatically switches to the secondary clock source if the primary clock fails.

Syntax: `set {clock1|clock2} {source}`

Example: `set clock1 a:1`
To set the primary master clock source to A:1.

Example: `set clock2 1:2`
To set the secondary master clock source to Quad T1 card in slot 1 source selected.

{clock1}

Set primary master transmit clock source.

{clock2}

Set secondary master transmit clock source.

{source}

Set the clock source to one of the following:

bri-addr	Clock recovered from the BRI port on the BRI card (BRI card must be in LUNT and 3DS0 mode)
ds1-addr	Clock recovered from the DS1 receiver
internal	Internal stratum 4E oscillator

set date

Use the **set date** command to set the date.

Syntax: `set date {mm/dd/yyyy}`

Example: `set date 1/1/2001`
The example will set the date to January 1, 20001.

{mm/dd/yyyy}

mm	Represents the month. Range is 1-12, single digits can be entered.
dd	Represents the Day. Range is 1-31, single digits can be entered.
yyyy	Represents the year. Range is 1999-2106.

set (ds0)

Use the **set (ds0)** command to setup one or all DS0s in a DS1. The command specifies DS0 or range of DS0s, and the setting to apply.

Syntax:	`set {ds0-addr} {setting}`
Example:	`set 3:1:1-4 type voice`
	To set the traffic type to voice on channels 1 - 4 on port 1 of slot 3.
Example:	`set a:1:1-4 signal emi`
	To set the signal type to E&M immediate start for channels 1 - 4 on port 1 of slot A.

{ds0-addr}

List of DS0 channels to apply setting to, in the form {slot:port:channel}.

slot	A for the controller card, or 1 - 6 for service cards.
port	Port number or range.
channel	Channel number or range.

{setting}

  signal

emdw	E&M delayed wink start. Used for ANI/DNS
emi	E&M immediate start with ringback (used for D3 PLAR and DPT)
emicpd	E&M immediate start with calling party disconnect with ringback
emw	E&M wink start
gs	Ground start signaling
ls	Loop start signaling
plar	D4 PLAR (Private Line Automatic Ringdown) signaling.

  type

data	Set the DS0 up to carry data (clear channel)
voice	Set the DS0 up to carry voice traffic (robbed-bit signaling)

set (ds1)

Use the **set (ds1)** command to set up DS1 interfaces. The command specifies a range of interfaces and the setting to apply.

> *Syntax:* `set {ds1-addr} {setting}`

> *Example:* `set a:1 framing esf`
> To set DS1 1 (port 1) on the controller (slot A) to use ESF framing.

{ds1-addr}

DS1 address in the form {slot:port}.

slot	A for the controller card, or 1-6 for service cards.
port	Port number range or all.

{setting}

down	Set the DS1 as Out-of-Service
up	Set the DS1 as In-Service. Enables alarm reporting (and LED) for the port specified
bpviolation	Set the bipolar violation alarm threshold. Command only functional when in TR-08 mode

none	Remove bipolar violation alarm
tenneg4	Set bipolar violation alarm threshold to .0001
tenneg5	Set bipolar violation alarm threshold to .00001
tenneg6	Set bipolar violation alarm threshold to .000001

equipment	Set equipment loopback on the DS1 Note: this feature is only available through Quad T1 cards. It is not available on the controllers.

loopdown	Disable equipment loopback on the DS1
loopup	Enable equipment loopback on the DS1

fdl	Set the Facilities Data Link (FDL) capabilities

none	Disable FDL output messages
alm13	Enable TR-08 alarm 13 FDL messages
alm16	Enable TR-08 alarm 16 FDL messages
t1403	Enable T1.403 FDL performance messages

framing	Set the DS1 framing type to one of the following:	
	d4	To D4 Superframe (SF) framing
	esf	To Extended Superframe (ESF) framing
	tr8afdl	TR-08 A shelf framing with FDL
	tr8anofdl	TR-08 A shelf framing with no FDL
	tr8b	TR-08 B shelf framing
id	Set the DS1 circuit identification string. This is the same as dsx1Circuit Identifier from DS1 MIB transmission vendor's identification. String text must be enclosed in quotes. Example: set {ds1-addr} id {"string"}	
lbo	Set the Line Build Out (LBO) to one of the following:	
	1	DSX-1 equalization for 0-133 feet (equivalent to CSU attenuation for LBO of 0dB)
	2	DSX-1 equalization for 133-266 feet
	3	DSX-1 equalization for 266-399 feet
	4	DSX-1 equalization for 399-533 feet
	5	DSX-1 equalization for 533-655 feet
	6	CSU attenuation for LBO of -7.5dB
	7	CSU attenuation for LBO of -15dB
	8	CSU attenuation for LBO of -22.5dB
line	Turn a line loopback to the DS1 interface on or off. If the line command is not used, the default for line loopback is loopdown.	
	loopdown	Disable the line loopback
	loopup	Enable a DS1 line loopback toward the DS1 drop
linecode	Set the DS1 interface line coding to one of the following. If the linecode command is not used, the default for linecode is B8ZS.	
	ami	Alternate Mark Inversion line coding
	b8zs	Binary 8 Zero Substitution line coding.
loopdetect	Enable detection of CSU loop code (10000 for loopup; 100 for loopdown)	

	on	Enable detection
	off	Disable detection
payload	Apply a payload loopback to the DS1 interface. If the payload command is not used, the default for payload loopback is loopdown.	
	loopdown	Disable the payload loopback
	loopup	Enable the payload loopback
threshold	Set defect thresholds for a DS1. Defaults for all are 0.	
	day	Set threshold for a daily interval
	bes	Bursty errored seconds range: 0 - 86400
	css	Controlled slip seconds range: 0 - 86400
	dm	Degraded minutes range: 0 - 1440
	es	Errored seconds range: 0 - 86400
	lcv	Line code violations range: 0 - 133401600
	les	Line errored seconds range: 0 - 86400
	pcv	Path code violations range: 0 - 133401600
	sefs	Severely errored frame seconds range: 0 - 86400
	ses	Severely errored seconds range: 0 - 86400
	uas	Unavailable seconds range: 0 - 86400
	min15	Set threshold for a 15 minute interval
	bes	Bursty errored seconds range: 0 - 900
	css	Controlled slip seconds range: 0 - 900
	dm	Degraded minutes range: 0 - 15
	es	Errored seconds range: 0 - 900
	lcv	Line code violations range: 0 - 1389600
	les	Line errored seconds range: 0 - 900
	pcv	Path code violations range: 0 - 1389600
	sefs	Severely errored frame seconds range: 0 - 900
	ses	Severely errored seconds range: 0 - 900
	uas	Unavailable seconds range: 0 - 900

set ethernet ip address

Use the set **ethernet ip address** command to set the Ethernet address for the Compact T1.

Syntax: `set ethernet ip address {ip-addr} [mask]`

Example: `set ethernet ip address 172.26.100.25 255.255.255.0`
Sets the Adit IP address to 172.26.100.25, and a subnet mask of 255.255.255.0.

{ip-addr}

Set the IP address for the Compact T1, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

[mask]

Set the subnet mask, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255. This is an optional setting.

set (fxo)

Use the **set (fxo)** command to setup one/all of the voice channels of an FXO card. The command specifies the list of voice channels within that card, and the setting to apply.

Syntax: `set {fxo-addr} {setting}`

Example: `set 2:1 signal ls`
Set the FXO on slot 2, port 1 to signaling type loop start.

{fxo-addr}

List of voice channels to apply setting to, in the form {slot:port}.

slot	Slot number 1 - 6, location of the FXO card
port	Port number or range

{setting}

rxgain	The receive level range is -9 to +7 (db). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7	
signal	Set the DS0 signaling type	
	dpt	Set the DS0 to Dial Pulse Terminate
	gs	Set the DS0 to Ground Start signaling
	ls	Set the DS0 to Loop Start signaling
	lscpd	Set the DS0 to Loop Start Calling Party Disconnect
txgain	The transmit level range is -9 to +7 (db). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7	

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set (fxs5G)

Use the **set (fxs5G)** command to setup voice channels of an FXS 5G card. The command specifies the list of voice channels, and the setting to apply.

Syntax: `set {fxs5G-addr} {setting}`

Example: `set 3:1-8 impedance 19`
> Sets the impedance of the FXS 5G card, in slot 3, to 900 ohms +2.16µF (µ-Law), see *show impedance* for the listing of index numbers.

{fxs5G-addr}

Voice channels to apply setting to, in the form of {slot:port}.

slot	Slot number 1 - 6, location of the FXS 5G card
port	Port number or range

{setting}

impedance	Sets the line impedance (see the following chart). Default for the FXS 5G is index 19 (900 ohms +2.16µF µ-Law)
	See *show impedance* command.
rxgain	The Receive direction is Network to Analog, with a range of -12 to +6 (dB). Available in .25 dB increments.Default setting is -6
signal	Set the DS0 signaling type

	gs	Set to Ground Start signaling
	gsrb	Set to Ground Start signaling with reverse battery
	gsw	Set to Ground Start Wink signaling
	gswrb	Set to Ground Start Wink signaling with reverse battery
	ls	Set to Loop Start signaling
	lsrb	Set to Loop Start signaling with reverse battery

txgain	The Transmit direction is Analog to Network, with a range of -12 to +6 (dB). Available in .25 dB increments. Default setting is -3
winktime	Set the wink time from 105 ms to 300 ms in 3 ms increments. Enter value or type "Default" (135 ms). Setting the wink time for any channel sets it for all channels on this card.

set id

Use the **set id** command to the unit ID.

> *Syntax:* `set id {"id-name"}`

> *Example:* `set id "ADIT600"`
>   ADIT600>

{"id-name"}

The name must be unique with a maximum of 20 characters. Name must be enclosed in quotes.

set ip gateway

Use the set **ip gateway** command to set the IP gateway address (also known as the default route) for the Compact T1. The command specifies the numeric Internet Protocol (IP) address. The new gateway address will not take effect until Controller is reset (**reset** command).

> *Syntax:* `set ip gateway {ip-addr}`

> *Example:* `set ip gateway 192.168.100.1`

{ip-addr}

Set the IP gateway address for the Compact T1, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

set ipds0

Use the **set ipds0** command to setup the DS0 management channel.

Note: the DS0 selected as the DS0 management channel can only reside on the Controller T1.

Syntax: `set ipds0 {setting} [ds0-addr|ip-addr]`

Example: `set ipds0 assign a:1:24`

The example sets the DS0 management channel to slot A (Controller), port 1, channel 24.

{setting}

assign	Assign the DS0 as the IP management channel
delete	Removes the IP over DS0 management channel (Default)
down	Set the DS0 management channel down (Default)
ip address	Set the DS0 management channel's IP address and optional subnet mask
up	Set the DS0 management channel up (enables)

[ds0-addr|ip-addr]

In the form {slot:port:channel}.

slot	A for the controller card
port	Port number or range.
channel	Channel number or ranges.
ip-addr	Setup the DS0 management channel IP address and the optional subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set local

Use the **set local** command to enable or disable local DIP switch settings. The LOCAL LED on the Controller, will display an green light indicator if **Local** is set to **ON**.

Syntax: `set local {on|off}`

Example: `set local off`

{on|off}

on	To configure the Compact T1 using the DIP switches.
off	To configure using the Command Line Interface (CLI).

Note: **set local** will not effect the ACO, ST, OPT or RST switches on the controller.

set login auth

Use the **set login auth** command to set the authentication method for controller logins, with local database or external RADIUS servers. When set to RADIUS the controller will try the RADIUS servers first, if no servers reply to the request, the controller will use its local database of users to authenticate the login. A set login authentication to RADIUS will fail without a minimum of 1 RADIUS server configured.

Syntax: `set login auth {local|radius}`

Example: `set login auth radius`
          The example will set the login authentication process to RADIUS.

{local|radius}

local	Authenticate user logins via the controller database (Default).
radius	Authenticate user logins via the external RADIUS servers.

set login support

Use the **set login support** command to enable/disable the internal login accounts for Customer Support personnel for the Controller and Router cards (IP or CMG).

Syntax: `set login support {disable|enable}`

Example: `set login support disable`
          The example will prohibit logins via Customer Support passwords.

{disable|enable}

disable	Prohibit logins via Customer Support passwords.
enable	Allow logins via Customer Support passwords.

set ntp

Use the **set ntp** commands to configure the Network Time Protocol functions.

set ntp disable

Use the **set ntp disable** command to disable Network Time Protocol (NTP) processing (RFC 2030). The initial default for this processing is disabled.

Syntax: **set ntp disable**

Example: **set ntp disable**
> The example will stop NTP processing on the Controller.

set ntp enable

Use the **set ntp enable** command to enable both Network Time Protocol (NTP) processing (RFC 2030). The initial default for this processing is disabled.

Syntax: **set ntp enable**

Example: **set ntp enable**
> The example will start NTP processing on the Controller.

set ntp poll

Use the **set ntp poll** command to specify the polling frequency when operating in unicast polled mode. When the NTP server address is configured to a non-zero value this setting will cause the Controller NTP client to issue a unicast NTP request to the configured NTP server at this frequency.

Syntax: **set ntp poll {seconds}**

Example: **set ntp poll 120**
> The example will poll the NTP server every 2 minutes.

{seconds}

The number of seconds between polls. Range is 16 - 1024 seconds, with a default of 16.

set ntp server address

Use the **set ntp server address** command to specify the IP address of the NTP server.

Syntax: `set ntp server address {ip-addr}`

Example: `set ntp server address 192.168.23.56`
The example will the IP address to be used to access the NTP server to 192.168.23.56.

{ip-addr}

The IP address of the NTP server for unicast polling, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255, or 0.0.0.0 for listening to broadcasts. The default is 0.0.0.0.

set ntp timezone

Use the **set ntp timezone** command to specify the timezone offset to GMT for this controller.

Syntax: `set ntp timezone {hour-offset} [minute-offset]`

Example: `set ntp timezone -5`
The example will set the time zone offset to be -5:00 from GMT (Greenwich Mean Time), which equates to Eastern Standard Time.

{hour-offset}

Offset from GMT in hours. Range is from -12 - 12, with a default of 0.

{minute-offset}

An optional parameter which sets the offset from GMT in minutes. Range is from 0 - 59, with a default of 0. This is used for half hour time zones.

set (ocudp) baud

Use the **set (ocudp) baud** command to configure the Baud Rate for OCU-DP ports.

Syntax: `set {ocudp-addr} baud {rate}[sw56|sw56cp]`

Example: `set 3:2 baud 2400`
    Set the baud rate on port 2 to 2400, on the OCU-DP card in slot 3

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-6) where the OCU-DP is located
port	Port number or range.

{rate}

2400	Set OCU-DP baud rate to 2400
4800	Set OCU-DP baud rate to 4800
9600	Set OCU-DP baud rate to 9600
19200	Set OCU-DP baud rate to 19200
38400	Set OCU-DP baud rate to 38400
56000*	Set OCU-DP baud rate to 56000 (Default)

	sw56	Set to switched 56 service
	sw56cp	Set to switched 56 service with call progress capability. Sends special call progress CMI codes to DSU.

64000	Set OCU-DP baud rate to 64000

set (ocudp) loopback

Use the **set (ocudp) loopback** command to manually set OCU/CSU loopback tests.

> *Syntax:* `set {ocudp-addr} loopback {csu|ocu} {loopdown|loopup}`
>
> *Example:* `set 3:2 loopback csu loopdown`

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot	Slot number (1-6) where the OCU-DP is located
port	Port number or range.

{csu|ocu}

csu	Set CSU manual loopback tests
ocu	Set OCU manual loopback tests

{loopdown|loopup}

loopdown*	Stop CSU/OCU manual loopback test (Default).
loopup	Start CSU/OCU manual loopback test

set (ocudp) loopdetect

Use the **set (ocudp) loopdetect** to configure the OCU non-latching/latching loopback code detection.

> *Syntax:* `set {ocudp-addr} loopdetect {csu|dsu|ocu} {llb|nllb}`
> `{disable|enable}`

> *Example:* `set 3:2 loopdetect csu llb enable`

{ocudp-addr}

The {slot:port} address of the OCU-DP card to apply the changes to.

slot	Slot number (1-6) where the OCU-DP is located
port	Port number or range.

{csu|dsu|ocu}

csu	Set CSU manual loop codes detection
dsu	Set DSU manual loop codes detection
ocu	Set OCU manual loop codes detection

{llb|nllb}

llb	Set up latching loopback detection
nllb	Set up non-latching loopback detection

{disable|enable}

disable	Disable loop detection
enable	Enable loop detection

set (ocudp) mvec

Use the **set (ocudp) mvec** to set Majority Vote Error Correction (MVEC).

> *Syntax:* `set {ocudp-addr} mvec {disable|enable}`
>
> *Example:* `set 3:2 mvec enable`

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot Slot number (1-6) where the OCU-DP is located

port Port number or range.

{disable|enable}

disable* Disable the error correct (Default).

enable Enable the error correct

set (ocudp) secondary

Use the **set (ocudp) secondary** to configure the secondary channel service.

> *Syntax:* `set {ocudp-addr} secondary {disable|enable}`
>
> *Example:* `set 3:2 secondary enable`

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot Slot number (1-6) where the OCU-DP is located

port Port number or range.

{disable|enable}

disable* Disable the secondary channel service (Default).

enable Enable the secondary channel service

set (ocudp) selftest

Use the **set (ocudp) selftest** to initiate the OCU-DP card to perform a self test. This request will display a message to wait 8 seconds before requesting selftest status with the status command.

Syntax: `set {ocudp-addr} selftest`

Example: `set 3:2 selftest`

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot   Slot number (1-6) where the OCU-DP is located

port   Port number or range.

set (ocudp) up/down

Use the **set (ocudp) up/down** to put the OCU-DP line In or Out-of-Service.

Syntax: `set {ocudp-addr} {down|up}`

Example: `set 3:2 up`

          Set the OCU-DP card in slot 3, port 2 as In-Service.

{ocudp-addr}

The {slot:port} address of the OCU-DP card you want to apply the changes to.

slot   Slot number (1-6) where the OCU-DP is located

port   Port number or range.

{up|down}

down   Set OCU-DP port as Out-of-Service

up   Set OCU-DP port as In-Service

set radius

set radius identifier

Use the **set radius identifier** command to enter an optional name that is used by the RADIUS server to identify this controller, as per section 5.32 of RFC 2865. If configured, the NAS0Identifier attribute is sent as part of the Access-Request.

Syntax: `set radius identifier {"radius-id"}`

Example: `set radius identifier "Adit600-1"`
> The example will set the RADIUS identifier to "Adit600-1".

{radius-id}

A RADIUS identifier with a range of 0 - 63 characters, enclosed in quotes. If entered as an empty string "", then no NAS-Identifier is sent. The default is an empty string and thus is not sent in the Access-Request.

set radius retries

Use the **set radius retries** command to specify the maximum number of RADIUS request attempts to send to each server before trying the next RADIUS server. Note: if none of the configured RADIUS servers are able to respond the login authentication will wait a total time of (number of servers x timeout x retries) seconds before attempting to authenticate the login locally.

Syntax: `set radius retries {number}`

Example: `set radius retries 2`
> The example will set the RADIUS retries to 2, which will try each RADIUS server a max of 2 times.

{number}

The number of retries for each RADIUS servers. Range is 1-6, with a default of 3.

set radius server address

Use the **set radius server address** command to specify the IP address of the external RADIUS server to use for RADIUS login authentication. Up to 3 different RADIUS servers can be configured, with queries sent to each in succession until one of them sends a reply.

Syntax: `set radius server {1|2|3} address {ip-addr} [port]`

Example: `set radius server 1 address 192.168.23.56`
> The example will set the IP address of RADIUS server 1 to 192.168.23.56.

{1|2|3}
The RADIUS server entry to modify.

{ip-addr}
Set the IP address of the RADIUS server, in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255, or 0.0.0.0 to disable this entry. The default is 0.0.0.0 (unused). Note: all 3 RADIUS servers cannot be set to 0.0.0.0 if any login auth settings are set to RADIUS.

[port]
This is an optional parameter. UDP port to be used to send the RADIUS queries. Default is 1812.

set radius server secret

Use the **set radius server secret** command to specify shared secret that the controller RADIUS client and the RADIUS server use to authenticate the RADIUS requests and replies.

Syntax: `set radius server {1|2|3} secret {"secret"}`

Example: `set radius server 1 address 192.168.23.56`
> The example will set the IP address of RADIUS server 1 to 192.168.23.56.

{1|2|3}
The RADIUS server entry to modify.

{secret}
An ASCII string with a range of 1 - 31 characters, enclosed in quotes. Default is an empty string "".

set radius timeout

Use the **set radius timeout** command to specify the maximum number of seconds to wait for a reply after each RADIUS request before sending the next attempt. Note: if none of the configured RADIUS servers are able to respond the login authentication will wait a total time of (number of servers x timeout x retries) seconds before attempting to authenticate the login locally.

Syntax: **set radius timeout {seconds}**

Example: **set radius timeout 2**
> The example will wait 2 seconds for each RADIUS reply.

{seconds}

The number of seconds to wait for a reply after each request before the next attempt. Range is 1 - 6, with a default of 3 seconds.

set (router) autologout

Use the **set (router) autologout** command to set the period of time of inactivity after which the user will be automatically logged-out of a Telnet session.

Syntax: **set {rtr_card-addr} autologout {minutes}**

Example: **set 3 autologout 0**
> The example will disable the auto-logout timer in the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{minutes}

The minutes of inactivity before auto-logout occurs. Range is 0-255. An entry of "0" will disable the auto-logout timer.

set (router) cdr

Use the **set (router) cdr** command to enable or disable Call Detail Recording (CDR) for the specified CMG card. Call Detail records can be viewed using the *show (router) log* command. This command applies to the CMG Router card only.

> *Syntax:* `set {cmg_card-addr} cdr {disable|enable}`

> *Example:* `set 1 cdr enable`
> > The example will enable Call Detail Recording for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{disable|enable}

disable	Disable Call Detail Recording.
enable	Enable Call Detail Recording.

set (router) compander

Use the **set (router) compander** command to set the companding algorithm to use with the PCM (G.711) voice stream to/from the TDM side of a connection. The default companding algorithm is mu-law. The companding algorithm chosen for the CMG must match the companding used on the associated TDM-side connected interface channel, i.e. FXS ports and/ or T1 channels. This command applies to the CMG Router card only.

> *Syntax:* `set {cmg_card-addr} compander {alaw|mulaw}`

> *Example:* `set 1 compander alaw`
> > The example will set the compander algorithm to alaw on the CMG Router in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG Router card.

{alaw|mulaw}

alaw	The companding algorithm used in Europe and elsewhere.
mulaw	The companding algorithm used in North America.

set (router) default

Use the **set (router)** default command to reset the Router card to its default configuration settings. This command will cause the Router card to perform a reboot.

>   *Syntax:* `set {rtr_card-addr} default`

> *Example:* `set 3 default`
> `Do you really want to do this ?  y`
> `OK`
> The example will reset the Router in slot 3 to its defaults.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

set (router) dhcp

Use the **set (router) dhcp** commands to configure the DHCP functions.

set (router) dhcp disable

Use the **set (router) dhcp disable** command to disable both DHCP server and DHCP relay functionality for the specified Router card.

Syntax: `set {rtr_card-addr} dhcp disable`

Example: `set 3 dhcp disable`
The example will set the Router in slot 3 to disable DHCP.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

set (router) dhcp relay server

Use the **set (router) dhcp relay server** command to enable a DHCP relay and assign a DHCP server address for the specified Router card.

Syntax: `set {rtr_card-addr} dhcp relay server`
`       {server-number} {ip-addr} {"profile-name"}`

Example: `set 3 dhcp relay server 1 134.200.3.45 "remotewan"`
The example will set the Router in slot 3 to enable DHCP relay server 1 at IP address 134.200.3.45 on WAN "remotewan".

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{server-number}

The server number (1 or 2) to specify.

{ip-addr}

The IP address of the server to relay to, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{"profile-name"}

The profile name for the Router interface that is used to reach this destination. This name must be enclosed in quotes, with a maximum of 11 characters.

set (router) dhcp server dnsserver

Use the **set (router) dhcp server dnsserver** command to set the IP address of up to 4 DNS servers that the DHCP server will inform the clients of.

Syntax: `set {rtr_card-addr} dhcp server dnsserver {number} {ip-addr}`

Example: `set 5 dhcp server dnsserver 4 122.104.33.220`
The example will set the 4th DNS server address for the DHCP server on the Router card in slot 5 to 122.104.33.220

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{number}

The DNS server entry, 1-4.

{ip-addr}

The address of the DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router) dhcp server domain

Use the **set (router) dhcp server domain** command to select the domain name to provide to DHCP clients.

Syntax: `set {rtr_card-addr} dhcp server domain {"domain-name"}`

Example: `set 5 dhcp server domain "carrieraccess.com"`
The example sets the domain name to "carrieraccess.com" in the DHCP server on the Router in slot 5.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"domain-name"}

The domain name, with a maximum of 43 characters. Name must be enclosed in quotes.

set (router) dhcp server duration

Use the **set (router) dhcp server duration** command to set the lease duration that the DHCP server applies to client assignments.

Syntax: `set {rtr_card-addr} dhcp server duration {hours:minutes}`

Example: `set 5 dhcp server duration 3:45`
The example set the lease duration for the DHCP server on the Router in slot 5 to 3 hours and 45 minutes.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{hours:minutes}

The lease duration in hours and minutes, in the form of HH:MM.
HH = 1-999, MM = 1-60.

set (router) dhcp server netbios nameserver

Use the **set (router) dhcp server netbios nameserver** command to set the NetBIOS Name Server (NBNS - RFC 1001/1002) that the DHCP server provides to clients.

Syntax: `set {rtr_card-addr} dhcp server netbios nameserver {1|2} {ip-addr}`

Example: `set 5 dhcp server netbios nameserver 1 192.168.100.80`
Note: DHCP server must first be enabled with the "startaddr" command. See *set (router) dhcp server startaddr on page 5-100*.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{1|2}

The NetBIOS Name Server entry.

{ip-addr}

The NBNS IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router) dhcp server netbios nodetype

Use the **set (router) dhcp server netbios nodetype** command to set the NetBIOS node type (see RFC 1001/1002) that the DHCP server provides to clients.

Syntax: `set {rtr_card-addr} dhcp server netbios nodetype {type-number}`

Example: `set 5 dhcp server netbios nodetype 1`
The example will set the NetBIOS node type to B-node.

Note: DHCP server must first be enabled with the "startaddr" command. See *set (router) dhcp server startaddr on page 5-100*.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{type-number}

The value is specified as a single octet that identifies the client type.

1	B-node	**4**	M-node
2	P-node	**8**	H-node

set (router) dhcp server netbios scope

Use the **set (router) dhcp server netbios scope** command to set the NetBIOS scope value (see RFC 1001/1002) that the DHCP server provides to clients.

Syntax: `set {rtr_card-addr} dhcp server netbios scope {scope-name}`

Example: `set 5 dhcp server netbios scope "Accounting"`
Note: DHCP server must first be enabled with the "startaddr" command. See *set (router) dhcp server startaddr on page 5-100*.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{scope-name}

The Scope is a DHCP option that represents a grouping of computers on a subnet using the same NetBIOS name. Enter up to 41 alphanumeric characters for the scope-name, enclosed in quotes.

set (router) dhcp server startaddr

Use the **set (router) dhcp server startaddr** command to enable the DHCP server on the specified Router card.

Syntax: `set {rtr_card-addr} dhcp server startaddr {ip-addr} {count}`

Example: `set 4 dhcp server startaddr 134.200.3.1 254`
The example will set the Router in slot 4 to enable the DHCP server with 254 address pool starting at 134.200.3.1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{ip-addr}

The starting address of the client address pool, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{count}

The number of IP addresses in the client address pool (1-254).

set (router) dns

Use the **set (router) dns** commands to set Domain Name Server (DNS) options.

set (router) dns domain

Use the **set (router) dns domain** command to set the default domain that the DNS resolver will add to any name queries that are not fully qualified.

Syntax: `set {rtr_card-addr} dns domain {domain-name"}`

Example: `set 3 dns domain "mycompany.com"`

The example will set the default domain to "mycompany.com" for the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"domain-name"}

The domain name, with a maximum of 43 characters. Name must be enclosed in quotes.

set (router) dns name

Use the **set (router) dns name** command to set the Router card host name.

Syntax: `set {rtr_card-addr} dns name {"host-name"}`

Example: `set 3 dns name "Adit25"`

The example will set the Router card host name to "Adit25" for the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"host-name"}

The host name for the Router card. This name must be enclosed in quotes, with a maximum of 15 characters.

set (router) dns resolver

Use the **set (router) dns resolver** command to enable/disable use of DNS resolver to convert domain names to IP addresses. The DNS server address must be set before the DNS resolver can be enabled.

Syntax: `set {rtr_card-addr} dns resolver {disable|enable}`

Example: `set 3 dns resolver disable`
> The example will disable the DNS resolver for the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{disable|enable}

> **disable**   Disable DNS resolver

> **enable**   Enable DNS resolver

set (router) dns server

Use the **set (router) dns server** command to configure the IP address of DNS servers.

Syntax: `set {rtr_card-addr} dns server {1|2} {ip-addr}`

Example: `set 3 dns server 1 10.10.10.0`
> The example will set the IP address of the DNS server number 1 to 10.10.10.0 for the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{1|2}

Define the DNS server.

> **1**   Setup IP address of DNS server 1

> **2**   Setup IP address of DNS server 2

{ip-addr}

The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router) enhanced security

Use the **set (router) enhanced security** command to enable or disable enhanced login security on the Router. When enabled the user will not receive any login prompt or other output until the security password is typed. The security password is set via the *set (router) password* command.

> *Syntax:* `set {rtr_card-addr} enhanced security {disable|enable}`

> *Example:* `set 5 enhanced security enable`
> The example will enable the enhanced security on the Router card in slot 5.
>
> **Note:** A **set 5 password security "password"** command must be completed before the enhanced security can be enabled.
> See, *set (router) password on page 5-129*

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{disable|enable}

disable	Disable enhanced login security
enable	Enable enhanced login security

set (router) hookflash

Use the **set (router) hookflash** command to specify the flash maximum time in milliseconds. This is the time beyond which a disconnect, rather than a hookflash event, is declared. Flash event processing may be turned off by setting this parameter to zero. This command applies to the CMG Router card only.

> *Syntax:* `set {cmg_card-addr} hookflash {milliseconds}`

> *Example:* `set 5 hookflash 500`
> The example will set the hookflash to 500 milliseconds (half a second) on the CMG card in slot 5.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{milliseconds}

Maximum flash length, between 500 and 1500 milliseconds, or 0. Default is 1500 milliseconds.

set (router) lmi

Use the **set (router) lmi** command to specify the Local Management Interface (LMI) protocol to use for the specified Router card.

Syntax: `set {rtr_card-addr} lmi {annexd|disable|lmi}`

Example: `set 5 lmi annexd`
The example will configure LMI on the Router card in slot 5 to Annex D.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{annexd|disable|lmi}

annexd	Set LMI to Annex D.
disable	Disable LMI on the Router.
lmi	Set LMI to LMI rev1 (DLCI 1023)

set (router) lmi poll

Use the **set (router) lmi poll** command to specify the Local Management Interface (LMI) for the specified Router card.

Syntax: `set {rtr_card-addr} lmi poll {counter|interval}`
`        {value}`

Example: `set 5 lmi poll counter 15`
The example will configure LMI poll count to 15, on the Router card in slot 5.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{counter|interval}

counter	Set the LMI count. **{value}** = count of how many link status enquiries can go un-responded before the link is declared down. Range is 0-255.
interval	Set LMI period **{value}** = LMI period. Range is between 0-255 seconds.

set (router) log

Use the **set (router) log** command to set whether the CMG text log will continuously add new log entries by over-writing the oldest entries, or will stop adding new log entries after the log is full. Entering this command will cause the log to be cleared. This command applies to the CMG Router card only.

> *Syntax:* **set {cmg_card-addr} log {first|last} [detail]**

> *Example:* **set 5 log last detail**
>> The example will set the log to add new entries and display the log in detail on the Router card in slot 5.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{first|last}

first	Stop adding new entries when log is full (Default)
last	Always add new entries, overwrite old entries.

[detail]

Will display the log entries in greater detail, which will cause less entries to fit in the log.

set (router) login auth

Use the **set (router) login auth** command to specify how login authentication for this router should be performed. The router supports a configuration setting for each router card to determine how the router card logins are to be authenticated, as per one of the following choices: authenticate router logins from the router card local database (default), authenticate router logins by having the controller send a RADIUS access-request message to the controller's RADIUS servers, or authenticate router logins identically to controller logins. The last choice will cause the router logins to be authenticated either via RADIUS or the controller's database of users and passwords, as configured for the controller. This configuration is done with Controller CLI only (no menu support). This command applies to the IP Router card only.

> *Syntax:* `set {rtr_card-addr} login auth`
> `{controller|local|radius}`

> *Example:* `set 5 login auth controller`
> The example will set the Router in slot 5 to have logins authenticated by the Controller.

{rtr_card-addr}

The slot number (1-6) that contains the IP Router card.

{controller|local|radius}

controller	Use the Controller login authentication.
local	Authenticate user logins via the router database (Default).
radius	Authenticate user logins via the Controller's RADIUS servers.

set (router) login prompt

Use the **set (router) login prompt** command to enable or disable the suppression of the Router login prompt for a user that telnets in from the Controller CLI. The user level of the current Controller user will be passed to the Router card at the time the telnet starts. This configuration allows a single login and authentication at the controller to apply to Router telnet sessions as well as the usual Controller CLI. This command applies to the IP Router card only.

> *Syntax:* `set {rtr_card-addr} login prompt {disable|enable}`

> *Example:* `set 5 login prompt disable`
> > The example will set disable the login prompt to users that telnet to the Router in slot 5 from the Controller CLI.

{rtr_card-addr}

The slot number (1-6) that contains the IP Router card.

{disable|enable}

disable	Do not present a login prompt to the user that telnets to the Router via Controller CLI.
enable	Present a login prompt to the user that telnets to the Router via Controller CLI (Default).

set (router) mgcp

Use the **set (router) mgcp** command to setup Media Gateway Call Protocol (MGCP) parameters. This command applies to the CMG Router card only.

set (router) mgcp addressformat

The **set (router) mgcp addressformat** is an interoperability command. It is used to remove or put square brackets around IP Addresses in transmitted MGCP commands. The standard convention and default setting is to have the brackets. The CMG is capable of receiving either format regardless of this setting. This command applies to the CMG Router card only.

Syntax: **set {cmg_card-addr} mgcp addressformat {brackets|nobrackets}**

Example: **set 1 mgcp addressformat nobrackets**
The example will remove brackets from around IP addresses in MGCP commands issued by the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{brackets|nobrackets}

brackets	MGCP will place brackets around IP addresses (Default)
nobrackets	MGCP will not place brackets around IP addresses

set (router) mgcp algorithmname

The **set (router) mgcp algorithmname** is an interoperability command to configure non-default MGCP designations for voice coding algorithms supported by the CMG. MGCP algorithm names are used in the "a:" attribute in the Local Connection Options (L:) parameter line of a CRCX or MDCX command. The CMG will ignore the case of characters in algorithm names received in MGCP commands from a call agent. Default algorithm names are taken or derived from standard encoding names registered at IANA, as specified at www.iana.org, the RTP section. This command takes effect immediately and applies to the CMG Router card only.

The default MGCP algorithm names are given in column 2 below.

Algorithm	CMG Algorithm ID	MGCP Algorithm Name
g711 mu-law	g711mu	PCMU
g711 A-law	g711a	PCMA
g729A	g729a	G729A
g726-16 kb/s	g726_16	g726-16
g726-24 kb/s	g726_24	g726-24
g726-32 kb/s	g726_32	g726-32
g726-40 kb/s	g726_40	g726-40

NOTE: The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature it will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Service.

Syntax: `set {cmg_card-addr} mgcp algorithmname {setting} {"algorithm-name"}`

Example: `set 1 mgcp algorithmname g711mu "Gxxx"`
The example will set the mgcp algorithm coding to G.711 for mu-law and name it "Gxxx", for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{setting}

Enter one of the following: g711mu, g711a, g726_16, g726_24, g726_32, g726_40, g729a.

{"algorithm-name"}

The MGCP algorithm name for the CMG card. This name must be enclosed in quotes, with a maximum of 16 characters.

set (router) mgcp callagent address

Use the **set (router) mgcp callagent address** command to initialize the address (notified entry) used by MGCP to send commands to the call agent. The address may be given in the form of an IPv4 address or as a domain name. The domain name form can only be used if DNS has been enabled. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp callagent address`
`{ip-addr|"domain-name"}`

Example: `set 1 mgcp callagent address "callagent.com"`
The example will set the domain-name to be used by MGCP to access the call agent to "callagent.com" for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{ip-addr|"domain-name"}

ip-addr	The default IP address for MGCP to send command to call agent. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
domain-name	The default domain name for MGCP to send commands to call agent. Name has a maximum of 43 characters, enclosed in quotes.

set (router) mgcp callagent filter

Use the **set (router) mgcp callagent filter** command to prevent the CMG from accepting MGCP messages from call agents except those that have been explicitly configured via the *set (router) mgcp callagent address* or *set (router) mgcp callagent secondary address* command. This command takes effect immediately.

Syntax: `set {cmg_card-addr} mgcp callagent filter`
`{disable|enable}`

Example: `set 1 mgcp callagent filter enable`
The example will set the CMG in slot 1 to ignore MGCP from non-configured IP addresses.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{disable|enable}

disable	Accept MGCP messages from all IP addresses.
enable	Ignore MGCP messages from IP addresses that are not those of the configured call agents.

set (router) mgcp callagent port

Use the **set (router) mgcp callagent port** command to initialize the UDP port (notified entity port) to be used by MGCP to send commands to the call agent.

Note: the MGCP specification RFC2705 suggests a port number of 2727 for the call agent. This is the default that the CMG uses to communicate with a call agent. However, many MGCP implementations use the port 2427, making it the same as the usual MGCP port of a gateway. If one is having trouble reaching the call agent, one should probably try configuring the port to 2727. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp callagent port {port-number}`

Example: `set 1 mgcp callagent port 2427`
   The example will set the port number to be used by MGCP to access the call agent to 2427 for the CMG card slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{port-number}

Port number for MGCP on the call agent. Range is from 0 to 65535. Default 2727.

set (router) mgcp callagent secondary address

Use the **set (router) mgcp callagent address** command for configuring a secondary call agent address that will be tried if the primary call agent does not reply to the notifications. The secondary call agent address will function in the same fashion as would multiple IP addresses returned in a domain name query. See RFC 2705 for a detailed discussion of how multiple call agents are handled by MGCP gateways. The address may be given in the form of an IPv4 address or as a domain name. The domain name form can only be used if DNS has been enabled. This command takes effect after the card had been reset.

Syntax: `set {cmg_card-addr} mgcp callagent secondary address {ip-addr|"domain-name"}`

Example: `set 1 mgcp callagent secondary address "callagent.carrieraccess.com"`
The example will set the secondary domain-name to be used by MGCP to access the callagent to "callagent.carrieraccess.com" for the CMG card in slot 1

{cmg_card-addr}
The slot number (1-6) that contains the CMG Router card.

{ip-addr|"domain-name"}

ip-addr	The secondary call agent IP address for MGCP to send commands to. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
domain-name	Secondary call agent domain-name for MGCP to send command to. The name must be enclosed in quotes.

set (router) mgcp callagent secondary port

Use the **set (router) mgcp callagent port** command for configuring the port number for the secondary call agent that will be tried if the primary call agent does not reply to the notifications. This command takes effect after the card has been reset.

Syntax: `set {cmg_card-addr} mgcp callagent secondary port {port-num}`

Example: `set 1 mgcp callagent secondary port 5000`
The example will set the port number to be used by the MGCP to access the secondary call agent to 5000 for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG Router card.

{port-num}

Default port number for MGCP on the secondary call agent. Range from 0 to 65535, with a default of 2727.

set (router) mgcp default

Use the **set (router) mgcp default** command to set all configurable MGCP options to their default values. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp default`

Example: `set 1 mgcp default`
The example will set the MGCP to default values CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

set (router) mgcp dialstring format

The **set (router) mgcp dialstring format** is an interoperability command to specify the reporting format of dialed digit strings in the Observed Events parameter of MGCP NTFY messages. Either the individual digits are separated by commas or not. The default, which is the recommended usage, is to separate digits with commas. This command applies to the CMG Router card only. Note: The *set (router) mgcp package default* command also affects the dialstring format. See description below.

Syntax: `set {cmg_card-addr} mgcp dialstring format {commas|nocommas}`

Example: `set 1 mgcp dialstring format commas`
The example will set the MGCP dialstring format to separate the digits with commas, for the CMG in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{commas|nocommas}

commas	Insert commas between digit events (Default)
nocommas	Do not insert commas between digit events

set (router) mgcp down

Use the **set (router) mgcp down** command to disable MGCP processing. Incoming MGCP messages from any call agent will be ignored, and endpoint activity will not cause any outgoing MGCP messages to be sent, nor any events to be accumulated. This is the default mode when the CMG is initially provisioned. If MGCP is configured as down when a reset or power cycle occurs, the call agent will NOT be notified when the reset or power cycle is complete.

The options for this command allow the invoker of the command to specify how the call agent is to treat active voice channels as they go out of service. The default ("now") is an immediate termination of service on each provisioned ("up") voice channel, whether active (on a call) or not. The call agent will be informed of the shutdown via an RSIP message for each voice channel with the "forced" restart method. If the "graceful" or "timeout" option is used, the call agent will be informed of the desire to shut down each active voice channel via an RSIP message with "graceful" restart method, and each inactive channel with the "forced" restart method. After a call has cleared or the timeout period has expired on an active voice channel, a final RSIP will be sent, using the "forced" restart method.This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp down [graceful|now|timeout]`
`         [time]`

Example: `set 1 mgcp down graceful`
The example will shut down MGCP for the CMG card in slot 1. Inform the call agent as each channel's call ends.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

[graceful|now|timeout]

graceful	Wait for current calls to end before placing endpoint Out-of-Service
now	Disconnect any existing calls immediately (Default)
timeout	Wait a defined time (see time below) before taking endpoint out of service, disconnect any remaining calls. No new calls established during waiting period
[time]	Number of seconds to wait before taking endpoints Out-of-Service. Default time is 60 seconds.

set (router) mgcp gatewayid

Use the **set (router) mgcp gatewayid** command to set the gateway name or IP address to be used in MGCP command header lines and the SDP. By default, the gateway ID that will be used is the domain name of the CMG if DNS is enabled or the IP address of the LAN or WAN interface used to communicate with the call agent. The user may set an explicit name or address by entering it in the command. The domain name form can only be used if DNS has been enabled. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp gatewayid`
`{default|ip-addr|"domain-name"}`

Example: `set 1 mgcp gatewayid "gateway1.carrieraccess.com"`
The example will set the gateway ID to "gateway1.carrieraccess.com" for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{default|ip-addr|"domain-name"}

default	Use the DNS domain name or the IP address configured for the WAN or LAN interface
ip-addr	Use the IP address for the gateway ID in the MGCP header. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
domain-name	Use the name for the gateway ID in the MGCP header. Name has a maximum of 43 characters and is enclosed in quotes.

set (router) mgcp keepalive

Use the **set (router) mgcp keepalive** command to configure a keep-alive timer that will cause the CMG to resend RSIP restart messages on expiration. When enabled, this countdown timer is reset every time an MGCP message is received from the call agent. On expiration, the CMG will react by starting periodic transmission of a wildcard RSIP restart MGCP message to each of the configured call agents until it is acknowledged. This command takes effect immediately.

Syntax: `set {cmg_card-addr} mgcp keepalive {disablements}`

Example: `set 1 mgcp keepalive 5`

The example will set the MGCP keep-alive timer to 5 minutes for the CMG in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{disablements}

disable	Disables the MGCP keep-alive timer. Default is disable.
minutes	The number of minutes for the countdown timer. Range is 0 - 255, where 0 will also disable the timer.

set (router) mgcp package default

The **set (router) mgcp package default** is an interoperability command to set the default signal/event package to be used for the IETF version of MGCP. The default for this default is the DTMF (D) package. In the NCS version of MGCP, the default package is always the Line (L) package. This parameter does not apply to the NCS version of MGCP, whose default package is always the Line (L) package. For whichever package is made the default, the package name is not required in the softswitch-to-gateway MGCP parameter lines R, S, or T. In the gateway-to-softswitch O (observed events) parameter line, if the default package is set to DTMF(D), no package name is prepended to reported dialstring or digit events. In all other cases for observed events O, the package name is prepended (i.e. the L and G package names are always prepended in observed events). This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp package default {d|g|l}`

Example: `set 1 mgcp package default g`
> The example will set the MGCP General package the default signal/event package, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{d|g|l}

d	Make the DTMF (D) package the default
g	Make the General (G) package the default
l	Make the Line (L) package the default

set (router) mgcp parsemode

The **set (router) mgcp parsemode** is an interoperability command to set the strictness with which incoming MGCP messages are parsed. If parsemode is set to **lenient**, then some incoming messages which may contain protocol errors for the configured protocol version, or contain requests to perform unavailable functions, may not produce an error response, if the message can be interpreted correctly, and/or if the requested unavailable function is unimportant to the desired operation. The **verbose** option behaves the same as the **lenient**, except that log entries are added to record the fact that it occurred. The **strict** option enforces all protocol requirements and function availability by means of an error return code. The default parse mode is **lenient**. This is done to account for certain softswitch implementations which do not strictly adhere to the protocol spec, or for which certain services would not work if a particular request for an unavailable benign function were to be rejected. Use of "lenient" parsemode can lead to "mysterious" problems if there is a serious protocol mismatch between the call agent and CMG. It is recommended that the parsemode be set to "strict" or "verbose" when one is attempting to determine why softswitch-CMG communications do not seem to allow CMG voice calls to be made or services to be activated. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp parsemode`
        `{lenient|strict|verbose}`

Example: `set 1 mgcp parsemode strict`
        The example will set the MGCP parsemode for incoming messages to strict, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{lenient|strict|verbose}

lenient	Do not return an error response in benign situations (Default)
strict	Return an error response for all protocol errors or requests for unavailable functions
verbose	Do not return an error response in benign situations, but log the event

set (router) mgcp piggyback

The **set (router) mgcp piggyback** is a interoperability command to set allow or disallow of the sending of more than one MGCP command in the same message. Some call agents support piggybacking, and some do not. The gateway will always support the processing of received piggybacked commands. The default, for greatest interoperability is to disable the sending of piggybacked commands. Enabling of piggybacking can improve MGCP throughput and provide simpler processing when an endpoint is in the quarantine state. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp piggyback {disable|enable}`

Example: `set 1 mgcp piggyback enable`
The example will enable the sending of piggybacked commands in one MCGP message packet, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{disable|enable}

disable   Disallow sending of piggyback commands (Default)

enable   Allow sending of piggybacked commands

set (router) mgcp port

Use the **set (router) mgcp port** command to set the gateway's UDP port for receiving MGCP commands. The default port is 2427. The port number may be set to any 16-bit number, but must not interfere with standard port numbers of other TCP or UDP applications.This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp port {port-number}`

Example: `set 1 mgcp port 5000`
The example will set the local UDP port number for MGCP to 5000, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{port-number}

The port number range is from 1025 to 65535.

set (router) mgcp protocolid

Use the **set (router) mgcp protocolid** command to configure a global protocol ID string which will override the default protocol ID string used in MGCP command lines. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp protocolid {default|`
`        "id-name"}`

Example: `set 1 mgcp protocolid "MGCP 1.0 CACS"`
        The example will set the protocol ID string to "MGCP 1.0 CACS".

{cmg_card-addr}

The slot number (1-6) that contains the CMG Router card.

{default|"id-name"}

default   Use the default protocol ID string

"id-name"   Override the default protocol ID string with this string. Identifier of up to 20 characters, enclosed in quotes.

If the protocol ID setting is set to "default" or the null string (""), then the following default strings will be used depending on the configured MGCP version.

MGCP Version	Default Protocol ID
ietf10	MGCP 1.0
ietf01	MGCP 0.1
ncs	MGCP 0.1 NCS 1.0

set (router) mgcp quarantine

The **set (router) mgcp quarantine** is a interoperability command to specify the default quarantine handling method that the CMG will employ if the call agent has not sent an explicit quarantine handling value in the last Request Notify message. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp quarantine {loop|step} {discard|process}`

Example: `set 1 mgcp quarantine loop process`
The example sets the default quarantine method for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{loop|step}

loop	Can generate multiple notifications to a request notify
step	Generate at most one notification to a request notify (Default)

{discard|process}

discard	Discard events that are in the quarantine buffer
process	Process events that are in the quarantine buffer (Default)

set (router) mgcp report hookswitch

The **set (router) mgcp report hookswitch** is a interoperability command to specify wether the hookswitch events (offhook, onhook and flashhook) will always be reported to the call agent when they occur ("persistent event"), or whether an event request must be made by the call agent first. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp report hookswitch {always|onrequest}`

Example: `set 1 mgcp report hookswitch onrequest`
The example will set the MCGP hookswitch reporting mode to wait for a request from the call agent, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{always|onrequest}

always	Always report hookswitch events (Default)
onrequest	Wait for a request from the call agent before reporting hookswitch events

set (router) mgcp retries

Use the **set (router) mgcp retries** command to specify the number of times an MGCP command is retransmitted if there is no response from a call agent.   After the last retry, if another message timeout occurs, the endpoint will enter a disconnected mode.

Syntax: `set {cmg_card-addr} mgcp retries {value}`

Example: `set 1 mgcp retries 4`
> The example sets the MCGP number of retries, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{value}

The value range is 0 - 10.

set (router) mgcp rsipwildcard

The **set (router) mgcp rsipwildcard** command to configure whether the CMG should send a single wildcard RSIP or individual RSIPs for each endpoint, at those times when all endpoints are transitioning. The CMG will default to individual RSIPs. If the wildcard RSIP setting is enabled, the CMG will send an RSIP with the wildcard endpoint ID when it transitions all of the endpoints. The call agent can then use AUEPs to determine individual endpoint status. The CMG transitions all of the endpoints when it sets MGCP up or down or when it is about to reboot or has just finished booting. Individual RSIPs will always be sent when an endpoint is going to transition up or down independent from the other endpoints, such as when a CLI command sets an endpoint up or down, or when the disconnected state has occurred. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp rsipwildcard`
`        {disable|enable}`

Example: `set 1 mgcp rispwildcard enable`
> The example will enable use of RSIP wildcard, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG Router card.

{disable|enable}

disable	Send individual RSIPs (Default).
enable	Send wildcard RSIP.

set (router) mgcp sdpmode

The **set (router) mgcp spdmode** is a interoperability command to specify the content in transmitted Session Description Protocol (SDP) message sections.This option is included to account for call agents or remote gateways that cannot handle full content (default). This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp sdpmode {full|minimal}`

Example: `set 1 mgcp sdpmode minimal`
The example will set the SDP mode to send only minimal content, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{full|minimal}

full   SDP sections contain all mandatory lines (v, o, s, c, t, M)

minimal   SDP sections contain only necessary lines (v, c, m) plus a. Which are the only lines really used for setting VoIP media stream parameters.

set (router) mgcp timeout

Use the **set (router) mgcp timeout** command specify the maximum bound on MGCP retransmission. The time between retries will exponentially climb from a minimum of about 200 ms up to the value entered here +200 ms. The value entered bounds the maximum number of milliseconds that MGCP should wait for a response to a command sent to the call agent, before retrying the command. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp timeout {milliseconds}`

Example: `set 1 mgcp timeout 5000`
The example will set the timeout to 5 seconds, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{milliseconds}

Milliseconds range: 0 and 65535. Default is 3000 milliseconds (3 seconds).

set (router) mgcp tos

Use the **set (router) mgcp tos** command to configure the IP TOS byte value to be sent in each transmitted MGCP packet. This command takes effect immediately.

Syntax: `set {cmg_card-addr} mgcp tos {value}`

Example: `set 1 mgcp tos 0x28`

The example will set the IP TOS value to 0x28 on the CMG in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{value}

IP TOS byte value, in the format of 0x (2 hex digits). Default setting is 0.

The following table contains the appropriate TOS value for various IP precedence and Diffuser Code points:

IP Precedence	TOS		Diffuser Codepoint	TOS
IP Precedence = 0	0x00		EF = 101110	0xB8
IP Precedence = 1	0x20		AF11 = 001010	0x28
IP Precedence = 2	0x40		AF12 = 001100	0x30
IP Precedence = 3	0x60		AF13 = 001110	0x38
IP Precedence = 4	0x80		AF21 = 010010	0x48
IP Precedence = 5	0xA0		AF22 = 010100	0x50
IP Precedence = 6	0xC0		AF23 = 010110	0x58
IP Precedence = 7	0xE0		AF31 = 011010	0x68
			AF32 = 011100	0x70
			AF33 = 011110	0x78
			AF31 = 100010	0x88
			AF32 = 100100	0x90
			AF33 = 100110	0x98

set (router) mgcp up

Use the **set (router) mgcp up** command to start MGCP processing of incoming messages and endpoint events. MGCP must be up for the Customer Media Gateway to properly interact with an external call agent. The CMG notifies the call agent by means of one or more Restart in Progress (RSIP) commands with the Restart Method parameter set to "restart". An RSIP is sent for each voice channel which is configured as "up", after an initial random delay of not more than 30 seconds. If MGCP is configured as up when a CMG board reset or power cycle occurs, RSIP commands will be sent to the call agent when the board is ready for MGCP operation. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp up`

Example: `set 1 mgcp up`
> The example will start MGCP processing, with call agent with call agent notification, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

set (router) mgcp version

The **set (router) mgcp version** is an interoperability command to specify the version of the MGCP protocol which is running on the Customer Media Gateway. This version must be compatible with the version of MGCP running on the call agent. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} mgcp version {ietf01|ietf10|ncs}`

Example: `set 1 mgcp version ietf01`
> The example will set the MCGP protocol version to IETF version 0.1, for the CMG card in slot 1.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{ietf01|ietf10|ncs}

ietf01	IETF MGCP version 0.1, as specified in an IETF MGCP Internet draft
ietf10	IETF MGCP version 1.0, as specified in IETF RFC 2705 (Default)
ncs	PacketCable MGCP version NCS 1.0

set (router) ntp

Use the **set (router) ntp** command to setup Network Time Protocol (NTP) parameters.

set (router) ntp enable/disable

Use the **set (router) ntp enable/disable** command to enable/disable NTP processing.

Syntax: `set {rtr_card-addr} ntp {enable|disable}`

Example: `set 1 ntp enable`

The example will enable NTP processing on the Router card in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains a Router (IP or CMG) card.

{enable|disable}

enable	Enable NTP processing
disable	Disable NTP processing

set (router) ntp poll

Use the **set (router) ntp poll** command to specify polling of the NTP server every defined number of seconds.

Syntax: `set {rtr_card-addr} ntp poll {seconds}`

Example: `set 1 ntp poll 120`

The example will Poll the Network Time Protocol server every 2 minutes, for the Router card in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{seconds}

The number of seconds between polls. Seconds range is 16 to 1024. Default is 16.

set (router) ntp server

Use the **set (router) ntp server** command to specify the IP address of the NTP server.

Syntax: `set {rtr_card-addr} ntp server {ip-addr}`

Example: `set 1 ntp server 10.10.10.0`
> The example will set the address to be used to access the NTP server to 10.10.10.0, on the Router in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{ip-addr}

The IP address of the NTP server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. Setting the NTP server value to 0.0.0.0 will cause the router to listen to and process NTP broadcasts.

set (router) ntp timezone

Use the **set (router) ntp timezone** command to specify the timezone offset relative to GMT for this Router.

Syntax: `set {rtr_card-addr} ntp timezone {hour-offset}`
`[minute-offset]`

Example: `set 1 ntp timezone -5`
> The example will specify the gateway time to be 5 hours from GMT (Greenwich Mean Time), which equates to Eastern Standard time, for the router in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{hour-offset}

Used to calculate gateway time from GMT. The hour-offset range is -12 to 12.

[minute-offset]

Used to calculate gateway time from GMT. The minute-offset range is 0 to 60.

set (router) password

Use the **set (router) password** command to manage password access on the Router card.

Syntax: `set {rtr_card-addr} password {setting} {"password"}`

Example: `set 5 password view "Fred"`

The example sets the View password to "Fred" on the Router card in slot 5.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{setting}

admin	Set Administration level password on the Router.
config	Set Configuration level password on the Router.
security	Set Security level password on the Router.
view	Set View level password on the Router.

{"password"}

A password with a maximum of 15 characters. Password must be enclosed in quotes, and is case-sensitive.

set (router) ppp auth

Use the **set (router) ppp auth** command to configure the PPP (Point-to-Point Protocol) authentication on the specified Router card.

set (router) ppp auth byremote protocol

Syntax: `set {rtr_card-addr} ppp auth byremote protocol {chap|none|pap}`

Example: `set 5 ppp auth byremote protocol none`
The example will set the Router in slot 5 to not allow PPP authentication of this Adit by the remote PPP device.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{chap|none|pap}

chap	Set to the CHAP protocol.
none	The remote PPP device cannot authenticate this Adit (Default).
pap	Set to the PAP protocol.

set (router) ppp auth byremote secret

Syntax: `set {rtr_card-addr} ppp auth byremote secret {"password"}`

Example: `set 5 ppp auth byremote secret "public"`
The example will set the PPP authentication secret/password for the Router in slot 5 to "public"

Note: A set (router) ppp auth by remote protocol command must be completed before this command can be implemented.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"password"}

A password with a maximum of 15 characters. Password must be enclosed in quotes.

set (router) ppp auth byremote user

Syntax: `set {rtr_card-addr} ppp auth byremote user`
`{profilename|"protocol-name"}`

Example: `set 5 ppp auth byremote user profilename`
The example will set the PPP authentication user name for the Router in slot 5
to equal the profile name.

Note: A **set (router) ppp auth byremote protocol** command must be
completed before this command can be implemented.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{profilename|"protocol-name"}

profilename	Use the profile name as the CHAP or PAP user name.
"protocol-name"	The CHAP or PAP user name. A maximum of 16 characters, enclosed in quotes.

set (router) ppp auth ofremote protocol

Syntax: `set {rtr_card-addr} ppp auth ofremote protocol`
`{chap|none|pap}`

Example: `set 5 ppp auth ofremote protocol none`
The example will set the Router in slot 5 to not allow PPP authentication of this
Adit by the router.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{chap|none|pap}

chap	Set to the CHAP protocol.
none	The remote PPP device cannot authenticate this Adit (Default).
pap	Set to the PAP protocol.

set (router) ppp security

Use the **set (router) ppp security** command to set up the local external security server, that the Router will use to authenticate remote PPP devices.

set (router) ppp security address

Syntax: `set {rtr_card-addr} ppp security address {ip-addr}`

Example: `set 5 ppp security address 10.1.1.1`
The example will set external security server address to 10.1.1.1, for the Router in slot 5.

Note: A **set (router) ppp security server** command must be completed before this command can be implemented.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{ip-addr}

The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router) ppp security password

Syntax: `set {rtr_card-addr} ppp security password {"password"}`

Example: `set 5 ppp security password "public"`
The example will set the password to a local external security server to "public", for the Router in slot 5.

Note: A **set (router) ppp auth by remote protocol** command must be completed before this command can be set.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"password"}

A password with a maximum of 15 characters. Password must be enclosed in quotes.

set (router) ppp security server

Syntax: `set {rtr_card-addr} ppp security server`
`{none|radius|tacacs}`

Example: `set 5 ppp security server none`
The example will set the Router in slot 5 to not use an external security server to authenticate remote PPP devices.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{none|radius|tacacs}

none	Do not use an external security server to authenticate remote PPP devices (Default).
radius	Will set the server to use the RADIUS (Remote Authentication Dial-In Service) protocol. RADIUS is a client/server-based authentication software system.
tacacs	Will set the server to use the TACACS+ (Terminal Access Controller Access Control System) protocol. TACACS+ provides services of authentication, authorization and accounting independently.

set (router) priority tos

Use the **set (router) priority tos** command to configure parameters that will be used to recognize routed voice packets which will be handled with higher priority over other routed data.

For each IP datagram to be routed, the TOS byte from the IP header will be logically AND'd with the configured TOS mask and compared to the TOS match value. If they match, the datagram will be handled with a greater priority than other routed data but with lower priority than its own VoIP data. This command takes effect immediately.

Syntax: `set {cmg_card-addr} priority tos {disable|mask-value match-value}`

Example: `set 5 priority tos oxfc oxb8.`

{cmg_card-addr}

The slot number (1-6) that contains the CMG Router card.

{disable|mask-value match-value}

disable	Disable (default), will result in no priority handling of routed voice packets
mask-value	Mask to be applied to the TOS byte in the IP header. In the format of 0x (2 hex digits)
match-value	TOS byte match value. In the format of 0x (2 hex digits).

The following table contains the appropriate TOS mask and match for various IP precedence and DiffServ code points:

IP Precedence	Mask	TOS
IP Precedence = 0	0xE0	0x00
IP Precedence = 1	0xE0	0x20
IP Precedence = 2	0xE0	0x40
IP Precedence = 3	0xE0	0x60
IP Precedence = 4	0xE0	0x80
IP Precedence = 5	0xE0	0xA0
IP Precedence = 6	0xE0	0xC0
IP Precedence = 7	0xE0	0xE0

DiffServ Codepoint	Mask	TOS
EF = 101110	0xFC	0xB8
AF11 = 001010	0xFC	0x28
AF12 = 001100	0xFC	0x30
AF13 = 001110	0xFC	0x38
AF21 = 010010	0xFC	0x48
AF22 = 010100	0xFC	0x50
AF23 = 010110	0xFC	0x58
AF31 = 011010	0xFC	0x68
AF32 = 011100	0xFC	0x70
AF33 = 011110	0xFC	0x78
AF31 = 100010	0xFC	0x88
AF32 = 100100	0xFC	0x90
AF33 = 100110	0xFC	0x98

set (router) proxy

Use the **set (router) proxy** command to enable/disable proxy ARP mode on the Router. This command will add an IP interface between the Controller and the Router over the backplane. In this way the Controller can be accessed by IP hosts over the Router's LAN/WAN interfaces without using the Controller's physical Ethernet interface.

Syntax: `set {rtr_card-addr} proxy {disable|enable} [ip-addr]`
`[mask|bits]`

Example: `set ethernet ip address 10.0.0.1 255.0.0.0`
`set 3:1 ip address 192.168.100.1/24`
`set 3 proxy enable 192.168.100.80/24`
`set ip gateway 192.168.100.80`
Set a Router card port to proxy ARP for the Compact T1, where the Router card is located in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{disable|enable}

When proxy ARP is enabled the Router will allow both the Router and Controller to be accessed from the Router LAN and WAN interfaces.

If an IP address is provided that is in the same subnet as one of the Router IP subnets and is not in the same subnet as the Controller Ethernet IP address then the Controller will be able to initiate IP connections through the Router, initiate IP connections through the Router, and be able to use the Router as its default gateway. It is highly recommended for optimum connectability, that the Controller's proxy IP address be a unique host address in one of the Router subnets.

NOTE: If no IP address is provided in the **set (router) proxy enable** command or the IP address is in the same subnet as the Controller Ethernet IP address, then the Controller will not be able to initiate connections through the Router, such as TFTP and PING. It will only be able to reply to connections initiated from the outside.

{ip-addr}

Set the IP address for the proxy interface on the Compact T1, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

[mask|bits]

mask   Set the subnet mask, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255. This is an optional setting.

bits   Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

set (router) reboot

Use the **set (router) reboot** command to set automatic reboot after an upload of code or configuration file.

> *Syntax:* `set {rtr_card-addr} reboot {code|config}`
> `{disable|enable}`

> *Example:* `set 5 reboot both disable`
> Disable automatic reboot after upload for the Router in slot 5.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{code|config}

code	Automatic reboot after code upload
config	Automatic reboot after configuration upload

{disable|enable}

disable	Will disable automatic reboot
enable	Will enable the automatic reboot after upload of a file

set (router) rip

Use the **set (router) rip** command to specify RIP packets to transmit and receive.

> *Syntax:* `set {rtr_card-addr} rip {recv|send} {v1|v1and2|v2}`

> *Example:* `set 3 rip recv v1`
> The example will configure receive RIP on the Router card in slot 3 to V1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{recv|send}

recv	Set RIP receive version
send	Set RIP send version

{v1|v1and2|v2}

v1	Set RIP to version 1
v1and2	Set RIP to version 1 and version 2
v2	Set RIP to version 2

set (router) snmp

Use the **set (router) snmp** command to set the SNMP contact, location and name on the specified Router card.

set (router) snmp contact

Use the **set (router) snmp contact** command to set the value of sysContact on the specified Router card.

Syntax: `set {rtr_card-addr} snmp contact {"contact-name"}`

Example: `set 1 snmp contact "John Doe"`
The example will set the value of sysContact on the Router card in slot 1 to "John Doe".

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"contact-name"}

The value of sysContact, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

set (router) snmp location

Use the **set (router) snmp location** command to set the value of sysLocation on the specified Router card.

Syntax: `set {rtr_card-addr} snmp location {"location-name"}`

Example: `set 1 snmp location "Newark"`
The example will set the value of sysLocation on the Router card in slot 1 to "Newark".

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"location-name"}

The value of sysLocation, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

set (router) snmp name

Use the **set (router) snmp name** command to set the value of sysName on the specified Router card.

Syntax: `set {rtr_card-addr} snmp name {"system-name"}`

Example: `set 1 snmp name "AditRouters"`

The example will set the value of sysName on the Router card in slot 1 to "AditRouters".

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"system-name"}

The value of sysName, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

set (router) stp

Use the **set (router) stp** commands to configure the Spanning Tree Protocol on the Router.
Note: Enter {slot} only. If {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.

set (router) stp bridge forwarddelay

Use the **set (router) stp bridge forwarddelay** command to configure Spanning Tree bridge forward delay value for the bridge. The bridge forward delay is the time spent by a Port in the Listening or Learning States before the transitioning to the Learning or Forwarding State, respectively.

Syntax: `set {rtr_card-addr} stp bridge forwarddelay {value}`

Example: `set 3 stp bridge forwarddelay 15`
The example will set the Spanning Tree bridge forward delay time to 15 seconds, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{value}

The value can range from 4 to 30 seconds, with a default of 15.

set (router) stp bridge hellotime

Use the **set (router) stp bridge hellotime** command to configure Spanning Tree bridge hello time value for the bridge.

Syntax: `set {rtr_card-addr} stp hellotime {value}`

Example: `set 3 stp bridge hellotime 3`
The example will set the Spanning Tree bridge hello time to 3 seconds, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{value}

The value can range from 1 to 10 seconds, with a default of 2.

set (router) stp bridge maxage

Use the **set (router) stp bridge maxage** command to configure Spanning Tree maximum age value for the bridge. The bridge max age value specifies the maximum age of received protocol information before it is discarded.

Syntax: `set {rtr_card-addr} stp bridge maxage {value}`

Example: `set 3 stp bridge maxage 15`
> The example will set the Spanning Tree bridge max age to 15 seconds, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{value}

The value can range from 6 to 40 seconds, with a default of 20.

set (router) stp bridge priority

Use the **set (router) stp bridge priority** command to configure Spanning Tree priority value for the bridge.

Syntax: `set {rtr_card-addr} stp priority {value}`

Example: `set 3 stp bridge priority 32768`
> The example will set the Spanning Tree bridge priority to 32768, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{value}

The value can range from 0 to 65535, with a default of 32768.

set (router) stp enable/disable

Use the **set (router) stp enable/disable** command to enable and disable Spanning Tree Protocol on the Router.

Syntax: `set {rtr_card-addr} stp {disable|enable}`

Example: `set 3 stp enable`

The example will enable Spanning Tree on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

Note: Enter {slot} only. If {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.

{disable|enable}

disable	Disable Spanning Tree protocol
enable	Enable Spanning Tree protocol

set (router) syslog

Use the **set (router) syslog** commands to configure the Router to send alarm and event messages to a Syslog server.

set (router) syslog enable/disable

Use the **set (router) syslog enable/disable** command to enable and disable sending alarm and event messages to an external SysLog server from the Router.

Syntax: `set {rtr_card-addr} syslog {disable|enable}`

Example: `set 3 syslog enable`

The example will enable alarms and event messages to the external SysLog server, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{disable|enable}

disable	Disable SysLog protocol
enable	Enable SysLog protocol

set (router) syslog facility

Use the **set (router) syslog facility** command to set the Syslog facility value that the Router card will report to a syslog server in each message.

Syntax: `set {rtr_card-addr} syslog facility {value}`

Example: `set 3 syslog facility 16`

The example will set the Syslog facility value to 16, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{value}

The range of valid facility values is from 0 to 23, with a default of 16 (local use 0).

set (router) syslog level

Use the **set (router) syslog level** command to set the Syslog severity level. Events of all severity levels lower in number (more severe) will be sent to the Syslog server.

Syntax: `set {rtr_card-addr} syslog level {severity}`

Example: `set 3 syslog level 4`

The example will set the Syslog severity level to 4, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{severity}

The severity threshold level can range from 0 to 7.

set (router) syslog server

Use the **set (router) syslog server** command to set the IP address of an external Syslog server.

Syntax: `set {rtr_card-addr} syslog server {ip-addr}`

Example: `set 3 syslog server 10.0.0.1`

The example will set the external Syslog server IP address to 10.0.0.1, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{ip-addr}

Set the IP address for the external Syslog server, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

set (router) voip

Use the **set (router) voip** commands to set Voice over IP (VoIP) parameters. This command applies to the CMG Router card only.

set (router) voip default

Use the **set (router) voip default** command to set all VoIP options to their default values.

Syntax: `set {cmg_card-addr} voip default`

Example: `set 3 voip default`
> The example will set the VoIP options to their default settings, on the CMG card in slot 3.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

set (router) voip dtmf edge

Use the **set (router) voip dtmf edge** command to configure the CMG to notify DTMF digits on the leading or trailing edge. Setting this configuration item to leading edge shall cause the CMG to act on DTMF digits, for collection or notification purposes, at the time the key is pressed. Setting this configuration item to trailing edge shall cause the CMG to act on DTMF digits at the time the key is released. This command takes effect immediately.

Syntax: `set {cmg_card-addr} voip dtmf edge {leading|trailing}`

Example: `set 3 voip dtmf edge trailing`
> The example will set the CMG in slot 3 to notify the call agent of digits when the key is released.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{leading|trailing}

leading	Will cause the CMG to act on DTMF digits, for collection or notification purposes, at the time the key is pressed.
trailing	Will cause the CMG to act on DTMF digits at the time the key is released.

set (router) voip g729a

Use the **set (router) voip g729a** command to enable or disable the G.729 codec in the CMG. This command takes effect after the card has been reset.

NOTE: The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature it will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Service.

Syntax: `set {cmg_card-addr} voip g729a {disable|enable}`

Example: `set 3 voip g729a enable`

   The example will enable G.729 on the CMG card in slot 3.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{disable|enable}

disable   Will prevent the use of the G.729 codec.

enable   Will allow the use of the G.729 codec. Enable is the default.

set (router) voip jitterbuffer

Use the **set (router) voip jitterbuffer** command to specify dynamic delay adjustment to minimize delay through the jitter buffer, or maintain a static average delay through the jitter buffer.

Syntax: `set {cmg_card-addr} voip jitterbuffer {dynamic|static}`

Example: `set 3 voip jitterbuffer static`
The example will specify no dynamic delay adjustment for the jitter buffer, for the CMG card in slot 3.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{dynamic|static}

dynamic	Perform dynamic delay adjustment to minimize delay
static	Maintain a static average delay, equal to two times the packet time (Default)

set (router) voip osi

Use the **set (router) voip osi** command to adjust the time of the Open Switch Interval (OSI) signal.

Syntax: `set {cmg_card-addr} voip osi {milliseconds}`

Example: `set 3 voip osi 1000`
The example will set the OSI to 1 second, on the CMG card in slot 3.

{cmg_card-addr}

The slot number (1-6) that contains the CMG router card.

{milliseconds}

Range is from 500 to 2500 ms, default is 900 ms.

set (router) voip packing

Use the **set (router) voip packing** command to configure the packing order for g726 voice coding algorithms. The new default packing order for each voice coding algorithm is Big Endian. Note that when upgrading from CMG version 1.0 the packing order for G.726-32 will be Little Endian until changed by the user to load defaults is issued.This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} voip packing`
        `{g726_40|g726_32|g726_24|g726_16}`
        `{bigendian|littleendian}`

Example: `set 3 voip packing g726_32 bigendian`
        Use big-endian packing for the g726_32 codec.

{cmg_card-addr}

The slot number (1-6) that contains the CMG router card.

{g726_40|g726_32|g726_24|g726_16}

Voice coding algorithm to configure.

{bigendian|littleendian}

  bigendian   Use big-endian packing for this codec

  littleendian   Use little-endian packing for this codec

set (router) voip payload type

Use the **set (router) voip payload type** command to configure whether or not the CMG will process RTP packets with invalid payload types in the RTP header. This command applies to the CMG Router card only.

Syntax: `set {cmg_card-addr} voip payload type {lenient|strict}`

Example: `set 3 voip payload type lenient`
        The example will set the CMG card to process packets with invalid payload type values.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{algorithm}

  lenient   Process packets with invalid payload type

  strict   Do not process packets with invalid payload type (Default)

set (router) voip ptime

Use the **set (router) voip ptime** command to specify the default packetization time for the specified algorithm. The packetization time determines the frequency at which RTP packets are transmitted. The MGCP call agent may override the new default set by this command on a call-by-call basis. At the end of a call, the configured default is back in force. This command takes effect immediately.

NOTE: The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature is will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Service.

Syntax: `set {cmg_card-addr} voip ptime {algorithm} {time}`

Example: `set 3 voip ptime g711mu 20`
The example will specify a 20 millisecond default packetization time for G.711, on the CMG card in slot 3.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{algorithm}

g711a	Set packetization time for G.711 A-law
g711mu	Set packetization time for G.711 mu-law
g726_16	Set packetization time for G.726 16 Kbps
g726_24	Set packetization time for G.726 24 Kbps
g726_32	Set packetization time for G.726 32 Kbps
g726_40	Set packetization time for G.726 40 Kbps
g729a	Set packetization time for G.729 8 Kbps
all	Set packetization time for all algorithms

{time}

Default packetization time in milliseconds. Valid values are 10, 20, 30, 40, 50, 60, 70, or 80 milliseconds. Where 40 through 80 are only valid for g729a.

set (router) voip rtcp cname

Use the **set (router) voip rtcp cname** command to specify the name to be used for the CNAME field of Real-Time Control Protocol (RTCP) packets.

Syntax: `set {cmg_card-addr} voip rtcp cname {gatewayid|"name"}`

Example: `set 3 voip rtcp cname gatewayid`
> The example will set the VoIP RTCP CNAME to the same as gateway ID, on the CMG card in slot 3.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{gatewayid|"name"}

Default is gatewayid.

> **gatewayid**   Use the gateway ID in the CNAME.
>
> **name**   Identifying the gateway, maximum 64 characters, enclosed in quotes.

set (router) voip rtcp interval

Use the **set (router) voip rtcp interval** command to specify the time interval between RTCP reports.

Syntax: `set {cmg_card-addr} voip rtcp interval {seconds}`

Example: `set 3 voip rtcp interval 0`
> The example will turn off RTCP reporting for the CMG card in slot 3.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{seconds}

Interval time is in seconds, range is 0 to 255. If zero, RTCP reporting is turned off. Default is 5 seconds.

set (router) voip rtp baseport

Use the **set (router) voip rtp baseport** command to specify the base UDP port to be used when allocating ports for transmitting or receiving RTP packet streams in VoIP calls. All ports allocated for RTP, including the base port, must be even-numbered. Each allocated RTP port number will be equal to the base port plus some even offset. The odd port number just above each allocated RTP port will be used for sending or receiving RTCP packets, which contain reports of packet and performance statistics for the associated RTP. The CMG will reserve a block of 288 consecutive ports starting at this port for RTP and RTCP.

Syntax: `set {cmg_card-addr} voip rtp baseport {port-number}`

Example: `set 5 voip rtp baseport 10000`

   The example will set the RTP base port to 10000, on the CMG card in slot 5.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{port-number}

The port number range is from 0 to 65535. Default is 30000.

set (router) voip rtpmap

Use the **set (router) voip rtpmap** command to specify the dynamic payload type and name to be used for a specific algorithm in the Session Description Protocol (SDP) part of MGCP connection commands. This command takes effect immediately.

The defaults are:

Algorithm	Payload Type	SDP Name
G.726-16 kb/s	96	G726-16
G.726-24 kb/s	97	G726-24
G.726-40 kb/s	98	G726-40
G.729A	18	G729A

NOTE: In accordance with current IANA assignments (www.iana.org, RTP section), G.726-32 kb/s is assigned a (non-dynamic) payload type of 2, G.711 mu-law is assigned payload type 0, and G.711 A-law is assigned payload type 8. (One may also assign a dynamic payload type to G.726-32 by means of the above command, in case there is a conflict with the use of payload type 2, which was formerly assigned to G.721, in RFC 1890.) Only one payload type and DSP name may be assigned per algorithm.

NOTE: The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature is will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Service.

Syntax: `set {cmg_card-addr} voip rtpmap {algorithm} {type} {"name"}`

Example: `set 3 voip rtpmap g726_16 96 "G.726-16"`
The example will specify the payload type 96 to refer to G.726-16 kb/s with SDP name G.26-16.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{algorithm}

Enter one of g711mu, g711a, g726_16, g726_24, g726_32, g726_40, g729a

{type}

RTP dynamic payload type, 96 - 127.

{"name"}

Identifier up to 16 characters, enclosed in quotes.

---

set (router) voip sdpaddress

Use the **set (router) voip sdpaddress** command to set the address value to be used for the origin and connection lines in the SDP.

Syntax: `set {cmg_card-addr} voip sdpaddress`
`{gatewayid|domain-name|ip|ip-addr}`

Example: `set 3 voip sdpaddress domainname`
The example will configure the SDP address value to match the DNS domain name.

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

{domainname|gatewayid|ip|ip-addr}

domainname	Use the DNS domain name if DNS is enabled or DMG IP address if DNS is disabled.
gatewayid	Use the MGCP gateway ID.
ip	Use the CMG IP address.
ip-addr	Use this IP address, in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 - 255.

set (router-lan) collision

Use the **set (router-lan) collision** commands to configure collision alarms.

set (router-lan) collision interval

Use the **set (router-lan) collision interval** command to specify the time interval over which excessive collision alarms are calculated.

Syntax: `set {rtr_lan-addr} collision interval {seconds}`

Example: `set 3:1 collision interval 0`

The example will set the local LAN interface on slot 3 to disable collision alarms.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{seconds}

Range from 0 to 65535. With a value of 0 collision alarms will be disabled.

set (router-lan) collision threshold

Use the **set (router-lan) collision threshold** command to specify the thresholds used to determine excessive collision alarm state.

Syntax: `set {rtr_lan-addr} collision threshold {high|low} {count}`

Example: `set 3 "Adit50" collision threshold high 500`
The example will set the high alarm threshold to 500, for the local LAN interface on slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{high|low}

high	The number of collisions in the collision interval time period above which an excess collision alarm is raised.
low	The number of collisions in the collision interval time period below which a standing excess collision alarm is cleared.

{count}

The number of collisions in the collision interval time period. Range is 0 - 65536.

set (router-lan) filter forward

Use the **set (router-lan) filter forward** command to specify the forwarding mode for Layer 2 filters on the LAN interface.

Syntax: `set {rtr_lan-addr} filter forward`
`        {matching|nontmatching}`

Example: `set 3:1 filter forward notmatching`

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{matching|nontmatching}

matching	Only those frames matching a rule will be forwarded.
notmatching	Only those frames NOT matching a rule will be forwarded.

set (router-lan) framing

Use the **set (router-lan) framing** command to specify which ethernet frame types are supported on the LAN interface.

Syntax: `set {rtr_lan-addr} framing {ipx|other}`
`{ieee8022|ieee8023|ethii|snap} {disable|enable}`

Example: `set 3:1 framing ipx ieee8022 enable`
The example will enable the 802.2 frame type for IPX packets on the LAN of the Router card in slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ipx|other}

ipx	Enable or disable a frame type for the IPX protocol
other	Enable or disable a frame type for protocols other than IP and IPX

{ethii|ieee8022|ieee8023|snap}

ethii	Ethernet II framing
ieee8022	IEEE 802.2 framing
ieee8023	IEEE 802.3 framing
snap	LLC/SNAP framing

{disable|enable}

disable	Disable the frame type
enable	Enable the frame type

set (router-lan) gateway

Use the **set (router-lan) gateway** command to specify a default IP gateway for the specified LAN interface. If there is no static network entry to 0.0.0.0, then this address is used as the default gateway for packets with no explicit route.

Syntax: `set {rtr_lan-addr} gateway {ip-addr}`

Example: `set 3:1 gateway 192.168.201.144`

> The example will set the local LAN interface on slot 3 to use a default gateway at IP address 192.168.201.144.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr}

The IP address of the gateway, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router-lan) ip address

Use the **set (router-lan) ip address** command to specify an IP address for the specified LAN interface. When first installed the Router card's LAN interface has a default IP address of 10.0.0.1 with subnet mask of 255.0.0.0.

Syntax: `set {rtr_lan-addr} ip address {ip-addr} [mask]`

Example: `set 3:1 ip address 192.168.202.244 255.255.255.0`
The example will set the local LAN interface on slot 3 to IP address 192.168.202.244, with a subnet mask of 255.255.255.0.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ip-addr}

The Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[mask]

The subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

set (router-lan) ipx network

Use the **set (router-lan) ipx network** command to specify IPX network numbers for the four IPX LAN frame types. This enables the Adit to Router IPX to Remote (WAN) networks, even if an IPX server does not exist on the local LAN. Typically, the Adit will learn its external network number. However, if the local LAN does not have a server or if the IPX RIP setting is set to <Neither>, and you wish to Router IPX to Remote (WAN) networks, the external network number must be defined.

Syntax: `set {rtr_lan-addr} ipx network`
`{ieee8022|ieee8023|ethii|snap} {network}`

Example: `set 3:1 ipx network ieee8022 000000fl`
The example will set the local LAN interface on slot 3 to IP address 192.168.202.244, with a subnet mask of 255.255.255.0.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{ethii|ieee8022|ieee8023|snap}

ethii	Ethernet II framing
ieee8022	IEEE 802.2 framing
ieee8023	IEEE 802.3 framing
snap	LLC/SNAP framing

{network}

External IPX network, specified as an 8-digit hexadecimal number.

set (router-lan) phy

Use the **set (router-lan) phy** command to specify the ethernet PHY (physical specifications) speed and mode.

NOTE: It is highly recommended that this setting be left at auto-negotiation. Connecting ethernet devices with incompatible setting can lead to severe network performance degradation, increased collisions, late collisions, CRC errors, and undetected data corruption.

Syntax: `set {rtr_lan-addr} phy {setting}`

Example: `set 3:1 phy full100`
    The example will force the Ethernet PHY to 100 MHz full-duplex on the Router in slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{setting}

auto	Auto-negotiate (highly recommended).
full10	10 MHz full-duplex.
full100	100 MHz full-duplex.
half10	10 MHz half-duplex.
half100	100 MHz half-duplex.

set (router-lan) rip

Use the **set (router-lan) rip** commands to specify RIP for the specified LAN interface.

set (router-lan) rip ip

Use the **set (router-lan) rip ip** command to specify the IP RIP for the specified LAN interface.

Syntax: `set {rtr_lan-addr} rip ip {both|neither|recv|send}`

Example: `set 2:1 rip ip send`

The example will set RIP on the local LAN interface on slot 2 to send.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{both|neither|recv|send}

both	Enable IP RIP (or IPX RIP and SAP) in both directions.
neither	Shut IP RIP (or IPX RIP and SAP) off completely.
recv	Enable IP RIP (or IPX RIP and SAP) in the receive direction only.
send	Enable IP RIP (or IPX RIP and SAP) in the send direction.

set (router-lan) rip ipx

Use the **set (router-lan) rip ipx** command to specify the IPX RIP and SAP for the specified LAN interface.

Syntax: `set {rtr_lan-addr} rip ipx {both|neither|recv|send}`

Example: `set 2:1 rip ipx send`

 The example will set RIP and SAP on the local LAN interface on slot 2 to send.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{both|neither|recv|send}

both	Enable IP RIP (or IPX RIP and SAP) in both directions.
neither	Shut IP RIP (or IPX RIP and SAP) off completely.
recv	Enable IP RIP (or IPX RIP and SAP) in the receive direction only.
send	Enable IP RIP (or IPX RIP and SAP) in the send direction.

set (router-lan) stp

Use the **set (router-lan) stp** commands to configure the Spanning Tree Protocol on this interface.

set (router-lan) stp enable/disable

Use the **set (router-lan) stp enable/disable** command to enable/disable Spanning Tree Protocol on this interface. To enable STP on an interface it must be enabled globally with the **set (router) stp enable** command.

Syntax: `set {rtr_lan-addr} stp {disable|enable}`

Example: `set 3:1 stp enable`

The example will enable Spanning Tree on the LAN for this interface.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{disable|enable}

disable	Disable Spanning Tree on this interface.
enable	Enable Spanning Tree on this interface.

set (router-lan) stp port cost

Use the **set (router-lan) stp port cost** command to configure Spanning Tree path cost value for this bridge port.

Syntax: `set {rtr_lan-addr} stp port cost {port-cost-value}`

Example: `set 3:1 stp port cost 100`
> Sets the Spanning Tree port cost value at 100, on the Router in slot 3.

{rt_lanr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{port-cost-value}

The value can range from 1 to 65535, higher values represent slower data paths. For a 100 Mb LAN a value of 19 is recommended. For a 10 Mb LAN a value of 100 is recommended.

set (router-lan) stp port priority

Use the **set (router-lan) stp port priority** command to configure Spanning Tree priority value for this bridge port.

Syntax: `set {rtr_lan-addr} port priority {port-priority-value}`

Example: `set 3:1 stp port priority 128`
> The example will set the STP port priority to 128, on the Router in slot 3.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{port-priority-value}

Spanning Tree port priority for this bridge port. Range from 0 to 255, with a default of 128.

set (router-lan) up/down

Use the **set (router-lan) up/down** command to set the specified LAN interface up or down. When the Router port is set down, a link failure will not cause an alarm. This can be used to eliminate alarms from Router ports that are not in-use. When the Router port is set up, a link failure on the ethernet port will cause an alarm to be reported to the Compact T1.

Syntax: `set {rtr_lan-addr} {down|up}`

Example: `set 2:1 down`

The example will set the local LAN interface on slot 2 down.

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.

{down|up}

down	Set the Router as Out-of-Service. This command turns off the LED and disables alarm reporting for the Router specified.
up	Set the Router as In-Service. This command turns on the LED and enables alarm reporting for the Router specified.

set (router-trunk) encapsulation

Use the **set (router-trunk) encapsulation** command to specify the encapsulation to use on the Router interface.

Syntax: `set {rtr-trunk-addr} encapsulation {setting}`

Example: `set 2:1:5 encapsulation pppofr`
The example will configure encapsulation on the Router card in slot 2, port 1, trunk 5 to PPP over Frame Relay.

{rtr-trunk-addr}

slot	Slot number (1-6) that contains the Router (IP or CMG) card
port	Port number of the Router is 1
trunk	Trunk number for this port, 1-24

{setting}

fr	Frame Relay as per RFC 2427
ppp	Point-to-Point Protocol (PPP) as per RFC 1661 and 1662
pppofr	PPP over Frame Relay as per RFC 1973

set (router-trunk) multilink group

Use the **set (router-trunk) multilink group** command to specify a router trunk to be part of a multilink PPP group. Note: It is recommended, for performance, that all of the individual links in the multilink group have approximately the same bandwidth.

Syntax: `set {rtr-trunk-addr} multilink group {number}`

Example: `set 3:1:1-2 multilink group 1`
The example will form a multilink PPP group that combines trunk 1 and 2.

`set 3:1:3 multilink group`
The example will add a third trunk to the multilink PPP group from above.

{rtr-trunk-addr}

slot	Slot number (1-6) of the Adit that contains the Router (IP or CMG) card
port	Port number of the Router is 1
trunk	Trunk number for this port, 1-24

{number}

The multilink group number.

set (router-trunk) up/down

Use the **set (router-trunk) up/down** command to set the WAN trunk up or down. When the Router trunk is set down a link failure will not cause an alarm. This can be used to eliminate alarms from Router trunks that are not in-use. When the Router trunk is set up, a link failure on the WAN trunk will cause an alarm to be reported to the Adit.

Syntax: `set {rtr-trunk-addr} {down|up}`

Example: `set 2:1:1 down`

The example will set the first Router trunk interface on slot 2 down.

{rtr-trunk-addr}

In the form {slot:port:trunk}.

slot	Slot number (1-6) of the Adit that contains the Router (IP or CMG) card.
port	Port number of the Router is 1.
trunk	Trunk number for this port, 1-24.

{up|down}

down	Set the WAN down.
up	Set the WAN up.

set (router-trunk) voice bandwidth limit

Use the **set (router-trunk) voice bandwidth limit** command to specify the maximum percentage of bandwidth on this trunk that voice calls are allowed to consume. The remaining percentage of the bandwidth on a CMG trunk to be reserved for routed or bridged data. Routed or bridged data is allowed to use any available bandwidth, but it is carried at a lower priority than the voice. If the bandwidth required to carry an additional VoIP call will put the total bandwidth used by VoIP calls above that allowed for voice on the trunk, then the call will be denied and the caller will hear the all-circuits-busy tone. This command applies to the CMG Router card only.

Syntax: `set {cmg-trunk-addr} voice bandwidth limit {percent}`

Example: `set 2:1:1 voice bandwidth limit 90`
> The example will limit voice calls to 90% of the bandwidth on trunk 1 of the CMG card in slot 2.

{cmg-trunk-addr}

slot   The slot number (1-6) that contains the CMG card.

port   Port number of the Router is 1.

trunk   Trunk number for this port, 1-24.

{percent}

The maximum percentage of VoIP bandwidth. Range is 0 - 100.

set (router-voice) algorithm preference

Use the **set (router-voice) algorithm preference** command to specify the list of voice coding algorithms which will be supported for VoIP calls, on the specified voice channel(s). More than one algorithm can be listed, and they should be in order of preference. The default algorithm preference list contains all supported codecs in the order shown below. This command takes effect immediately, and applies to the CMG Router card only.

> **NOTE:** The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this codec will not appear in the available codec list used in the MGCP and DSP messages and negotiation. The command, however, will still succeed to allow for pre-configuration.

Syntax: `set {cmg_voice-addr} algorithm preference`
`{alg-choice1} [alg-choice2] [alg-choice3]...`

Example: `set 2:1:1:1-24 algorithm preference g726_32 g711mu`
The example will set the algorithm preference G.726-32 with a second choice as G711 mu-law for voice channels 1 through 24 on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}.

slot	The slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

{alg-choice1}

g711a	G.711 A-law PCM - 64 kb/s
g711mu	G.711 mu-law PCM - 56 or 64 kb/s
g729a	G.729 CS-ACELP - 8 kb/s
g726_40	G.726 ADPCM - 40 kb/s
g726_32	G.726 ADPCM - 32 kb/s
g726_24	G.726 ADPCM - 24 kb/s
g726_16	G.726 ADPCM - 16 kb/s

[alg-choice2] through [alg-choice6]

These optional fields should be listed in order of preference. Algorithms are used from the list above and are only listed once.

set (router-voice) cpd

Use the **set (router-voice) cpd** command for configuring how calling party disconnect should be signaled to an endpoint. Calling party disconnect is signaled to a voice endpoint by generating an Open Switch Interval (OSI) ABCD signaling bit pattern. On analog POTS lines this causes the loop to be opened for this interval. The duration of this OSI signal is configurable via the **set (router) voip osi** command. When set to "disabled" the CMG will never sent the OSI signal to the endpoint. This is appropriate for normal POTS telephones with no automated devices attached. When set to "osi" the CMG will issue the OSI signal to the endpoint only when an L/osi signal request is received from the call agent. This is appropriate when working with a call agent that requests L/osi, but only for endpoints that have automated equipment attached, such as voice mail systems, auto-answering modems, or fax machines. When set to "enabled" the CMG will issue the OSI signal to the endpoint when an L/osi signal request is received from the call agent or after the last connection on that endpoint is deleted. This is appropriate when working with a call agent that does not request L/osi, but only for endpoints that have automated equipment attached, such as voice mail systems, auto-answering modems, or fax machines. This command take effect immediately and applies to the CMG Router card only.

Syntax: `set {cmg_voice-addr} cpd {disable|enable|osi}`

Example: `set 2:1:1:1-4 cpd enable`
The example will enable automatic playing of CPD on endpoint after the last connection is deleted or when OSI is signaled.

{cmg_voice-addr}

In the form {slot:voip:port}

slot   The slot number (1-6) that contains the CMG card.

voip   To designate VoIP 1:1 is used.

channel   Channel number for the router is 1-48, range or all

{disable|enable|osi}

disabled   Do not play CPD on endpoint. Disable is the default.

enable   Play CPD on the OSI signal or after the last connection is deleted on endpoint.

osi   Play CPD on the OSI signal only.

set (router-voice) default

Use the **set (router-voice) default** command to reset all CLI accessible options for one or more CMG voice channels to their defaults. Defaults are set for algorithm preference, compander, echo cancellation, echo tail, endpoint prefix, endpoint suffix, silence suppression and TOS. This command applies to the CMG Router card only.

> *Syntax:* **set {cmg_voice-addr} default**

> *Example:* **set 2:1:1:1-4 default**
>> The example will reset voice channel provisioning to defaults for voice channels 1-4 on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

> **slot**   The slot number (1-6) that contains the CMG card.

> **voip**   To designate VoIP 1:1 is used.

> **channel**   Channel number for the router is 1-48, range or all

set (router-voice) down

Use the **set (router-voice) down** command to take a CMG voice channel out-of-service. Once out-of-service, the call agent cannot access the endpoint ID associated with this voice channel. Also, the phone, fax, or data user connected to this channel from an FXS port or T12 channel cannot make or receive calls. The options for this command allow the invoker of the command to specify how the call agent is to treat the voice channel as it goes out-of-service. The default option ("now") causes an immediate termination of any active call, with an RSIP with "forced" restart method sent to the call agent. Use of the "graceful" or "timeout" option provides for keeping an active call up, either for its duration or for a particular timeout period, before the channel is taken out-of-service. In this case, an RSIP with "graceful" restart method is sent initially to the call agent. After the call is disconnected or the timeout period expires, the channel is taken out-of service, and a final RSIP is sent with the "forced" restart method.

Syntax: `set {cmg_voice-addr} down {graceful|now|timeout} [seconds]`

Example: `set 2:1:1:9 down now`
The example will take voice channel 9 out-of-service immediately, on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

slot	The slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

{graceful|now|timeout}

graceful	Wait for current calls to end before placing endpoint Out-of-Service
now	Disconnect any existing calls immediately (Default)
timeout	Wait a defined time (see time below), then disconnect calls

[seconds]

When timeout is selected, this field defines the number of seconds to wait before taking endpoints Out-of-Service. Default time is 60 seconds.

set (router-voice) dtmfrelay

Use the **set (router-voice) dtmfrelay** command to enable or disable the relay of DTMF packets as per RFC 2833. This command applies to the CMG Router card only.

Syntax: `set {cmg_voice-addr} dtmfrelay {disable|enable}`

Example: `set 2:1:1:7 dtmfrelay enable`
Enables DTMF relay on voice channel 7 on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

slot	The slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

{disable|enable}

disable	Disable DTMF relay as the default for voice calls (Default)
enable	Enable DTMF relay as the default for voice calls

set (router-voice) echo cancellation

Use the **set (router-voice) echo cancellation** command to enable/disable echo cancellation as the default for voice calls for one or more voice channels. The new default set by this command may be overridden on a call-by-call basis by the MGCP call agent. At the end of a call, the configured default is back in-force. This command applies to the CMG Router card only.

Syntax: `set {cmg_voice-addr} echo cancellation {disable|enable}`

Example: `set 2:1:1:7 echo cancellation disable`
Disables echo cancellation as the default for calls on voice channel 7, on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

slot	The slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

{disable|enable}

disable	Disable echo cancellation as the default for voice calls
enable	Enable echo cancellation as the default for voice calls (Default)

set (router-voice) echo tail

Use the **set (router-voice) echo tail** command to set the maximum round-trip delay expected in the voice path between the CMG and the phone, including acoustical delay at the phone. This command applies to the CMG Router card only.

> *Syntax:* `set {cmg_voice-addr} echo tail {milliseconds}`

> *Example:* `set 2:1:1:all echo tail 8`
> > The example will set the echo tail to 8 milliseconds for all voice channels on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

> **slot** The slot number (1-6) that contains the CMG card.

> **voip** To designate VoIP 1:1 is used.

> **channel** Channel number for the router is 1-48, range or all

{milliseconds}

Valid values: 8, 16, 24, 32 and 64. Default is 16 milliseconds.

set (router-voice) endpoint prefix

Use the **set (router-voice) endpoint prefix** command to set the common part of the MGCP endpoint name for one or more voice channels. The default prefix is "aaln". Note the endpoint prefix is combined with the endpoint suffix to form a complete MGCP endpoint name in the form "prefix/suffix" (the slash is added) for each voice channel. These names are used by a call agent to address the channel. The intent of the prefix part of the name is to indicate the type of voice channel. For example, "aaln" refers to analog (FXS) lines, while "ds0" could refer to the channels of a T1 line. However, unless a call agent demands it, there is no restriction on the prefix name. This command applies to the CMG Router card only.

Syntax: `set {cmg_voice-addr} endpoint prefix {"prefix"}`

Example: `set 2:1:1:all endpoint prefix "ds0"`
> The example will set endpoint prefix to "ds0" on all the voice channels on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

slot The slot number (1-6) that contains the CMG card.

voip To designate VoIP 1:1 is used.

channel Channel number for the router is 1-48, range or all

{"prefix"}

An identifier with a maximum of 16 characters, enclosed in quotes.

set (router-voice) endpoint suffix

Use the **set (router-voice) endpoint suffix** command to set the variable part of the MGCP endpoint name for one or more voice channels. The default suffix is the voice channel number. Note: the endpoint prefix is combined with the endpoint suffix to form a complete MGCP endpoint name for each voice channel. If the defaults are used, the endpoint names are "aaln/1", aaln/2", "aaln/3", etc. These names are used by a call agent to address the channel. This command applies to the CMG Router card only.

   Syntax: `set {cmg_voice-addr} endpoint suffix {"suffix"}`

Example: `set 2:1:1:3 endpoint suffix "bob"`
         The example will set endpoint name suffix to "bob" for voice channel 3 on the
         CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

   slot   The slot number (1-6) that contains the CMG card.
   voip   To designate VoIP 1:1 is used.
   channel   Channel number for the router is 1-48, range or all

{"suffix"}

An identifier with a maximum of 16 characters, enclosed in quotes.

set (router-voice) log start

Use the **set (router-voice) log start** command to start logging events to the CMG text log, for the particular voice channels specified. Events are currently of two types, errors and MGCP. This command does not clear the log before enabling new events. The events to be logged are defined separately for each voice channel. (ie: one may start error logging for all channels, then set error plus MGCP logging for one specific channel). This command applies to the CMG Router card only.

Syntax: `set {cmg_voice-addr} log start {both|errors|mgcp}`

Example: `set 2:1:1:8 log start both`

The example will start logging errors MGCP for channel 8 on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

slot	The slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

{both|errors|mgcp}

both	Record MGCP protocol events and errors
errors	Record protocol and other errors only
mgcp	Record MGCP protocol events only

set (router-voice) log stop

Use the **set (router-voice) log stop** command to stop logging events to the CMG text log, for the particular voice channel(s) specified. This command applies to the CMG Router card only.

Syntax: `set {cmg_voice-addr} log stop`

Example: `set 2:1:1:8 log stop`

The example will stop logging for channel 8 on the CMG card in slot 2.

{cmg_voice-addr}

Definition is same as above.

set (router-voice) rxgain

Use the **set (router-voice) rxgain** command to set gain on the receive side (packet-to-TDM) voice path for the specified voice channel(s). This gain setting can be overridden by the call agent on a call-by-call basis. This command applies to the CMG Router card only.

> *Syntax:* `set {cmg_voice-addr} rxgain {gain}`

> *Example:* `set 2:1:1:10  rxgain -3`
> The example will set the receive-side gain to -3 dB for the voice channel 10 on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

slot   The slot number (1-6) that contains the CMG card.

voip   To designate VoIP 1:1 is used.

channel Channel number for the router is 1-48, range or all

{gain}

Gain range is -14 to 14 dB. Default gain is 0 dB.

set (router-voice) silence

Use the **set (router-voice) silence** command to enable or disable silence suppression as the default for voice calls for one or more voice channels. The new default set by this command may be overridden on a call-by-call basis by the MGCP call agent. At the end of a call, the configured default is back in-force. Silence suppression may not apply to certain voice compression algorithm types. This command applies to the CMG Router card only.

>   *Syntax:* `set {cmg_voice-addr} silence {disable|enable}`

>   *Example:* `set 2:1:1:all silence enable`
>   The example will enable silence suppression as the default for all voice calls for all voice channels on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

>   **slot**   The slot number (1-6) that contains the CMG card.

>   **voip**   To designate VoIP 1:1 is used.

>   **channel** Channel number for the router is 1-48, range or all

{disable|enable}

>   **disable**   Do not use silence suppression unless overridden by the call agent (Default)

>   **enable**   Use silence suppression if possible and not overridden by the call agent

set (router-voice) slash

Use the **set (router-voice) slash** command for configuring a CMG endpoint so that the implied slash, "/", between the endpoint prefix and suffix can be suppressed. This command applies to the CMG Router card only.

> *Syntax:* `set {cmg_voice-addr} slash {disable|enable}`

> *Example:* `set 2:1:1:all slash disable`
> > The example will disable use of slash between endpoint prefix and suffix.

{cmg_voice-addr}

In the form {slot:voip:port}

> **slot** The slot number (1-6) that contains the CMG card.
>
> **voip** To designate VoIP 1:1 is used.
>
> **channel** Channel number for the router is 1-48, range or all

{disable|enable}

> **disable** Suppress the use of a slash between the endpoint prefix and suffix.
>
> **enable** Insert a slash between the endpoint prefix and suffix. (Default)

set (router-voice) tos

Use the **set (router-voice) tos** command to set the default value for the Type of Service (TOS) byte in the IP header of outgoing VoIP packets for the specified channel(s). This value may be overridden by the call agent on a call-by-call basis. This command applies to the CMG Router card only.

> *Syntax:* `set {cmg_voice-addr} tos {2-hex-digits}`

> *Example:* `set 2:1:1:all  tos 0xA0`
> > The example will set the default priority 5 (in the original classification scheme) for VoIP packets for all voice channels of the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

> **slot** The slot number (1-6) that contains the CMG card.
>
> **voip** To designate VoIP 1:1 is used.
>
> **channel** Channel number for the router is 1-48, range or all

{2-hex-digits}

Specified bits to be sent in TOS byte. The first (leftmost) 3 bits represent the "precedence" or priority. Bit 4 (from the left) indicates optimize for delay. Bit 5 indicates optimize for throughput. Bit 6 indicates optimize for reliability.

set (router-voice) txgain

Use the **set (router-voice) txgain** command to set the gain on the transmit side (TDM-to-packet) voice path for the specified voice channel(s). This gain setting can be overridden by the call agent on a call-by-call basis. Note: DTMF detection can be gain sensitive, some adjustment may be necessary. This command applies to the CMG Router card only.

Syntax: **set {cmg_voice-addr} txgain {gain}**

Example: **set 2:1:1:9 txgain 6**
           The example sets the transmit-side gain to 6 dB for the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

   slot   The slot number (1-6) that contains the CMG card.

   voip   To designate VoIP 1:1 is used.

   channel   Channel number for the router is 1-48, range or all

{gain}

Gain range is -14 to 14 dB. Default is 0 dB.

set (router-voice) up

Use the **set (router-voice) up** command to bring a voice channel back into service. This will cause an RSIP message to be sent to the call agent, with the "restart" value for the Restart Method parameter. It will also enable the processing of TDM-side events (eg: offhook) which are either requested by the call agent or are defined as persistent events see **set (router) mgcp report hookswitch**. Note: The RSIP message is not sent immediately when the "up" command is given. It is sent after a random delay of not more than about 30 seconds. It is best if calls to or from the channel are not attempted until about 30 seconds after the "up" command is given. This command applies to the CMG Router card only.

Syntax: **set {cmg_voice-addr} up**

Example: **set 2:1:1:2 up**
           The example will set channel 2 back in-service on the CMG card in slot 2.

{cmg_voice-addr}

In the form {slot:voip:port}

   slot   The slot number (1-6) that contains the CMG card.

   voip   To designate VoIP 1:1 is used.

   channel   Channel number for the router is 1-48, range or all

set (router-wan) dlci

Use the **set (router-wan) dlci** command to set the DLCI (Data Link Connection Identifier) for a specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} dlci {value}`

Example: `set 1 "LosAngeles" dlci 16`

> The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to use DLCI value 16.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{value}

DLCI value to use, 16-1022

set (router-wan) gre

Use the **set (router-wan) gre** command to configure Generic Routing Encapsulation tunneling for a specified WAN interface.

set (router-wan) gre address

Use the **set (router-wan) gre address** command to configure the IP addresses for GRE tunneling for a specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} gre address {local_ip-addr} [remote-ip-addr] ["tunnel-name"]`

Example: `set 3 "LosAngeles" gre address 10.0.0.0 20.0.0.0 "LATunnel"`

The example will set the WAN interface named "LosAngeles" to the IP addresses to be 10.0.0.0 and 20.0.0.0.

Note: A **set 3 "LosAngeles" gre ip all** command is required before this command.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{local-ip-addr}

The IP Address of the local end of the tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[remote-ip-addr]

The IP Address of the far end of the tunnel, required if GRE tunneling is set to All, prohibited if GRE tunneling is set to By Network. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

["tunnel-name"]

A symbolic name to give to this tunnel, required if GRE tunneling is set to All, prohibited if GRE tunneling is set to By Network. Up to 12 characters, enclosed in quotes.

set (router-wan) gre ip

Use the **set (router-wan) gre ip** command to configure the GRE tunneling of the IP protocol for a specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} gre ip {all|bynetwork|disable}`

Example: `set 3 "LosAngeles" gre ip all`
The example will set the WAN interface "LosAngeles" in slot 3, to pass all packets through a GRE tunnel.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{all|bynetwork|disable}

all	Tunnel all packets on this interface to the tunnel destination address.
bynetwork	Tunnel packets based on their destination address by matching GRE network entries, see *add (router-wan) gre network* command.
disable	Disable GRE tunneling.

set (router-wan) gre ipx

Use the **set (router-wan) gre ipx** command to configure the GRE tunneling of the IPX protocol for a specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} gre ipx {all|disable}`

Example: `set 3 "LosAngeles" gre ipx all`
The example will set the WAN interface named "LosAngeles" in slot 3, to pass all IPX packets through a GRE tunnel.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{all|disable}

all	Tunnel all packets on this interface to the tunnel destination address.
disable	Disable GRE tunneling.

set (router-wan) ip

Use the **set (router-wan) ip** command to set the IP traffic handling on the WAN interface.

Syntax: **set {rtr_card-addr} {"wan-name"} ip**
{block|bridge|route}

Example: **set 1 "LosAngeles" ip route**
Sets the WAN interface named "LosAngeles" on the Router in slot 1 to route IP.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{block|bridge|route}

block	Set the WAN to block IP.
bridge	Set the WAN to bridge IP.
route	Set the WAN to route IP.

set (router-wan) ip address

Use the **set (router-wan) ip address** command to set the IP address for a WAN interface.

Syntax: **set {rtr_card-addr} {"wan-name"} ip address**
{ip-addr} [mask]|unnumbered}

Example: **set 1 "LosAngeles" ip address 100.2.2.2 255.255.255.0**
The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to the IP address 100.2.2.2, with a subnet mask of 255.255.255.0.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{ip-addr}

The Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[mask]

The subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

{unnumbered}

Treat this as an un-numbered interface, as per RFC 1812.

set (router-wan) ipx

Use the **set (router-wan) ipx** command to set the IPX traffic handling on the WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} ipx {setting}`

Example: `set 1 "LosAngeles" ipx bridge`

The example will set the WAN interface named "LosAngeles" in slot 1, to bridge IPX.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{setting}

block	Set the WAN to block IPX.
bridge	Set the WAN to bridge IPX with optimized local advertising IPX servers and networks.
optimize	Set the WAN to bridge IPX with optimized local advertising of IPX servers and networks.

Setting to optimize enables the Adit to use a custom network optimization feature, which ensures that only necessary data is transmitted over the WAN connection. The Adit will initiate IPX learning mode. Learning mode is effective for optimizing bandwidth usage for IPX RIP, SAP, serialization and watchdog (IPX and SPX) packets. If you choose this option, the Adit will initiate learning mode in order to gain knowledge of local and remote networks and services. Once it knows of remote networks and services, it can advertise the information on the local LAN on behalf of the remote networks and servers.

set (router-wan) nat

Use the **set (router-wan) nat** commands to configure Network Address Translation (NAT) on a specified WAN interface.

set (router-wan) nat address

Use the **set (router-wan) nat address** command to configure Network Address Translation (NAT) public addresses for a specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} nat address {assigned|ip-addr} [count]`

Example: `set 1 "LosAngeles" nat address 201.17.172.11 8`

The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to perform NAT translation to one of 8 public address from 201.17.172.11 to 201.17.172.19.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{assigned|ip-addr}

assigned	The NAT address assigned by remote.
ip-addr	The Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

[count]

An optional field defining the number of public addresses in the NAT pool. Default is 1

set (router-wan) nat enable/disable

Use the **set (router-wan) nat** command to enable and disable Network Address Translation (NAT) on a specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} nat {disable|enable}`

Example: `set 1 "LosAngeles" nat enable`

The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to enable NAT mapping.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{disable|enable}

disable	Disable NAT mapping.
enable	Enable NAT mapping.

set (router-wan) nat ports

Use the **set (router-wan) nat ports** command to configure Network Address Translation (NAT) to dynamically map ports or preserve them. This field should only be set to "preserved" if an application that you are using requires a specific port number.

Syntax: `set {rtr_card-addr} {"wan-name"} nat ports {dynamic|preserved}`

Example: `set 1 "LosAngeles" nat ports dynamic`

The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to enable dynamic NAT port mapping.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{dynamic|preserved}

dynamic	Set NAT port mapping to be dynamic.
preserved	Preserve original port.

set (router-wan) other

Use the **set (router-wan) other** command to set the traffic handling of protocols other than IP or IPX on the specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} other {block|bridge}`

Example: `set 1 "LosAngeles" other bridge`

The example will set the WAN interface named "LosAngeles" in slot 1, to bridge other protocols.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{block|bridge}

block	Set the WAN to block protocols other than IP or IPX.
bridge	Set the WAN to bridge protocols other than IP or IPX.

set (router-wan) ppp

Use the **set (router) ppp** command to configure the PPP (Point-to-Point Protocol) on the specified Router card.

set (router) ppp auth ofremote user

Use the **set (router) ppp auth ofremote user** command to set the CHAP or PAP name by which a remote PPP device is authenticated by this Adit.

Syntax: `set {rtr_card-addr} {"wan-name"} ppp auth ofremote user {profilename|"protocol-name"}`

Example: `set 5 "LosAngeles" ppp auth ofremote user profilename`
The example will set the PPP authentication user name for the WAN interface named "LosAngeles" tin slot 1 to equal the profile name.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{profilename|"protocol-name"}

profilename	Use the profile name as the CHAP or PAP user name.
"protocol-name"	The CHAP or PAP user name. A maximum of 16 characters, enclosed in quotes.

set (router) ppp compression

Use the **set (router) ppp compression** command to configure the PPP compression with the remote PPP device.

Syntax: `set {rtr_card-addr} {"wan-name"} ppp compression {setting}`

Example: `set 5 "LosAngeles" ppp compression enable`

The example will set PPP to attempt to negotiate PPP compression on the WAN interface named "LosAngeles" in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{setting}

disable	Disable PPP compression negotiation (Default).
easy	Typical data on this interface is easy to compress, such as text files (Default).
enable	Enable PPP compression negotiation.
hard	Typical data on this interface is hard to compress, such as binary files.

set (router) ppp security server

Use the **set (router) ppp security server** command to set the security server with the remote PPP device.

Syntax: `set {rtr_card-addr} {"wan-name"} ppp security server {external|local}`

Example: `set 5 "LosAngeles" ppp security server local`

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{external|local}

external	PPP External Security Server
local	PPP Local Security Server

set (router-wan) rip

Use the **set (router-wan) rip** command to set the type of RIP updates on the specified interface.

set (router-wan) rip ip updates

Use the set **(router-wan) rip ip updates** command to set the type of RIP updates on the specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} rip ip updates {never|periodic|triggered}`

Example: `set 1 "LosAngeles" rip ip updates never`
The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to not sent RIP updates.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{setting}

never	Set the WAN to not send RIP updates.
periodic	Set the WAN to send periodic RIP updates.
triggered	Set the WAN to send triggered RIP updates.

set (router-wan) rip ipx updates

Use the **set (router-wan) rip ipx updates** command to set the type of IPX RIP updates on the specified WAN interface.

Syntax: `set {rtr_card-addr} {"wan-name"} rip ipx updates {never|periodic|triggered}`

Example: `set 1 "LosAngeles" rip ipx updates never`
Sets the WAN interface "LosAngeles" to not sent RIP updates.

{rtr_card-addr} The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"} The WAN interface to modify. The name must be enclosed in quotes.

{setting}

never	Set the WAN to not send RIP updates.
periodic	Set the WAN to send periodic RIP updates.
triggered	Set the WAN to send triggered RIP updates.

set (router-wan) stp

Use the **set (router-wan) stp** commands to configure the Spanning Tree Protocol on the specified WAN interface.

set (router-wan) stp enable/disable

Use the **set (router-wan) stp enable/disable** command to enable and disable Spanning Tree Protocol on this interface. To enable Spanning Tree on an interface it must first be enabled globally with the **set (router) stp enable** command and the WAN must be set to bridge the IP protocol.

Syntax: `set {rtr_card-addr} {"wan-name"} stp {disable|enable}`

Example: `set 3 stp enable`

   The example will enable Spanning Tree on this interface.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{disable|enable}

   disable   Disable Spanning Tree on this interface.

   enable   Enable Spanning Tree on this interface.

set (router-wan) stp port cost

Use the **set (router-wan) stp port cost** command to configure Spanning Tree path cost value for this bridge port.

Syntax: `set {rtr_card-addr} {"wan-name"} stp port cost {port-cost-value}`

Example: `set 3 stp port cost 650`
> The example sets the Spanning Tree port cost value at 650, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{port-cost-value}

The value can range from 1 to 65535, with higher values representing slower data paths. A value of 15625/# of DS0s is recommended.

set (router-wan) stp port priority

Use the **set (router-wan) stp port priority** command to configure Spanning Tree priority value for this bridge port.

Syntax: `set {rtr_card-addr} {"wan-name"} port priority {port-priority-value}`

Example: `set 3 stp port priority 128`
> The example sets the Spanning Tree port priority to 128, on the Router in slot 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{port-priority-value}

The value can range from 0 to 255 seconds, with a default of 128.

set (router-wan) trunk

Use the **set (router-wan) trunk** command to configure the trunk port or multilink group for a specified WAN interface. If the trunk encapsulation is subsequently changed, this trunk assignment is reset to 0.

> *Syntax:* `set {rtr_card-addr} {"wan-name"} trunk [multilink-group] {number}`

> *Example:* `set 1 "LosAngeles" trunk 3`
> > The example will set the WAN interface named "LosAngeles" on the Router in slot 1 to be mapped to trunk 3.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

[multilink-group]

Indicates that the number is the multilink group to use, else the number is the trunk number to use.

{number}

Trunk or multilink group to use, range is 1-24.

set (router-wan) up/down

Use the **set (router-wan) up/down** command to set the specified WAN interface up or down.

> *Syntax:* `set {rtr_card-addr} {"wan-name"} {down|up}`

> *Example:* `set 1 "LosAngeles" up`
> > The example will enable the WAN interface named "LosAngeles" on the Router in slot 1.

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

{down|up}

down	Set the Router WAN to disabled.
up	Set the Router WAN to enabled.

set screen

Use the **set screen** command to set the height of the scrolling output screen, in number of lines. For example, if the screen height is set to 40 lines, the Command Line Interface (CLI) will print the maximum of 40 lines of a long output before pausing. To set the screen to scroll without pausing, set the screen height to 0.

Syntax: **set screen {screen-height|off}**

Where screen-height is the number of lines in the scrolling output screen.

set snmp

Use the **set snmp** command to set the Simple Network Management Protocol (SNMP) MIB-II System Group objects.

Syntax: `set snmp {setting} {string}`
Where {setting} is as below, and {string} is its value.

Example: `set snmp name "ADIT 1"`
To set the SNMP system name to "ADIT 1"

Example: `set snmp nms 2 192.168.3.50`
Set the second SNMP NMS IP address to 192.168.3.50

{setting}

Set the values for any of the following SNMP MIB-II System Group object

contact {string}	SysContact. 1 - 255 characters, enclosed in quotes
getcom {string}	SNMP Get-Community. 1 - 32 characters, enclosed in quotes
location {string}	SysLocation. 1 - 255 characters, enclosed in quotes
name {string}	Set the value of the SysName (name enclosed by quotes).
nms {n} {ip-addr}	Set the IP address of the SNMP manager where the SNMP agent will send traps (up to 3 NMS addresses). The {n} is a number from 1 to 3, to differentiate your NMS addresses.
setcom {string}	Set the value of the SNMP Set-Community string.
trapauth {disable|enable}	Enable or disable authentication traps.
trapcom {string}	Set the value for the SNMP Trap-Community string. 1 - 32 characters, enclosed in quotes
trapevent {setting}	Set minimum severity level for (enterprise) event trap generation.

	all	Set event trap severity limit to 'all'.
	critical	Set event trap severity limit to 'critical'.
	major	Set event trap severity limit to 'major'.
	minor	Set event trap severity limit to 'minor'.
	warning	Set event trap severity limit to 'warning'.
	none	Set event trap severity limit to 'none'.
trapvers {1|2}		Set SNMP trap version number, 1 or 2. Example: set snmp trapvers 1

set syslog

Use the **set syslog** commands to configure the Syslog client features.

set syslog disable

Use the **set syslog disable** command to disable sending alarm and event messages to external syslog servers. The initial default setting is disabled.

Syntax: `set syslog disable`

Example: `set syslog disable`
> The example will disable syslog on the Controller.

set syslog enable

Use the **set syslog enable** command to enable sending alarm and event messages to external syslog servers. The command will fail if there is not at least one syslog server configured, see **set syslog server**. The initial default setting is disabled.

Syntax: `set syslog enable`

Example: `set syslog enable`
> The example will enable syslog on the Controller.

set syslog server all facility

Use the **set syslog server all facility** command to specify the syslog facility value that the controller will report to the syslog server in each message.

Syntax: `set syslog server all facility {value}`

Example: `set syslog server 2 facility 18`
> The example will set the facility value in the syslog messages sent to syslog server 2 to 18 (local use 2).

{value}

The facility value to report in the syslog messages sent to the server. Range is 0 - 23, with a default of 16.

set syslog server all level

Use the **set syslog server all level** command to set the syslog severity level threshold. Events of all severity levels will be sent to the syslog server.

Syntax: `set syslog level all facility {severity}`

Example: `set syslog server all level 4`

The example will set the threshold for sending syslog messages to include critical, major and minor alarms only, for all three syslog servers.

{severity}

The syslog severity level threshold. Range 0 - 7, with a default of 3.

0	
1	
2	Only critical alarms will be sent
3	Only critical and major alarms will be sent
4	Only critical, major and minor alarms will be sent
5	Only critical, major, minor alarms and alert events will be sent
6	Only critical, major, minor alarms, alert and informational events will be sent
7	

set syslog server address

Use the **set syslog server address** command to specify the IP address of the external syslog servers. Up to three different syslog servers can be configured, with all messages sent to all configured servers, based on server threshold level.

Syntax: `set syslog server {1|2|3} address {ip-addr}`

Example: `set syslog server 2 address 192.168.23.56`

The example will set the IP address to be used to access syslog server 2 to 192.168.23.56.

{1|2|3}

The syslog server entry to modify.

{ip-addr}

Set the IP address of the syslog server, in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255, or 0.0.0.0 for none. The default is 0.0.0.0. Note: all 3 servers cannot be set to 0.0.0.0 if the syslog enable setting is enabled.

set syslog server facility

Use the **set syslog server facility** command to set the system log facility value.

Syntax: `set syslog server {1|2|3} facility {value}`

Example: `set syslog server 2 address 192.168.23.56`
The example will set the IP address to be used to access syslog server 2 to 192.168.23.56.

{1|2|3}

The syslog server entry to modify.

{value}

Facility message 0-23, default is 16.

set syslog server level

Use the **set syslog server level** command to set the system log facility value.

Syntax: `set syslog server {1|2|3} level {severity}`

Example: `set syslog server 2 address 192.168.23.56`
The example will set the IP address to be used to access syslog server 2 to 192.168.23.56.

{1|2|3}

The syslog server entry to modify.

{severity}

Severity threshold level, range 0-7.

set time

Use the **set time** command to set the time.

Syntax: `set time {hh:mm:ss}`

Example: `set time 12:00:00`
The example will set the time to 12 noon.

{hh:mm:ss}

Where hh:mm:ss is the time in hours, minutes, and seconds, using a 24-hour clock.

set user

Use the **set user** command to modify attributes for a specific user that have been created with the **add user** command.

set user level

Use the **set user level** command to set the user access level.

Syntax: `set user {"user-name"} level {1|2|3}`

Example: `set user "paul" level 2`

{"user-name"}

The user-name is a user ID to add to the system. Text is a single word, with no blank spaces and must be enclosed in quotes.

{1| 2| 3}

Sets the level of access.

> **Level 1**   Manager has full access to ALL commands. Typically, there is only one designated user at this level

> **Level 2**   Operator has access to all commands except for the **add user** and **set user** commands

> **Level 3**   Monitor (read only) has access to commands that display reports and status

set user password

Use the **set user password** to set the password for this user.

Syntax: `set user {"user-name"} password`

Example: `set user "john" password`
```
             New Password: **
             New Password again: **
```

{"user-name"}

The user-name is an existing user ID in the system. Text is a single word, with no blank spaces and must be enclosed in quotes.

set (v35)

Use the **set (v35)** command to setup V.35 ports. The command specifies the range of channels within that card, and the setting to apply.

Syntax: `set {v35-addr} {setting}`

Example: `set 6:1 rxclk normal`
       To set port 1 (v.35) on slot 6 to no inversion on the receive clock

{v35-addr}

In the form of {slot:port}.

slot	Slot number (1-6) of the Compact T1 where the V.35 card is located
port	Port number or range.

{setting}

Setting to apply one of the following:

clock	Set the clock source to one of the following:	
	source	to the internal Stratum 4E oscillator
	external	to the external source
cts	Set the Clear To Send operation mode to one of the following:	
	cd	follow CD
	high	force CTS high
	low	force CTS low
	rts	follow RTS
data	Set the data mode to one of the following:	
	invert	invert the receive and transmit data
	normal	do not invert receive and transmit data
equipment	Sets the V.35 port to equipment loopback, which loops the transmit V.35 signal back toward the V.35 receive (toward the T1)	
	loopdown	disable equipment loopback
	loopup	enable equipment loopback
line	Sets the V.35 port to line loopback, which loops the received V.35 signal back toward the V.35 signal toward the V.35 transmit (away from T1)	
	loopdown	disable line loopback
	loopup	enable line loopback

rxclkinv	Set the receive clock invert mode to one of the following:	
	invert	invert the receive clock
	normal	do not invert the receive clock
speed	Set the data rate for each DS0 to which a V.35 is crossconnected	
	56	56K data rate
	64	64K data rate
txclkinv	Set the transmit clock invert mode to one of the following:	
	invert	invert the transmit clock
	normal	do not invert the transmit clock

set (v54)

Use the **set (v54)** command to setup V.54 Loopback Test Parameters. The command specifies the range of channels within that card, and the setting to apply.

Syntax: `set {v54-addr} v54 {setting} [off|on] [n] [nnn]`

Example: `set 6:1 v54 equipment clear`
> The example will clear the loop test counter on the V.54 card in slot 6, port 1.

{v54-addr}

In the form of {slot:port}.

slot   Slot number (1 - 6) for service cards.

port   Port number or range.

{setting}

equipment   Set the V.54 Equipment (Tx) parameters:

address   `Syntax: set {v54-addr} v54 equipment address {nnn}`
Set V.54 loop test address [nnn]
Set the address to be tested.
[nnn] {nnn} must be one of the following:
0 - 255.1, 3, 5, 7, 9, 11, 13, 15,17, 19, 21, 23, 25, 27, 29, 31, 37, 39, 43, 45, 47, 51, 53, 55, 59, 61, 63, 85, 87, 91, 95, 111, 119, 127, 255 (255 disables). See chart below.

clear   `Syntax: set{v54-addr} v54 equipment clear`
Clear the bit error rate counters during BER test

ignoreack   `Syntax: set{v54-addr} v54 equipment ignoreack {off|on}`
Ignore V.54 ACK check [off|on]
Ignore acknowledge from remote equipment. This allows potential testing with non-compliant equipment by ignoring the acknowledge phase. **WARNING: When choosing this option, the V.35 card will no longer be compliant with the V.54 specification. Use for debug purposes only.**

loopdown   `Syntax: set{v54-addr} v54 equipment loopdown`
Stop the test sequence

loopup   `Syntax: set{v54-addr} v54 equipment loopup`
Start the test sequence

pattern	`Syntax: set{v54-addr} v54 equipment pattern {n}` Set V.54 test pattern **n** is from the following: 0 = QRSS pattern (Default) 1 = 2047 pattern $2 = 2^{15}$ -1 pattern $3 = 2^{20}$ -1 pattern (QRSS with no bit stuffing)
prepcnt	`Syntax: set {v54-addr} v54 equipment prepcnt {nnn}` Set V.54 Rx prep-pattern count {nnn} **nnn** = the number of times that the preparatory pattern must be received to be recognized.
network	Set the V.54 Network loop address.
address	`Syntax: set {v54-addr} v54 network address {nnn}` Set the address of the port to {nnn}. **{nnn}** must be one of the following: 1, 3, 5, 7, 9, 11, 13, 15,17, 19, 21, 23, 25, 27, 29, 31, 37, 39, 43, 45, 47, 51, 53, 55, 59, 61, 63, 85, 87, 91, 95, 111, 119, 127, 255 (255 disables). See chart below.
disable	`Syntax: set {v54-addr} v54 network disable` Disable V.54 loop test
enable	`Syntax: set {v54-addr} v54 network enable` Enable V.54 loop test
prepcnt	`Syntax: set {v54-addr} v54 network prepcnt {nnn}` Sets the preparatory pattern response count. **nnn** = the number of times that the preparatory pattern must be received to be recognized.

[nnn] chart

0x01 - 1	0x0F - 15	0x1D - 29	0x33 - 51	0x57 - 87
0x03 - 3	0x11 - 17	0x1F - 31	0x35 - 53	0x5B - 91
0x05 - 5	0x13 - 19	0x25 - 37	0x37 - 55	0x5F - 95
0x07 - 7	0x15 - 21	0x27 - 39	0x3B - 59	0x6F - 111
0x09 - 9	0x17 - 23	0x2B - 43	0x3D - 61	0x77 - 119
0x0B - 11	0x19 - 25	0x2D - 45	0x3F - 63	0x7F - 127
0x0D - 14	0x1B - 27	0x2F - 47	0x55 - 85	0xFF - 255*

set verification

Use the **set verification** command to enable or disable verification prompts.

Syntax: `set verification {off|on}`

Example: `set verification off`

The example will cause yes/no verification messages to be suppressed.

{off|on}

   off   Turn yes/no verification prompts off.

   on   Turn yes/no verification prompts on.

show

The following show commands are linked to a detailed description of each command.

show autoexit	**show (router) snmp**
show (bri)	**show (router) stp**
show clock	**show (router) syslog**
show connect	**show (router) uploaduser**
show date	**show (router) voip**
show (ds0)	**show (router-lan)**
show (ds1)	**show (router-lan) collision**
show ethernet	**show (router-lan) filter**
show (fxo)	**show (router-lan) static**
show (fxs5G)	**show (router-lan) stp**
show impedance	**show (router-voice)**
show id	**show (router-wan)**
show ip	**show (router-wan) firewall**
show ipds0	**show (router-wan) nat bypass**
show local	**show (router-wan) ppp**
show login	**show (router-wan) static ip address**
show ntp	**show (router-wan) static ip network**
show (ocudp)	**show (router-wan) static ipx network**
show radius	**show (router-wan) static mac address**
show (router)	**show (router-wan) stp**
show (router) dhcp	**show (router-wan) trunk**
show (router) dns proxy	**show screen**
show (router) lmi	**show snmp**
show (router) log	**show syslog**
show (router) mgcp	**show time**
show (router) mgcp algorithmname	**show users**
show (router) ntp	**show (v35)**
show (router) ppp	**show (v54)**
show (router) rip	**show (wan)**

show autoexit

Use the **show autoexit** to display whether autoexit is on or off. If on, the time-out period is displayed.

Syntax: **show autoexit**

Example: **show autoexit**

```
> show autoexit
Autoexit is off.
```

show (bri)

Use the **show (bri)** to display settings for BRIs.

Syntax: **show {bri-addr}**

Example: **show 3:1**

The example will display the settings for port 1 (BRI) on slot 3.

```
> show 3:1
SLOT 3:
Settings for BRI Port 1:
    Mode:                       LT4TO1TDM
    Up/Down:                    UP
    CRV:                        31
    Performance Sync Source:    ADIT
    Auto Activate:              OFF

    Performance Threshold Settings     1 hour    1 day
                                       ------    ------
    errored seconds:                       40       100
    severely errored seconds:              10        25
```

{bri-addr}

The BRI address is in the form {slot:port}. Where {slot} displays connections for an entire slot, {slot:port} for a port within a given slot.

slot   Slot number (1-6) where the BRI card is located

port   Port number, range or all.

show clock

The **show clock** command displays the primary and secondary clocks.

Syntax: `show clock`

Example: `show clock`

In the following example, the primary clock source is in slot A (Controller card), DS1 2; and the secondary clock source is in slot 6 (BRI card), DS1 1.

```
> show clock
Primary Master Transmit Clock Source:    Slot A DS1  2
Secondary Master Transmit Clock Source:  Slot 6 BRI  1
```

show connect

The **show connect** command displays the static connections for channels and ports.

Syntax: `show connect {slot|slot:port|slot:port:channel}`

Example: `show connect a:1:1-4`

```
> show connect a:1:1-4
From         Desc                      Desc       To
--------  -------------         ------------- --------
A:01:01    LS VOICE  DS0 <--> FXS  VOICE     GS   01:01
A:01:02    LS VOICE  DS0 <--> FXS  VOICE     GS   01:02
A:01:03    LS VOICE  DS0 <--> FXS  VOICE     GS   01:03
A:01:04    LS VOICE  DS0 <--> FXS  VOICE     GS   01:04
```

{slot|slot:port|slot:port:channel}

slot   Slot number A is the Controller card or 1-6 for service cards.

port   Port number, range or all.

channel   Channel number, range or all.

show date

The **show date** command displays the date in *dd/mm/yyyy* format.

Example: **show date**

```
> show date
date: 08/10/2002
```

show (ds0)

The **show (ds0)** command displays settings for DS0s.

Syntax: **show {ds0-addr}**

Example: **show a:2:1-2**

In the following example, the **show (ds0)** command has queried slot A
(Controller card), port 2, channels 1 through 2.

```
>show a:2:1-2
SLOT A:
Settings for DS1  2:   channel  1:
    Type:           DATA
SLOT A:
Settings for DS1  2:   channel  2:
    Type:           DATA
```

{ds0-addr}

In the form {slot:port:channel}.

slot	A for the controller card, or 1 - 6 for service cards.
port	Port number or range.
channel	Channel number, range or all.

show (ds1)

The **show (ds1)** command displays settings for DS1s.

Syntax: **show {ds1-addr}**

Example: **show a:1**

In the following example, the query **show a:1** has returned the following DS1 settings for slot A (the controller card), port 1.

```
> show a:1
SLOT A:
Settings for DS1  1:
    Circuit ID:         DS1# A:1
    Up/Down:            DOWN
    Framing:            ESF
    Line Coding:        B8ZS
   Line Build Out:     DSX-1 EQUALIZATION FOR 0-133 ft.(CSU 0dB)
    Loop Code Detection:    ON
    Loopback:           OFF
    FDL Type:           None

    Performance Threshold Settings      15 min.    1 day
                                        ---------  ----------
    unavailable seconds:                    0            0
    severely errored seconds:               0            0
    errored seconds:                        0            0
    sev. errored frame seconds:             0            0
    line errored seconds:                   0            0
    controlled slip seconds:                0            0
    bursty errored seconds:                 0            0
    degraded minutes:                       0            0
    total linecode violations:              0            0
     total pathcode violations:             0            0
```

{ds1-addr}

In the form {slot:port}

slot   A for the controller card, or 1 - 6 for service cards.

port   Port number or range.

show ethernet

The **show ethernet** command displays ethernet and IP settings.

> *Example:* **show ethernet**

```
> show ethernet

   IP Address and Mask:       198.162.3.196  255.255.255.0
   IP Address of the Gateway:  192.168.3.202
   MAC Address:                00:E0:97:00:A9:33
```

show (fxo)

The **show (fxo)** command displays the settings for FXOs.

> *Syntax:* **show {fxo-addr}**

> *Example:* **show 1:1**
>> The example shows the port 1, FXO settings for the card in slot 1.

```
> show 1:1
SLOT 1:
Settings for FXS:   channel  1:
    Type:            VOICE
    Signaling:       LS
    RxGain:          -6    dB
    TxGain:          -3    dB
    LineLength:      SHORT
```

{fxo-addr}

In the form of {slot:port}.

slot	Location of the FXO card, slot 1 - 6
port	Port number, range or "all".

show (fxs5G)

The **show (fxs5G)** command displays the settings for the FXS 5G card.

Syntax: `show {fxs5G-addr}`

Example: `show 6:1`

This command will display the settings for the FXS channel 1 for the FXS 5G card located in Slot 6.

```
> show 6:1
SLOT 6:
Settings for FXS:   channel  1:
    Type:           VOICE
    Signaling:      LS
    RxGain:         -6     dB
    TxGain:         -3     dB
    Impedance:      900 Ohms + 2.16uF
```

Example: `show 4:1`

```
SLOT 4:
Settings for FXS:   channel  1:
    Type:           VOICE
    Signaling:      GSW
    RxGain:         -6     dB
    TxGain:         -3     dB
    Impedance:      900 Ohms + 2.16uF
    Wink time:      135 ms
```

Note: Wink time displays only when signaling is set to GSW or GSWRB.

{fxs5G-addr}

In the form of {slot} or {slot:port}. Note if only slot is listed, all ports will be displayed.

slot   Location of the FXS 5G card, slot 1 - 6

port   Port number, range or "all".

show impedance

The **show impedance** command displays the impedance settings for FXS 5G card.

Syntax: `show impedance`

Example: `show impedance`

```
Index              Impedance                CODEX      Country
-----  --------------------------------     -----   -------------------
   1   120 Ohms + (.110µF || 820 Ohms)     A-law   Norway
   2   150 Ohms + (.047µF || 510 Ohms)     A-law   Malaysia
   3   150 Ohms + (.072µF || 830 Ohms)     A-law   Belgium
   4   200 Ohms + (.100µF || 680 Ohms)     A-law   China
   5   215 Ohms + (.137µF || 1k   Ohms)    A-law   France
   6   220 Ohms + (.115µF || 820 Ohms)     A-law   Austria, Germany,
                                                    Mexico, Switzerland
   7   220 Ohms + (.120µF || 820 Ohms)     A-law   Australia
   8   270 Ohms + (.120µF || 910 Ohms)     A-law   Finland
   9   300 Ohms + (.220µF || 1k   Ohms)    A-law   United Kingdom
  10   370 Ohms + (.310µF || 620 Ohms)     A-law   New Zealand
  11   400 Ohms + (.033µF || 500 Ohms)     A-law   Denmark
  12   400 Ohms + (.050µF || 500 Ohms)     A-law   Greece
  13   600 Ohms                            A-law   Korea, Indonesia,
                                                    Italy, Poland,
                                                    Russia, Spain,
                                                    Thailand, China
  14   600 Ohms + 1.00µF                   µ-law   Japan
  15   600 Ohms + 1.50µF                   A-law   Saudi Arabia
  16   600 Ohms + 2.16µF                   µ-law   Korea
  17   800 Ohms                            A-law   Netherlands
  18   900 Ohms                            A-law   Brazil
  19   900 Ohms + 2.16µF                   µ-law   USA, Taiwan
```

Note: In general, µ-Law settings are used for T1 applications, A-Law settings are used for E1 applications.

show id

The **show id** command displays the system ID for the Compact T1.

Syntax: `show id`

Example: `show id`

The example shows the ID of a Compact T1 labeled "Compact T11"

```
Compact T11> show id
ID: Compact T11
```

show ip

The **show ip** command displays the IP Address information for the Compact T1.

Syntax: `show ip`

Example: `show ip`

```
> show ip

  IP Address and Mask:        192.168.3.193  255.255.255.0
  IP Address of the Gateway:  192.168.3.202
OK
```

show ipds0

The **show ipds0** command displays the settings for the DS0 management channel.

Syntax: `show ipds0`

Example: `show ipsd0`

```
> show ipds0
Administrative state:   DOWN
DS0 Selected:           a:1:1
IP Address and Mask:    192.168.210.1  255.255.255.0
```

show local

The **show local** command shows whether the Compact T1 is in local mode.

Syntax: **show local**

Example: **show local**

```
> show local
LOCAL:          ON
```

show login

The **show login** command displays the RADIUS login authentication configuration settings for the Controller.

Syntax: **show login**

Example: **show login**

```
> show login

Login Authentication Parameters:

Authentication Type: local
Support Logins: enabled
```

show ntp

The **show ntp** command displays the configuration settings for the Controller NTP client.

Syntax: **show ntp**

Example: **show ntp**

```
> show ntp

  NTP Settings:
    NTP:                          Disabled
    NTP Server Address:           0.0.0.0
    NTP Polling Interval (seconds): 16
    NTP Timezone (offset from GMT): 0 hours 0 minutes
```

show (ocudp)

Use the **show (ocudp)** to display baud, loopdetect, error correction, switched and enhanced switched service and secondary channel provisioning.

Syntax: `show {ocudp-addr}`

Example: `show 2:1`

```
SLOT 2:
Settings for OCUDP Port 1:
    Up/Down:                          UP
    Baudrate:                         56000
    Loopdetect Types Enabled:
                              CSU Non-Latching
                              DSU Non-Latching
                              OCU Non-Latching
    Error Correction:             DISABLE
    Secondary Channel:            DISABLE
```

{ocudp-addr}

The {slot:port} address of the OCU-DP card to display.

slot Slot number (1-6) of the chassis where the OCU-DP is located. If no port is specified, all ports will be displayed.

port Port number or range.

show radius

The **show radius** command displays the RADIUS configuration settings for the Controller.

Syntax: `show radius`

Example: `show radius`

```
RADIUS Configuration Parameters:
 Authentication: enabled for
                 Slot 4
                 Slot 5
 NAS Identifier:
 Retry count:    3
 Timeout (sec):  3
 Server(1) :     UNUSED
 Server(2) :     UNUSED
 Server(3) :     UNUSED
```

show (router)

The **show (router)** command displays the settings for the Router card.

Syntax: `show {rtr_card-addr}`

Example: `show 5`

```
> show 5
SLOT 5:
Login Settings for Router:
    Authentication:  Local
    Login Prompt:    Enabled

LMI Settings for Router:
    LMI:             Disabled

RIP Setting for Router:
    RIP Mode Receive:   RIP1
    RIP Mode Send:      RIP1

PPP Authentication/Security Settings for Router:
    Authentication by Remote:
        Protocol:       None
        User ID:        Local Profile Name

    Authentication of Remote:
        Protocol:       None

    Local Security Server:
        Type:           None

 PPP Statistics for Slot-5:

                    Up/Down      Rx          Rx          Tx          Tx
Remote Name  State Time       Packets     Octets      Packets     Octets
RemoteAdit   DOWN  1h27m16s      0           0           0            0

SNMP Settings for Router:
  SNMP Communities:
   Name          Address            Access
   public        0.0.0.0            Read
```

```
    SNMP Trap Destinations:
      Name          Address              Location
        public       0.0.0.0               Local LAN

    Name:                   unknown
    Contact:                unknown
    Location:               unknown

  DHCP Server/BOOTP Relay Agent Settings for Router:
      DHCP:               Disabled

  DNS Proxy Settings for Router:
      Total: 0

  Spanning Tree Protocol Settings for Router:
      Spanning Tree:      Enabled
      Bridge Hello Time:     2 seconds
      Bridge Max Age:        20 seconds
      Bridge Forward Delay:  15 seconds
      Bridge Priority:       32768

  Syslog Settings for Router:
      Syslog:             Disabled

  TFTP Upload/Download User Settings for Router:
      Reboot After Code is Loaded:              Yes
      Reboot After Configuration is Loaded:     Yes


                                    Upload/Download
      IP Address         Client Site  Code   Config
      Total: 0

  LAN Profile Name for Router:
      LocalAdit          192.168.3.195

  WAN Profile Name(s) for Router:
      RemoteAdit         Unnumbered
```

{rtr_card-addr}
The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) dhcp

The **show (router) dhcp** command displays the current DHCP settings for the Router card.

Syntax: `show {rtr_card-addr} dhcp`

Example: `show 5 dhcp`

The example shows the DHCP settings for the Router card in slot 5.

```
> show 5 dhcp
SLOT 5:
DHCP Server/BOOTP Relay Agent Settings for Router:
   DHCP: Disabled
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) dns

The **show (router) dns** command displays the current DNS setup for the Router card.

Syntax: `show {rtr_card-addr} dns`

Example: `show 3 dns`

```
> show 5 dns
SLOT 5:
DNS Settings:
    DNS Resolver:               Disabled
    DNS Server 1 IP Address:    0.0.0.0
    DNS Server 2 IP Address:    0.0.0.0
    DNS Host Name:
    DNS Default Domain:

    DNS Static Host List:
     Total: 0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router card.

show (router) dns proxy

The **show (router) dns proxy** command displays the current DNS Proxy setup for the Router card.

   Syntax: `show {rtr_card-addr} dns proxy`

Example: `show 5 dns proxy`

```
> show 5 dns proxy
SLOT 5:
DNS Proxy Settings for Router:
    Total: 0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) lmi

The **show (router) lmi** command displays the current Local Management Interface (LMI) settings for the Router card.

   Syntax: `show {rtr_card-addr} lmi`

Example: `show 5 lmi`
        The example shows the LMI settings for the Router card in slot 5.

```
> show 5 lmi
SLOT 5:
LMI Settings for Router:
   LMI: Disabled
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) log

The **show (router) log** command displays the logging configuration of the CMG card. This command applies to the CMG Router card only.

Syntax: `show {cmg_card-addr} log`

Example: `show 4 log`

The example shows the logging configuration for the CMG card in slot 4.

```
> show 4 log
SLOT 4:
Log Settings for CMG:

    Logging Mode:           First
    Log Details:            No
    Call Detail Records (CDR): Disabled

    Total Ports Logging: 0
```

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

show (router) mgcp

The **show (router) mgcp** command to display all options set through **set (router) mgcp** commands. This command applies to the CMG Router card only.

Syntax: `show {cmg_card-addr} mgcp`

Example: `show 4 mgcp`

```
SLOT 4:
MGCP Settings for CMG:
  Activation, Addressing, and Transactions:
    MGCP State:               Down
    Call Agent IP Address:    0.0.0.0
    Call Agent Domain Name:   (not applicable)
    Call Agent MGCP Port:     2727
    Gateway MGCP Port:        2427
    MGCP Gateway ID:          Default
    Response Timeout (ms):    3000
    Max Retries:              3

  Interoperability Settings:
    Version:                  IETF 1.0
    Hookswitch Reporting:     Always
    Default IETF Event Package: D
    Piggybacking:             Disabled
    Address Format:           Brackets
    Dialstring Format:        Commas
    SDP Mode:                 Full
    Parse Mode:               Lenient
    Quarantine:               Step Process

  Voice Algorithm Names for Local Connection Options (LCO):

    CMG Algorithm ID          MGCP LCO Name
    g711mu
    g711a
    g726_16
    g726_24
    g726_32
    g726_40
```

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

show (router) mgcp algorithmname

The **show (router) mgcp algorithmname** command to display all MGCP designations for voice coding algorithms supported by the CMG. This displays the CLI defined name, if any, and the default for each algorithm. MGCP algorithm names are used in the "a:" attribute in the Local Connection Options (L:) parameter line of a CRCX or MDCX command. This command applies to the CMG Router card only.

Syntax: **show {cmg_card-addr} mgcp algorithmname**

Example: **show 4 mgcp algorithmname**
> The example will show all MGCP names of voice coding algorithms supported by the CMG card in slot 4.

```
> show 4 mgcp algorithmname
SLOT 4:
MGCP Voice Algorithm Names for CMG Local Connection Options
(LCO):

    CMG Algorithm ID              MGCP LCO Name
    g711mu
    g711a
    g726_16
    g726_24
    g726_32
    g726_40
```

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

show (router) ntp

The **show (router) ntp** command displays settings for NTP options.

Syntax: `show {rtr_card-addr} ntp`

Example: `show 4 ntp`

The example shows the NTP options for the Router card in slot 4.

```
> show 4 ntp
SLOT 4:
NTP Settings for CMG:
    NTP:                       Disabled
    NTP Server:                0.0.0.0
    NTP  Interval (seconds):120
    NTP Timezone (offset from GMT):0 hours 0 minutes
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) ppp

The **show (router) ppp** command displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the Router card.

Syntax: `show {rtr_card-addr} ppp`

Example: `show 5 ppp`

```
> show 5 ppp
SLOT 5:
PPP Authentication/Security Settings for Router:
    Authentication by Remote:
        Protocol:       CHAP
        Secret:         public
        User ID:        Local Profile Name

    Authentication of Remote:
        Protocol:       CHAP

    Local Security Server:
        Type:           Radius
        IP Address:     168.0.0.100
        Password:       test
PPP Statistics for Slot-4:

                    Up/Down   Rx         Rx        Tx        Tx
Remote Name State Time      Packets   Octets   Packets   Octets
----------- ----- --------- ---------- --------- --------- -----
RemoteAdit  DOWN  26m36s        0          0         0         0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) rip

The **show (router) rip** command displays the current RIP settings for the Router card.

Syntax: `show {rtr_card-addr} rip`

Example: `show 5 rip`

```
> show 5 rip
SLOT 5:
RIP Settings for Router:
   RIP Mode Receive:   RIP2
   RIP Mode Send:      Rip2
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) snmp

The **show (router) snmp** command displays the current SNMP settings for the specified Router card.

Syntax: `show {rtr_card-addr} snmp`

Example: `show 5 snmp`

```
> show 5 snmp
SLOT 5:
SNMP Settings for Router:
  SNMP Communities:
    Name        Address           Access
    public      0.0.0.0           Read

  SNMP Trap Destinations:
    Name        Address           Location
    public      0.0.0.0           Local LAN

  Statistics Averaging Interval:  1 min.

  Name:                 unknown
  Contact:              unknown
  Location:             unknown
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) stp

The **show (router) stp** command displays the current Spanning Tree Protocol settings for the specified Router card.

Syntax: `show {rtr_card-addr} stp`

Example: `show 5 stp`

```
> show 5 stp
SLOT 5:
Spanning Tree Protocol Settings for Router:
    Spanning Tree:       Enabled
    Bridge Hello Time:    2 seconds
    Bridge Max Age:      20 seconds
    Bridge Forward Delay: 15 seconds
    Bridge Priority:      32768
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) syslog

The **show (router) syslog** command displays the current Syslog setup for the Router card.

Syntax: `show {rtr_card-addr} syslog`

Example: `show 5 syslog`

```
> show 5 syslog
SLOT 5:
Syslog Settings for Router:
    Syslog:              Enabled
    Facility:            20
    Level:               3
    Server IP Address:   192.168.3.3
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) uploaduser

The **show uploaduser** command displays the current list of users allowed to upload and download configuration and code files.

> *Syntax:* `show {rtr_card-addr} uploaduser`

Example: `show 5 uploaduser`

```
> show 5 uploaduser
SLOT 5:
TFTP Upload/Download User Settings for Router:
    Reboot After Code is Loaded:          Yes
    Reboot After Configuration is Loaded:   Yes


                                Upload/Download
    IP Address        Client Site   Code    Config
    ---------------   -----------   ----    ------
    Any               Adit1          X        X
    Total: 1
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

show (router) voip

The **show voip** command displays the current settings for all VoIP parameters. This command applies to the CMG Router card only.

Syntax: `show {cmg_card-addr} voip`

Example: `show 4 voip`

```
> show 4 voip
SLOT 4:
VoIP Settings for CMG:

  VoIP Configuration:
    RTP Baseport:                30000
    RTCP CNAME:                  Default Gateway ID
    RTCP Interval (seconds):     5
    Jitterbuffer Mode:           Static
    Flash Timeout (milliseconds): 1500
    Compander:                   A-Law
    Call Detail Records:         Disabled

  Voice Algorithm SDP Identification and Ptimes:

                                 RTP            RTP
    CMG ID          SDP Name     Payload Type   Ptime
    -------------   -------------- -------------- --------------
    g711mu          pcmu         0              20
    g711a           pcma         8              20
    g726_16         g726-16      96             20
    g726_24         g726-24      98             20
    g726_32         g726-32      2              20
    g726_40         g726-40      99             20
    dtmf_relay      telephone-event 97          20
```

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

show (router-lan)

The **show (router-lan)** command displays the settings for the Router card.

Syntax: `show {rtr-addr}`

Example: `show 4:1`

```
> show 4:1
SLOT 4:
Settings for RTR LAN 1:
    Profile Name:           LocalAdit
    Up/Down:                UP
    Proxy:                  Disabled
    Physical link:          Automatic
    MAC Address:            00:E0:97:01:E3:A2

    IP Settings:
        IP Address and Mask:  192.168.3.193      255.255.255.0
        Default Router:       192.168.3.202
        Enabled Frame Types:  Ethernet II
        RIP Direction:        Send
        Secondary IP Addresses and Masks:
                              192.168.1.1        255.255.255.0
    IPX Settings:
        Enabled Frame Types:  None
        RIP Direction:        Send
        802.2  Ext. Network:  00000000
        Eth II Ext. Network:  00000000
        SNAP   Ext. Network:  00000000
        802.3  Ext. Network:  00000000

    Other Settings:
        Enabled Frame Types:  None

LAN Collision Threshold Settings for LocalAdit:
    Sample Interval:         10
    Collision High Threshold: 500
    Collision Low Threshold: 10

LAN Spanning Tree Protocol Settings for LocalAdit:
    Spanning Tree:           Disabled

Static IP Network Settings for LocalAdit:
    Total: 0
```

```
Static IPX Network Settings for LocalAdit:
    Total: 0

Static IP Address Settings for LocalAdit:
    Total: 0

Static MAC Address Settings for LocalAdit:
    Total: 0

LAN Filters Enabled for LocalAdit:
    Forward Mode: Forward ALL Frames NOT Matching Filters

    Filter Type    Source/Dest    Filter Name
    -----------    -----------    -----------
    Total: 0

LAN MAC Address Filters Defined for LocalAdit:
    Total: 0


LAN Protocol Filters Defined for LocalAdit:
    Total: 0


LAN Custom Filters Enabled Defined for LocalAdit:
    Total: 0
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	The slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

show (router-lan) collision

The **show (router-lan) collision** command displays the current LAN collision alarm settings for the specified Router card.

> *Syntax:* `show {rtr-addr} collision`

> *Example:* `show 5 "Adit50" collision`

```
> show 5 "Adit50" collision
SLOT 5:
LAN Collision Threshold Settings for Adit50:
    Sample Interval:         15
     Collision High Threshold: 500
   Collision Low Threshold:  10
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

show (router-lan) filter

The **show (router-lan) filter** command displays the current LAN Layer 2 data filters applied to the LAN on the specified Router card.

Syntax: `show {rtr-addr} filter [address|all|custom|protocol]`

Example: `show 5:1 filter`

```
> show 5:1 filter
SLOT 5:
LAN Filters Enabled for Adit50:
    Forward Mode: Forward ALL Frames NOT Matching Filters

    Filter Type    Source/Dest    Filter Name
    -----------    -----------    -----------
    Protocol                      XNSrule
    Protocol                      XNSrule
    Total: 2
```

Example: `show 5:1 filter all`

```
> show 5:1 filter all
SLOT 5:
LAN MAC Address Filters Defined for Adit50:
    Total: 0


LAN Protocol Filters Defined for Adit50:

    Protocol Name    Ethernet Value    IEEE Value
    -------------    --------------    ----------
    SPANTRE          0                 42
    XNSrule          807               0
    XNSrule          807               0
    Total: 3


LAN Custom Filters Enabled Defined for Adit50:
  Total: 0
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

[address|custom|protocol|all]

This setting will display the defined filter types of the specified filters.

address	Display Address filters only.
custom	Display Custom filters only.
protocol	Display Protocol filters only.
all	Display all the defined filters.

show (router-lan) static

The **show (router-lan) static** commands to display the current list of static entries for the LAN on the specified Router card.

show (router-lan) static ip address

The **show (router-lan) static ip address** command displays the current list of static IP address entries for the LAN on the specified Router card.

Syntax: `show {rtr-addr} static ip address`

Example: `show 5:1 static ip address`

```
> show 5:1 static ip address
SLOT 5:
Static IP Address Settings for Adit50:

    Device Name   IP Address
    -----------   --------------
    Adit122       120.0.0.10
    Total: 1
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

show (router-lan) static ip network

The **show (router-lan) static ip network** command displays the current list of static IP network entries for the LAN on the specified Router card.

Syntax: `show {rtr-addr} static ip network`

Example: `show 5:1 static ip network`

```
SLOT 5:
Static IP Network Settings for Adit50:

    Network          Subnet Mask        Metric    Next Gateway
    100.0.0.0        255.0.0.0          1         192.136.43.52
    Total: 1
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

show (router-lan) static ipx network

The **show (router-lan) static ipx network** command displays the current list of static IPX network entries for the LAN on the specified Router card.

Syntax: `show {rtr-addr} static ipx network`

Example: `show 5:1 static ipx network`

```
SLOT 5:
Static IPX Network Settings for Adit50:
    Total: 0
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

show (router-lan) static mac address

The **show (router-lan) static mac address** command displays the current list of static MAC address entries for the LAN on the specified Router card.

Syntax: `show {rtr-addr} static mac address`

Example: `show 5:1 static mac address`

```
SLOT 5:
Static MAC Address Settings for Adit50:

    Device Name    MAC Address
    Adit 66        00:E0:97:00:E9:CD
    Total: 1
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

show (router-lan) stp

The show **(router-lan) stp** command displays the current Spanning Tree Protocol settings for the specified LAN interface.

Syntax: `show {rtr-addr} stp`

Example: `show 5:1 stp`

```
SLOT 5:
LAN Spanning Tree Protocol Settings for Adit1:
    Spanning Tree:          Disabled
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port} or {slot "profile-name"}.

slot	Slot number (1-6) that contains the Router card.
port	Port number of the Router is 1.
"profile-name"	Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

show (router-voice)

The show **(router-voice)** command displays the CMG voice line provisioning. This command applies to the CMG Router card only.

> *Syntax:* `show {cmg_voice-addr}`

> *Example:* `show 4:1:1:1`

```
SLOT 4:
Voice Channel Settings for CMG:
    Voice Channel:            1
    MGCP Endpoint ID:         aaln/1
    Channel Status:           Up
    Echo Cancellation:        Enabled
    Echo Tail (milliseconds): 16
    Receive Gain (dB):        -1
    Transmit Gain (dB):       -1
    VoIP Algorithm Pref. Order: g711mu
    Silence Suppression:      Disabled
    Type of Service (TOS) Byte: 5
    Channel Use for Fax Relay: Nonreserved
```

{cmg_voice-addr}

In the form {slot:voip:port}

slot	Slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

show (router-wan)

The **show (router-wan)** command displays the current configuration settings for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"}`

Example: `show 5 "LosAngeles"`

```
SLOT 5:
Settings for RTR WAN LosAngeles:
    State:                Enabled
    IP Settings:
        Mode:             Route
        WAN Network Updates: Never
        GRE Tunneling:    Disabled

    IPX Settings:
        Mode:             Blocked

    Other Settings:
        Mode:             Blocked

    NAT Gateway:          Enabled
        NAT Port Numbers: Dynamic
        NAT Address:      Assigned by Remote

WAN PPP Authentication/Security Settings for LosAngeles:
    Authentication of Remote User:
        User ID:          Remote Profile Name: LosAngeles
        Security Server:  Local

    Compression:          Disabled
        Typical Data:     Easy to Compress

WAN Trunk Setting for LosAngeles:
        WAN Port Number:  1
        Connection Type:  PPP

WAN Spanning Tree Protocol Settings for LosAngeles:
    Spanning Tree:        Disabled

WAN Static IP Network Settings for LosAngeles:
    Total: 0
```

```
WAN Static IPX Network Settings for LosAngeles:

    Network    Hops   Ticks   Next IPX Router
    --------   ----   -----   ----------------
WAN Static IP Address Settings for LosAngeles:
    Total: 0

WAN Static MAC Address Settings for LosAngeles:
    Total: 0

WAN Static NAT Address Settings for LosAngeles:
    Total: 0

WAN Firewall Settings for LosAngeles:
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) firewall

The **show (router-wan) firewall** command displays the current firewall filter settings for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} firewall`

Example: `show 5 "LosAngeles" firewall`

```
SLOT 5:
WAN Firewall Settings for LosAngeles:

   Service(s)      LAN Device(s)        WAN Device(s)        Lo
1. SMTP           192.0.0.0/8       ==> 192.0.0.0/8         Log
2. Telnet         100.0.0.0/24      ==> 200.0.0.0/24        Alm
Last ! Any        *                 <== ==> *
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) nat bypass

Use the **show (router-wan) nat bypass** command to see the current list of NAT bypass entries for the WAN interface on the specified Router card. This command applies to the IP Router only.

Syntax: `show {rtr_card-addr} {"wan-name"} nat bypass`

Example: `show 2 "RemoteUnit" nat bypass`

```
SLOT 2:
WAN NAT Bypass Address Settings for RemoteAdit:

    IP Address          Netmask
    156.65.0.0          255.255.255.0
    201.23.16.0         255.255.255.0
    Total: 2
```

{rtr_card-addr}

The slot number (1-6) that contains the IP Router card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) ppp

The **show (router-wan) ppp** command displays the current PPP (Point-to-Point Protocol) settings for the specified WAN interface.

> *Syntax:* `show {rtr_card-addr} {"wan-name"} ppp`

> *Example:* `show 5 "LosAngeles" ppp`

```
> show 5 "LosAngeles" ppp
SLOT 5:
WAN PPP Authentication/Security Settings for LosAngeles:
    Authentication of Remote User:
        User ID:            Remote Profile Name: LosAngeles
        Security Server:    Local

    Compression:            Disabled
        Typical Data:       Easy to Compress
PPP Statistics for Slot-4:

                    Up/Down    Rx        Rx        Tx        Tx
Remote Name  State Time      Packets   Octets   Packets   Octets
RemoteAdit   DOWN  26m36s       0         0         0         0
```

{rtr_card-addr}
The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}
The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) static ip address

The **show (router-wan) static ip address** command displays the current list of static IP address entries for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} static ip address`

Example: `show 5 "LosAngeles" static ip address`

```
> show 5 "LosAngeles" static ip address
SLOT 5:
WAN Static IP Address Settings for LosAngeles:
    Total: 0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) static ip network

The **show (router-wan) static ip network** command displays the current list of static IP network entries for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} static ip network`

Example: `show 5 "LosAngeles" static ip network`

```
> show 5 "LosAngeles" static ip network
SLOT 5:
WAN Static IP Network Settings for LosAngeles:

    Network          Subnet Mask      Metric   Remote Tunnel Addr
    200.1.1.0        255.255.255.0      1
    Total: 1
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) static ipx network

The **show (router-wan) static ipx network** command displays the current list of static IPX network entries for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} static ipx network`

Example: `show 5 "LosAngeles" static ipx network`

```
SLOT 5:
WAN Static IPX Network Settings for LosAngeles:

    Network    Hops    Ticks    Next IPX Router
    00000011   2       4        00:00:00:00:00:00
    Total: 1
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) static mac address

The **show (router-wan) static mac address** command displays the current list of static IP MAC address entries for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} static mac address`

Example: `show 5 "LosAngeles" static mac address`

```
SLOT 5:
WAN Static MAC Address Settings for LosAngeles:

    Device Name    MAC Address
    Adit32         00:E0:97:00:E9:CD
    Total: 1
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) static nat address

The **show (router-wan) static nat address** command displays the current static NAT address entries for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} static nat address`

Example: `show 5 "LosAngeles" static nat address`

```
> show 5 "RemoteUnit" static nat address
SLOT 5:
WAN Static NAT Address Settings for RemoteUnit:
    Total: 0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) stp

The **show (router-wan) stp** command displays the current Spanning Tree Protocol settings for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} stp`

Example: `show 5 "LosAngeles" stp`

```
    > show 5 "LosAngeles" stp
    SLOT 5:
    WAN Spanning Tree Protocol Settings for LosAngeles:
        Spanning Tree:         Enabled
         Port Cost:             651    seconds
       Port Priority:        128  seconds
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show (router-wan) trunk

The **show (router-wan) trunk** command displays the current trunk assignment for the specified WAN interface.

Syntax: `show {rtr_card-addr} {"wan-name"} trunk`

Example: `show 5 "LosAngeles" trunk`

```
> show 5 "LosAngeles" trunk
SLOT 5:
WAN Trunk Setting for LosAngeles:
        WAN Port Number:     1
        Connection Type:     PPP
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

{"wan-name"}

The WAN interface to modify. The name must be enclosed in quotes.

show screen

The **show screen** command displays the screen settings.

Example: `show screen`

```
>show screen
Screen Height = 23
```

show snmp

The **show snmp** command displays the SNMP settings.

Example: `show snmp`

```
SNMP Settings:
  System Name:
  System Location:
  System Contact:
  GET Community:          public
  SET Community:          desktop
  TRAP Community:         public
  Trap version:           0
  Authentication TRAP     disabled
  Event TRAP              none
  NMS 1:
  NMS 2:
  NMS 3:
```

show syslog

The **show syslog** command displays the configuration settings for the Controller syslog client.

Syntax: `show syslog`

Example: `show syslog`

```
Syslog Settings:
  Syslog:  Disabled
```

Server	IP Address	Facility	Threshold Level
1	0.0.0.0	16	3
2	0.0.0.0	16	3
3	0.0.0.0	16	3

show time

The **show time** command displays the system time, in 24 hour hh:mm:ss format.

Example: `show time`

```
time:  00:22:51
```

show users

The **show users** command displays a list of all users and their settings, and if they are logged on at the time (0=not logged on, 1=logged on).

Syntax: `show users`

Example: `> show users`

```
   User         Level    Last Login          Logged In
   ----         -----    ----------          ---------
 * jack          1       00:00:13 01/01/1999      1

 * indicates self
```

show (v35)

Use the **show (v35)** to display current settings for V.35 card.

Syntax: `show {v35-addr}`

Example: `show 2:1`

The example shows settings for port 1 (V.35) on slot 2.

```
> show 2:1
SLOT 2:
Settings for V35 Port 1:
     CTS:                   Always High
     Timing:                Source
     Rx Clock Inversion:    Normal
     Tx Clock Inversion:    Normal
     Data Inversion:        Normal
     Data Speed:            64K
     Data Rate:
     Loopback:              None
```

{v35-addr}

In the form {slot|slot:port}.

slot   slot (1-6) location of a V.35 card.

port   Port number or range.

show (v54)

Use the **show (v54)** to display current settings for V.54 card.

Syntax: `show {v54-addr}`

Example: `show 3:1`

The example shows settings for port 1 (V.54) on slot 3.

```
SLOT 3:
Settings for V35 Port 1:
    CTS:                  Always High
    Timing:               Source
    Rx Clock Inversion:   Normal
    Tx Clock Inversion:   Normal
    Data Inversion:       Normal
    Data Speed:           64K
    Data Rate:
    V.54 Rx LB:           disabled
    V.54 Rx Addr:         0
    V.54 Test Addr:       0
    V.54 Tx Prep count:   15
    V.54 Rx Prep count:   15
    V.54 Test Pattern:    QRSS
    V.54 Ignore ACK:      OFF
    Loopback:             None
```

{v54-addr}

In the form {slot|slot:port}.

slot   slot (1 - 8) location of a V.35/54 card.

port   Port number or range.

show (wan)

The **show wan** command displays current WAN settings for the Router card.

Syntax: `show {wan-addr}`

Example: `show 5:1:1`

The example displays the settings of WAN 1 for the Router card on slot 5.

```
> show 5:1:1
SLOT 5:
Settings for RTR 1 WAN 1:
    Up/Down:        UP
```

{wan-addr}

In the form {slot|slot:port:wan}.

slot   slot (1-6) location of a Router (IP or CMG) card.

port   Port number or range.

wan   WAN number, 1-24.

status

Use the **status** command to see the status of the system clocks, DS0s, DS1s, equipment, and the DS0 Management Channel.

status (bri)	**status (router) ip address table**
status clock	**status (router) ip network table**
status (ds0)	**status (router) ipx network table**
status (ds1)	**status (router) ipx server table**
status equipment	**status (router) log**
status (fxo)	**status (router) mac address table**
status (fxs5G)	**status (router) mgcp**
status ipds0	**status (router) performance**
status (ocudp)	**status (router) stp**
status (ocudp) performance	**status (router-lan)**
status (ocudp) performance history	**status (router-trunk)**
status (router)	**status (router-voice)**
status (router) alarms	**status sessions**
status (router) channels	**status (v35)**
status (router) dns	**status (v54)**
status (router) events	

status (bri)

Use the **status (bri)** to display the status/performance statistics for the specified BRI.

Syntax: `status {bri-addr} [performance] [history]`

Example: `status 3:1`

The example displays status of port 1 (BRI) on slot 3.

```
> status 3:1
SLOT 3:
Status for BRI Port 1:
    Loopback:               NONE
    Corrupt CRC:            NONE
```

Example: `status 3:1 performance`

The example displays statistics of port 1 (BRI) on slot 3.

```
> status 3:1 performance
SLOT 3:
Performance Statistics for BRI Port 1:

                           current  previous  current  previous
                           1 hour   1 hour      day      day
errored seconds:              0        0         0        0
severely errored seconds:     0        0         0        0
block errors:                 0        0

elapsed time in current 1-hour interval: 00:38:00
completed 1-hour intervals in data:          0
```

Example: `status 3:1 performance history`

The example displays statistics of port 1 (BRI) on slot 3.

```
> status 3:1 performance history
SLOT 3:
Performance Statistics for BRI Port 1:

                          HES     HSES      BE     DES     DSES
current interval           0        0        0       0        0
totals:                    0        0        0       0        0
elapsed time in current 1-hour interval: 00:41:48
completed 1-hour intervals in data:    0
```

{bri-addr}

The BRI address, in the form {slot:port}.

   slot   The slot number (1-6) that contains the BRI card

   port   Port number, range or "all"

[performance]

Displays the current performance statistics for specified BRI.

[history]

Displays historical performance statistics for specified BRI.

status clock

Use the **status clock** command to display the current status of both the selected primary and secondary clocks.

   Syntax: **status clock**

   Example: **status clock**

```
Active Clock Source: Secondary

Primary:
  Clock Source:      Slot A DS1 1
  Clock Status:      Out of Service
Secondary:
  Clock Source:      Internal
  Clock Status:      In Service
```

status (ds0)

Use the **status (ds0)** command to display the current status of the specified DS0.

Syntax: **status {ds0-addr}**

Example: **status a:1:1**

Displays the current status of the DS0s on port 1 on slot A (controller card), port 1, channel 1.

```
> status a:1:1

DS0        Rx AB    Tx AB    Signal  T1          TP
---        -----    -----    ------  ---------   --
A:1:1      11       01       EMW     Traffic     N
```

Display Descriptions

Rx AB -   AB bits received by the FXS or FXO port

Tx AB -   AB bits transmitted by the FXS or FXO port

Signal -   Signaling mode for which the port is configured

T1 -   T1 Status

TP -   Trunk Processing

{ds0-addr}

In the form of {slot:port:channel}.

slot	A for the controller card, or 1-6 for service cards.
port	Port number or range.
channel	Channel number or range, for T1 ports.

status (ds1)

Use the **status (ds1)** command to display the current status of the specified DS1.

Syntax: `status {ds1-addr} [performance] [history]`
Where you can either specify a {slot:port} address to display an individual port or range of ports.

Example: `> status a:1`
```
    SLOT A:
    Status for DS1  1:
        Receive:                Traffic
        Transmit:               Traffic
        Loopback:               OFF
```

{ds1-addr}

In the form of {slot:port}.

slot   A for the controller card, or 1-6 for service cards.

port   Port number or range.

[performance]

Display current performance statistics for the specified port or ports.

[history]

Display historical performance statistics for the specified port or ports.

status equipment

Use the **status equipment** command to display current equipment information of the Compact T1.

Syntax: **status equipment [slot]**

Example: **status equipment**

```
> status equipment
BootCode Version:   1.19


          CardType   Status      SW Vers    CLEI
          --------   ------      -------    ----
SLOT A    T1x2       Present      3.1.0     SIC3DH0CAA
SLOT 1    FXOx8      Present      1.12      SIIXPV0DAA
SLOT 2    FXSx8      Present      1.09      SIC3GJ0CAA
SLOT 3    FXOx8      Present      1.12      SIIXPV0DAA
SLOT 4    RTRx1      Present      1.31       NOT AVAIL
SLOT 5    T1x4       Present      1.73      SIIXFWBDAA
SLOT 6    V35x2      Present      2.01      SIC3HK0CAA
```

Example: **status equipment a**

```
> status equipment a
SLOT A

CardType:           T1x2               Compact T1 TDM
Status:             Present
BootCode Version:   1.19
SW Revision:        3.1.0 (build: 9)
CLEI:               SIC3DH0CAA
LOCAL:              OFF
Switch Settings:
   Alarms Contacts Enabled
   FOR DS1 #1
     B8ZS Linecode
     Loopback Off
     ESF framing with Loop Start or Ground Start signaling
   FOR DS1 #2
     B8ZS Linecode
     Loopback Off
   ESF framing with Loop Start or Ground Start signaling
```

Example: **status equipment 4**

The example with display the status of the card in slot 4. In this example a Router card is in this slot.

```
> status equipment 4
SLOT 4

CardType:          RTRx1
Status:            Present
SW Revision:       1.31B
BootCode Version:  1.72
FPGA Revision:      1.08
CLEI:              NOT AVAIL
LOCAL:         OFF
```

[slot]

If a slot number is not entered, the status of the all slots will be displayed.

   slot   A for the controller card, or 1 - 6 for service cards.

status (fxo)

Use the **status (fxo)** to display the current near-end line status of the specified FXO.

Syntax: `status {fxo-addr}`

Example: `status 5:2`

The example displays status of port 2 (FXO) on slot 5.

```
> status 5:2

FXO     Rx AB  Tx AB  Signal=>T1 sig  T1                TP
---     -----  -----  --------------  ----------------  --
5:2     01     10     GS=>GS          Traffic           N
```

See *Display Descriptions on page 5-256* for definitions of column headings.

{fxo-addr}

slot   The slot number (1-6) that contains the FXO card

port   Port number or range.

status (fxs5G)

Use the **status (fxs5G)** to display the current near-end line status of the specified FXS 5G card.

Syntax: `status {fxs5G-addr}`

Example: `status 4:1`

The example displays status of port 1 (FXS 5G) on slot 4.

```
> status 4:1

FXS   Rx AB  Tx AB  Signal=>T1 Sig  T1                 TP
---   -----  -----  -------------   ----------------   --
4:1    01     01      LS => LS       Traffic            N
```

{fxs5G-addr}

slot	The slot number (1-6) that contains the FXS 5G card
port	Port number or range.

Display Descriptions

DS0 - Identifies location of DS0

Rx AB - AB bits received by the FXS or FXO port (real-time)

Tx AB - AB bits transmitted by the FXS or FXO port (real-time)

Signal - Signaling mode for which the FXS or FXO port is configured

gs	Set to Ground Start signaling
gsrb	Set to Ground Start signaling with reverse battery
gsw	Set to Ground Start Wink signaling
gswb	Set to Ground Start Wink signalling with reverse battery
ls	Set to Loop Start signaling
lsrb	Set to Loop Start signaling with reverse battery

T1 - Status of the T1 (Traffic, Loss of Signal, Loss of Framing, Loopback)

TP - Trunk Processing (Y = yes, N = no)

status ipds0

Use the **status ipds0** command to display the current status of the DS0 management channel.

Syntax: `status ipds0`

Example: `status ipds0`

```
> status ipds0
Operational state:     DOWN
```

status (ocudp)

Use the **status (ocudp)** command to displaystatus for selftest and loopbacks.

Syntax: `status {ocudp-addr}`

Example: `status 2:1`

```
SLOT 2:
Status for OCUDP Port 1:
    Selftest:
 Results as of 23:25:48  01/07/2001
    Datapath:                    PASS
    FPGA:                        PASS
    OCU:                         PASS

    OCU Manual Loopback:         NONE
    CSU Manual Loopback:         NONE

    OCU NonLatching Loopback:    NONE
    DSU NonLatching Loopback:    NONE
    CSU NonLatching Loopback:    NONE

    OCU Latching Loopback:       NONE
    DSU Latching Loopback:       NONE
    CSU Latching Loopback:       NONE
```

{ocudp-addr}

The {slot:port} address of the OCU-DP card to display.

| slot | Slot number (1-6) where the OCU-DP is located |
| port | Port number or range. |

status (ocudp) performance

Use the **status (ocudp) performance** command to display performance statistics for the current 15 minute interval, previous 15 minute interval, previous 1 hour interval, and for the previous day.

Syntax: **status {ocudp-addr} performance**

Example: **status 2:1 performance**

```
> status 2:1 performance
SLOT 2:
Performance Statistics for OCUDP Port 1:


                             current    previous
                            15 min.    15 min.     1 hour      1 day
                           ----------- ----------- ----------- ----------
out of service seconds:        775          0           0           0
loss of frame seconds:           0          0           0           0
loss of signal seconds:        784          0           0           0
bipolar violations seconds:      0          0           0           0

elapsed time in current 15 min. interval: 13:27
valid 15 min. intervals in hour:              0
valid 15 min. intervals in Day:               0
```

{ocudp-addr}

The {slot:port} address of the OCU-DP card to display.

slot   Slot number (1-6) where the OCU-DP is located

port   Port number or range.

status (ocudp) performance history

Use the **status (ocudp) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96).

Syntax: `status {ocudp-addr} performance`

Example: `status 2:1 performance`

```
> status 2:1 performance history
SLOT 2:
Performance Statistics for OCUDP Port 1:

                  OOS     BPV     LOF     LOS
                 -----   -----   -----   -----
curr. interval:   248       0       0     248
prev. intvl  1:   899       0       0     900
prev. intvl  2:   886       0       0     896
                 =====   =====   =====   =====
totals:          2033       0       0    2044

elapsed time in current 15 min. interval:  4:14
valid 15 min. intervals in data:              2
```

{ocudp-addr}

The {slot:port} address of the OCU-DP card to display.

slot	Slot number (1-6) where the OCU-DP is located
port	Port number or range.

status (router)

Use the **status (router)** command to display the current Router status information.

Syntax: `status {rtr-addr}`

Example: `status 5:1`

      The example displays status of the Router card in slot 5.

```
SLOT 5:
Status for RTR Port 1:
    Run Status:           Running
    Collision Alarm:      NO
    Link Alarm:           NO
    Alarm LED:            Red
    10/100 LED:           Off
    Link LED:             Off
    Collision LED:        Off
    Transmit LED:         Off
    Receive LED:          Off
```

{rtr-addr}

The Router (IP or CMG) address is in the form {slot:port}.

    slot   Slot number (1-6) that contains the Router card.

    port   Port number of the Router is 1.

status (router) alarms

Use the **status (router) alarms** command to display the current alarm log from the specified Router card.

Syntax: `status {rtr_card-addr} alarms`

Example: `status 5 alarms`

```
          ROUTER BLADE ALARM LOG REPORT Slot-5
   Time              Message                      Count

   Jan  4 22:26:47.0 Ethernet Link 5:1 Down.
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

status (router) channels

Use the **status (router) channels** command to display a condensed status report of all voice channel endpoints. This command applies to the CMG Router card only.

Syntax: `status {cmg_card-addr} channels`

Example: `status 3 channels`

```
                  CMG VoIP Channel Status - Slot 3
  MGCP: Down  Call Agent: 0.0.0.0/2727  Endpoint Prefix: aaln/
  # STATUS  SIG  CONN   # STATUS  SIG  CONN    # STATUS  SIG  CONN
  1-Down    FXSL ....... 17-Down   FXSL ....... 33-Down   FXSL .......
  2-Down    FXSL ....... 18-Down   FXSL ....... 34-Down   FXSL .......
  3-Down    FXSL ....... 19-Down   FXSL ....... 35-Down   FXSL .......
  4-Down    FXSL ....... 20-Down   FXSL ....... 36-Down   FXSL .......
  5-Down    FXSL ....... 21-Down   FXSL ....... 37-Down   FXSL .......
  6-Down    FXSL ....... 22-Down   FXSL ....... 38-Down   FXSL .......
  7-Down    FXSL ....... 23-Down   FXSL ....... 39-Down   FXSL .......
  8-Down    FXSL ....... 24-Down   FXSL ....... 40-Down   FXSL .......
  9-Down    FXSL ....... 25-Down   FXSL ....... 41-Down   FXSL .......
 10-Down    FXSL ....... 26-Down   FXSL ....... 42-Down   FXSL .......
 11-Down    FXSL ....... 27-Down   FXSL ....... 43-Down   FXSL .......
 12-Down    FXSL ....... 28-Down   FXSL ....... 44-Down   FXSL .......
 13-Down    FXSL ....... 29-Down   FXSL ....... 45-Down   FXSL .......
 14-Down    FXSL ....... 30-Down   FXSL ....... 46-Down   FXSL .......
 15-Down    FXSL ....... 31-Down   FXSL ....... 47-Down   FXSL .......
 16-Down    FXSL ....... 32-Down   FXSL ....... 48-Down   FXSL .......
```

{cmg_card-addr}

The slot number (1-6) that contains the CMG Router card.

status (router) dns

Use the **status (router) dns** command to display the current state of DNS resolver and the entries in the DNS cache.

Syntax: `status {rtr_card-addr} dns`

Example: `status 4 dns`

```
> status 4 dns

          ROUTER BLADE DNS RESOLVER REPORT Slot-4
 DNS RESOLVER IS ENABLED

 My DNS Ip Address  10.  0.  0.  1
 My DNS Hostname    Adit25.test

 Primary   DNS Server  10. 10. 10.  0
 Secondary DNS Server   0.  0.  0.  0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

status (router) events

Use the **status (router) events** command to display the current event log from the specified Router card.

Syntax: `status {rtr_card-addr} events`

Example: `status 5 events`

```
              ROUTER BLADE EVENTS LOG REPORT Slot-5

    Time            Message                              Count

    Jan 10  0:56:44.8 Download EVE.RPT by Controller
    Jan 10  0:54:27.4 Download complete in 0.0 secs [17440 bps]
    Jan 10  0:54:27.4 Download ALM.RPT by Controller
    Jan 10  0:14:23.5 ADMIN login terminated
    Jan 10  0:14:21.8 Download complete in 0.1 secs [61600 bps]
    Jan 10  0:14:21.7 Download config.cfg by Controller
    Jan 10  0:14:21.6 Send CFG Change Notice to Controller - PASS
    Jan 10  0:14:20.7 NVRAM Flash Task Wakeup Event Sent
    Jan 10  0:10:56.5 Login accepted at ADMIN level
    Jan 10  0:03:29.9 ADMIN login terminated
    Jan 10  0:03:28.5 Download complete in 0.1 secs [60880 bps]
    Jan 10  0:03:28.4 Download config.cfg by Controller
    Jan 10  0:03:28.3 Send CFG Change Notice to Controller - PASS
    Jan 10  0:03:27.4 NVRAM Flash Task Wakeup Event Sent
    Jan 10  0:02:48.7 Login accepted at ADMIN level
    Jan  9 23:29:34.5 Download complete in 0.1 secs [60160 bps]
    Jan  9 23:29:34.3 Download config.cfg by Controller
    Jan  9 23:29:34.3 Send CFG Change Notice to Controller - PASS
    Jan  9 23:29:33.4 NVRAM Flash Task Wakeup Event Sent
    Jan  9 23:28:35.7 Download complete in 0.1 secs [60000 bps]
    Jan 9 23:28:35.5 Download config.cfg by Controller
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

status (router) ip address table

Use the **status (router) ip address table** command to display the current IP address table for the specified Router card.

> *Syntax:* **status {rtr_card-addr} ip address table ["profile-name"]**

> *Example:* **status 5 ip address table**
>
> ```
> >    status 5 ip address table
>
>            ROUTER BLADE IP ADDRESSES REPORT Slot-5
>
>     Adit50 has learned 2 IP Addresses from 1 Port.
>      Display: <IP Address >   Learned From: <All Ports   >
>
>            Port Name                IP Address        MAC Address
>
>       1.   Local LAN     Static    120.0.0.10
>       2.   Local LAN     Direct    192.168.3.196     00E09701E574
> ```

> *Example:* **status 5 ip address table "Adit50"**
>
> ```
> > status 5 ip address table "Adit50"
>
>            ROUTER BLADE IP ADDRESSES REPORT Slot-5
>
>     Adit50 has learned 2 IP Addresses
>      Display: <IP Address >   Learned From: <Local LAN >
>
>                     IP Address        MAC Address
>
>       1.    Static    120.0.0.10
>       2.    Direct    192.168.3.196     00E09701E574
> ```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

status (router) ip network table

Use the **status (router) ip network table** command to display the current table of learned IP Networks for the specified interface on the Router card.

Syntax: `status {rtr_card-addr} ip network table ["profile-name"]`

Example: `status 5 ip network table`

```
> status 5 ip network table
         ROUTER BLADE IP NETWORKS REPORT Slot-5
Total Entries-3 on 2 Ports
Display: <IP Networks >  Learned From: <All Ports   >


           Network           Subnet Mask    Metric Next Gateway    Port Name
   1. Static 200.1.1.0      255.255.255.0  1                       LosAngeles
   2. Static 100.0.0.0      255.0.0.0      1      192.136.43.52   Local LAN
   3. Direct 192.168.3.0    255.255.255.0  1      192.168.3.196   Local LAN
```

   Example: `status 5 ip network table "Adit50"`

```
 > status 5 ip network table "Adit50"
         ROUTER BLADE IP NETWORKS REPORT Slot-5
Total Entries-2 on Local LAN
Display: <IP Networks >  Learned From: <Local LAN >


           Network           Subnet Mask     Metric Next Gateway    Frame
   1. Static 100.0.0.0      255.0.0.0       1      192.136.43.52   Eth II
   2. Direct 192.168.3.0    255.255.255.0  1      192.168.3.196   Eth II
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

status (router) ipx network table

Use the **status (router) ipx network table** command to display the current table of learned IPX Networks for the specified interface on the Router card.

Syntax: `status {rtr_card-addr} ipx network table ["profile-name"]`

Example: `status 5 ipx network table`

```
> status 5 ipx network table
          ROUTER BLADE IPX NETWORKS REPORT Slot-5
Total Entries-4 on 1 Ports
Display: <IPX Networks>  Learned From: <All Ports   >


        Network  Hops Ticks  Next IPX Router    Port Name   Frame Type
   1. Static 00000011 2    4                        LosAngeles   802.3
   2. Static 00000011 2    4                        LosAngeles   802.2
   3. Static 00000011 2     4                       LosAngeles   SNAP
   4. Static 00000011 2    4                       LosAngeles   Eth II
```

Example: `status 5 ipx network table "Adit50"`

```
> status 5 ipx network table "Adit50"
          ROUTER BLADE IPX NETWORKS REPORT Slot-5
Total Entries-0 on Local LAN
Display: <IPX Networks>  Learned From: <Local LAN >


            Network  Hops Ticks  Next IPX Router    Frame Type
 No Records to Display...
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

status (router) ipx server table

Use the **status (router) ipx server table** command to display the current table of learned IPX Servers for the specified interface on the Router card.

Syntax: `status {rtr_card-addr} ipx server table`
`["profile-name"]`

Example: `status 4 ipx server table`

```
> status 4 ipx server table

          ROUTER BLADE IPX SERVERS REPORT Slot-4

Total Entries-0 on 0 Ports
Display: <IPX Servers >  Learned From: <All Ports   >

     Network    Hops Type Name        Port Name    Frame Type

 No Records to Display...
```

Example: `status 5 ipx server table "Adit50"`

```
> status 5 ipx server table "Adit50"
          ROUTER BLADE IPX SERVERS REPORT Slot-5

Total Entries-0 on Local LAN
Display: <IPX Servers >  Learned From: <Local LAN >

     Network    Hops Type Name        Frame Type

 No Records to Display...
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

status (router) log

Use the **status (router) log** command to display the log of all CMG events. This command applies to the CMG Router card only.

> *Syntax:* `status {cmg_card-addr} log`
> `["profile-name"]`

Example: `status 5 log`

```
> status 4 log

          CMG LOG REPORT Slot-4
Date    Time        Event Type Trans ID  Chan Event Description
------ ----------- ---------- --------- ---- ------------------
```

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

status (router) mac address table

Use the **status (router) mac address table** command to display the current table of learned MAC Addresses for the specified interface on the Router card.

Syntax: `status {rtr_card-addr} mac address table ["profile-name"]`

Example: `status 5 mac address table`

```
> status 5 mac address table
          ROUTER BLADE MAC ADDRESSES REPORT Slot-5

Adit50 has learned 2 MAC Addresses from 1 Port.
 Display: <MAC Address>   Learned From: <All Ports   >

      Port Name           MAC Address
   1.  Local LAN     Direct 00E09701E574
   2.  Local LAN     Static 00E09700E9CD
```

Example: `status 5 mac address table "Adit50"`

```
> status 5 mac address table "Adit50"
          ROUTER BLADE MAC ADDRESSES REPORT Slot-5

Adit50 has learned 2 MAC Addresses
 Display: <MAC Address>   Learned From: <Local LAN >

              MAC Address
   1.    Direct 00E09701E574
   2.    Static 00E09700E9CD
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

["profile-name"]

The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

status (router) mgcp

Use the **status (router) mgcp** command to display counts of all MGCP sent and received return codes, internal errors and other statistics. This command applies to the CMG Router card only.

Syntax: `status {cmg_card-addr} mgcp`

Example: `status 4 mgcp`

```
> status 4 mgcp

          CMG MGCP REPORT Slot-4

 MGCP Status and Statistics

   Call Agent Communications State:      Connected

   Statistics:
   Item               Count    Item               Count
   ------------------ -----    ------------------ -----
   MGCP:
     Tot Msgs Sent     0       Sent Msgs not ACKed 0
     Tot Msgs Rcvd     0       Errored Msgs Rcvd   0
     Tot ACKs Sent     0       Prot Err ACKs Sent  0
     Tot ACKs Rcvd     0       Negative ACKs Rcvd  0
                               Msg Retries         0

   Total Protocol Errors:   0

   Return Codes Sent  Rcvd  Description
   ------------ ----- ----- ----------------------------------
     None
```

{cmg_card-addr}

The slot number (1-6) that contains the CMG card.

status (router) performance

Use the **status (router) performance** command to display the current runtime statistics from the specified Router card.

> *Syntax:* `status {rtr_card-addr} performance`
>
> *Example:* `status 5 performance`

```
> status 5 performance


          ROUTER BLADE PERFORMANCE REPORT Slot-5
Run-time Statistics for Adit50.

LAN Packet Totals:  Received 0       Transmitted 0       Errors 0
WAN Packet Totals:  Received 0       Transmitted 0       Errors 0

 Remote's         Forwarded     Throughput      Comp. Ratio Remote
 Name             to WAN        to/from WAN     to/from WAN conns.
 LosAngeles          0  pps      0 /0     bps        /         0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

status (router) stp

Use the **status (router) stp** command to display the current Spanning Tree state from the specified Router card.

Syntax: `status {rtr_card-addr} stp`

Example: `status 5 stp`

```
> status 5 stp

          ROUTER BLADE SPANNING TREE PROTOCOL REPORT Slot-5

 STP Stats

No Enabled STP Ports Detected.

 STP View

 Bridge Priority: 32768 Address:00E09701E574
 Root Priority: 32768 Address:00E09701E574
 Root Port: 0  Path Cost 0
```

{rtr_card-addr}

The slot number (1-6) that contains the Router (IP or CMG) card.

status (router-lan)

Use the **status (router-lan)** command to display the current Router status information.

Syntax: `status {rtr_lan-addr}`

Example: `status 5:1`

The example displays status of the Router card in slot 5.

```
> status 5:1
SLOT 5:
Status for RTR Port 1:
    Run Status:            Running
    Collision Alarm:       NO
    Link Alarm:            YES
    Alarm LED:             Red
    10/100 LED:            Off
    Link LED:              Off
    Collision LED:         Off
    Transmit LED:          Off
    Receive LED:           Off
```

{rtr_lan-addr}

The Router (IP or CMG) address is in the form {slot:port|slot "profile-name"}.

slot   The slot number (1-6) that contains the Router card.

port   Port number.

profile-name   Existing WAN identifier, enclosed in quotes.

status (router-trunk)

Use the **status (router-trunk)** command to display the current status information for the specified Trunk on the Router card.

> *Syntax:* `status {rtr_trunk-addr}`
>
> *Example:* `status 5:1:1-4`

```
> status 5:1:1-4
SLOT 5:
Status for RTR 1 Trunk 1:
    Link Alarm:              NO
SLOT 5:
Status for RTR 1 Trunk 2:
    Link Alarm:              NO
SLOT 5:
Status for RTR 1 Trunk 3:
    Link Alarm:              NO
SLOT 5:
Status for RTR 1 Trunk 4:
    Link Alarm:              NO
```

{rtr_trunk-addr}

The Router (IP or CMG) trunk address is in the form {slot:port:trunk}.

slot	The slot number (1-6) that contains the Router card.
port	Port number.
trunk	Trunk number, a range or "all" can be used here. Port numbers are 1-24.

status (router-voice)

Use the **status (router-voice)** command to display the status of service, calls, signaling, connections, call agent communications and telephony statistics for a CMG router voice channel. This command applies to the CMG Router card only.

Syntax: `status {cmg_voice-addr}`

Example: `status 5:1:1:3`

```
            CMG VoIP CHANNEL REPORT Slot-5

VoIP Channel 3:
  Endpoint ID:         aaln/3
  Admin State:         Normal
  Oper State:          Normal
  Call State:          Call In Progress
  Call Direction:      Incoming

  Signaling Status:
    Hookswitch State:    Off Hook
    Last Events Requested: L/hd(N)
    Current Digit Map:
        x.[#T]

  Call/Connection Status for Connection ID 1:
    Leg # In Conference: 0
    Call ID:             1
    Caller ID Number:
    Caller ID Name:
    RTP Payload Type:    0
    Connection Mode:     Receive Only
    Local RTP Socket:    192.168.24.193:30000
    Remote RTP Socket:   0.0.0.0:0
    Algorithm In Use:    None
    Rx Gain            0 dB
    Tx Gain            0 dB
    Connection Statistics
      Packets Sent:      0
      Packets Rcvd:      0
      Payld Octets Sent: 0
      Payld Octets Rcvd: 0
      Dropped Packets:   0
      Jitter:            0
```

```
     Delay:              0

Call Agent Communications Status for this Endpoint:
  Notified Entity:    [192.168.24.228]:2427
  Comm State:         Up
  Last Cmd Rcvd:      CRCX
  From:               192.168.24.228:2427
  Last Cmd Sent:      NTFY

Telephony Statistics

Item            Count
-------------- -----
Offhooks        1
Onhooks         0
Seizures        2
Tone Digits     0
Pulse Digits    0
```

{cmg_voice-addr}

In the form {slot:voip:channel}.

slot	The slot number (1-6) that contains the CMG card.
voip	To designate VoIP 1:1 is used.
channel	Channel number for the router is 1-48, range or all

status sessions

Use the **status sessions** command to display the current status of all active CLI sessions.

Syntax: **status sessions**

Example: **status sessions**

```
> status sessions
  Session    User         Login Port
  -------    ----         ----------
* CLI        paul         RS-232
* indicates current session
```

status (v35)

Use the **status (v35)** to display the current near-end line status of the V.35 card.

Syntax: **status {v35-addr}**

Example: **status 2:1**

The example displays status of port 1 (V.35) on slot 2

```
> status 2:1
SLOT 2:
Status for V35  PORT 1:
        DCD:    Low
        CTS     Low
        DSR:    Low
        RTS:    Low
        DTR:    Low
```

{v35-addr}

In the form of {slot|slot:port}.

slot	The slot number (1-6) that contains the V.35 card
port	Port number or range.

Display Descriptions

DCD	-	Data Carrier Detect indicates port is receiving a carrier signal
CTS	-	Clear to Send indicates port is ready to receive data
DSR	-	Data Set Ready indicates port is ready to send data
RTS	-	Request to Send
DTR	-	Data Terminal Ready

status (v54)

Use the **status (v54)** to display the current near-end line status of the V.54 card.

Syntax: `status {v54-addr}`

Example: `status 3:all`

The example displays status of all ports (V.54) on slot 3.

```
> status 3:all
SLOT 3:
Status for V35  PORT 1:
        DCD:   Low
        CTS:   Low
        DSR:   Low
        RTS:   Low
        DTR:   Low
       BERT:   N/A
SLOT 3:
Status for V35  PORT 2:
        DCD:   Low
        CTS:   Low
        DSR:   Low
        RTS:   Low
        DTR:   Low
       BERT:   N/A
```

{v54-addr}

slot   The slot number (1-6) that contains the V.54 card

port   Port number or range.

Display Descriptions

DCD - Data Carrier Detect indicates port is receiving a carrier signal

CTS - Clear to Send indicates port is ready to receive data

DSR - Data Set Ready indicates port is ready to send data

RTS - Request to Send

DTR - Data Terminal Ready

BERT - Bit Error Rate Test

store

The **store** command is used to upload a software file from a defined slot to a defined location on a PC, via TFTP. Currently uploads for general use are only permitted for the Controller and Router card configuration files.

Syntax: `store {number} tftp {ip-addr} {"file-name"}`

Example: `store 5 tftp 192.168.2.35 "d:\AditBackup\file.cfg"`

```
Filename:  d:\AditBackup\file.cfg
Source IP Address:  198.162.3.196
Target IP Address:  192.168.43.52
Source Card Slot:   5
Source Card Type:   RTRx1

'store tftp' will be executed with the above parameters.
A TFTP server must be running on the host system.

Do you really want to do this? y

Card software download in progress. Please be patient...

Software transfer command completed.
```

{number}

Slot number (1 to 6) that you are uploading the software from.

{ip-addr}

Host IP address in the form of xxx.xxx.xxx.xxx, where xxx is a number from 1 to 255. If not supplied, the host IP address from the database will be used.

{"file-name"}

This will name the configuration file that you are storing. File must be a .cfg file and enclosed in quotes.

telnet

telnet (router)

Use the **telnet (router)** command to establish a Telnet session from the Compact T1 CLI to the Router card menu-driven user interface.

Syntax: `telnet {rtr-addr}`

Example: `telnet 1`

The example will Telnet into a Router in Slot 1.

```
> telnet 3
Connected.
          Escape character is '^]'.
Attempting Router connection...
Router [Wed Apr 24, 2002 13:00:15] (<CR> to login)
Password >******
Select a terminal type...
(<space> or <back-space> to toggle, <CR> to accept)

Terminal: <VT100>
```

{rtr-addr}

The Router address is in the form {slot|slot:port}.

slot	Slot location (1 - 6) of a Router (IP or CMG) card.
port	Port number of a Router is 1. **Note: only required on IP Router when release 1.1 or earlier.**

CHAPTER 6

T1 Controller Card

In this Chapter

- Overview

- Features

- Technical Specifications

- Configuration
  - CLI Commands
  - DIP Switch Settings

- LEDs

- DS0 Management (IP over DS0)

- TR-08 Mode 1

Overview

The Compact T1 with the Dual T1 Controller Card offers a cost-effective, compact solution that delivers a wide range of services from both wireline and wireless access networks. The T1 Controller Card includes two T1 ports with integrated CSUs and a built-in 1/0 cross-connect matrix providing full, non-blocking connectivity between the T1 Controller Card and any of the six service card slots. The total T1 capacity can be increased to 18 network access trunks or drop-and-insert user connections by adding a full complement of Quad T1 Service Cards.

The Compact T1 offers a modular design that includes the T1 Controller Card (required) and an array of available service cards. This flexibility allows the Compact T1 to function in a variety of applications, including:

- 1 to 18 T1 multi-service digital cross-connect system
- 48 FXS/FXO/DPT channel bank
- 24 FXS Voice over IP (VoIP) Customer Media Gateway (CMG)
- 40 ISDN BRI shelf
- 6 Ethernet IP Router/WAN nest
- 2 to 12 V.35 or synchronous RS-232 port drop-and-insert CSU/DSU
- 1 to 24 OCU-DP digital data service (DDS) delivery device

The modular Compact T1 platform also allows service providers to scale across service types, network architectures, and bandwidth requirements to fit a dynamic service delivery environment. Service cards provide the physical, electrical, and logical connections for either customer service demarcations or network access. Any service card can be placed in any service card slot. In addition, the (CMG) Service Card enables the Compact T1 to provide a cost-effective migration path to packet-based softswitching infrastructures using the MGCP protocol for both existing TDM-based infrastructures and Greenfield VoIP applications.

The T1 Controller Card has several local and remote management options available. The card can be configured and managed locally using the front-panel DIP switches or the Command Line Interface (CLI). Front-panel LEDs quickly communicate alarm and T1 line status, as well as mode of operation. Remote management is accomplished directly either over an in-band DS0 management channel or via a separate SNMP Ethernet connection.

Features

- Allows any service connection or network access line to be deployed in any slot
- Provides integrated 18 T1 port digital cross-connect for service grooming and restoration
- Supplies integrated dual T1 CSU/DSUs and SNMP management on the Controller
- Support for VoIP services through the Customer Media Gateway (CMG) Service Card (Note: CMG configuration assumes 5 CMG + 1 QT1, 24 channels per CMG Card using G.711 @ 20 ms and 48 channels per CMG Card using over subscription)
- Enables remote SNMP and Telnet provisioning, monitoring, and testing of services and network conditions
- D4 PLAR to loop start conversion

Technical Specifications

Product Includes

- 18 T1 port built-in, non-blocking 1/0 Digital Cross-connect System
- Robbed-bit (voice) and clear channel (data) signaling on the same T1
- TR-08 signaling configured as either AB, BB, A or B
- Integral dual T1 ports that support drop-and-insert applications
- T1.231 performance monitoring statistics: Ninety-six 15 minute segments (24 hour period)
- Performance Report Messages
- PBX trunk signaling, E&M to loop start and ground start conversion
- Analog voice signaling, CLASS features such as Call Waiting, Call Forwarding, Calling Party Disconnect and DNIS/DID
- Front-panel LED indicators for T1 status, major and minor alarms, remote/local management mode, and Alarm Cut-Off status
- Controller support for IP router card code download through its Ethernet management port
- Configurations automatically stored in non-volatile memory
- D4 PLAR to loop start conversion
- SNMP agent, supporting MIB objects:

- RFC 1213 (MIB-II)	- RFC 2493
- RFC 1659 (V.35)	- RFC 2494 (DS0-MIB)
- RFC 1907 (SNMPv2-MIB)	- RFC 2495 (DS1-MIB)
- RFC 2011 (IP-MIB)	- RFC 2571 (SNMP)
- RFC 2233 (IF-MIB)	

Advanced Features

- RADIUS Login Authentication
- Syslog
- NTP

Management

- Local
  - Simple setup using front panel DIP switches for channel bank applications
  - RS-232 craft port interface drives up to 50 ft. (15.24 m) cable, and provides a Command Line Interface (CLI) using ASCII terminal or PC with terminal emulation software, modem using XMODEM or PPP sessions
- Remote
  - 10Base-T Ethernet management port provides
    - Local IP management connectivity
    - RJ-45 connector mounted on rear panel of chassis
    - 10Base-T link LED status indicator
    - IP management over a dedicated DS0 bearer channel
- Integrated TFTP client for remote download of controller software upgrades
- CLI offers three levels of password controlled security

Network T1 Interface

- Selectable single or dual T1 ports operating at 1.544 Mbps ±50 bps
- Expansion to 18 T1s in a single chassis using Quad T1 Service cards
- SF (D4) and ESF framing
- AMI or B8ZS line coding
- Short or long-haul loop settings
- Integrated CSU function
- Line build out (DSX-1): 655 feet
- Receive sensitive (DS1): 0 to -22.5 dB
- Jitter and wander ITU-T B.824 (3/93)
- Channel status LEDs
- Two RJ-48C connectors on rear panel of chassis
- Solid-state (fuseless) overvoltage and overcurrent T1 line protection meets Telcordia GR-1089-CORE intra-building lightning/power cross limits
- CAS signaling options

Service Interfaces Supported

- IP Router card (supports up to 24 WAN connections per card)
- Customer Media Gateway (CMG) Service card (to support VoIP)
- FXO/DPT 8-channel Voice Service card
- FXS 8-channel Voice Service card
- ISDN BRI 2, 4 and 8-channel Service cards
- Dual V.35 and Dual V.35/V.54 Service cards
- Quad T1 Network Access/Drop-and-Insert Service card
- OCU-DP Single and 4 port Service cards

Network Standards

- AT&T Pub 54016, TR 62411
- ANSI T1-403, T1.102, T1.231

Clocking

- Loop-timed from any T1
- Revertive clock switching provides automatic backup to secondary T1 should the primary T1 fail
- Operates as a Stratum 4E device

Alarms

- One major and one minor alarm output
- One alarm input
- Alarm contacts accessible from external alarm connector
- All alarms are logged in an event log
- Loss of AC power triggers minor alarm
- Generates SNMP traps for alarming (MIB objects)

Testing and Diagnostics

- Standard T1 line and payload loopbacks
- T1.231 performance history

Power Consumption

- 4 W maximum

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- FCC Part 68
- NEBS Level 3 certified
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A
- CS-03

Physical

- Dimensions: 3.5 in. (H) x 1 in. (W) x 11.25 in. (D)
                       8.9 cm (H) x 2.5 cm (W) x 28.6 cm (D)
- Weight: 5.7 oz. (.16 kg)

For information on Compact T1 Environment required, see *Installation Environment on page 2-2.*

Configuration

Options on the Controller card are set by the DIP switches or the Command Line Interface (CLI).

> **NOTE:** The default IP address for the Controller is 10.0.0.10.

CLI Commands

The following commands are used to configure the Controller card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set clock*
  Sets the primary and secondary transmit clock
- *set date*
  Sets the date for the system
- *set (ds1)*
  Sets up the DS1 interfaces (up, down, bpviolation, fdl, framing, id string, lbo, line loopup, linecode, loopdetect, payload, threshold)
- *set ipds0*
  Sets up the DS0 management channel (assign, disable, down, IP address, up)
- *show (ds1)*
  Displays current settings for DS1 (circuit ID, up, down, framing, line coding, clock source, line build out, loop code detection, loop back, fdl type)
- *show ipds0*
  Displays the settings for the DS0 management channel
- *status (ds1)*
  Displays the status of the DS1 (receive, transmit, loopback)
- *status ipds0*
  Display the status of the DS0 management channel

DIP Switch Settings

On the front of the TDM Controller card are DIP switches you can use to configure the unit locally.

Switch	Function	Description
ACO	Alarm Cut Off	**0 =** Alarm contacts enabled (close when alarm occurs). *Default*. **1 =** Alarm contacts disabled (open).
ST	Self Test	**0** = Normal operation. *Default*. **1 =** Perform Self Test.
OPT	Spare	
RST	Reset	**0** = User-configured operation. *Default*. **1 =** Reset configuration to factory defaults, and reset CLI password.
T1-1 T2-1	Line Coding	**0 =** B8ZS. *Default*. **1 =** AMI
T1-2 T2-2	Line Loopback	**0 =** Loopback off. *Default*. **1 =** Loopback on
T1 3-4 T2 3-4	Framing	**0** = ESF (Extended Superframe). *Default*. **1** = D4
T1 5 - 6 T2 5 - 6	Signaling	

Switch 3	Switch 4	Switch 5	Switch 6	Setting
0	1	1	1	TR-08 A-Shelf with FDL, 16-bit Alarm frame
1	0	0	0	TR-08 A-Shelf with FDL, 13-bit Alarm frame
1	0	0	1	TR-08 A-Shelf with FDL disabled
1	0	1	0	TR-08 B-Shelf
0	0	0	0	Loop Start/Ground Start. *Default*.
0	0	0	1	E&M Immediate Start with ringback. (used for D3 PLAR and DPT)
0	0	1	0	E&M Immediate Start with ringback and Calling Party Disconnect (CPD)

LEDs

The T1 Controller has a set of six LEDs you can use to troubleshoot your Compact T1. The table below describes each LED.

0 (Off) 1 (On)

LED	State	Description
MAJOR	Off	No major alarms present
	Red	Major alarm present
MINOR	Off	No minor alarms present
	Yellow	Minor alarms present
LOCAL	Off	Remote mode (DIP switches disabled)
	Green	Local mode (DIP switches enabled)
ACO	Off	Normal mode. No alarms are being suppressed.
	Yellow	Alarm cutoff active. One or more active alarms suppressed.
T1-1 and T1-2	Off	Off line
	Green	Normal
	Red	Loss of Signal (LOS) detected
	Yellow	Bipolar Violation (BPV) detected
	Flashing Green	Loopback active
	Flashing Red	Loss of Frame (LOF) or Alarm Indication Signal (AIS) detected
	Flashing Yellow	Yellow alarm (Remote Alarm Indication) detected.

DS0 Management (IP over DS0)

The DS0 Management Channel provides SNMP management and remote access. The IPDS0 feature allows for full Transmission Control Protocol/Internet Protocol (TCP/IP) connectivity to remote Compact T1 and can be used for Simple Network Management Protocol (SNMP) trap reporting and configuration, Trivial File Transfer Protocol (TFTP) upgrades of Controllers and Service cards, and remote telnet access.
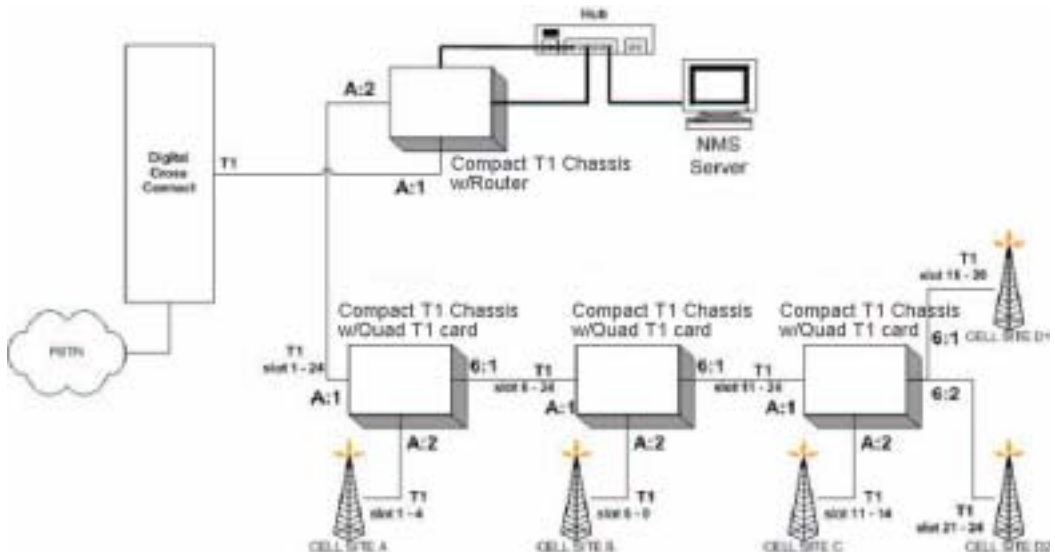
TR-08 Mode 1

The Compact T1 TR-08 will provide Mode 1 non-concentrated integrated service to the Compact T1 platform. The TR-08/SLC-96 interface will allow a direct T1 physical connection to a TR-08 capable digital switch, eliminating the need for an exchange office end platform.

Each TR-08 provisioned T1 will handle the signaling throughput for 24 DS0 voice channels. With T1-1 provisioned as an A shelf and T1-2 provisioned as a B shelf, the Compact T1 will provide 48 DS0 voice channels with alarm reporting capability for both shelves.

The TR-08 options can be provisioned either through CLI or controller front panel DIP switches. When a T1 is provisioned to be TR-08, it's respective set of service card slots (T1-1 slots 1-3, T1-2 slots 4-6) will be nailed-up to the T1's DS0s per TR-08 Mode 1.

Each T1 can be configured to be an A shelf or B shelf. The A shelf will carry alarm information over FDL for the A and B shelf cards. The following combinations can be set up:

- Single A shelf
- Two A shelves
- A and B shelf
- TR-08 provisioned T1 and a ESF provisioned T1

The A shelf can be set for FDL or no FDL and either alarm frame format 13 or 16 can be selected. This selection can be done either by CLI (see *set (ds1) in Chapter 5*) or for DIP switch settings (see *DIP Switch Settings on page 6-9*).
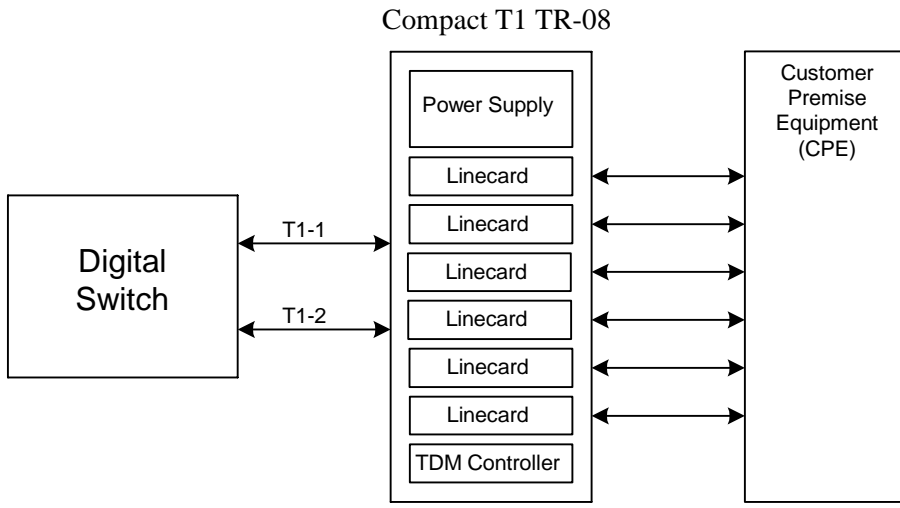
Compact T1 TR-08

Compact T1 TR-08 Configuration

FXO Voice Card

In this Chapter

- Overview

- Features

- Technical Specifications

- Card Configuration
  - CLI Commands
  - DIP Switch Settings

- LEDs

- Channel Associated Signaling (CAS) Conversions

Overview

The FXO Voice Service card provides high-density provisioning of reliable Foreign Exchange Office (FXO) or Direct Inward Dialing (DID) telephone services. Eight FXO or Dial Pulse Terminate (DPT) telephone line channels can be deployed on each FXO Service card. These cards can be inserted into any slot of the Compact T1 six-slot chassis, and up to 96 lines in two side-by-side chassis occupying just two rack units of space.

The FXO function sinks battery current and detects ringing voltage originating from the central office or PBX line, enabling the transport of dial tone and calling features to remote locations. When configured as a DPT interface, the channels sink and detect forward and reverse line current, emulating the functions of a central office DID line. DID service provides the necessary dialed digits to ring a telephone extension directly through a PBX, without requiring attendant intervention. DPT and FXO functions are also used with Automatic Call Distributor (ACD), voice mail, and Computer Telephony Integration (CTI) applications.

A unique range of software-controlled signaling capabilities connects virtually any type of 20 wire battery-sink telephone line service. Supported features include caller ID, calling party disconnect, distinctive ringing, ground start, and E&M signaling conversion. Automatic impedance balancing provides echo-free service connections across a wide range of customer equipment and line conditions. V.90 transmission ensures optimal dial-up modem performance.

As a component of the Compact T1 platform, the FX0 Service card as several local and remote management options available through the Compact T1 Controller. The card can be locally configured and managed using the front-panel DIP switches or the Command Line Interface (CLI). Front-panel LEDs indicate call progress and channel status.

Features

- Delivers FXO or DID telephone services from T1 access circuits
- Supports CLASS services including Caller ID, Calling Party Disconnect and Distinctive Ringing
- Provides up to 48 FXO or DPT voice lines in one chassis, or up to 96 lines in two side-by-side Compact T1s occupying just two rack units of equipment space (19 inch rack)
- Complies with NEBS Level 3 standards for loop range and ringing protection for end office and customer premises
- Offers fuseless overvoltage and overcurrent protection to minimize service calls from lightning and power cross incidents

Technical Specifications

Controller Software Required

T1 Controller

- Release 1.2.2 or higher is required

FXO Transmission Performance

- Return Loss: ERL > 26 dB, SRL > 18 dB with respect to $900\Omega + 2.16\mu F$
- Transhybrid Loss: ERL > 26 dB, SRL > 18 dB with respect to $900\Omega + 2.16\mu F$
- Idle Noise: A/D < 16 dBrnC0, D/A, 12 dBrnC0
- Crosstalk Coupling: < 70 dB at 0 dBrn0
- Signal/Distortion: > 35 dB with 1004 Hz, 0 dBm0 input
- Overload: +3.0 dBm/900Ω
- Frequency Response: +0.3 dB -1.0 dB from 300 to 3400 Hz
- Encoding: μ-law 255 for U.S. and Canada as defined in CCITT G.711 and G.712
- Terminating Impedance: $900\Omega + 2.16\mu F$
- Transmit Gain/Loss: +7 to -9 dB, switch selectable per card
- Receive Gain/Loss: +7 to -9 dB, switch selectable per card
- Modem Support: Full compatibility with V.90 modems

FXO Signaling Performance

- DC Loop Range: > 1600Ω loop or ground start
- Ringer Equivalency Number (REN): 0.4B (AC)
- Ringing Voltage Detection: detects Class A ringing follows distinctive ringing
- FXO DC Resistance: 100Ω
- Maximum DC: 150 mA
- Overvoltage: UL 1950, FCC Part 68 lightning protection
- Overcurrent: 600 V rms, 60 Amps
- Protection: solid-state (fuseless) overvoltage and over current protection
- Termination Type: FXO loop start or ground start, switch selectable per card or via management interface per channel
- Signaling Selection: DPT functionality enabled/disabled on all 8 channels
- Address Signaling: DTMF or dial pulse
- Calling Party Disconnect: detects and forwards current interruption to disconnect answering devices and modems

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- FCC Part 68
- NEBS Level 3 certified for type 2 and 4 equipment
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A
- CS-03

Physical

- Connections made on RJ21-X telco connector rear panel
- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
  8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 9.1 oz. (.26 kg)

For information on Compact T1 Environment required, see *Installation Environment on page 2-2.*

Card Configuration

The FXO voice card can be configured, using DIP switches on the card, to support either FXO loop start or FXO ground start signaling, with various transmit and receive attenuation options.

Note that the attenuation settings you configure via DIP switches apply to all eight channels on a card. If you want different attenuation options for individual channels, use the Command Line Interface to configure your FXO channels.

CLI Commands

The following commands are used to configure the FXO card. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- connect
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set (fxo)*
  To setup the voice channels parameters (rx gain, signal, tx gain)
- *show (fxo)*
  Displays the settings (type, signaling, RxGain, TxGain) for the FXO
- *status (ds0)*
  Displays the status (AB bits received, AB bits transmitted, signal, trunk processing) of the DS0s (AB Bit Monitoring)
- *status (fxo)*
  Displays the status (AB bits received, AB bits transmitted, signal, T1 activity, trunk processing) of the specified FXO (AB Bit Monitoring)

DIP Switch Settings

Each FXO card contains ten DIP switches that can be used to select signaling options for all eight channels.

Switch	Function	Description	Note
1-2	Signal Type	1 2 **0 0** = FXO Loop Start **1 0** = FXO Ground Start **0 1** = DPT (use with E&M setting on T1) **1 1** = FXO Loop Start with Calling Party Disconnect	
3-6	Receive Gain/Loss	3 4 5 6 **0 0 0 0** = 0 dB **0 0 0 1** = -9 dB **0 0 1 0** = +2 dB **0 1 0 0** = +3 dB **1 0 0 0** = +4 dB	These settings allow for receive gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. **+9 (1110) is not available.**
7-10	Transmit Gain/Loss	7 8 9 10 **0 0 0 0** = 0 dB **0 0 0 1** = -9 dB **0 0 1 0** = +2 dB **0 1 0 0** = +3 dB **1 0 0 0** = +4 dB	These settings allow for transmit gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. **+9 (1110) is not available.**

LEDs

Each FXO port on a card has its own LED, described in the table below.

State	Loop Start Meaning	Ground Start Meaning	Dial Pulse Termination Meaning
Off	N/A	Idle (tip open)	Idle (loop open)
Green	Idle	Tip ground (incoming seizure)	Incoming seizure
Red	N/A	Ring ground (outgoing seizure)	Loop closure (outgoing seizure)
Yellow	Call in progress	Call in progress	Call in progress (reverse battery)
Flashing green	Ringing	Ringing	N/A

Channel Associated Signaling (CAS) Conversions

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for a FXO voice card.

DS0	FXO Analog			
	LS	**GS**	**DPT**	**LSCPD**
VoIP Port				
LS	N	N	N	N
T1 DS0				
LS	Y	N	N	Y
GS	N	Y	N	N
EMDW	N	N	N	N
EMI	N	N	Y	N
EMICPD	N	N	N	N
EMW	N	N	N	N

DPT = Dial Pulse Termination

EMDW = E&M Delayed Wink start

EMI = E&M Immediate start

EMICPD = E&M Immediate Start with Calling Party Disconnect

EMW = E&M Wink start

GS = Ground Start

GSRB = Ground Start with Reverse Battery

LS = Loop Start

LSCPD = Loop Start Calling Party Disconnect

LSRB = Loop Start with Reverse Battery

VoIP = Voice over IP (CMG only)

CHAPTER 8

FXS Voice Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - DIP Switch Settings
- LEDs
- Channel Associated Signaling (CAS) Conversions

Overview

The FXS Voice Service card provides high-density provisioning of cost-effective telephone services. Eight Foreign Exchange Station (FXS) telephone line channels can be deployed on each FXS Voice Service card. These cards can be inserted into any card slot of the six-slot Compact T1. This allows the provisioning of up to 48 FXS lines in a single chassis and up to 96 lines in two side-by-side units occupying just two rack units of space.

A unique range of software-controlled signaling capabilities connects virtually any type of 2-wire battery-feed telephone line service. FXS loop start or ground start interfaces provide either outside (external) phone lines or on-premises (internal) business line services. Supported features include caller ID, calling party disconnect, distinctive ringing, three-way calling, and E&M signaling conversion. Automatic impedance balancing provides echo-free service connections for a wide range of customer equipment and line conditions. V.90 transmission ensures optimal dial-up modern performance.

As a component of the Compact T1 platform, the FXS service card has several local and remote management options available through the Controller. The card can be locally configured and managed using the front-panel DIP switches or the Command Line Interface (CLI). Front-panel LEDs quickly communicate call progress and channel status.

Features

- Supports CLASS services including Caller ID, Calling Party Disconnect and Distinctive Ringing
- Provides up to 48 FXS voice lines in one chassis or up to 96 lines in two side-by-side units occupying just two rack units of equipment space (19-inch rack)
- Complies with NEBS Level 3 standards for loop range and ringing protection for end office and customer premises
- Offers fuseless overvoltage and overcurrent protection to minimize service calls from lightning and power cross incidents
- Minimizes power consumption for high-density service delivery with automatic battery voltage switching
- Selectable impedence and CODEC types

Technical Specifications

Controller Software Required

T1 Controller

- Release 1.50 or higher is required for the FXS 5G card

FXS Transmission Performance

- Return Loss: ERL > 28 dB, SRL > 20 dB with respect to $900\Omega + 2.16\mu F$
- Transhybrid Loss: ERL > 28 dB, SRL > 20 dB with respect to $900\Omega + 2.16\mu F$
- Idle Noise: A/D < 15 dBrnC0, D/A, < 10 dBrnC0
- Crosstalk Coupling: < 80 dBm0 at 0 dBrnC0
- Signal/Distortion: > 45 dB with 1004 Hz, 0 dBm0 input
- Terminating Impedance: $900\Omega + 2.16\mu F$
- Transhybrid Impedance: automatic
- Transmit Gain/Loss: +6 to -12 in .25 increments, switch selectable per card or management selectable per channel
- Receive Gain/Loss: +6 to -12 in .25 increments, switch selectable per card or management selectable per channel
- Overload: +3.0 dBm/90
- Frequency Response: +0 dB -1.0 dB from 300 to 3400 Hz
- Longitudinal Balance: >63 dB per IEEE 455 and FCC Part 68
- Modem Support: Full compatibility with V.90 modems

FXS Signaling Performance

- DC Loop Range: 1000Ω standard, 1600Ω extended
- Loop Feed: Nominal -48 VDC with 31mA current limit for long loops, -36 VDC @ 27mA for short loops with automatic battery switching
- Off-Hook Detection: Detects tip or ring currents > 6mA
- Ring Ground: Detects ring ground currents > 8mA
- Ringing Voltage: All-channel simultaneous ringing power, 85 V rms, 20 Hz
- Maximum Ringers: 5 REN, FCC Class B ringers
- Internal Ringing Cadence: Ringing cadence is 2 seconds on, 4 seconds off for E&M wink start conversion modes
- Control Technique: Solid-state with no mechanical relays
- Overvoltage: UL 1950, FCC Part 68 lightning protection
- Overcurrent: 600 V rms, 60 Amps
- Supports CLASS features such as calling party ID, three-way calling, and distinctive ringing
- Calling Party Disconnect: Calling party (forward) disconnect provides 2 second current interruption to disconnect answering devices and modems - requires E&M signaling service on the T1
- FXS Signaling: FXS loop start or FXS ground start with LS/GS selection per channel
- FXSDN Signaling: E&M immediate or wink start to either loop start or ground start conversion with ringback tone for carrier services such as Megacom[®], Flexpath[®], DSS[®], VPN[®], VNET[®], etc. Wink delay for advanced ANI/DNIS 800 number services
- Ringer Equivalency Number (REN): 0.0 by definition

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- NEBS Level 3 certified for type 2 and 4 equipment
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A

Physical

- Connections made on RJ-21X telco connector rear panel
- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
                   8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.8 oz. (.16 kg)

For information on Environment required, see *Installation Environment on page 2- 2.*

Card Configuration

The FXS voice card can be configured, using DIP switches on the card, to support either FXS loopstart or FXS groundstart signaling, with various transmit and receive attenuation options.

Note that the attenuation settings configured via DIP switches apply to all eight channels. For different attenuation options for individual channels, use the CLI.

CLI Commands

The following commands are used to configure the FXS cards. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- *connect*
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set (fxs5G)*
  To setup the voice channels parameters of a FXS 5G card (rx gain, signal, tx gain, impedance and wink time)
- *show (fxs5G)*
  Displays the settings (type, signaling, rx gain, tx gain, impedance, wink time) for the FXS 5G
- *show impedance*
  Displays the impedance settings for FXS 5G cards
- *status (fxs5G)*
  Displays the status (AB bits received, AB bits transmitted, signal, T1 activity, trunk processing) of the specified FXS (AB Bit Monitoring)

DIP Switch Settings

Each FXS card contains ten DIP switches that can be used to select signaling options for all eight channels.

Switch	Function	Description	Note
1-2	Signal Type	1 2	
		0 0 = FXS Loop Start **1 0** = FXS Ground Start	
3-6	Receive Gain/ Loss	3 4 5 6	These settings allow for receive gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5 and 6.
		0 0 0 0 = 0 dB **0 0 0 1** = -9 dB **0 0 1 0** = +2 dB **0 1 0 0** = +3 dB **1 0 0 0** = +4 dB	
7-10	Transmit Gain/ Loss	7 8 9 10	These settings allow for transmit gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5 and 6.
		0 0 0 0 = 0 dB **0 0 0 1** = -9 dB **0 0 1 0** = +2 dB **0 1 0 0** = +3 dB **1 0 0 0** = +4 dB	

NOTE: The FXS channels default to a short loop setting (up to 1.6 miles for 26 AWG, and 2.6 miles for 24 AWG). To set an FXS channel to have a long loop setting, see *set (fxs5G) command in Chapter 5, CLI Commands.*

LEDs

Each FXS port has a corresponding LED, described in the table below. This chart applies to all the FXS service cards.

State	Loop Start Meaning	Ground Start Meaning
Off	N/A	Idle (tip open)
Green	Idle	Tip ground (incoming seizure)
Red	N/A	Ring ground (outgoing seizure)
Yellow	Call in progress	Call in progress
Flashing green	Ringing	Ringing

Channel Associated Signaling (CAS) Conversions

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for an FXS voice card. The following chart does not apply to the FXS INTL card, which only carries R2 signaling.

DS0	FXS Analog		
	LS/LSRB	GS/GSRB	GSW
VoIP Port			
LS	Y	N	N
T1 DS0			
LS	Y	Y	N
GS	Y	Y	N
EMDW	Y	Y	N
EMI	Y	N	N
EMICPD	Y	Y	N
EMW	Y	Y	N
TR8LSGS	Y	Y	N

EMDW = E&M Delayed Wink start
EMI = E&M Immediate start
EMICPD = E&M Immediate Start with Calling Party Disconnect
EMW = E&M Wink start
GS = Ground Start
GSW = Ground Start Wink
GSRB = Ground Start with Reverse Battery
LS = Loop Start
LSRB = Loop Start with Reverse Battery
TR8LSGS = TR-08 Loop Start/Ground Start
VoIP = Voice over IP (CMG only)

CHAPTER 9

ISDN BRI Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
    - CLI Commands
    - LEDs
- Connector Pinouts
    - 25-Pair Telco Connectors

Overview

The ISDN BRI Service Cards enable service providers and enterprises to deploy high-density, standards-based, ISDN Basic Rate Interface (BRI) services over one or more T1 or DSL access lines using TDM or ATM transport. ISDN voice, data, and real-time video applications may be cost effectively deployed as part of any integrated broadband service delivery.

ISDN BRI

BRI provides an end-to-end digital connection for customers with voice, data and video needs. BRI has 2 Bearer (B) channels at 64 Kbps for voice or data and 1 Data or Delta (D) channel at 16 Kbps for signal and control. With some ISDN BRI devices, the two B-channels can be aggregated together for 128 Kbps capacity.

3-DS0 BRITE Mode

The ISDN BRI Card supports the 3-DS0 BRITE mode of operation. In this mode, three DS0 channels support a BRI channel, providing eight BRI per T1. The BRI channel consists of two B and a D channel (2B+D) which is also transported in a full DS0. The D-channel supports the Embedded Operations Channel (EOC) and is used to pass signaling and other management information, such as loopback commands.

The following is an example of how a Compact T1 with a ISDN BRI card can function as a Line Unit Network Termination (LUNT) with central office applications, and a Line Unit Line Termination (LULT) with subscriber lines.

Features

- Enables carriers to economically bundle ISDN with all other services at 64 Kbps or 128 Kbps over T1 access lines
- Configurable as either Line Unit Line Terminal (LULT) for interfacing to ISDN switch interfaces at the central office, or Line Unit Network Terminal (LUNT) for customer premises deployment
- Provides direct NTU service demarcation for ISDN video conferencing, 128 Kbps dial-up Internet, point-of-sale terminals, and ISDN Centrex or telephone applications
- Enables high service density with up to 40 ISDN BRI lines from 4 T1 lines in a single Compact T1, or up to 80 ISDN BRI lines in two chassis occupying two rack units of equipment space (19-inch rack)
- Offers solid-state fuseless protection for central office NEBS compliance and customer premises FCC and UL safety requirements

Technical Specifications

Controller Software Required

T1 Controller

- Release 1.2.2 or higher is required

Product Includes

- Configurable as Line Unit Line Terminal (LULT) or Line Unit Network Terminal (LUNT)
- Works with all standard Carrier Serving Area (CSA) loops - maximum 18,000 ft. range (#26 AWG copper)
- Line coding: 2
- Line Rate: 160 Kbps (80 kbaud)
- Front-panel multi-function LEDs provide out-of-Service, LOS/Self-test fail, ES/SES detected, Sync, Loopback, and Normal indications
- Interoperable with other standards-based ISDN BRI equipment
- B1, B2, and 2B+D payload loopbacks supported
- Maximum bridged tap length is 2.5 kft. (762 m)
- Rear-accessed U-interface connections

Management

- Standard ISDN SNMP MIB supported

Network Interface

- 3 DS0 mode: Uses 3 contiguous DSO channels per ISDN BRI channel on T1

Network Standards

- Telcordia TR-NWT-000397 (1993)
- Telcordia TR-TSY-000821 (1991)
- Telcordia TR-TSY-000829 (1989)
- ANSI T1.1992
- ITU-T Q.920, Q.921

Clocking

- Loop timing derived from Channel 1 of ISDN BRI card or any Compact T1 T1 line

Testing & Diagnostics

- Initiates 2B+D, B1, or B2 loopbacks toward the BRI at the NT1
- Performs self test at power up
- 3 DSO mode: supports external loopback testing via EOC messages from the switch

Product Supports

- TR-821 alarms
- TR-397/TR-829/TR-821 Generic Segmented Performance Monitoring
- TR-829 multi-EOC messages in 3 DS0 and 4:1 TDM modes
- Metallic DC test signature in Line Unit Network Terminal (LUNT) mode

Power

- Maximum power input: 6 W (8 port)
- Solid-state fuseless protection

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- NEBS Level 3 certified for type 2 and 4 equipment
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
                8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 6.9 oz. (.20 kg)

For information on Compact T1 Environment required, see *Installation Environment, on page 2-2.*

Card Configuration

BRI card options are set with the Command Line Interface (CLI). For additional information on these commands, see *Chapter 5, CLI Commands*.

CLI Commands

- *connect*
  Creates two-way connections between channels
- *disconnect*
  Removes a connection created by the connect command
- *set (bri)*
  Setup of ISDN ports (up/down, threshold, call reference value)
- *set (bri) autoactivate*
  Set up the ISDN circuits when the FDL link cannot be used
- *set (bri) mode*
  Set up ISDN cards mode of operation (3-DS0)
- *set (bri) pmsync*
  Set up the BRI card source for performance monitoring synchronization
- *set (ds0)*
  For cross-connect to ISDN, must be data type
- *status (ds1)*
  Displays line status or performance statistics of a specific DS1
- *set clock*
  Set the primary and secondary (clock1/clock2) master transmit clock source
- *show (bri)*
  Displays BRI port configuration
- *show clock*
  Displays actual clock source
- *show (ds1)*
  Displays DS1 configuration
- *status (bri)*
  Displays port status or performance statistics for the specified BRI
- *status clock*
  Displays actual clock status and source

LEDs

There is an LED for each ISDN BRI on a card. The function for each LED is listed below:

State	Description
Off	Line U-interface is attempting synchronization, or BRI is out of service.
Red	Line alarm (LOS or self test failure)
Yellow	ES or SES has occurred.
Flashing yellow	Line U-interface is synchronized with customer equipment, but is not passing customer data.
Flashing green	Line U-interface is in external loopback toward the switch at the unit.
Green	Normal (Line U-interface is active and transparently passing customer data.)

Connector Pinouts

25-Pair Telco Connectors

Circuit connections are made at the 25-pair telco connectors. A standard 25-pair telephone cable with RJ-21X wiring and a male D-type connector at the Compact T1 end is required.

Slot/Pair Designation

The following designations apply whether a Dual, Quad or Octal ISDN BRI Card is placed in Slot 1 through 6. However, a Dual would only use the first 2 of the 8 pair, a Quad the first 4, and an Octal all 8. The following is the breakdown of designated pairs to each Compact T1 slot.

SLOT	25-Pair Telco Connector
#1	#1 - 8 (first 8 pairs) on J1
#2	# 9 - 16 (next 8 pairs) on J1
#3	# 17 - 24 (next 8 pairs) on J1
#4	#1 - 8 (first 8 pairs) on J2
#5	# 9 - 16 (next 8 pairs) on J2
#6	# 17 - 24 (next 8 pairs) on J2

NOTE: For the location of the 25-Pair Telco Connectors, on the back of the Adit, see *25-Pair Telco Connectors, on page 3-9*

25-Pair Telco Connector Pinouts

	Pair	Pin Location	Function	Color Code
SLOT 1 on J1 or SLOT 4 on J2	1	26 1	Tip Channel 1 Ring Channel 1	White Blue
	2	27 2	Tip Channel 2 Ring Channel 2	White Orange
	3	28 3	Tip Channel 3 Ring Channel 3	White Green
	4	29 4	Tip Channel 4 Ring Channel 4	White Brown
	5	30 5	Tip Channel 5 Ring Channel 5	White Slate
	6	31 6	Tip Channel 6 Ring Channel 6	Red Blue
	7	32 7	Tip Channel 7 Ring Channel 7	Red Orange
	8	33 8	Tip Channel 8 Ring Channel 8	Red Green
SLOT 2 on J1 or SLOT 5 on J2	9	34 9	Tip Channel 9 Ring Channel 9	Red Brown
	10	35 10	Tip Channel 10 Ring Channel 10	Red Slate
	11	36 11	Tip Channel 11 Ring Channel 11	Black Blue
	12	37 12	Tip Channel 12 Ring Channel 12	Black Orange
	13	38 13	Tip Channel 13 Ring Channel 13	Black Green
	14	39 14	Tip Channel 14 Ring Channel 14	Black Brown
	15	40 15	Tip Channel 15 Ring Channel 15	Black Slate
	16	41 16	Tip Channel 16 Ring Channel 16	Yellow Blue

	Pair	Pin Location	Function	Color Code
SLOT 3 on J1 or SLOT 6 on J2	17	42 17	Tip Channel 17 Ring Channel 17	Yellow Orange
	18	43 18	Tip Channel 18 Ring Channel 18	Yellow Green
	19	44 19	Tip Channel 19 Ring Channel 19	Yellow Brown
	20	45 20	Tip Channel 20 Ring Channel 20	Yellow Slate
	21	46 21	Tip Channel 21 Ring Channel 21	Violet Blue
	22	47 22	Tip Channel 22 Ring Channel 22	Violet Orange
	23	48 23	Tip Channel 23 Ring Channel 23	Violet Green
	24	49 24	Tip Channel 24 Ring Channel 24	Violet Brown
	25	50 25	Reserved	Violet Slate

CHAPTER 10

OCU-DP Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - Basic Setup
  - LEDs
- Jumper Settings
- Alarms
- Line Rates/Line Lengths
- Connector Pinouts
  - DDS RJ-48S
  - 25-Pair Telco Connector

Overview

The Single and Quad Port all-rate OCU-DP Service Cards provide electrical and physical termination of the 4-wire Digital Data Service (DDS) that is traditionally used to interconnect lower-speed serial synchronous Data Terminal Equipment (DTE) devices such as routers, Frame Relay Access Devices (FRAD), or video conferencing equipment. Now DDS can be integrated with DS0 voice, fractional T1 data, ISDN, and IP services – over multiple T1s or DS3s. This enables service providers to deliver transport for legacy enterprise data networking or Common Channel Signaling (CCS) circuits commonly used in Signaling System 7 (SS7) telephone networks using one card for all standard DDS types. Plus, it can be used as a replacement for low-density, unmanaged D4 channel banks.

The OCU-DP Service Cards provide scalable, independently configurable, synchronous data service rates from 2.4 Kbps to 64 Kbps, including Switched 56 Kbps data rates. Up to eight OCU-DP cards can be inserted into any of the service card slots of the Compact T1, providing up to 32 DDS connections. These cards enable industry leading density and cost per port at Central Offices (COs) hub and collocations (COLOs) and cell sites.

For example, the OCU-DP ports can be groomed and mapped into any of the DS1 or DS3 ports of the Controller. The Compact T1's (3/1/0) digital cross-connect functionality offers DS0 service grooming, T1 drop-and-insert, and voice access integration not available in traditional multiplexers.

The OCU-DP Service Cards have several local and remote management options available through the Controllers. Cards can be locally configured and managed using the Command Line Interface (CLI). Remote management is accomplished directly over either an in-band DS0 management channel or a separate SNMP network connection.

Customer Premise Application

Local Loop: 4-wire DDS

Bipolar AMI, RZ

Primary   Secondary

PSTN

Four RJ-48S 4-wire
keyed jacks

-45 dB maximum loop loss, all rates

T1

Compact T1

RS-232

2.4 - 72 KBPS

or V.35

DSU/CSU

OCU DP
DS0A data channel format

Line Rates		
Primary Channel / Primary and Secondary		
Only		**Channel**
64 KBPS /		
56 KBPS / 72 KBPS		
38.4 KBPS / 51.2 KBPS		
19.2 KBPS / 25.6 KBPS		
9.6 KBPS / 12.8 KBPS		
4.8 KBPS / 6.4 KBPS		
2.4 KBPS / 3.2 KBPS		
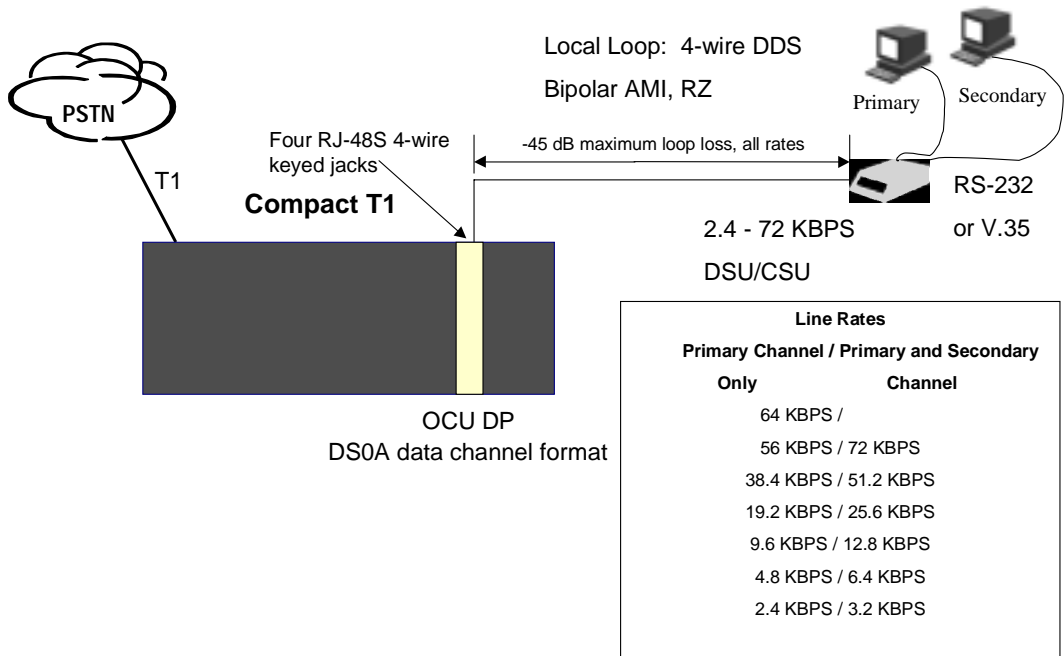
In this model, the carrier deploys the Compact T1 in conjunction with DDS DSU/CSUs to provide standards-based DDS access for customer data terminal needs. In essence, the Compact T1 integrates the DDS capabilities that were traditionally served by D4 or DLC Remote Terminal equipment into a customer premise multi-service solution.

SS7 Backhaul Application
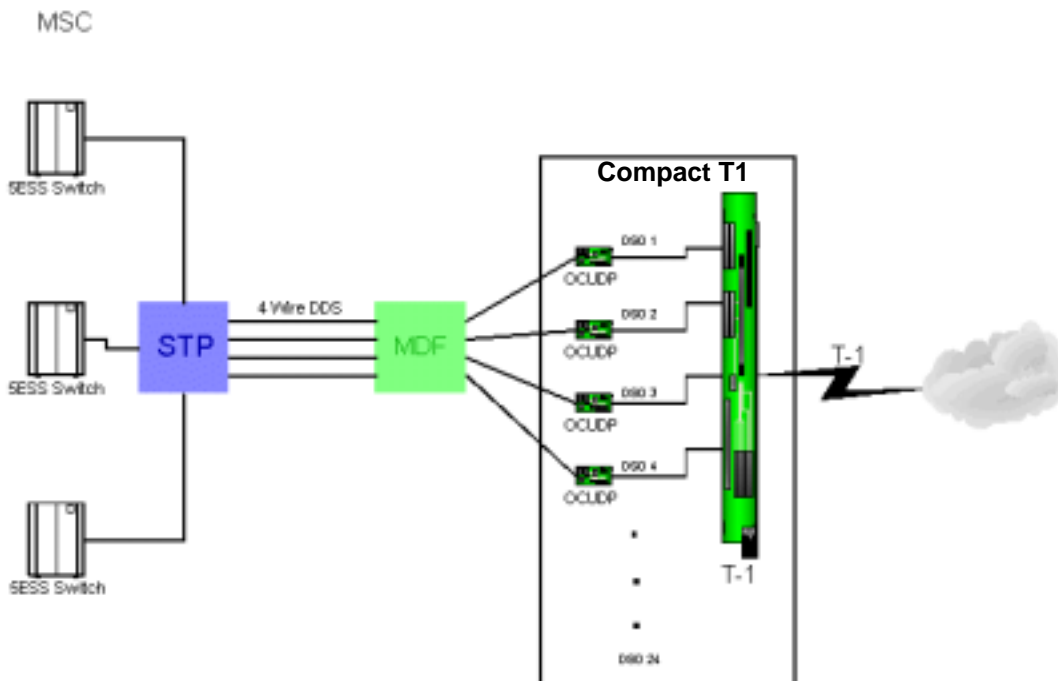
In this application, the carrier uses the OCU to transfer signaling and call information between MSCs.

Features

- Provides available baseband data rates from 2.4 to 72 Kbps
- Supports primary and secondary channel services, 64K clear channel service, and 4-wire Switched-56 service
- Complies with AT&T Pub. 62310
- Offers Bipolar Violation (BPV), Loss of Frame (LOF-DDSII), Loss of Signal (LOS) and Out-of-Service (OOS) performance counters: 15 minute, 1 hour and 24 hour intervals available
- Offers BPV, OOS, LOF and LOS selectable alarm thresholds
- Supplies built-in self-tests including data path and RAM test status and TDM and CSU failures
- Supports DDS network control codes for OCU, CSU and DSU latching and non-latching service loopbacks
- Supports system timing from any T1 line and provides it to the connected DTE
- Deploys up to 24 OCU-DP service ports in a single chassis, or a total of 48 OCU-DP service ports in two side-by-side Compact T1s occupying just two rack units of equipment space (19 inch rack)

Technical Specifications

Controller Software Required

T1 Controller

- Release 3.2 or higher is required

Service Interface

- Single-port OCU-DP interface
  - One RJ-48S front-panel jack
  - Strap selections for rear-panel RJ-21X telco connector
- Four-port OCU-DP interface
  - Four RJ-48S front-panel jack
  - Strap selections for rear-panel RJ-21X telco connector

Network Interface

- Each OCU port DS0 cross-connected to T1 port

Loopbacks

OCU, CSU and DSU:

- Manual loopbacks activate via CLI
- Non-latching loopbacks activate via network code
- Latching loopbacks activate via network code

Clocking

- Loop-timed from any T1 in the platform
- Sources clock to the DTE device

Power Consumption

- 6 W maximum, Four Port OCU-DP card
- 3 W maximum, Single Port OCU-DP card

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- Designed to meet NEBS Level 3 for type 2 and 4 equipment (not certified)

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
                          8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.7 oz. (.16 kg)

For information on Compact T1 Environment required, see *Installation Environment on page 2-2.*

Card Configuration

OCU-DP card options are set with the Command Line Interface (CLI). For additional information on these commands, see *Chapter 5, CLI Commands*.

CLI Commands

Configuration Commands

- *set (ocudp) baud*
  Set up OCU-DP port baud rate
- *set (ocudp) loopdetect*
  Set OCU-DP non-latching/latching loopback code detection
- *set (ocudp) mvec*
  Set Majority Vote Error Correction (MVEC)
- *set (ocudp) secondary*
  Set up the secondary channel service
- *set (ocudp) up/down*
  Set the OCU-DP line In or Out-of-Service.

Test Commands

- *set (ocudp) loopback*
  Set the manual loopback tests
- *set (ocudp) selftest*
  Start the OCU-DP self test

OCU-DP Status Commands

- *show (ocudp)*
  Displays OCU-DP card configuration (baud, loopdetect, error correction, switched and enhanced switched service and secondary channel provisioning)
- *status (ocudp)*
  Displays the status or performance statistics of the OCU-DP card (OOS, LOF, LOS and BPV seconds)

Basic Setup

Command	Description
`set {ocudp-addr} baud {2400|4800|9600|19200|38400| 56000*|64000}`	Set the OCU-DP Baud rate. Where ocudp-addr = {slot:port} of the OCU-DP card to apply settings to.
`set {ocudp-addr} up`	Set the OCU-DP port 1 up.
`show {ocudp_card-addr}`	Show the OCU-DP card settings. Where ocudp_card-addr = {slot} of the OCU-DP card.
`disconnect a`	Disconnects all connections to slot a (controller)
`set {ds0-addr} type data`	Sets a DS0 data signaling type
`connect {ds0-addr} {ocudp-addr}`	Connects DS0 (in previous step) to OCU-DP port (in previous step).
`show connect (ocudp_card-addr}`	Displays connect information for OCU-DP card.

LEDs

There are two LEDs for each channel on the OCU-DP card. The function for each LED is listed below:

State		Description
Yellow Flickering	ALL	Boot Software in control.
Green (walking down) Red (walking up)	ALL	Application Software in control (repeated 3.5 times).
Red, slow flash	ALL	In Boot. Application flash code checksums did not match and Boot is waiting for application download.
Red	ALL	In Application code waiting for Controller to issue SW/HW revision request. This is the first request that comes from the OCU-DP card manager in the Controller.
Green Yellow	Top Bottom	Port in Self-test. Duration is 5-8 seconds.
Off	Top Bottom	Port is set down (Out-Of-Service).
Green	Top	Port is receiving valid signals.
Red	Top	Port is receiving no signal (primary) or no frame sync (secondary or clear channel).
Red Flashing	Bottom	Port is receiving bipolar violations
Yellow	Bottom	Port is in loopback.

Jumper Settings

The P1 and P2 Jumpers are defaulted to RJ-48S, which are the set of pins nearest the bottom of the service card. With the jumper in this position the signals are routed to the RJ-48S connector(s) on the face of the card. To route the signals to the 25-pin Telco connector at the rear of the unit, move the jumpers to the backplane position, which is the set of pins toward the top of the service card.

P1 applies to connectors 1 and 2 (connector 2 only with the 4 port card).
P2 applies to connectors 3 and 4 (for the four port card only).

Top of Card
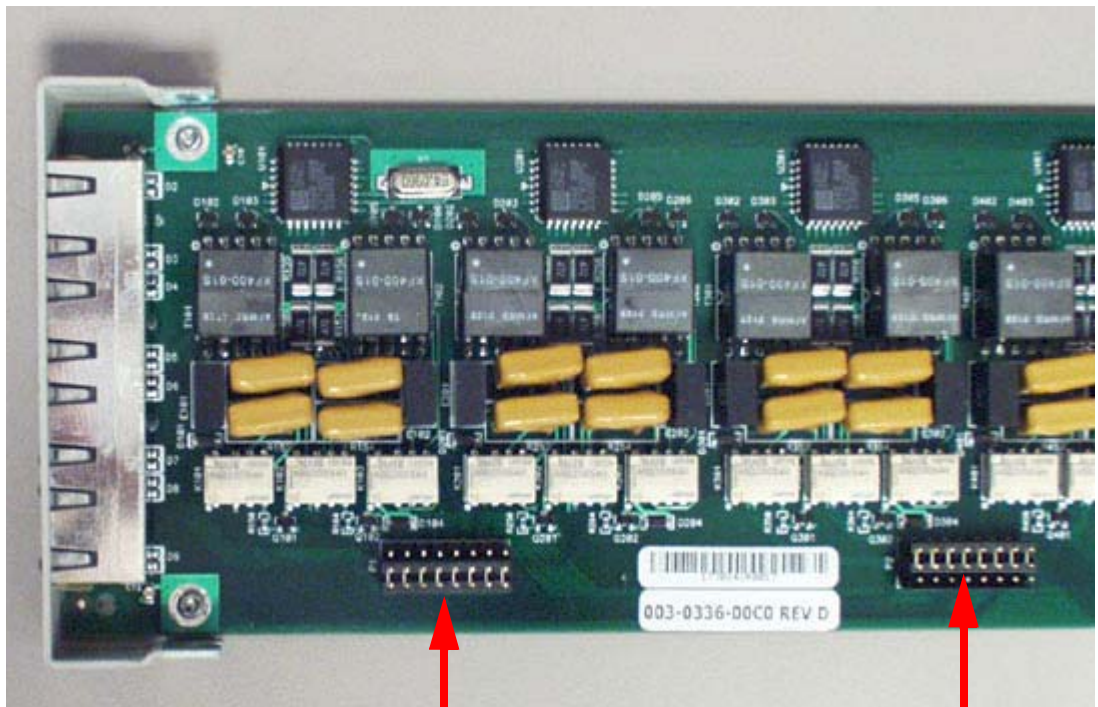
Front of Card   **P1 is set to RJ-48S Position**   **P2 is set to 25-Pin Telco Position**

Alarms

The OCU-DP cards and supporting Controller Software will support the following alarms:

Alarm/ Event	Severity	Category	Description	Clear Mechanism (alarms only)
Card Detect	Information	Equipment	OCU-DP card inserted	
Card Removed	Information	Equipment	OCU-DP card removed	
Out of Service (OOS)	Major	Facility	Network sending Out-of-Service code (OOS) or card has LOS.	Correct with Network or replace or deprovision the card.
Los of Signal (LOS)	Major	Facility	No signal at customer link.	Correct with Customer data path, replace the card, or reconnect the drop.
Los of Frame (LOF)	Major	Facility	Framing patter not detected at customer link.	Correct with Customer data path, replace the card, or reconnect the drop.
Bipolar Violation (BPV)	Minor	Facility	Excessive violations on customer interface.	Correct with the incoming signal, or deprovision card.

Line Rates/Line Lengths

All lengths were measured to meet a BER of 10^{-7} with up to 45 dB of cable attenuation at the Nyquist frequency for 56, 64 and 72 Kbps, and 40 dB all other rates.

Service Data Rate	Primary Channel / Secondary Channel	Max. Loop Distance (24 AWG) Primary Channel only/Primary & Secondary Channel	
2.4 Kbps	2.4 Kbps/3.2 Kbps	13.8 miles/12.7 miles	(22.3 km/20.4 km)
4.8 Kbps	4.8 Kbps/6.4 Kbps	11.0 miles/10.0 miles	(17.7 km/16.1 km)
9.6 Kbps	9.6 Kbps/12.8 Kbps	8.0 miles/13.3 miles	(13.0 km/12.2 km)
19.2 Kbps	19.2 Kbps/25.6 Kbps	6.3 miles/5.9 miles	(10.1 km/9.4 km)
38.4 Kbps	38.4 Kbps/51.2 Kbps	5.5 miles/5.3 miles	(8.8 km/8.5 km)
56 Kbps	56 Kbps/72 Kbps	5.1 miles/4.7 miles	(8.2 km/7.6 km)
64 Kbps	64 Kbps	4.7 miles	(7.6 km)

Connector Pinouts

The OCU-DP is part of the network, and connects to customer equipment.

DDS RJ-48S

The pinout for RJ-48S female is as follows:
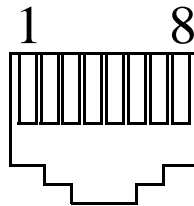
Pin	Function	Description
1	Receives Data (R-1)	From Customer to Network Interface
2	Receives Data (T-1)	From Customer to Network Interface
3-6	Not Used	
7	Transmits Data (T)	From Network Interface to Customer
8	Transmits Data (R)	From Network Interface to Customer

Note: The above listed functions are relative to this port.

25-Pair Telco Connector

Pinout for the Single (noted by an *) or Quad OCU-DP card. Must setup jumpers on card to use this connector.
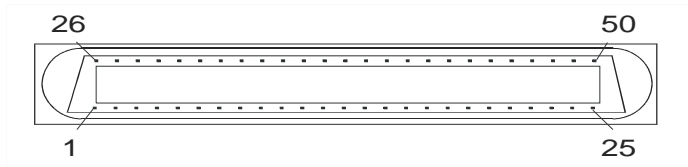
Card Slot	Line	J1 T1	R1	T	R	Card Slot	Line	J2 T1	R1	T	R
1	1*	26	1	27	2	4	1*	26	1	27	2
	2	28	3	29	4		2	28	3	29	4
	3	30	5	31	6		3	30	5	31	6
	4	32	7	33	8		4	32	7	33	8
2	1*	34	9	35	10	5	1*	34	9	35	10
	2	36	11	37	12		2	36	11	37	12
	3	38	13	39	14		3	38	13	39	14
	4	40	15	41	16		4	40	15	41	16
3	1*	42	17	43	18	6	1*	42	17	43	18
	2	44	19	45	20		2	44	19	45	20
	3	46	21	47	22		3	46	21	47	22
	4	48	23	49	24		4	48	23	49	24

T1 and R1 = Receive. T and R = Transmit.

Note: The above information is relative to the connector.

CHAPTER 11

Power Supply

In this Chapter

- 115 VAC/-48 VDC Power Supply/ Charger

- Ringer Waveform Options

- Replacing a Power Supply

115 VAC/-48 VDC Power Supply/Charger

The 115 VAC/-48 VDC Power Supply and Charger enables the Compact T1 to be powered from either 115 VAC or -48 VDC sources, and includes an integral battery charger and ringing generator. Integrating AC and DC power options, battery charger and ringing generator functions in the Adit chassis dramatically reduces installation time, space and cost requirements and inventory considerations in comparison to separate power conversion or Uninterruptable Power Systems (UPS) equipment.

Front-panel LEDs provide easy-to-read indications of power input, battery status and alarms. Remote notification to network operations and to monitoring centers of loss of AC input or low DC input voltage is available via SNMP .

The ringing generator provides 25 Ringer Equivalence Number (REN) output, supporting up to 48 FXS simultaneous ringing lines with normal cadence ringing. Three ringer waveform shapes and three selectable ringer frequencies ensure performance over a wide range of outside line or customer premises applications.

Features

- Enables Compact T1 to be powered from 115 VAC or -48 VDC source
- Automatic switchover to Battery Backup Unit without power interruption
- Selectable ringer frequency settings of 20, 25 and 50 Hz
- Integrated 25 REN ringing generator supports high capacity applications
- Automatic switchover to Battery Backup Unit without power interruption
- Installs quickly and easily with fully connectorized design
- Solid-state fuseless protection for Central Office NEBS and customer premises FCC and UL safety requirements

Technical Specifications

AC Electrical Input

- 115 VAC (95 to 132 VAC, 57 to 63 Hz), 2.5 A rms, 130 W maximum
- Maximum inrush current: 24 A peak at 132 VAC
- Rear-panel mounted circuit breaker operates for overcurrent conditions greater than 4 A
- Front-panel AC INPUT status LED

DC Electrical Input

- -48 DC (-40 to -60 V), 2.1 ADC, 90 W maximum
- Maximum cold start inrush current: 30 A peak at -60 VDC
- Solid-state input overcurrent protection trips at 2.5 A at 68° F (20° C)
- Extended mode: jumper option enables Compact T1 startup at low battery input voltage

Electrical Output

- -37 VDC (short loop)/ -54 DC (long loop), talk battery, 1.45 A maximum
- -54 VDC battery charger output, 0.5 A maximum
- +5 VDC, 9 A maximum
- Automatic switchover to battery backup without power interruption

Battery Charger

- Front-panel battery status LED
- Battery charging output limited to 0.5 A maximum

Alarms

Generates minor alarm contact closure on External Alarm Connector when

- AC input voltage is not present or circuit breaker is open
- -48 VDC battery input voltage magnitude is low or absent

Ringing Generators

- Nominal 85 V rms (108 V rms max)
- Referenced to -54 VDC (-60 VDC max) output
- Supports three jumper-selectable ringer waveform shapes
- Drives 25 REN indefinitely with minimum output voltage of 65 V rms at normal ringer cadence
- Ringer frequency is selectable, 20 25 or 50 Hz $\pm$ 15%
- Overload protected

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- NEBS Level 3 certified for type 2 and 4 equipment GR-1089-CORE, GR-63-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A

Mexico

- NOM 19, Safety of Data Processing Equipment

Interface Connectors

● IEC-320, 15 A 3-prong AC power receptacle
● Rear PCB connector: Compact T1 backplane

Physical

● Dimensions: 3.5 in. (H) x 2 in. (W) x 12 in. (D)
                8.9 cm (H) x 5.1 cm (W) x 30.5 cm (D)
● Weight: 115 VAC - 1 lb. 6 oz. (0.62 kg)
            24 VDC - 1 lb. 9 oz. (0.71 kg)

For information on Compact T1 Environment required, see *Installation Environment, on page 2-2*.

Input Power

The following graphic displays the back of the chassis with a 115 VAC/-48 VDC Power Supply installed.

115 VAC LEDs

The power supply card has two LEDs, as described in the table below.

LED	State	Description
AC Input	Off	AC input missing or failure
	Green	AC input present
Battery	Off	Battery input not used
	Green	Battery charging or operating from DC source only.
	Yellow	Battery discharging
	Red	Battery low (less than 42V), ringer disabled

Ringer Waveform Options

The default standard ringer waveform setting (for all three power supplies) will work well in most applications. However, if there is a ringer detection problem with the equipment, the user can alter the shape of the waveform by populating the jumpers on the power supply as described below. The Ringer Frequency can be configured using jumpers, as displayed below.
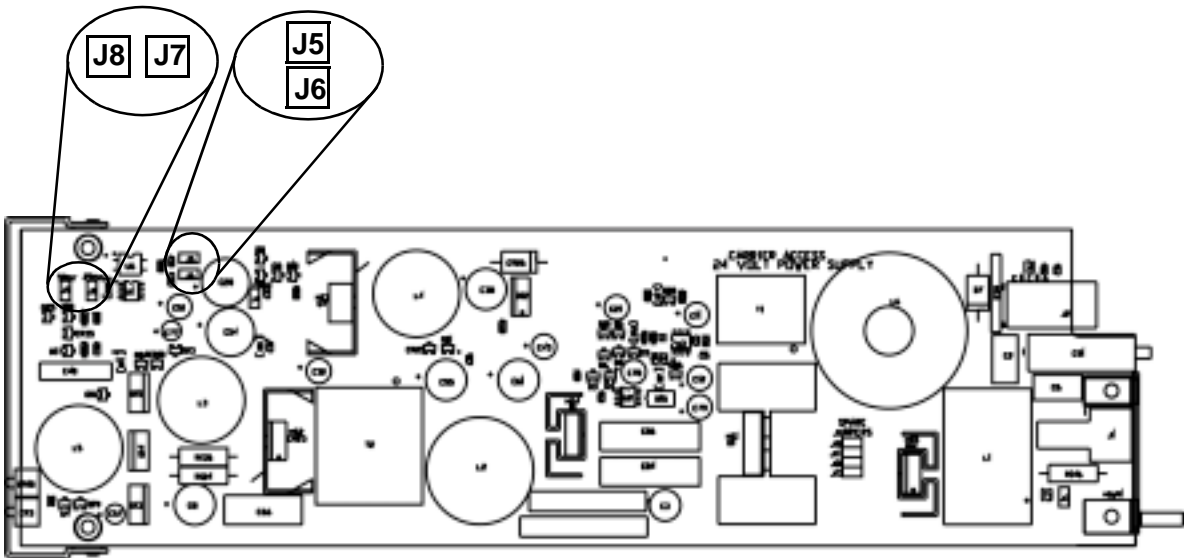
Standard Waveform

The standard waveform
(default) should work
well for most applications.

Ringer Frequency: 20 Hz
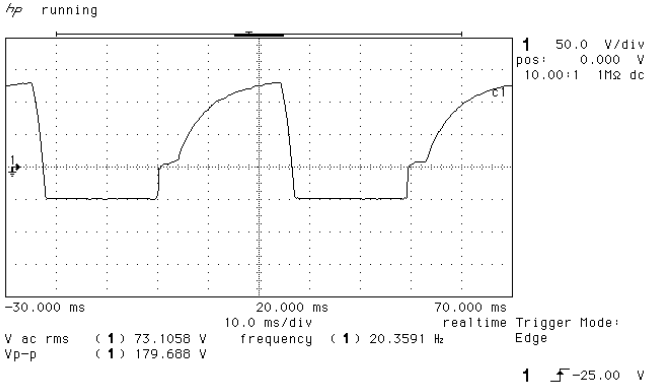
Ringer Frequency: 25 Hz

Ringer Frequency: 50 Hz

Square Waveform

Ringer Frequency: 20 Hz


```
hp   running
1    50.0  V/div
pos:    0.000  V
10.00:1   1MΩ dc
                                        c1
-30.000 ms        20.000 ms       70.000 ms
                10.0 ms/div        realtime Trigger Mode:
                                            Edge
V ac rms   ( 1 ) 83.9077 V  frequency  ( 1 ) 20.3639 Hz
Vp-p       ( 1 ) 185.938 V
                                    1   -25.00  V
```

Ringer Frequency: 25 Hz


```
hp   running
1    50.0  V/div
pos:    0.000  V
10.00:1   1MΩ dc
                                        c1
-40.000 ms        10.000 ms       60.000 ms
                10.0 ms/div        realtime Trigger Mode:
                                            Edge
V ac rms   ( 1 ) 88.0407 V  frequency  ( 1 ) 24.9720 Hz
Vp-p       ( 1 ) 206.250 V
                                    1   -25.00  V
```

Ringer Frequency: 50 Hz


```
hp   running
1    50.0  V/div
pos:    0.000  V
10.00:1   1MΩ dc
                                        c1
-20.000 ms        5.000 ms        30.000 ms
                5.00 ms/div        realtime Trigger Mode:
                                            Edge
V ac rms   ( 1 ) 85.9933 V  frequency  ( 1 ) 51.4579 Hz
Vp-p       ( 1 ) 187.500 V
                                    1   -25.00  V
```

Long Rise Time or Rounded Waveform

Ringer Frequency: 20 Hz


```
hp   running
                                              1   50.0   V/div
                                              pos:    0.000  V
                                              10.00:1  1MΩ dc
                                                          c1

-30.000 ms              20.000 ms         70.000 ms
                        10.0 ms/div          realtime Trigger Mode:
V ac rms    ( 1 ) 73.1058 V   frequency  ( 1 ) 20.3591 Hz    Edge
Vp-p        ( 1 ) 179.688 V
                                              1   ⌐-25.00  V
```

Ringer Frequency: 25 Hz


```
hp   running
                                              1   50.0   V/div
                                              pos:    0.000  V
                                              10.00:1  1MΩ dc
                                                          c1

-40.000 ms              10.000 ms         60.000 ms
                        10.0 ms/div          realtime Trigger Mode:
V ac rms    ( 1 ) 68.1753 V   frequency  ( 1 ) 25.0424 Hz    Edge
Vp-p        ( 1 ) 175.000 V
                                              1   ⌐-25.00  V
```

Ringer Frequency: 50 Hz


```
hp   running
                                              1   50.0   V/div
                                              pos:    0.000  V
                                              10.00:1  1MΩ dc
                                                          c1

-20.000 ms              5.000 ms          30.000 ms
                        5.00 ms/div          realtime Trigger Mode:
V ac rms    ( 1 ) 46.6736 V   frequency  ( 1 ) 51.1662 Hz    Edge
Vp-p        ( 1 ) 135.938 V
                                              1   ⌐-25.00  V
```

Replacing a Power Supply

Nut and lock washer

Faceplate

Power Cord
Connector

Back

Front

1. Disconnect power cord from the unit.

2. Remove nut and lock washer from power supply retention stud located directly above power cord socket.

3. Remove power supply by grasping faceplate at top and bottom and pulling power supply straight out of the case.

4. When installing the power supply, be certain to engage top and bottom edges of power supply circuit board in the card guides located 1 1/4 inches inside the front opening of the case.

5. Slowly slide the power supply into the case while making sure that the power supply retention stud aligns with and passes through its attachment hole in the rear of the case. Press gently on the faceplate of the power supply to ensure that the connector on the power supply is fully mated to its mating connector on the backplane.

6. Replace nut and lock washer on the power supply retention stud.

7. Reconnect the power cord to the unit.

CHAPTER 12

Quad T1 Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Jumper Settings
- Connector Pinouts
  - 25-pin Telco Connector
  - RJ-48 Connector
- LEDs
- Configuration Restrictions

Overview

The Quad T1 Service card enables service providers and enterprise network managers to cost-effectively provision and expand network bandwidth or drop-side T1 bandwidth. The Quad T1 card can be inserted into any slot of the six-slot chassis and supports an array of network access technologies, including full drop-and-insert functionality, fractional and full T1 data and voice trunking.

When fully equipped with four Quad T1 Service cards plus the T1 Controller card an Compact T1 can support can support up to 18 T1 access lines. This available bandwidth enables the Adit to cost-effectively address small to medium sized business requirements, multi-tenant units, fixed or mobile wireless backhaul, as well as end-office applications. The flexible Quad T1 Service card allows physical connections to either the front-panel 8-pin connector or the rear-panel 25-pair telco connectors.

As a component of the Compact T1 platform, the Quad T1 Service card provides several local and remote management options through the Compact T1 Controller card. The Quad T1 card can be locally configured and managed using the Command Line Interface (CLI). Front-panel LEDs indicate each port's activity and status.

Features

- Integrates T1 CSU functionality with FCC registration for direct connection to T1 lines
- Supports B8ZS or AMI encoding and SF (D4) or ESF framing
- Flexible system clock timing may be derived from any T1
- Insert up to four Quad T1 Service cards plus the Controller's two T1s in a single Compact T1 for a total of 18 T1s/CSUs per chassis
- Supplies up to 36 T1s in two Compact T1 occupying just two rack units of equipment space (19-inch rack)
- Allows full non-blocking digital cross-connection (DCS) of all timeslots to any Adit service card
- Offers solid-state fuseless protection for central office NEBS compliance and customer premises FCC and UL safety requirements

Technical Specifications

Controller Software Required

T1 Controller

- Release 1.3.1 or higher is required

T1 Interface

- Line rate (transmitted): 1.544 Mbps ±50 bps
- Selectable B8ZS or AMI encoding
- SF (D4) or ESF framing
- Integrated CSU
- Line Build Out (DSX-1): 655 feet
- Receive Sensitive (DS1): 0 to -22.5 dB
- Jitter and wander ITU-T G.824 (3/93)
- Solid-state fuseless overvoltage and overcurrent T1 line protection
- Channel status LEDs
- Front or rear connections:
  - Front: uses faceplate-mounted RJ-48C connectors
  - Rear: uses rear-panel RJ-21X connectors
- Less than 3 ms signaling latency
- Less than 10 ms overall Adit system signaling latency

Network Interface

- The Quad T1 Service card may be configured as either a network or drop-side interface

Network Standards

- T1.107
- T1.102
- T1.203
- T1.231
- T1.403

Clocking

- Any one of the four T1 interfaces on a card may be selected by the controller as the Adit platform timing source

Alarms

- Support standard T1.403 alarms

Testing and Diagnostics

- T1.403 payload loopbacks (ESF only)
- T1.403 remote and local line loopbacks (ESF and SF)
- DS0 loopbacks
- T1.231 Performance History (15 minute intervals, 24 hour totals)
- T1.203 Performance Report Messages (PRMs)

Power Consumption

- Less than 3 W per card

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- FCC Part 68
- NEBS Level 3 certified for type 2 and 4 equipment
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A
- CS-03

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
                8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.1 oz. (0.14 kg)

For information on Compact T1 Environment required, see *Installation Environment on page 2-2.*

Card Configuration

All options on the Quad T1 cards are set using the Command Line Interface (CLI). The default for the connectors are the RJ-48s on the front of the T1card, however by moving the jumpers to the backplane, the Telco connectors on the back of the unit are enabled. See *Jumper Settings on page 12-7* for more information.

CLI Commands

The following commands are used to configure the Quad T1 card. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- *connect*
  Creates two-way connections between channels.
- *disconnect*
  Removes a connection created by the connect command.
- *set (ds1)*
  Sets up the DS1 interfaces (clock, up, down, equipment loopup, fdl, framing, id string, lbo, line loopup, linecode, loopdetect, payload loopup, threshold).
- *show (ds1)*
  Displays current settings for DS1 (circuit ID, up.down, framing, line coding, clock source, line build out, loop code detection, loop back, fdl type).
- *status (ds1)*
  Displays the status of the DS1 (receive, transmit, loopback).

Jumper Settings

The P2 and P3 Jumpers are defaulted to RJ-48, which are the set of pins nearest the connectors. In this position the T1 signals (TX and RX) are routed to the RJ-48 connectors on the face of the card, see *RJ-48 Connector on page 12-10* for pinout information. To route the T1 signals to the 25-pin Telco connector at the rear of the unit, move all the jumpers to the "backplane" position (the two rightmost pins for each signal). See *25-pin Telco Connector on page 12-8* for pinout information.

P2 and P3 Jumpers

Front   Back

Connector Pinouts

26   50

1   25
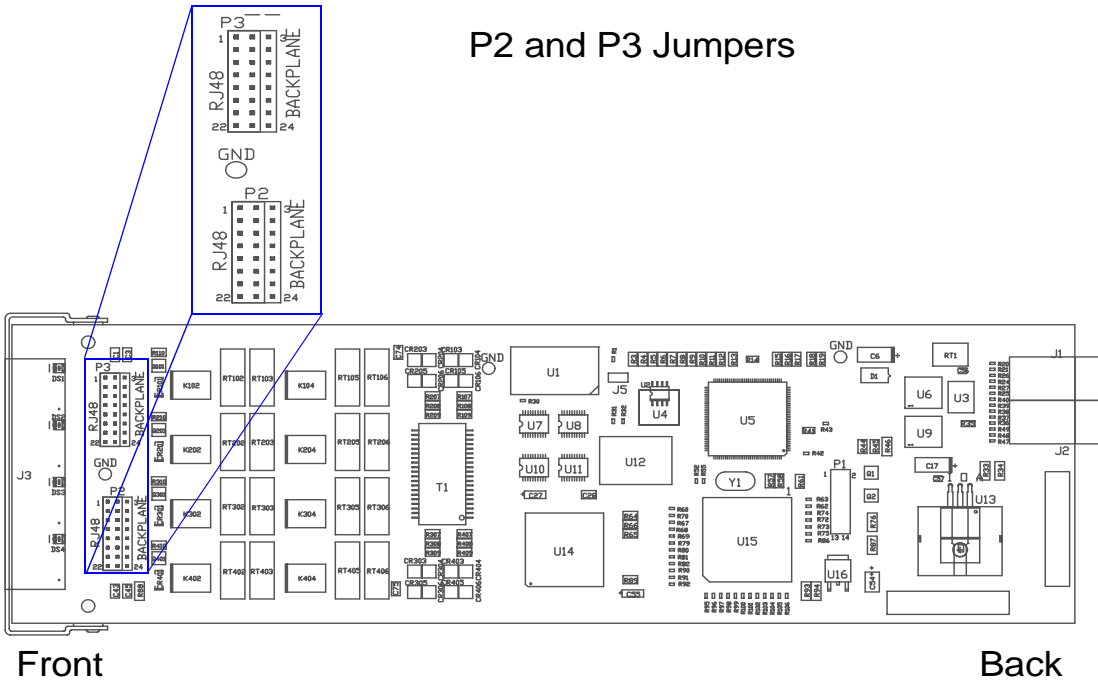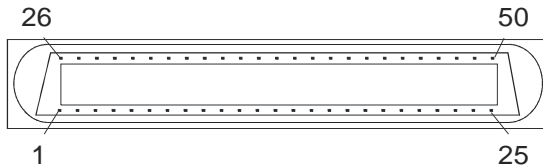
25-pin Telco Connector

The pinouts are as follows:

Slot	Port	Pair	Pin Location	Function	Color Code
1 and 4	1	1	26 1	Tip Receive from DS1 network Ring Receive from DS1 network	White Blue
		2	27 2	Tip Transmit to DS1 network Ring Transmit to DS1 network	White Orange
1 and 4	2	3	28 3	Tip Receive from DS1 network Ring Receive from DS1 network	White Green
		4	29 4	Tip Transmit to DS1 network Ring Transmit to DS1 network	White Brown
1 and 4	3	5	30 5	Tip Receive from DS1 network Ring Receive from DS1 network	White Slate
		6	31 6	Tip Transmit to DS1 network Ring Transmit to DS1 network	Red Blue
1 and 4	4	7	32 7	Tip Receive from DS1 network Ring Receive from DS1 network	Red Orange
		8	33 8	Tip Transmit to DS1 network Ring Transmit to DS1 network	Red Green
2 and 5	1	9	34 9	Tip Receive from DS1 network Ring Receive from DS1 network	Red Brown
		10	35 10	Tip Transmit to DS1 network Ring Transmit to DS1 network	Red Slate

Slot	Port	Pair	Pin Location	Function	Color Code
2 and 5	2	11	36 11	Tip Receive from DS1 network Ring Receive from DS1 network	Black Blue
		12	37 12	Tip Transmit to DS1 network Ring Transmit to DS1 network	Black Orange
2 and 5	3	13	38 13	Tip Receive from DS1 network Ring Receive from DS1 network	Black Green
		14	39 14	Tip Transmit to DS1 network Ring Transmit to DS1 network	Black Brown
2 and 5	4	15	40 15	Tip Receive from DS1 network Ring Receive from DS1 network	Black Slate
		16	41 16	Tip Transmit to DS1 network Ring Transmit to DS1 network	Yellow Blue
3 and 6	1	17	42 17	Tip Receive from DS1 network Ring Receive from DS1 network	Yellow Orange
		18	43 18	Tip Transmit to DS1 network Ring Transmit to DS1 network	Yellow Green
3 and 6	2	19	44 19	Tip Receive from DS1 network Ring Receive from DS1 network	Yellow Brown
		20	45 20	Tip Transmit to DS1 network Ring Transmit to DS1 network	Yellow Slate
3 and 6	3	21	46 21	Tip Receive from DS1 network Ring Receive from DS1 network	Violet Blue
		22	47 22	Tip Transmit to DS1 network Ring Transmit to DS1 network	Violet Orange
3 and 6	4	23	48 23	Tip Receive from DS1 network Ring Receive from DS1 network	Violet Green
		24	49 24	Tip Transmit to DS1 network Ring Transmit to DS1 network	Violet Brown
NA	NA	25	50 25	Reserved	Violet Slate

RJ-48 Connector

There are four RJ-48C (female) connectors on the front of the Quad T1 Card.

1   8
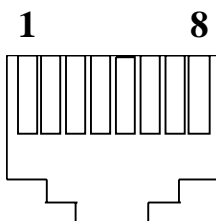
The pinouts are as follows:

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	n/c	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 - 7	n/c	Not connected
8	Chassis Ground	

LEDs

Each channel on the Quad T1 card has two LEDs. The description of the top LED is shown below, the bottom LED is not used with this application.

Top LED
(active)

Bottom LED
(not used)

State	Description
Off	Off line
Green	Normal
Red	Loss of Signal (LOS)
Yellow	Bipolar Violation (BPV)
Flashing Green	Loopback active
Flashing Yellow	Yellow Alarm (Remote Alarm Indication)
Flashing Red (Slow)	Loss of Frame (LOF) or Alarm Indication Signal (AIS)
Flashing Red (Fast)	Self-test Failure

Configuration Restrictions

There are some configuration restrictions with the Quad T1 Service Card.
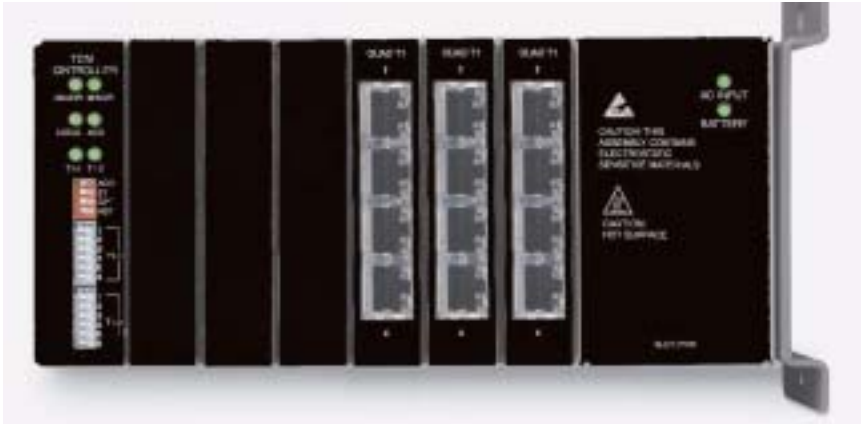
If an Compact T1 contains three (3) Quad T1 cards:

- remaining three (3) slots can be any combination of BRI, FXS, FXO or Router cards.
- remaining three (3) slots can contain two (2) V.35 cards, with the remaining slot empty.

If an Compact T1 contains four (4) Quad T1 cards:

- remaining two (2) slots must be empty.

CHAPTER 13

Router (IP) Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinouts
  - Ethernet
- LEDs

Overview

The fast-changing world of IP services requires products with the capability to generate new value-added revenues. The IP Router Service card offers the performance and expandability of a dedicated router in a low-cost solution with simple integrated management through the Adit platform.

Unlike other internal routing solutions that support software-based routing by adding bundles to the system software, the IP Router card employs a dedicated processor to ensure high performance and product feature expansion. It delivers high-speed Internet and Intranet connectivity to small and medium-sized businesses, as well as remote and branch office users. A powerful set of standard features includes IP and IPX routing, Layer 2 bridging, ML-PPP, networking security, and management capabilities to integrate services in the digital last mile.

The Compact T1 supports up to six IP Router cards, in any slot, or other combinations of services. This flexibility enables service providers to target multi-tenant units with a single device that supports business-class voice, Internet access and data services. The addition Multi-Link Point-to-Point Protocol (ML-PPP) to the IP Router card ensures that service providers can continue to support the growing needs of customers, beyond one or two T1s.

The IP Router card simplifies delivery of data networking solutions by leveraging the advantages of the single IP management, while reducing costly cabling expense through a direct 10/100Base-TX Ethernet interface connection.

IP Router cards are easily managed through the Compact T1 user interface, identified by a single IP address. With this capability, multiple cards within a single Compact T1 can be configured, monitored and maintained through one unique IP address, speeding installation and simplifying management tasks.

The IP Router card is SNMP, CLI or menu-driven manageable. Management connectivity is provided either through the user data port connection on the IP Router card, the local RS-232 craft port, the Ethernet management port, or the dedicated management channel on the T1 Controller.

The Router Service card configuration information can be uploaded to the NOC while router code upgrades are loaded to the Router card. The uploading and downloading is accomplished through the Ethernet management port and/or the user data connection. In addition, the CLI management option enables management configuration information to be created offline and loaded into the system either via a script or TFTP.

Features

- Supplies auto-sensing 10/100Base-TX Ethernet
- Supports up to 6 router cards per Compact T1
  - Multi-point networking with up to 24 WAN connections per router
  - Each WAN connection can be provisioned with multiple DS0s
  - Deliver more than two T1s bandwidth per Router card; up to 60 DS0s per Router card
  - Enables multiple T1 facilities to function as a single IP WAN interface using ML-PPP for bandwidth scalability beyond a single T1
- Ensures high performance and feature expansion through dedicated IP Router card processor
- Enables management via menu-driven user interface or CLI Router interface
- Supports packet filtering and Spanning Tree Protocol
- Allows Network Address Translation (NAT) and Port Address Translation (PAT)
- Supports Dynamic Host Configuration Protocol (DHCP)
- Delivers a minimum of 3,000 packets per second
- RADIUS Login Authentication

Technical Specifications

Controller Software Required

T1 Controller

- Release 3.0 or higher is required

Management

- Menu-driven over RS-232 and CLI
- Ping, SNMP, Telnet over IP
- Ethernet management port
- IP management connection via T1 FDL, Ethernet and DS0 bearer channel
- Code download via TFTP
- Configuration upload and download via TFTP

WAN Interface

- Any T1 interface on the Compact T1 platform
- Up to 24 WAN interfaces per router
- Up to 60 DS0s bandwidth per router
- PPP, Frame Relay, PPP in Frame Relay, MLPPP and GRE tunneling

LAN Interface

- A single 10/100Base-TX auto-sensing port

Routing

- IPX RIP/SAP
- IP RIPv1, RIPv2, RIPv/RIPv2 compatibility mode
- Static routing
- Classless routing (CIDR)

Bridging

- IEEE 802.1D MAC bridging

Router Performance

- Minimum of 3,000 64-byte packets per second throughput

Advanced Capabilities

- DHCP server
- Syslog
- SNTP
- Spanning Tree Protocol
- Van Jacobson message header compression
- Domain Name Server (DNS) proxy
- IP fragmentation and reassembly support
- Secondary IP Address

Frame Relay

- RFC 1490 encapsulation
- ANSI T1.617 Annex D LMI
- ITU Q.933 Annex A LMI

Filtering

- LAN/WAN Filters up to Layer 4, stateful

Security

- Three user accounts
- Three levels of security
- PAP and CHAP
- Network Address Translation (NAT)
- NAT Bypass
- Port Address Translation (PAT)
- RADIUS Login Authentication

MIBs

- RFC 1212 (Concise MIB)
- RFC 1213 (MIB II)
- RFC 1643 (Ethernet)
- RFC 2233 (Interface)
- RFC 2011 (IP)
- RFC 1471 (LCP/PPP)
- RFC 1473 (IP/PPP)
- RFC 2115 (Frame Relay)
- RFC 1406 (DS1/E1)
- RFC 1659 (RS-232)
- Enterprise MIB

Clocking

- Loop-timed from any T1 or the internal system clock
- Simple Network Time Protocol (SNTP) support for timing from a separate network

Testing and Diagnostics

- Ping
- WAN Monitor

Power

- Less than 2 W

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- NEBS Level 3 certified for type 2 and 4 equipment
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A

Mexico

- NOM 19, Safety of Data Processing Equipment

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
                8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.2 oz. (0.15 kg)

For information on Compact T1 Environment required, see *Installation Environment on page 2-2.*

Card Configuration

The IP Router has the option of configuration through CLI or the Router menu-driven user interface, which is accessed through Telnet. The following CLI commands are all Router related. For information on the IP Router menu-driven user interface, see the IP Router User Manual.

> **NOTE:** The default IP address for the IP Router is 10.0.0.1.

CLI Commands

For detailed information on the following Router commands, see *Chapter 5, CLI Commands*.

- *add (router) dns proxy*
  Enable DNS proxy and add a remote DNS server address to the router card

- *add (router) remote*
  Add a remote WAN profile to the WAN profile table

- *add (router) snmp community*
  Add a SNMP community to an interface on the router card

- *add (router) snmp trap*
  To specify a destination to send SNMP trap messages

- *add (router) uploaduser*
  To specify a host that is allowed to upload configuration/software files

- *add (router-lan) filter*
  Add address filters (address, custom, protocol) to the table of Layer 2 filters applied to the specified LAN interface

- *add (router-lan) static*
  Add static elements on the specific LAN interface (IP address, IP network, IPX network, MAC address).

- *add (router-wan) firewall*
  Add a firewall rule to a WAN.

- *add (router-wan) gre network*
  Add a "by network" GRE tunnel to a WAN.

- *add (router-wan) nat bypass*
  Add subnets to the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface.

- *add (router-wan) static*
  Add static elements to the specified WAN interface (IP address, IP network, IPX network, MAC address and NAT address).

- *clear (router) ip address table*
  Flush the learned entries from the IP address table for the specific interface from the specified Router card.

- *clear (router) mac address table*
  Flush the learned entries from the MAC address table for the specific interface from the specified router card.

- *connect (router-trunk) (t1)*
  Creates two-way connections between the router port trunk connections and any DS0 channels of the service card or Controller.

- *delete (router) dns proxy*
  Remove a remote DNS server address from the specified Router card.

- *delete (router) remote*
  Delete a remote WAN profile from the WAN profile table.

- *delete (router) snmp community*
  Delete an SNMP community entry.

- *delete (router) snmp trap*
  Delete a trap destination from the router card.

- *delete (router) uploaduser*
  Remove an existing authorized uploaduser.

- *delete (router-lan) filter*
  Remove a a single filter rule from the table of Layer 2 filters applied to the specified LAN interface.

- *delete (router-lan) static*
  Remove a static element from the LAN interface (IP address, IP network, IPS network and MAC address).

- *delete (router-wan) firewall*
  Remove a firewall rule from a WAN.

- *delete (router-wan) gre network*
  Remove a "by network" GRE tunnel to a WAN.

- *delete (router-wan) nat bypass*
  Delete an IP subnet or host from the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface.

- *delete (router-wan) static*
  Remove a static element from the WAN interface (IP address, IP network, IP network, MAC address).

- *disconnect {slot:port:trunk}*
  Removes a connection created by the connect {trunk-addr}{t1-addr}

- *install (slot) router*
  Will prepare the controller for the insertion of a new router card that will keep its currently loaded configuration.

- *load tftp*
  Will download software via TFTP to the Controller or the Router card.

- *rename (router) (router-wan/lan)*
  Change the name of a remote WAN or local LAN profile on the Router card.

- *reset (router)*
  Reboot the Router. All new configuration will be in-use.

- *rtrping*
  Router will perform a ping test and report the result.

- *set (router) autologout*
  Set the period of time on inactivity after which the user will be automatically logged-out of a Telnet session

- *set (router) default*
  Reset the Router card to its default configuration settings.

- *set (router) dhcp*
  Disable both DHCP server and DHCP relay functionality for the Router.

- *set (router) dns*
  Configure the Domain Name Server (DNS) options.

- *set (router) enhanced security*
  Enable/disable enhanced login security on the Router

- *set (router) lmi*
  Specify the Local Management Interface (LMI) protocol to use for the Router.
- *set (router) log*
  Set password access on the Router card (access level, password)
- *set (router) login auth*
  Sets how login authentication for this router should be performed
- *set (router) login prompt*
  Enable/disable the suppression of the Router login prompt for a user that telnets in from the Controller CLI
- *set (router) ntp*
  Set Network Time Protocol (NTP) parameters
- *set (router) password*
  Manage password access on the specified Router card
- *set (router) ppp auth*
  Set the PPP authentication on the specified Router card
- *set (router) ppp security*
  Set up the local external security server which the Router card will use to authenticate remote PPP devices
- *set (router) proxy*
  Configures Router in-use basics (up, down and proxy).
- *set (router) reboot*
  Set automatic reboot after an upload of code or configuration file.
- *set (router) rip*
  Specify version of RIP packets to transmit and receive.
- *set (router) snmp*
  Set the value of sysContact, sysLocation and sysName on the Router.
- *set (router) stp*
  Setup the Spanning Tree Protocol on the Router.
- *set (router) syslog*
  Configure the Router to send alarm and event messages to a Syslog server
- *set (router-lan) collision*
  Set the collision alarms (interval and threshold).

- *set (router-lan) filter forward*
  Set the forwarding mode for Layer 2 filters added to the specified LAN interface.
- *set (router-lan) framing*
  Set which ethernet frame types are supported on the Router LAN interface.
- *set (router-lan) gateway*
  Specify a default IP gateway for the specified LAN interface.
- *set (router-lan) ip address*
  Specify an IP address for the specified LAN interface.
- *set (router-lan) ipx network*
  Specify an IPX network numbers for the four IPX LAN frame types.
- *set (router-lan) phy*
  Specify the ethernet PHY (physical specifications) speed and mode.
- *set (router-lan) rip*
  Set the IP RIP for the LAN interface.
- *set (router-lan) stp*
  Setup the Spanning Tree Protocol on this interface.
- *set (router-lan) up/down*
  Set the LAN interface up or down.
- *set (router-trunk) encapsulation*
  Specify the encapsulation to use on the Router interface.
- *set (router-trunk) multilink group*
  Specify that a trunk is part of a multilink PPP group
- *set (router-trunk) up/down*
  Set the Router trunk up or down.
- *set (router-wan) dlci*
  Configure the DLCI for a specified WAN interface that will be using a frame relay encapsulated trunk.
- *set (router-wan) gre*
  Configure the GRE tunneling for a specified WAN interface.
- *set (router-wan) ip*
  Set the IP traffic handling on the WAN interface.

- *set (router-wan) ip address*
  Set the IP address for a WAN interface.

- *set (router-wan) ipx*
  Set the IPX traffic handling on the specified WAN interface.

- *set (router-wan) nat*
  Configure Network Address Translation (NAT) on a specified WAN interface.

- *set (router-wan) other*
  Set traffic handling of protocols other than IP or IPX on the specified WAN interface.

- *set (router-wan) ppp*
  Configure PPP on the specified Router card.

- *set (router-wan) rip*
  Set the type or RIP updates on the WAN interface.

- *set (router-wan) stp*
  Configure the Spanning Tree Protocol on the WAN interface.

- *set (router-wan) trunk*
  Configure the trunk port for a specified WAN interface.

- *set (router-wan) up/down*
  Set the specified WAN interface up or down.

- *show (router)*
  Displays the current Router settings (DHCP, DNS proxy, LMI, PPP, RIP, SNMP, STP, syslog and uploaduser).

- *show (router) dhcp*
  Displays the current DHCP settings for the Router

- *show (router) dns*
  Displays the current DNS setup for the router card

- *show (router) dns proxy*
  Displays the current DNS Proxy setup for the router card

- *show (router) lmi*
  Displays the current Local Management Interface (LMI) settings

- *show (router) ntp*
  Displays the settings for NTP options

- *show (router) ppp*
  Displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the router

- *show (router) rip*
  Displays the current RIP settings for the Router

- *show (router) snmp*
  Displays the current SNMP settings for the Router

- *show (router) stp*
  Displays the current Spanning Tree Protocol settings for the router

- *show (router) syslog*
  Displays the current Syslog setup for the router

- *show (router) uploaduser*
  Displays the current list of users allowed to upload and download configuration and code files

- *show (router-lan)*
  Displays the settings for the router card

- *show (router-lan) collision*
  Displays the current LAN collision alarm settings for the router

- *show (router-lan) filter*
  Displays the current LAN Layer 2 data filters applied to the LAN on the router

- *show (router-lan) static*
  Displays the current list of static entries for the LAN on the router

- *show (router-lan) stp*
  Displays the current Spanning Tree Protocol settings for the LAN interface

- *show (router-wan)*
  Displays the current Router WAN settings (firewall, PPP, static entries, STP and trunk).

- *show (router-wan) nat bypass*
  Displays the current list of NAT bypass entries for the WAN interface on the specified Router card.

- *status (router)*
  Displays the current Router status information

- *status (router) channels*
  Displays a condensed status report of all voice channel endpoints
- *status (router) dns*
  Displays the current state of the DNS resolver and entries in the DNS cache
- *status (router) events*
  Displays the current event log from the router
- *status (router) ip address table*
  Displays the current IP address table for the specified Router
- *status (router) ip network table*
  Displays the current table of learned IP Networks for the specified interface
  on the router card
- *status (router) ipx network table*
  Displays the current table of learned IPX Networks for the specified
  interface on the router card
- *status (router) ipx server table*
  Displays the current table of learned IPX Servers for the specified interface
- *status (router) mac address table*
  Displays the current table of learned MAC Addresses for the specified
  interface on the router card
- *status (router) performance*
  Displays the current runtime statistics from the specified router
- *status (router) stp*
  Displays the current Spanning Tree state from the specified router
- *status (router-lan)*
  Displays the current Router status information
- *status (router-trunk)*
  Displays the current status for the specified trunk on the Router card.
- *store*
  Save a software file from a defined slot to a defined location on a PC, via
  TFTP.
- *telnet (router)*
  Establish a Telnet session from the Compact T1 CLI to the Router port user
  interface.

Connector Pinouts

Ethernet

The pinout for the RJ-48C (female) connector on the front of the card is as follows:
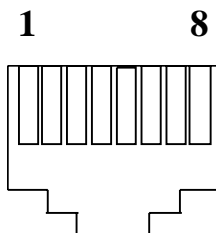
1   **8**

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4	N/C	Not connected
5	N/C	Not connected
6	Transmit -	Transmit to network
7	N/C	Not connected
8	N/C	Not connected

LEDs

The following chart describes each LED, and it's state, of the Router card.

LED	State	Description
CRD	Off	Loss of power
	Green	No current alarms
	Red	Alarm state active. See alarm log for cause
	Red Flashing	Self-test or Boot in-process
	Yellow Flashing	Card is saving data to flash RAM, do not power down
10/100	Off	10 Mb ethernet
	Green	100 Mb ethernet
LNK	Off	No ethernet link
	Green	Good ethernet link
COL	Off	No current ethernet transmit collisions
	Yellow	Ethernet collisions have occurred and have not dropped to minimum level
	Yellow Flashing	Ethernet collision occurring
TX	Off	No ethernet transmit activity
	Green	Ethernet transmit activity
RX	Off	No current ethernet receive activity
	Green	Current ethernet receive activity

Router (CMG) Card

In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinout
  - Ethernet
- Softswitch Interoperability Settings
- LEDs

Overview

The Customer Media Gateway (CMG) Service card for the Compact T1 platform combines IP Router functionality with the ability to translate circuit-based voice services into packet-based voice services, or Voice over IP (VoIP). The CMG Service card provides a cost-effective migration path for both existing Compact T1 TDM-based deployments and greenfield VoIP applications.

When installed in an Compact T1, the CMG Service Card enables the packetization of voice services using the Media Gateway Control Protocol (MGCP).   This allows standards-based voice processing, call control and signaling communications with the service provider's call agent or softswitch. The card also provides IP routing and bridging between LAN and WAN connections for VoIP and data traffic, plus IP QoS/ policy management features – facilitating a truly integrated, packet-based voice and data delivery solution.

Under control of the call agent, the CMG Service Card equips the service provider to offer revenue generating CLASS and IP Centrex calling features, enabling service migration from traditional Class 5 architectures to softswitch solutions. Distinctive ringing, call waiting, DTMF tone detection, call progress tone generation, and caller ID are just some of the many signaling and service solutions that are offered through the CMG Service card.

With the availability of the CMG Service Card, the Compact T1 becomes the first broadband service distribution gateway that supports modular voice services over IP, providing voice/data policy management as an integrated, coordinated, platform-wide capability. The integrated routing protocols ease network deployments, while the IP class-of-service traffic management features simplify the aggregation of sensitive voice packet streams into a multi-service converged data network.

As a component of the Compact T1 platform, the CMG Service card provides several local and remote management options. The card can be locally configured and managed using the menu-based interface, a Command Line Interface (CLI) via the on-card user dataport or through the Compact T1 Controller. Remote management is accomplished directly from the Compact T1 Controller over an in-band DS0 management channel, a separate SNMP network management facility, or in-band via any configured IP WAN interface.

Features

- Provides up to 48 channels of uncompressed voice mediation (VoIP) or T1/DS0 channels
- Up to eight T1s of VoIP conversion per Compact T1
- Supports voice/fax/modem calls, voice compression, silence suppression, comfort noise generation, and echo cancellation
- Utilizes standards-based softswitch call control: MGCP (IETF version 0.1, 1.0, 1.0 bis, and, NCS)
- Supplies 10/100Base-TX Ethernet LAN Interface for mediated voice or local LAN traffic
- Enables WAN routing with IP packet switching, filtering and policy enforcement
- Supports routing protocols: RIP V1 & V2
- Includes WAN data protocols (T1 WAN): PPP, PPP over Frame Relay, Frame Relay (RFC1490) and ML-PPP
- Supports multiple softswitch types
- Enables a variety of Centrex and CLASS services
- Configurable tone databases allows tone files support world-wide tailoring of call-progress tones and cadences to meet in-country specifications
- Selectable FXS impedances provide world-wide coverage of line impedance variations and companding types
- Support for cross-connects between data cards (CMG, IP Router, and V.35) across the backplane enhances flexibility of data network configurations and connections to existing data infrastructure

Technical Specifications

Controller Software Required

T1 Controller

- Compact T1 release 4.0 or higher to support a CMG Service card
- Compact T1 release 5.0 or higher and CMG release 1.1 or higher to support all features listed in this chapter

Management

- Menu-driven over RS-232 connection or Telnet
- Ping, SNMP, Telnet support
- Ethernet management port
- IP management connection via T1 FDL, Ethernet, IP/DS0 bearer channel and in-band WAN
- Software upgradeable via TFTP
- Configuration upload and download via TFTP

Voice and Packet Interfaces

- Voice/Fax/Modem - up to 48 designated FXS or DS0 channels
- LAN - 10/100Base-TX port on card
- WAN - designated Adit T1 lines and channel groups (IP over PPP, Frame Relay, PPP over Frame Relay, MLPPP)
- Internal - backplane cross-connect interfaces to other data cards (CMG, IP Router or V.35)

Voice Processing and Mediation

- Voice coding using G.711, G.726-16, G.726-24, G.726-24, G.726-32, G.726-40
- Capacity of 48 channels of PCM, 24 channels of compressed codecs
- Concentration (over-subscription) of voice channels supported for compressed codecs
- G.168 echo cancellation (up to 64 ms)
- RTP packetization (over UDP/IP)
- 10-30 ms packetization time
- TOS prioritization
- 160 ms jitter buffer, dynamic delay adjustment
- RTCP performance reporting
- Call progress tone and cadence generation via provisionable tone files

Connection Types (Media Flows)

- TDM-to-Packet or Hairpin (TDM-TDM)
- 2-way, 1-way, Inactive (for call hold)
- 2 connections per endpoint (for call waiting, transfer)
- 3-way conferencing

Routing and Policy Management

- IPX RIP/SAP, RIP V1/2 static routing and Classless Inter-Domain Routing (CIDR)
- PAP and CHAP
- NAT, NAT bypass and PAT
- DHCP
- DNS Proxy
- Spanning Tree Protocol
- Firewall filtering
- Voice prioritization

Router Performance

- Up to 0.84 Mbps upstream full-duplex IP WAN traffic
- Minimum of 3,000 64-byte packets per second per duplex direction
- See IP Router Service card *Technical Specifications on page 13-3* for additional information on routing features and specifications.

Advanced Capabilities

- DNCP Server/BOOTP Relay
- SysLog
- SNTP
- DNS Proxy
- Secondary IP address

TDM-Side Signaling

- FXS loop start
- DTMF tone detection
- Call progress tone generation
- Caller ID generation, FSK VMWI
- Distinctive ringing

Softswitch Call Control and Signaling

- MGCP (IETF RFC 2705 and NCS 1.0)
- IETF Version 0.1, 1.0, 1.0bis

Services Enabled (under Softswitch Control)

- Basic calling, caller ID
- Call waiting, call forwarding, voice mail
- Hold/transfer, conference using external bridge
- Many other Centrex and CLASS services

Softswitch/Call Agent Interoperability

- Interoperable with the leading softswitches
- MGCP auditing - status and capabilities
- Interoperability configuration options

Network Standards

- ANSI, CCITT, IEEE 802.3, IEEE 802.1q
- IETF - RFC 2705, others per router card

Power

- Dissipation: approx. 6 W
- Internal solid-state (fuseless) protection
- Fan free operation

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- Designed to meet NEBS Level 3 for type 2 and 4 equipment (not certified)

Canada

- CSA 22.2 No. 60950-00
- ICES-003, Class A

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
                8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.2 oz. (0.15 kg)

For information on Compact T1 Environment required, see *Installation Environment on page 2-2*.

Card Configuration

The CMG Service card has the option of configuration through CLI or the Router menu-driven user interface, which is accessed through Telnet. The following CLI commands are all router related. For information on the Router menu-driven user interface, see the CMG Router User Manual.

> **NOTE:** The default IP address for the Adit CMG Router is 10.0.0.0.

CLI Commands

Many of the router features can be configured directly with CLI commands.For detailed information on the following Router commands, see *Chapter 5, CLI Commands*.

Minimum Configuration Required

The CMG Service card requires an external call agent to operate as an MGCP-controlled media gateway or IAD.

The gateway must contact the call agent, on power up or reset. Therefore, the following configuration commands **MUST** be used to enter the call agent's IP address or domain name.

```
set {rtr_card-addr} mgcp callagent address {ip-addr}
```

```
set {rtr_card-addr} mgcp up
```

All other CLI commands listed below MAY be used to set customer media gateway options, but may not be necessary, since the defaults have been chosen to meet the most common expected uses. Some configuration may be necessary for proper interoperation with a given call agent.

- *add (router) dns proxy*
  Enable DNS proxy and add a remote DNS server address to the router card
- *add (router) remote*
  Add a remote WAN profile to the WAN profile table
- *add (router) snmp community*
  Add a SNMP community to an interface on the router card
- *add (router) snmp trap*
  To specify a destination to send SNMP trap messages

- *add (router) static dns host*
  Add a static DNS host record
- *add (router) uploaduser*
  To specify a host that is allowed to upload configuration/software files
- *add (router-lan) filter*
  Add an address filter to the table of Layer 2 filter applied specified LAN interface
- *add (router-lan) secondary ip address*
  Add a secondary IP address and subnet to the specified LAN interface
- *add (router-lan) static*
  Add static elements on the specified LAN interface
- *add (router-wan) firewall*
  Add a firewall rule to a WAN
- *add (router-wan) gre network*
  Add a "by network" GRE tunnel to a WAN
- *add (router-wan) nat bypass*
  Add subnets to the list of source addresses that will not be subject to NAT translation when passing though a NAT enabled WAN interface
- *add (router-wan) static*
  Add static elements on the specified WAN interface
- *clear (router) ip address table*
  Flush the learned entries from the IP address table for the specific interface from the specified router card
- *clear (router) log*
  Clear the CMG event log on the CMG Router card
- *clear (router) mac address table*
  Flush the learned entries from the MAC address table for the specific interface from the specified router card
- *clear (router) mgcp stats*
  Set all MGCP statistic counts to zero on the CMG Router card
- *connect (router-trunk) (t1)*
  Creates two-way connections between the router port trunk connections and any DS0 channels of the service card or controller

- *connect (card-trunk) (card-trunk)*
  Configure card-to-card WAN cross-connects between two Router cards or between a Router card and a V.35 card

- *connect (router-voice) (t1|fxs)*
  Creates two-way connections between the CMG voice channels and DS0 channels of and FXS or T1 service card or Controller T1

- *delete (router) dns proxy*
  Remove a remote DNS server address from the specified router card

- *delete (router) remote*
  Delete a remote WAN profile from the WAN profile table

- *delete (router) snmp community*
  Delete an SNMP community entry

- *delete (router) snmp trap*
  Delete a trap destination from the router card

- *delete (router) static dns host*
  Delete a static DNS host record

- *delete (router) uploaduser*
  Remove an existing authorized uploaduser

- *delete (router-lan) filter*
  Remove a a single filter rule from the table of Layer 2 filters applied to the specified LAN interface

- *delete (router-lan) secondary ip address*
  Delete a secondary IP address and subnet to the specified LAN interface

- *delete (router-lan) static*
  Remove a static elements from the specified LAN interface

- *delete (router-wan) firewall*
  Remove a firewall rule from a WAN

- *delete (router-wan) gre network*
  Remove a "by network" GRE tunnel to a WAN

- *delete (router-wan) nat bypass*
  Delete an IP subnet or host from the list of source addresses that will not be subject to NAT translation when passing though a NAT enabled WAN interface

- *delete (router-wan) static*
  Remove a static element from the WAN interface

- *disconnect {slot:port:trunk}*
  Removes a connection created by the connect {trunk-addr}{t1-addr}

- *install (slot) router*
  Will prepare the controller for the insertion of a new router card that will keep its currently loaded configuration

- *load tftp*
  Will download software via TFTP to the Controller or the Router card

- *rename (router) (router-wan/lan)*
  Change the name of a remote WAN or local LAN profile on the Router card

- *reset (router)*
  Reboot the Router. All new configuration since the last configuration will be in-use

- *rtrping*
  Router will perform a ping test and report the result.

- *set (router) autologout*
  Set the period of time on inactivity after which the user will be automatically logged-out of a Telnet session

- *set (router) cdr*
  Enable/disable Call Detail Recording (CDR) for the CMG card

- *set (router) compander*
  Set the companding algorithm to use with the PCM (G.711) voice stream to/from the TDM side of a connection

- *set (router) default*
  Reset the Router card to its default configuration settings

- *set (router) dhcp*
  Configure the DHCP functions

- *set (router) dns*
  Set the CMG Domain Name Server (DNS) options

- *set (router) enhanced security*
  Enable/disable enhanced login security on the Router

- *set (router) hookflash*
  Specify the flash maximum time

- *set (router) lmi*
  Specify the Local Management Interface (LMI) protocol to use for the Router
- *set (router) log*
  Set password access on the Router card (access level, password)
- *set (router) login auth*
  Sets how login authentication for this router should be performed
- *set (router) login prompt*
  Enable/disable the suppression of the Router login prompt for a user that telnets in from the Controller CLI
- *set (router) mgcp*
  Set Media Gateway Call Protocol (MGCP) parameters
- *set (router) ntp*
  Set Network Time Protocol (NTP) parameters
- *set (router) password*
  Manage password access on the specified Router card
- *set (router) ppp auth*
  Configure the PPP (Point-to-Point Protocol) authentication
- *set (router) ppp security*
  Set the local external security server that the router will use to authenticate remote PPP devices
- *set (router) priority tos*
  Configure parameters that will be used to recognize routed voice packets which will be handled with higher priority over other routed data
- *set (router) proxy*
  Enable/disable proxy ARP mode
- *set (router) reboot*
  Set automatic reboot after an upload of code or configuration file
- *set (router) rip*
  Specify version of RIP packets to transmit and receive
- *set (router) snmp*
  Set the SNMP contact, location, name and statistics averaging interval

- *set (router) stp*
  Configure the Spanning Tree Protocol on the router
- *set (router) syslog*
  Configure the Router to send alarm and event messages to a Syslog server
- *set (router) voip*
  Set the Voice Over IP (VoIP) parameters
- *set (router-lan) collision*
  Configure collision alarms
- *set (router-lan) filter forward*
  Specify the forwarding mode for Layer 2 filters on the LAN interface
- *set (router-lan) framing*
  Specify which ethernet frame types are supported on the LAN interface
- *set (router-lan) gateway*
  Specify a default IP gateway for the specified LAN interface
- *set (router-lan) ip address*
  Specify an IP address for the specified LAN interface
- *set (router-lan) ipx network*
  Specify an IPX network numbers for the four IPS LAN frame types
- *set (router-lan) phy*
  Specify the ethernet PHY (physical specifications) speed and mode.
- *set (router-lan) rip*
  Specify IP RIP for the LAN interface
- *set (router-lan) stp*
  Configure the Spanning Tree Protocol on the LAN interface
- *set (router-lan) up/down*
  Set the LAN interface up or down.
- *set (router-trunk) encapsulation*
  Specify the encapsulation to use on the Router interface
- *set (router-trunk) multilink group*
  Specify that a trunk is part of a multilink PPP group
- *set (router-trunk) up/down*
  Set the Router trunk up or down

- *set (router-trunk) voice bandwidth limit*
  Set percentage of bandwidth on the trunk that is reserved for routed or bridged data
- *set (router-voice) algorithm preference*
  Specify the list of voice coding algorithms to be supported for VoIP calls
- *set (router-voice) cpd*
  Configure how calling party disconnect should be signaled to an endpoint
- *set (router-voice) default*
  Specify the list of voice coding algorithms to be supported for VoIP calls
- *set (router-voice) dtmfrelay*
  Specify the encapsulation to use on the Router interface
- *set (router-voice) echo cancellation*
  Enable/disable echo cancellation
- *set (router-voice) echo tail*
  Set the maximum time between the signal and its echo
- *set (router-voice) endpoint prefix*
  Set the prefix and suffix of the MGCP endpoint names
- *set (router-voice) log start*
  To start logging events to the CMG text log
- *set (router-voice) log stop*
  To stop logging events to the CMG text log
- *set (router-voice) rxgain*
  Set gain on receive side for voice channel
- *set (router-voice) silence*
  Enable/disable silence suppression
- *set (router-voice) slash*
  Suppresses the implied slash "/" between the endpoint prefix and suffix
- *set (router-voice) tos*
  Set gain on transmit side for voice channel
- *set (router-voice) txgain*
  Set the gain on the transmit side (TDM-to-packet) voice path
- *set (router-voice) up*
  Set the specified voice channel up or down

- *set (router-wan) dlci*
  Configure the DLCI for a specified WAN interface that will be using a frame relay encapsulated trunk
- *set (router-wan) gre*
  Configure the GRE tunneling for a specified WAN interface
- *set (router-wan) ip*
  Set the IP traffic handling on the WAN interface
- *set (router-wan) ip address*
  Set the IP address for a WAN interface
- *set (router-wan) ipx*
  Set the IPX traffic handling on the specified WAN interface
- *set (router-wan) nat*
  Configure Network Address Translation (NAT) on a specified WAN interface
- *set (router-wan) other*
  Set the traffic handling of protocols other than IP or IPX on the specified WAN interface
- *set (router-wan) ppp*
  Configure the PPP (Point-to-Point Protocol) on the specified router card
- *set (router-wan) rip*
  Set the type or RIP updates on the WAN interface
- *set (router-wan) stp*
  Configure the Spanning Tree Protocol on the specified WAN
- *set (router-wan) trunk*
  Configure the trunk port for a specified WAN interface
- *set (router-wan) up/down*
  Set the specified WAN interface up or down
- *show (router)*
  Displays the current Router settings
- *show (router) dhcp*
  Displays the current DHCP settings for the Router
- *show (router) dns*
  Displays the current DNS setup for the router card

- *show (router) dns proxy*
  Displays the current DNS Proxy setup for the router card
- *show (router) lmi*
  Displays the current Local Management Interface (LMI) settings
- *show (router) log*
  Displays the logging configuration of the CMG router card
- *show (router) mgcp*
  Displays the setting for MGCP options
- *show (router) mgcp algorithmname*
  Displays the designations for coding algorithms
- *show (router) ntp*
  Displays the settings for NTP options
- *show (router) ppp*
  Displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the router
- *show (router) rip*
  Displays the current RIP settings for the Router
- *show (router) snmp*
  Displays the current SNMP settings for the Router
- *show (router) stp*
  Displays the current Spanning Tree Protocol settings for the router
- *show (router) syslog*
  Displays the current Syslog setup for the router
- *show (router) uploaduser*
  Displays the current list of users allowed to upload and download configuration and code files
- *show (router) voip*
  Displays the current settings for all VOIP parameters
- *show (router-lan)*
  Displays the settings for the router card
- *show (router-lan) collision*
  Displays the current LAN collision alarm settings for the router

- *show (router-lan) filter*
  Displays the current LAN Layer 2 data filters applied to the LAN on the router

- *show (router-lan) static*
  Displays the current list of static entries for the LAN on the router

- *show (router-lan) stp*
  Displays the current Spanning Tree Protocol settings for the LAN interface

- *show (router-voice)*
  Displays the CMG voice line provisioning

- *show (router-wan)*
  Displays the current configuration settings for the specified WAN interface

- *show (router-wan) firewall*
  Displays the current firewall filter settings for the specified WAN interface

- *show (router-wan) nat bypass*
  Displays the current list of NAT bypass entries for the WAN interface

- *show (router-wan) ppp*
  Displays the current PPP (Point-to-Point Protocol) settings for the specified WAN interface

- *show (router-wan) static ip address*
  Displays the current list of static IP address entries for the specified WAN interface

- *show (router-wan) static ip network*
  Displays the current list of static IP network entries for the specified WAN interface

- *show (router-wan) static ipx network*
  Displays the current list of static IPX network entries for the specified WAN interface

- *show (router-wan) static mac address*
  Displays the current list of static IP MAC network entries for the specified WAN interface

- *show (router-wan) static nat address*
  Displays the current static NAT address entries for the specified WAN interface

- *show (router-wan) stp*
  Displays the current Spanning Tree Protocol settings for the specified WAN interface
- *show (router-wan) trunk*
  Displays the current trunk assignment for the specified WAN interface
- *show (wan)*
  Displays the current WAN settings for the Router
- *status (router)*
  Displays the current Router status information
- *status (router) alarms*
  Displays the current alarm log from the router
- *status (router) channels*
  Displays a condensed status report of all voice channel endpoints
- *status (router) dns*
  Displays the current state of the DNS resolver and entries in the DNS cache
- *status (router) events*
  Displays the current event log from the router
- *status (router) ip address table*
  Displays the current IP address table for the specified Router
- *status (router) ip network table*
  Displays the current table of learned IP Networks for the specified interface on the router card
- *status (router) ipx network table*
  Displays the current table of learned IPX Networks for the specified interface on the router card
- *status (router) ipx server table*
  Displays the current table of learned IPX Servers for the specified interface
- *status (router) log*
  Displays the current log of all CMG events
- *status (router) mac address table*
  Displays the current table of learned MAC Addresses for the specified interface on the router card

- *status (router) mgcp*
  Displays the current table of counts of all MGCP sent and received return codes, internal errors and other statistics

- *status (router) performance*
  Displays the current runtime statistics from the specified router

- *status (router) stp*
  Displays the current Spanning Tree state from the specified router

- *status (router-lan)*
  Displays the current Router status information

- *status (router-trunk)*
  Displays the current status information for the specified Trunk on the router

- *status (router-voice)*
  Displays the current status of service, calls signaling, connections, call agent communications and telephony statistics for a CMG router voice channel

- *store*
  Save a software file from a defined slot to a defined location on a PC, via TFTP

- *telnet (router)*
  Establish a Telnet session from the Compact T1 CLI to the Router port user interface

Connector Pinout

Ethernet

The pinout for the RJ-48C (female) connector on the front of the card is as follows:
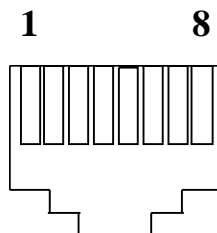
1   8

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4	N/C	Not connected
5	N/C	Not connected
6	Transmit -	Transmit to network
7	N/C	Not connected
8	N/C	Not connected

Softswitch Interoperability Settings

BroadSoft™

To configure interoperability with the BroadSoft BroadWorks™ Service Delivery Platform, the following equipment is required:

- Compact T1, Version 4.0
- CMG Router, Version 1.0
- BroadSoft BroadWorks Version 6.01.119 (for MGCP 1.0)
  Note: a *Device_Inventory Patch* must be obtained from BroadSoft to enable the correct setup with an Compact T1.

Codecs

It is recommended that only the following CMG Algorithms be used:

- G711mu
- G711a

In addition to limiting use to these algorithms, the order of the algorithm preference should be the same in the BroadWorks Applications Server, Media Server and the Compact T1.

Compact T1 Settings

Interoperability Settings on the Adit should be as follows:

Note: Piggybacking and Quarantine are the only two fields that are not set to defaults.

```
> show 4 mgcp
SLOT 4:
MGCP Settings for CMG:
  Activation, Addressing, and Transactions:    (set to the IP Address or
    MGCP State:                   Down          the Domain Name of
    Call Agent IP Address:        0.0.0.0       the BroadWorks
    Call Agent Domain Name:       (not applicable)Application Server)
    Call Agent MGCP Port:         2727
    Gateway MGCP Port:            2427
    MGCP Gateway ID:              Default
    Response Timeout (ms):        3000
    Max Retries:                  3

  Interoperability Settings:
    Version:                      IETF 1.0
    Hookswitch Reporting:         Always
    Default IETF Event Package:   D
    Piggybacking:                 Enabled
    Address Format:               Brackets
    Dialstring Format:            Commas
    SDP Mode:                     Full
    Parse Mode:                   Lenient
    Quarantine:                   Loop Process

  Voice Algorithm Names for Local Connection Options (LCO):

    CMG Algorithm ID             MGCP LCO Name
    g711mu
    g711a
    g726_16
    g726_24
    g726_32
  g726_40
```

LEDs

The following chart describes each LED, and it's state, of the Router card.

LED	State	Description
CRD	Off	Loss of power
	Green	No current alarms
	Red	Alarm state active. See alarm log for cause
	Red Flashing	Self-test or Boot in-process
	Yellow Flashing	Card is saving data to flash RAM, do not power down
VOIP	Off	No active VoIP calls or if the MGCP protocol is optioned **down**
	Green	Active VoIP calls
	Red	Call agent unreachable
	Yellow	Insufficient VoIP resources to complete call
LNK	Off	No ethernet link
	Green	Good ethernet link
10/100	Off	10 Mb ethernet
	Green	100 Mb ethernet
TX	Off	No ethernet transmit activity
	Green	Ethernet transmit activity
	Yellow	Current ethernet transmit collision
RX	Off	No current ethernet receive activity
	Green	Current ethernet receive activity

CHAPTER 15

V.35/V.54 Cards

In this Chapter

- Overview
  - V.35 Service Card
  - V.35/54 Service Card
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - LEDs
- Cables
- Connector Pinouts
  - V.35 DCE (DB-26)

Overview

V.35 Service Card

The V.35 Service card enables service providers and enterprise network managers to provision connectivity to high-speed serial synchronous Data Terminal Equipment (DTE) devices such as routers, Frame Relay Access Devices (FRAD) and video conferencing equipment.

The V.35 Service card provides scalable high-speed data service capacity to grow with user needs. Up to six V.35 cards can be inserted into any slot of the Compact T1 Customer Service Terminal, providing up to 12 fractional T1 V.35 connections from two T1 network connections. Two Adit Quad T1 Network Access/Drop-and-Insert cards allow eight T1s with full T1 CSU/DSU functionality to be terminated to eight V.35 ports in a single Compact T1. The Adit's digital cross-connect functionality offers service grooming, T1 drop-and-insert, and voice access integration that are not available in traditional CSU/DSU offerings.

Each V.35 port supports any n x 56/64 Kbps rate up to 1.536 Mbps. Both ports may operate simultaneously at any supported speed. Flexible clocking allows loop timing from any T1 line and provide system clocking to the connected DTE, supporting a wide range of data networking applications.

Local and remote management options for the V.35 cards are available through the Compact T1 Controller. The cards can be locally configured and managed using CLI.

V.35/54 Service Card

Additionally, each V.35 port supports V.54 loopback test capabilities. This feature enables V.54 loopback pattern recognition, generation and timing control to troubleshoot service from the network or the end device to the V.35 electrical interface. Four standard Bit Error Rate Test (BERT) patterns and an error counter are provided for testing.

Features

- Provides any n x 56/64 Kbps data rate up to 1.536 Mbps on each port
- Supports full non-blocking cross-connection of all timeslots to any T1 access line
- Enables up to 12 V.35 ports may be equipped in a single Compact T1
- Allows a total of 24 V.35 ports to be equipped in two Compact T1, occupying only two rack units of equipment space in a 19-inch rack
- Includes integration of T1 CSU/DSU functionality and remote management capabilities
- Supports adaptation and transport over TDM facilities
- Integrates frame relay or private line V.35 services with voice and Internet access over T1 lines

Additional V.54 Features

- V.54 Loop Test capability

Technical Specifications

Controller Software Required

T1 Controller

- Release 1.2.2 or higher is required for the V.35 card
- Release 3.0 or higher is required for the V.35/V.54 card

Service Interface

- Two V.35 interfaces:
    - DCE to DTE pinout
    - Two sub-miniature DB-26 connectors
    - Adapters outlined below

Network Interface

- T1 TDM

Clocking

- Looped-timed from any T1 or ISDN BRI card installed
- Sources clock to the DTE device

Testing and Diagnostics (V.35/54 card)

- Addressable V.54 loop up and loop down (127-code) pattern generation/detection
- 2047, 215-1, 220-1 and QRSS Test Patterns with error counter

Power

- 2 W maximum

Regulatory Approvals

USA

- UL60950
- FCC Part 15, Class A
- NEBS Level 3 for type 2 and 4 equipment
  GR-63-CORE, GR-1089-CORE

Canada

- CSA C22.2 No. 60950-00
- ICES-003, Class A

Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)
                8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 4.6 oz. (0.13 kg)

For information on Compact T1 Environment required, see *Installation Environment on page 2-2.*

Accessories

Sub-miniature DB-26 to Winchester adapter cables are required to interface DTE with the Dual V.35 card. Gender refers to the Winchester connector. One cable per port.

- P/N 005-0008 V.35 Male 10 Ft. (3.05 m) cable
- P/N 005-0009 V.35 Male 25 Ft. (7.62 m) cable
- P/N 005-0010 V.35 Male 50 Ft. (15.24 m) cable
- P/N 005-0011 V.35 Female 10 Ft. (3.05 m) cable

Card Configuration

The V.35 Service cards can be configured, using the Command Line Interface (CLI).

CLI Commands

The following commands are used to configure the V.35 Service cards. For detailed information on these commands, see *Chapter 5, CLI Commands.*

- *connect*
  Creates two-way connections between channels.

- *disconnect*
  Removes a connection created by the connect command.

- *set (v35)*
  Setup of channels of a V.35 card (clock, clear to send, data, equipment, line, receive clock invert, speed, transmit clock invert).

- *set (v54)*
  Set the V.54 loopback test parameters.

- *show (v35)*
  Displays the current settings for V.35 (clear to send, timing, Rx clock inversion, Tx clock inversion, data inversion, data speed, data rate, loopback)

- *show (v54)*
  Displays the current settings for V.54 (CTS, timing, Rx clock inversion, Tx clock inversion, data inversion, data speed, data rate, Rx LB, Rx Addr, test address, Tx Prep count, Rx Prep count, test pattern, ignore ACK, loopback)

- *status (v35)*
  Displays the current status of the specified V.35 (data terminal ready, request to send, data carrier detect, clear to send, data set ready).

- *status (v54)*
  Displays the current near-end line status of the specified V.54 (DCD, CTS, DSR, RTS, DTR, BERT).

LEDs

Each V.35 port has its own LED, as shown in the table below.

State	Description
Off	No T1 Assignment
Green	Normal (CD/RTS) Active
Red	CD inactive (T1-side failure)
Yellow	RTS inactive (equipment-side failure)
Flashing Yellow	Loopback toward T1 or equipment loop test
Flashing Green	Loopback toward equipment or network loop test

Cables

Depending on your application, you will need to purchase one or more of the available V.35 data cables:

Part Number	Description	Notes
005-0014	V.35 Female 10-foot cable	These cables are used to provide the V.35 DCE interface on a male connector to typical DTE applications. Order one cable per V.35 port.
005-0068	V.35 Female 25-foot cable	
005-0069	V.35 Female 50-foot cable	
005-0010	V.35 Male 50-foot cable	V.35 data cables with male connector for connecting a router with a female V.35 Winchester connector or other data equipment to a Compact T1 V.35 data port (sub-miniature DB-26). Order one cable per V.35 port.
005-0009	V.35 Male 25-foot cable	
005-0008	V.35 Male 10-foot cable	
005-0189	DB-25 V.35 Female 50-foot cable	These cables are used to provide a DB-25 DCE V.35 female interface for connection to a male DB-25 DTE V.35 interface. Order one per port.
005-0188	DB-25 V.35 Female 25-foot cable	
005-0187	DB-25 V.35 Female 10-foot cable	
005-0186	DB-25 V.35 Female 6-foot cable	

These cables can be purchased at a licensed distributor.

Connector Pinouts

V.35 DCE (DB-26)

The V.35 DCE data port connection is made at the sub-miniature DB-26 connector on the Compact T1 using the 10-foot, 25-foot, or 50 foot DTE V.35 cable equipped with a sub-miniature DB-26 connector and a 34-pin Winchester connector.

This cable is used to connect the Compact T1 V.35 DCE data ports to synchronous V.35 DTE data sources up to 1.536 Mbps, all rates (1-24) Nx56 or Nx64 channel-rate progression.

The V.35 data cables are built according to the pin assignments listed below:

Sub-miniature DB-26	Signal	Winchester 34-pin (female)	Paired Signals
1 (+ Shield)	← Protective Ground →	A	]
7	← Signal Ground →	B	
2	← Transmit Data A —	P	]
14	← Transmit Data B —	S	
3	— Receive Data A →	R	]
16	— Receive Data B →	T	
4	← RTS —	C	]
20	← DTR —	H	
5	— CTS →	D	]
6	— DSR →	E	
12	— Test Mode →	K	]
8	— CD (RLSD) →	F	
11	← External Clock A —	U	]
24	← External Clock B —	W	

Sub-miniature DB-26	Signal	Winchester 34-pin (female)	Paired Signals
10	— Xmit Clock A →	Y	]
23	— Xmit Clock B →	AA	
15	— Receive Clock A →	V	]
17	— Receive Clock B →	X	
22	← Local Loopback —	J	]
25	← Remote Loopback —	BB	
9, 13, 18	Open Pins/No Contact	L, N, NN	
19, 21, 26	Open Pins/No Contact		

CHAPTER 16

Maintenance

In this Chapter

- Software Upgrade
  - Minimum Version Levels
  - Determining Boot Code Software Level
  - Upgrading System and Router Software via TFTP
  - Upgrading System and Router Software via TFTP using Proxy
  - Upgrading Software Levels via X-Modem
- Backup Controller Configuration
  - Save Controller Configuration
  - Load Controller Configuration
- Replace Controller Card
- Hot Swap Service Card

Software Upgrade

Minimum Version Levels

Before starting a software upgrade, you must ensure that the Commpact T1 unit has the correct software and hardware versions. The first set of instructions below show how to determine the boot software version level in the unit. This is the simplest way to confirm these versions.

Determining Boot Code Software Level

1. Start a CLI session on the Commpact T1 using a terminal emulation program or via Telnet.

2. After login, type **status equipment** at the CLI prompt.
   A message similar to the following should appear:

```
> status equipment
BootCode Version:   1.18


        CardType     Status          SW Vers
        --------     ------          -------
SLOT A   T1x2        Present           1.4
SLOT 1   FXSx8         Not           resent
SLOT 2   FXSx8       Present          1.09
SLOT 3   T1x4        Present          1.36
SLOT 4   BRIx4       Present          1.00
SLOT 5   T1x4        Present          1.36
SLOT 6   FXSx8       Present          1.09
```

The BootCode Version must be at least 1.04. If it is less, contact Customer Servicce for a required hardware upgrade.

Upgrading System and Router Software via TFTP

1. Login to the Commpact T1, using a terminal emulation program or via Telnet.

2. Enter: **load [slot] tftp {ip-addr} "file-name"**
   where **[slot]** = the slot number of a router card. If no slot number is listed, the file is loaded to the Controller.
   {ip-addr} = the IP address of the host device holding the downloadable software
   "file-name" = the software file name, including path, if needed. Enclosed in quotes. Example: "**c:\unit_sw\tdm4_0_z_all.mgm**".

   This example loads **tdm4_0_z_all.mgm** via tftp from the C drive and **unit_sw** subdirectory. The path information must be provided.

   The tftp utility provideds with the downloadble software must also be running, **in the same directory** as the software file.

3. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.

4. Re-establish communication with the CLI using a terminal emulation program or Telnet. Check all configurations and system operation.

Upgrading System and Router Software via TFTP using Proxy

Required: - Router Service card (IP or CMG) release 1.32 or higher
         - Controller software 3.2 or higher
         - Ethernet cable connected to port on front of Router card

1. Set up the Proxy with the following commands
   ```
   set ethernet ip address {ip-addr} [mask]
   set {rtr_lan-addr} ip address {ip-addr} [mask]
   set {rtr_card-addr} proxy enable {ip-addr} [mask]
   set ip gateway {ip-addr}
   ```

   Example: (example with router in slot 3)
   ```
   set ethernet ip address 10.0.0.1 255.0.0.0
   set 3:1 ip address 192.168.100.1/24
   set 3 proxy enable 192.168.100.80/24
   set ip gateway 192.168.100.80
   ```

NOTE: See *Chapter 5, CLI Commands* for more information on these commands.

1. Login to the Compact T1 using the Proxy IP address, (example: 192.168.100.80) using a terminal emulation program or via Telnet.

2. Enter: **load [slot] tftp {ip-addr} "file-name"**
   where **[slot]** = the slot number of a router card. If no slot number is listed, the file is loaded to the Controller.
   {ip-addr} = the IP address of the host device holding the downloadable software
   "file-name" = the software file name, including path, if needed. Enclosed in quotes. Example: "**c:\unit_sw\tdm4_0_z_all.mgm**".

   This example loads **tdm4_0_z_all.mgm** via tftp from the C drive and **unit_sw** subdirectory. The path information must be provided.

   The tftp utility provided with the downloadble software must also be running, **in the same directory** as the software file.

3. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.

4. Re-establish communication with the CLI using a terminal emulation program or Telnet. Check all configurations and system operation.

Upgrading Software Levels via X-Modem

1. Login to the Compact T1.

2. Enter: **load xmodem** to download the application from the binary file. This will start the system looking for an xmodem download. The Commpact T1 will prompt you to send the file. Use one of the following methods:

Using HyperTerminal

- Pull down the **Transfer** menu
- Select **Send File** Provide the filename (and path if required), confirm that the xmodem protocol is used for the transfer, and start the download with the **Send** button
- A window will show the progress of the download.

Using Procomm

- Pull down the **File** menu
- Select **Connection Directory**
- Under the **Data** tab, use the **Basic Options** button to confirm that the xmodem protocol is used for file transfers
- Pull down the **Data** menu, select **Send File**, provide the filename, and start the download

Another Terminal Emulation Program

When using another terminal emulation program, confirm the use of xmodem protocol at 9600 baud, provide filename (and path) and initiate the download.

3. The binary file name is usually in the format: Adit.pkt. At 9600 baud, the file transfer will take approximately 20 minutes.

4. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.

5. Re-establish communication with the CLI using a terminal emulation program. Check all configurations and system operation.

Backup Controller Configuration

A text file from the current configuration can be generated to reload the in the event the configuration has been lost due to card or software problems. The download of the file, generated by the **print config** command, can be done by direct connect to the RS-232 port or via Telnet. The upload of the file from the PC back to theController can only be done via direct RS-232 connection. This is because the Controller will be at factory default and an IP address is not assigned to the Unit.

Save Controller Configuration

The following example is shown with a HyperTerm session, with Telnet selections in parenthesis, other programs may be used and the process is similar, however the menu selections may be different.

1. Start a HyperTerm session to an Commpact T1.

2. Type the CLI command **print config** and **do not** hit **[ENTER]**.

3. Type select **Transfer/Capture Text** from the drop-down menu.
   (Telnet - **Terminal/Start Logging**)

4. Name the file, select **OK**.

5. Return to the CLI command **print config** and hit **[ENTER]**.
   This process will exclude the **print config** command itself, from the configuration file you are creating.

6. (Telnet - Select **Terminal/Stop Logging**).

7. Save configuration file as a .txt file, if necessary (Telnet will create a .log file, which will need to be "saved as" a .txt file).

Load Controller Configuration

1. Open HyperTerm session with the Commpact T1 unit.

2. In HyperTerm, select **File/Properties/Settings/ASCII Setup**.
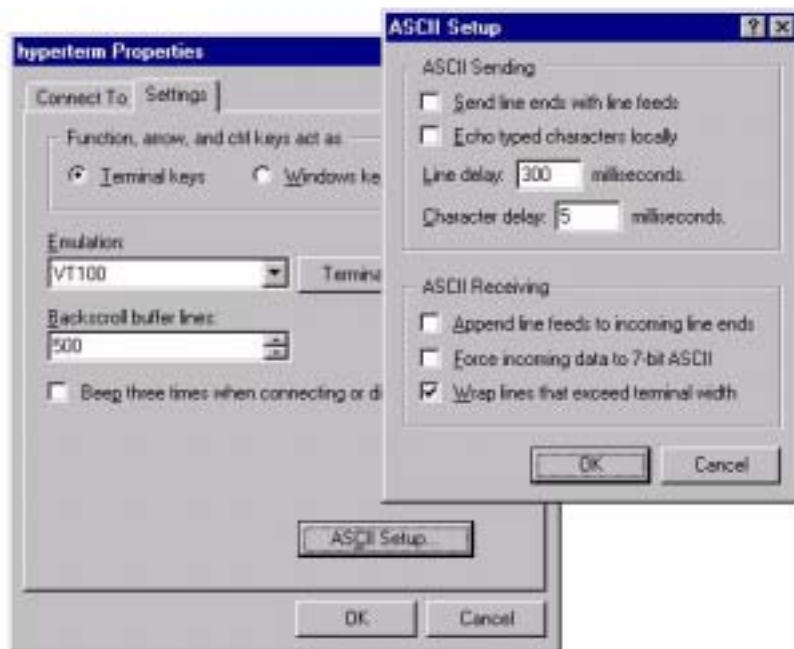
3. Set the **Line delay to 300 ms** and the **Character delay to 5 ms**.

4. Select **OK** to save ASCII Setup and **OK** to save HyperTerm Properties.

5. Select **Transfer/Send Text File**.

6. Select .txt file from previous steps.

7. Click **Open**.

8. Configuration will load.

Replace Controller Card

It is not necessary to power down a unit to replace a Controller, however if you would
like to load the configuration file to the new Controller card you **must** backup the
configuration file before this process.

1. Backup Controller Configuration, see *Save Controller Configuration on page 16-7.*

2. Remove Controller card, gently slide the Service card straight out of the slot.

3. Replace Controller card, gently slide the new Service card into the empty slot.

4. Ensure that the new card is seated firmly into the connector at the back of the unit.

5. Load Controller Configuration, see *Load Controller Configuration on page 16-8*

Hot Swap Service Card

To Hot-Swap (replace) a service card while the unit is powered on, follow the steps
below:

1. Gently slide the Service card straight out of the slot.

2. Gently slide the new Service card into the empty slot.

3. Ensure that the new card is fastened securely into the connector at the back of the unit.

APPENDIX A

SNMP Interface

In this Appendix

- Overview
- SNMP Basics
- Enterprise MIB Support
- Router Enterprise MIB Support
- Public MIB Support
- Router Public MIB Support
- SNMP Trap Reports

Overview

The Simple Network Management Protocol (SNMP) enables network operations centers (NOCs) to monitor and manage network elements across an internetwork. The Commpact T1 supports SNMP through its Ethernet port, which provides access to the carrier's TCP/IP management network.

SNMP Basics

SNMP is a mechanism for managing TCP/IP networks. It works by exchanging information between an SNMP Manager and an SNMP Agent.

MIB Structure

The SNMP Agent displays network information in a Management Information Base (MIB). MIBs are machine-to-machine interfaces that arrange and present information according to industry standards such as RFC 1213. MIBs are tree-like structures comprising nodes and leaves. Nodes are branch points used to divide information into categories. Leaves have object values that can be examined and changed. Common MIB objects include system names, performance statistics, and control values.

Control values are typically Integer types. This enables the object's value to represent a specific control selection. Selections are usually written in the "name(value)" format. For example, the selection "closed(1)" means that the "closed" state is indicated by a value of "1".

Enterprise MIB Support

This release is with full SNMPv1 and SNMPv2c support. Enterprise MIBs are defined using only SMIv2 (as noted in the table).

Enterprise MIB Name	Enterprise MIB Filename
CARRIERACCESS-GENERIC- MIB	carrieraccess-generic.mib
CARRIERACCESS-TC-MIB	carrieraccess-tc.mib
CAGEN-GENERIC-MIB	cagen-generic.mib
CAGEN-SLOT-MIB	cagen-slot.mib
CAGEN-SYSTEM-MIB	cagen-system.mib
ADIT600-SYSTEM-MIB	adit600-system.mib
CAGEN-ALARM-MIB	cagen-alarm.mib
CAGEN-EVENT-MIB	cagen-event.mib
CAGEN-TRAPS-MIB	cagen-traps.mib
CAGEN-DS0-MIB	cagen-ds0.mib
CAGEN-DS1-MIB	cagen-ds1.mib
ADIT600-DS1-MIB	adit600-ds1.mib
ADIT600-TDM-DS1-MIB	adit600-tdm-ds1.mib
CAGEN-FX-MIB	cagen-fx.mib
ADIT600-FX-MIB	adit600-fx.mib
CAGEN-V35-MIB	cagen-v35.mib
CAGEN-RS232-MIB	cagen-rs232.mib
CAGEN-BRI-MIB	cagen-bri.mib
ADIT600-TDM-ROUTER-MIB	adit600-tdm-router.mib
CAGEN-PPHONE-MIB	cagen-pphone.mib
CAGEN-OCUDP-MIB	cagen-ocudp.mib
CAGEN-IF-FACTORY-MIB	cagen-if-factory.mib

CAGEN-NTP-MIB	cagen-ntp.mib
CAGEN-SYSLOG-MIB	cagen-syslog.mib
ADIT600-TDM-CMG-MIB	adit600-tdm-cmg.mib
CAGEN-CMG-MIB	cagen-cmg.mib
ADIT600-TDM-DEPRECIATED-OIDS-MIB	adit600-tdm-depreciated-oids.mib
SNMPV2-CONF-MIB	snmpv2-conf.mib
SNMPV2-SMI-MIB	snmpv2-smi.mib
SNMPV2-TC-MIB	snmpv2-tc.mib

Router Enterprise MIB Support

Enterprise MIB Name	Enterprise MIB Filename
Router Specific	
CAGENROUTER-MIB	caGenRouter.mib
CAGENROUTER-CARDPROFILE-MIB	caGenRouter-CardProfile.mib
CAGENROUTER-DNS-MIB	caGenRouter-DNS.mib
CAGENROUTER-FILTERS-MIB	caGenRouter-Filters.mib
CAGENROUTER-LANPROFILE-MIB	caGenRouter-LanProfile.mib
CAGENROUTER-MANAGEMENT-MIB	CAGenRouter-Mgt.mib
CAGENROUTER-NTTPPROFILE-MIB	caGenRouter-NTPProfile.mib
CAGENROUTER-REPORTS-MIB	caGenRouter-Reports.mib
CAGENROUTER-SPANTREE-MIB	caGenRouter-SpanTree.mib
CAGENROUTER-STATIC-MIB DEFINITIONS	caGenRouter-Static.mib
CAGENROUTER-TC-MIB	caGenRouter-tc.mib
CAGENROUTER-TRUNK-MIB	caGenRouter-trunk.mib
CAGENROUTER-WANPROFILE-MIB	caGenRouter-WanProfile.mib

CMG Specific	
ADIT-CMG-MIB	adit-cmg.mib
ADITCMG-CARD-MIB	adit-cmg-card.mib
ADITGENCMG-ALGO-MIB	aditGenCmg-algo.mib
ADITGENCMG-MGCP-MIB	aditGenCmg-mgcp.mib
ADITGENCMGCARD-TC-MIB	aditGenCmg-tc.mib
ADITGENCMG-TRUNK-MIB	aditGenCmg-trunk.mib
ADITGENCMG-VCHAN-MIB	aditGenCmg-vchan.mib
ADITGENCMG-VOIP-MIB	aditGenCmg-voip.mib
Common with Controller	
CARRIERACCESS-GENERIC-MIB	carrieraccess-generic.mib
CARRIERACCESS-TC-MIB	carrieraccess-tc.mib
CAGEN-GENERIC-MIB	cagen-generic.mib
CAGEN-SYSTEM-MIB	cagen-system.mib

Public MIB Support

MIB	Table	Comments
RFC1155 (RFC-1155-SMI-MIB)		
RFC1212 (RFC-1212-MIB)		
RFC1213 (RFC-1213-MIB)	system tcp interfaces udp ip snmp icmp	egp not supported
RFC1215 (RFC-1215-MIB)		
RFC1215-TRAP (RFC-1215-TRAP-MIB)		
RFC1659 (RFC1659-MIB)	rs232PortTable rs232SyncPortTable rs232InSigTable rs232OutSigTable	Supports V.35 Card Rs232AsnycPortTable not supported
RFC1907 (SNMPv2-MIB)	system sysORTable snmp	SMIv2 Extension of RFC1213
RFC2011 (IP-MIB)	ip ipAddrTable ipNetToMediaTable icmp	SMIv2 Extension of RFC1213
RFC2233 (IF-MIB)	ifTable ifXTable ifStackTable	IfTestTable, ifRcvAddressTable not supported
IANAifType-MIB	IANAifType	Used by RFC2233; no objects
RFC2493 (PerHist-TC-MIB)	Performance History TC	Defines textual conventions; no objects
RFC2494 (DS0-MIB, DS0BUNDLE-MIB)	dsx0ConfigTable dsx0ChanMappingTable dsx0BundleTable	Dsx0BondingTable not supported

RFC2495 (DS1-MIB)	dsx1ConfigTable dsx1CurrentTable dsx1IntervalTable dsx1TotalTable	Far End Tables and Fractional Table not supported
RFC2571 (SNMP-FRAMEWORK-MIB)	SNMP TC	Defines textual conventions1 no objects

Router Public MIB Support

MIB	Table	Comments
RFC1213 (RFC-1213-MIB)	system interfaces ip icmp tcp udp snmp	egp not supported
RFC1907 (SNMPv2-MIB)	system snmp	SMIv2 Extension of RFC1213 SysORTable not supported
RFC2011 (IP-MIB)	ip icmp	SMIv2 Extension of RFC1213. IpAddrTable not supported. Routing table and ipNetToMediaTable supported by Enterprise mibs.
RFC2233 (IF-MIB)	ifTable	IfTestTable, ifRcvAddressTable, ifXTable, ifStackTable not supported
RFC3291(RFC-3291-MIB) IANAifType-MIB	IANAifType	Used by RFC2233; no objects

SNMP Trap Reports

The Commpact T1 can send the following SNMP trap reports.

Standard Traps

Trap	Description	Test Method
authenticationFailure	Occurs when a bad community string is used.	Attempt a Get or Set using an invalid community string.
linkDown	Sent when a DS1 changes from an up (in-service) state to a down (out-of-service) state. It is not sent when a DS1 is set "down" by a manual command. Also sent when a DS1 is set up manually, if it is in an out-of-service state.	Disconnect an in-service DS1.
linkUp	Sent when a DS1 changes from a down (out-of-service) state to an up (in-service) state. It is not sent when a DS1 is set "up" by a manual command.	Connect a DS1 and put it into service.
coldStart	Sent whenever the SNMP agent is restarted as a result of a software reset or unit power-up.	Cycle the power off and on.

Enterprise Traps

Trap	Description	Test Method
caGenEventLogTrap	This trap is generated when an event has been logged into the device's Event Log. This trap contains 5 mandatory variable bindings and may contain up to 3 optional variable bindings. The mandatory variable bindings are caGenEventLogIndex, caGenEventSeverity, caGenEventCategory, caGenEventCode, and caGenEventDate. The optional variable bindings are caGenEventInfoParam1, caGenEventInfoParam2 and caGenEventAdditionalText. The optional variable bindings (if present) will always appear at the end of the variable binding list.	

APPENDIX B

Diagnostices & Troubleshooting

In this Appendix

- Alarms
- Logs
- Status and Performance
- Loopbacks Overview
  - DS1 Loopbacks
  - V.35 Loopbacks
  - V.35/V.54 Loop
  - V.54 Equipment Loopback
  - OCU-DP Loopbacks
- Router Diagnostics and Performance Tools

Alarms

Test Alarm

The Commpact T1 alarm functions can be manually tested using the following command for setting critical, major and minor alarms. Turning alarms on or off will produce alarm messages and log entries stating the alarm event was manually set/cleared by the user.

Syntax: `set alarms {critical|major|minor} {off|on}`

Identify Alarm

Alarm indicators

● LEDs - When an Alarm is triggered, the LED (labeled CRD) will display a red indicator light, which will stay on until the Alarm is cleared. The following is the LED information for the T1 Controller card. For LED infomation for the specific service card see the chapter for that card.

LED	State	Description
MAJOR	Off	No major alarms present
	Red	Major alarm present
MINOR	Off	No minor alarms present
	Yellow	Minor alarms present
LOCAL	Off	Remote mode (DIP switches disabled)
	Green	Local mode (DIP switches enabled)
ACO	Off	Normal mode. No alarms are being suppressed.
	Yellow	Alarm cutoff active. One or more active alarms suppressed.
T1-1 and T1-2	Off	Off line
	Green	Normal
	Red	Loss of Signal (LOS) detected
	Yellow	Bipolar Violation (BPV) detected
	Flashing Green	Loopback active
	Flashing Red	Loss of Frame (LOF) or Alarm Indication Signal (AIS) detected
	Flashing Yellow	Yellow alarm (Remote Alarm Indication) detected.

The following are hyperlinks to all the card LED information:

T1 Controller Card, LEDs

FXO Voice Card, LEDs

FXS Voice Card, LEDs

ISDN BRI Card, LEDs

OCU-DP Card, LEDs

Single Channel POTS Card, LEDs

Router (IP) Card, LEDs

Router (CMG) Card, LEDs

Terminal Server Router Card, LEDs

V.35/V.54 Cards, LEDs

Power Supply, 115 VAC LEDs

Display Alarms

Use the **alarms** command to display the active alarms. Each alarm is related to a particular address and has a severity category (major, minor, critical, alert). The report can be filtered by port address and/or severity.

Syntax: `alarms [slot|slot:port|slot:port:channel] [category] [severity]`

```
> alarms
 Time      Date     Severity Description
  07:35:45 01/04/2002 Major     Test Major Alarm
  07:35:21 01/04/2002 Minor     Test Minor Alarm
  07:34:57 01/04/2002 Critical Test Critical Alarm
  07:30:39 01/04/2002 Major     1:1-OCUDP Out of Service
  03:50:55 01/04/2002 Major     1:1-OCUDP Loss of Signal
  00:00:20 01/01/2002 Major     4:1-CMG Ethernet Link Down
  00:00:20 01/01/2002 Major     5:1-RTR Ethernet Link Down
  00:00:05 01/01/2002 Major     A:2-DS1 Loss Of Signal
  00:00:05 01/01/2002 Major     A:1-DS1 Loss Of Signal
Total=10

    Category = bri|ds1|env|equipment|fxo|fxs|rtr|v35
    Severity = alert|critical|info|major|minor
```

Clear Alarm

Once an alarm is identified then the process of clearing it can begin.

- Silence Alarm, if necessary (Alarm Cut Off CLI command: **aco**)
- Check Connection
- Check Cable, replace if necessary
- Check hardware and replace if necessary
- Call Customer Service

Logs

Display the event log to view a log of all system events, or narrow the view to only display specific information.

Syntax: `log [slot|slot:port] [category] [severity]`

Example: `log`

```
     Time      Date     Severity  Description
   00:00:15 01/01/2002 Major     4:1-CMG Ethernet Link Down
   00:00:12 01/01/2002 Info      3-FXOx8 Card Detected
   00:00:12 01/01/2002 Info      2-FXS5Gx8 Card Detected
   00:00:06 01/01/2002 Major     A:2-DS1 Loss Of Signal
   00:00:05 01/01/2002 Info      4-CMGx1 Card Detected
   00:00:02 01/01/2002 Info      A-T1x2 Card Detected
   00:00:02 01/01/2002 Info      System Powerup
  Total=7


    Category = bri|ds1|env|equipment|fxo|fxs|rtr|v35
    Severity = alert|critical|info|major|minor
```

Status and Performance

The following status commands will display vital infomation regarding the system that will aid in troubleshooting. All commands listed below are hyperlinked to the CLI command.

status (bri)	**status (router) events**
status clock	**status (router) ip address table**
status (ds0)	**status (router) ip network table**
status (ds1)	**status (router) ipx network table**
status equipment	**status (router) ipx server table**
status equipment	**status (router) log**
status (fxo)	**status (router) mac address table**
status (fxs5G)	**status (router) mgcp**
status ipds0	**status (router) performance**
status (ocudp)	**status (router) stp**
status (ocudp) performance	**status (router-lan)**
status (ocudp) performance history	**status (router-trunk)**
status (router)	**status (router-voice)**
status (router) alarms	**status sessions**
status (router) channels	**status (v35)**
status (router) dns	**status (v54)**

Loopbacks Overview

A loopback test is a diagnostic procedure in which a signal is transmitted and returned to the sending device after passing through all or a portion of a network or circuit. The returned signal is compared with the transmitted signal in order to evaluate the integrity of the equipment or transmission path. The following are the Loopbacks available.

T1 Loopbacks

Card	Line	Equipment	Payload	CSU
Controller T1	Yes	No	Yes	Yes
Quad T1	Yes	Yes	Yes	Yes
V.35 T1	Yes	Yes	No	No
V.54 T1	Yes	Yes	No	No

OCU-DP Loopbacks

- Manual OCU Loopback
- Manual CSU Loopback
- OCU Latching Loopback
- CSU Latching Loopback
- DSU Latching Loopback
- DSU Non-Latching Loopback
- CSU Non-Latching Loopback
- OCU Non-Latching Loopback
- OCU Manual Loopback
- CSU Manual Loopback

DS1 Loopbacks

Note: T1 LEDs flash green during any DS1 loopback.

DS1 Line Loop

Loops at DS1 (at framer), signal not reframed. Have DS1 vendor check for framing/errors.
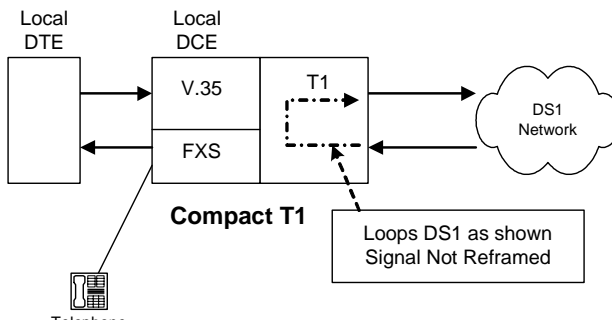
Enable Line Loopback

```
> set a:1 line loopup
OK
```

View Status of Loopback

DS1 Status

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:            Traffic
    Transmit:           Traffic
    Loopback:           LINE
```

Disable Line Loopback

```
> set a:1 line loopdown
OK
```

View Status of Loopback

DS1 Status

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:            Traffic
    Transmit:           Traffic
    Loopback:           OFF
```

DS1 Payload Loop

Loops at DS1 (in framer)
and reframes the T1.
Have DS1 vendor check
for framing/errors.
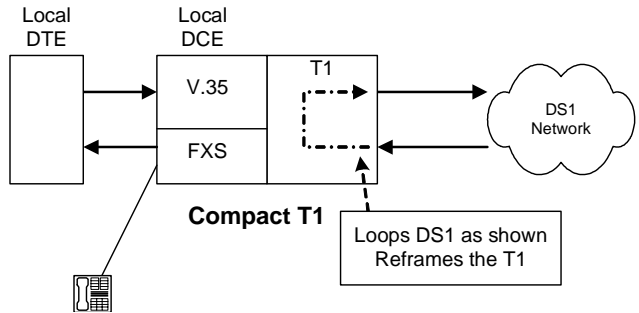
Enable Payload Loopback

```
> set a:1 payload loopup
OK
```

View Status of Loopback

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:            Traffic
    Transmit:           Traffic
    Loopback:           PAYLOAD
```

Disable Payload Loopback

```
> set a:1 payload loopdown
OK
```

View Status of Loopback

```
> status a:1
SLOT A:
Status for DS1  1:
    Receive:            Traffic
    Transmit:           Traffic
    Loopback:           OFF
```

Receiving DS1 CSU Loop

Causes a line Loopback. Loopup code sent by remote unit or network. Occurs at local DS1 CSU. Have DS1 vendor check for framing/errors.
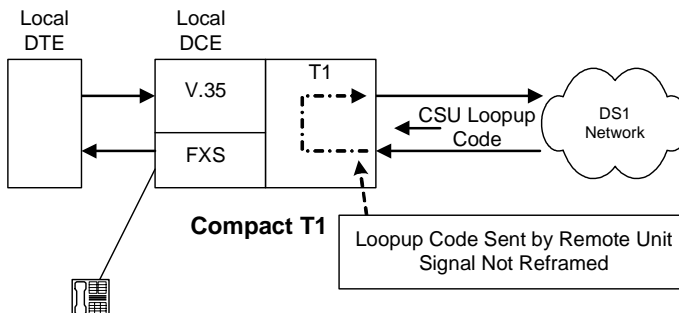
Enable Detection of CSU Loopcode

Enable detection of CSU loop code (10000 for loopup; 100 for loopdown).

```
> set a:1 loopdetect on
OK
```

View Status of Loopback

```
> show a:1
SLOT A:
Settings for DS1  1:
    Circuit ID:            DS1# A:1
    Up/Down:               UP
    Framing:               ESF
    Line Coding:           B8ZS
    Line Build Out:        DSX-1 EQUALIZATION FOR 0-133 ft.
(CSU 0dB)
    Loop Code Detection:   ON (Default)
    Loopback:              OFF
    FDL Type:              None
```

```
    Performance Threshold Settings          15 min.      1 day
    unavailable seconds:                       0           0
    severely errored seconds:                  0           0
    errored seconds:                           0           0
    sev. errored frame seconds:                0           0
    line errored seconds:                      0           0
    controlled slip seconds:                   0           0
    bursty errored seconds:                    0           0
    degraded minutes:                          0           0
    total linecode violations:                 0           0
    total pathcode violations:                 0           0


> status a:1
SLOT A:
Status for DS1  1:
    Receive:               Traffic
    Transmit:              Traffic
    Loopback:              LINE
```

DS1 Equipment Loop

Note: Quad T1 LED stays green during equipment loop. The DS1 Equipment Loopback is available on the Quad T1 card and is not available on the Controller card.
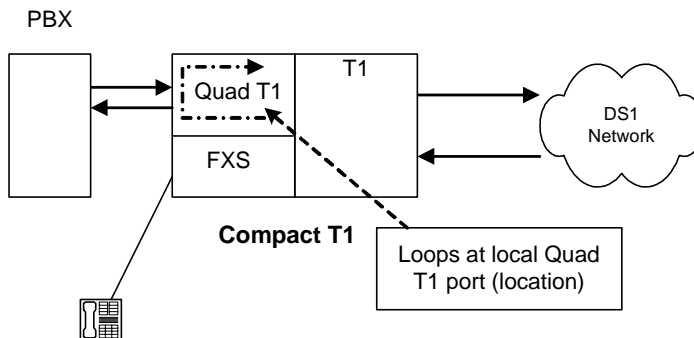
Enable Equipment Loopback

Where a Quad T1 card is in slot 5.

```
> set 5:1 equipment loopup
OK
```

View Status of Loopback

```
> show 5:1
SLOT 5:
Settings for DS1  1:
    Circuit ID:           DS1# 5:1
    Up/Down:              UP
    Framing:              ESF
    Line Coding:          B8ZS
    Line Build Out:       DSX-1 EQUALIZATION FOR 0-133 ft.
(CSU 0dB)
    Loop Code Detection:  ON
    Loopback:             EQUIPMENT
    FDL Type:             None

    Performance Threshold Settings       15 min.    1 day
```

```
unavailable seconds:                          0              0
severely errored seconds:                     0              0
errored seconds:                              0              0
sev. errored frame seconds:                   0              0
line errored seconds:                         0              0
controlled slip seconds:                      0              0
bursty errored seconds:                       0              0
degraded minutes:                             0              0
total linecode violations:                    0              0
total pathcode violations:                    0              0
```

Disable Equipment Loopback

```
> set 5:1 equipment loopdown
OK
```

View Status of Loopback

```
> show 5:1
SLOT 5:
Settings for DS1  1:
    Circuit ID:            DS1# 5:1
    Up/Down:               UP
    Framing:               ESF
    Line Coding:           B8ZS
    Line Build Out:        DSX-1 EQUALIZATION FOR 0-133 ft.
(CSU 0dB)
    Loop Code Detection:   ON
    Loopback:              OFF
    FDL Type:              None

    Performance Threshold Settings        15 min.      1 day
    unavailable seconds:                     0            0
    severely errored seconds:                0            0
    errored seconds:                         0            0
    sev. errored frame seconds:              0            0
    line errored seconds:                    0            0
    controlled slip seconds:                 0            0
    bursty errored seconds:                  0            0
    degraded minutes:                        0            0
    total linecode violations:               0            0
    total pathcode violations:               0            0
```

V.35 Loopbacks

```
Local          Local                                    Remote      Remote
DTE            DCE                                       DCE         DTE
        V.35        T1              T1         V.35
        
        Compact T1              Line          Compact T1       V.54
Equipment   Equipment          Loopback      Network          Loopback
Loopback    Unit                             Unit
```
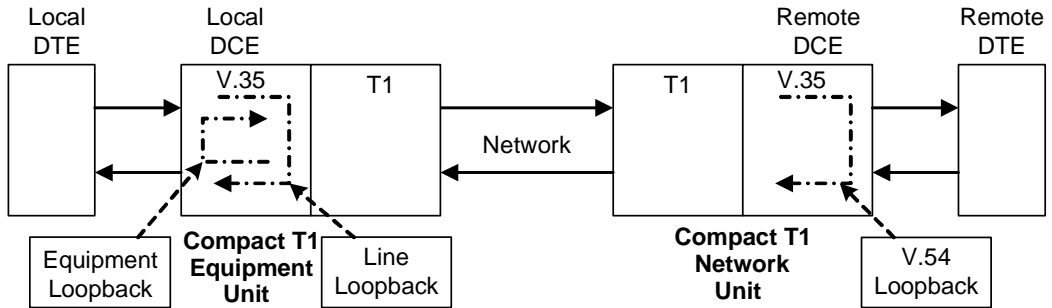
V.35 Line Loop

Note: V.35 LED flashes green during line loop.

Loop occurs at V.35 port. Check for sync and errors at local data port.

```
Local          Local
DTE            DCE
                    V.35         T1          DS1
                                             Network
               FXS
        Compact T1
                          Loop occurs at V.35
                          port (location)
```
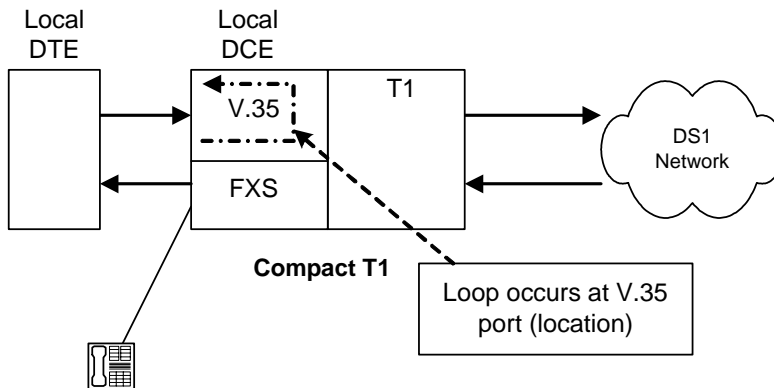
Enable Line Loopback

Where a V.35 card is in slot 6.

```
> set 6:1 line loopup
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:             Source
    Rx Clock Inversion: Normal
    Tx Clock Inversion: Normal
    Data Inversion:     Normal
    Data Speed:         64K
    Data Rate:          1536 K
    Loopback:           Line
```

Disable Line Loopback

```
> set 6:1 line loopdown
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:             Source
    Rx Clock Inversion: Normal
    Tx Clock Inversion: Normal
    Data Inversion:     Normal
    Data Speed:         64K
    Data Rate:          1536 K
    Loopback:           None
```

V.35 Equipment Loop

Note: V.35 LED flashes yellow during equipment loop.

Loops at local V.35 port. Check for sync and errors at remote data port, with or without BERT.
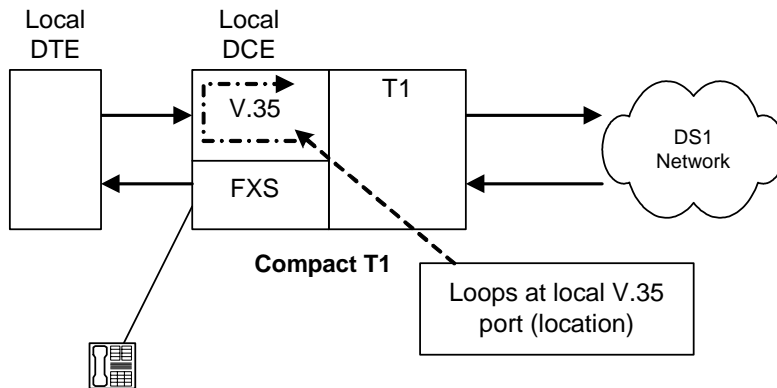
Enable Equipment Loopback

Where a V.35 card is in slot 6.

```
> set 6:1 equipment loopup
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                  Always High
    Timing:               Source
    Rx Clock Inversion:   Normal
    Tx Clock Inversion:   Normal
    Data Inversion:       Normal
    Data Speed:           64K
    Data Rate:            1536 K
    Loopback:             Equipment
```

Disable Equipment Loopback

```
> set 6:1 equipment loopdown
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:             Source
    Rx Clock Inversion: Normal
    Tx Clock Inversion: Normal
    Data Inversion:     Normal
    Data Speed:         64K
    Data Rate:          1536 K
    Loopback:           None
```

V.35/V.54 Loop

V.35/V.54 Service Card Description

The V.35 Card with V.54 Loop Test provides the capability for the V.35 card to detect network loop back initiation signals and provide a network loop back for loop testing. Each channel of the V.35 will continuously monitor the incoming data bit stream for a particular loop pattern. On detection of the pattern the channel will acknowledge the loop test request and put the channel into loop back. The channel will then continuously monitor for the loop test end pattern. On detection of the loop end pattern the channel will remove loop back and resume normal operation. Front panel LED's will indicate Loop test. Each channel can also initiate the loop test pattern causing another V.54 compatible device to loop back. The channel will then transmit a test pattern and calculate bit error rate (BER).

View V.35/V.54 Card Configuration

Where a V.35/V.54 card is in slot 6.

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                 Always High
    Timing:              Source
    Rx Clock Inversion:  Normal
    Tx Clock Inversion:  Normal
    Data Inversion:      Normal
    Data Speed:          64K
    Data Rate:           768 K
    V.54 Rx LB:          disabled
    V.54 Rx Addr:        255
    V.54 Test Addr:      255
    V.54 Tx Prep count:  15
    V.54 Rx Prep count:  15
    V.54 Test Pattern:   QRSS
    V.54 Ignore ACK:     OFF
    Loopback:            None
```

V.54 Loop

Note: Local LED flashes yellow, remote LED flashes green.

Transmit V.54 Loopup
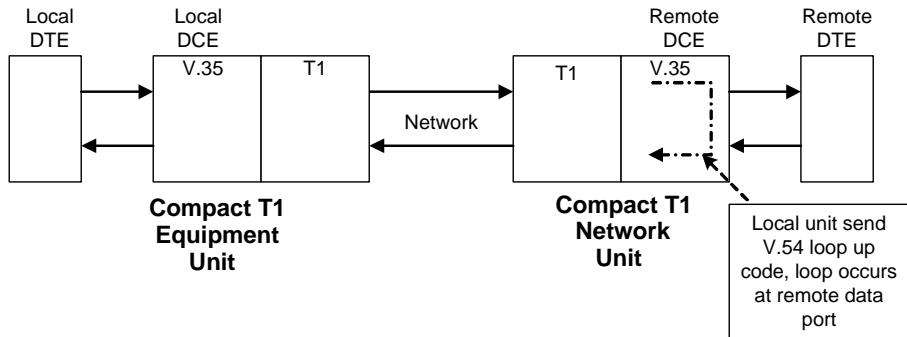
Receive V.54 Loopup
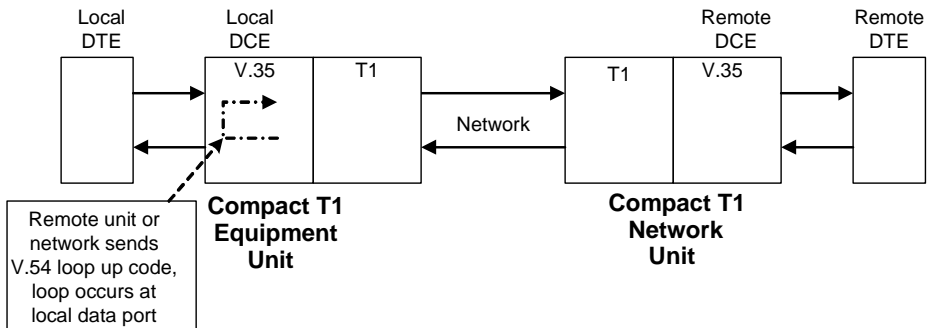
Enable V.54 Loop

Where a V.35/V.54 card is in slot 6.

```
> set 6:1 v54 network enable
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
     CTS:                  Always High
     Timing:               Source
     Rx Clock Inversion:   Normal
     Tx Clock Inversion:   Normal
     Data Inversion:       Normal
     Data Speed:           64K
     Data Rate:            768 K
     V.54 Rx LB:           enabled
     V.54 Rx Addr:         255
     V.54 Test Addr:       255
     V.54 Tx Prep count:   15
     V.54 Rx Prep count:   15
     V.54 Test Pattern:    QRSS
     V.54 Ignore ACK:      OFF
     Loopback:             None
```

V.54 Equipment Loopback

Enable V.54 Equipment Loopup

Where a V.35/V.54 card is in slot 6.

```
> set 6:1 v54 equipment loopup
OK
```

View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                  Always High
    Timing:               Source
    Rx Clock Inversion:   Normal
    Tx Clock Inversion:   Normal
    Data Inversion:       Normal
    Data Speed:           64K
    Data Rate:            768 K
    V.54 Rx LB:           enabled
    V.54 Rx Addr:         255
    V.54 Test Addr:       255
    V.54 Tx Prep count:   15
    V.54 Rx Prep count:   15
    V.54 Test Pattern:    QRSS
    V.54 Ignore ACK:      OFF
    Loopback:             Equipment(V.54)

> status 6:1
SLOT 6:
Status for V35  PORT 1:
    DCD:    High
    CTS:    High
    DSR:    High
    RTS:    High
    DTR:    High
    BERT:   RUNNING (Syncing up)
```

```
> status 6:1
SLOT 6:
Status for V35  PORT 1:
      DCD:   High
      CTS:   High
      DSR:   High
      RTS:   High
      DTR:   High
      BERT:  RUNNING
      BITS:     8386950
      ERRS:           0
       BER:  0.00000000
```

Disable V.54 Equipment Loopup

```
> set 6:1 v54 equipment loopdown
OK
```

View Status of Loopback

```
> status 6:1
SLOT 6:
Status for V35  PORT 1:
      DCD:   High
      CTS:   High
      DSR:   High
      RTS:   High
      DTR:   High
      BERT:  Complete
      BITS:   109030350
      ERRS:           0
       BER:  0.00000000
BERT DATE:   1/5/2001 01:39:18
```

OCU-DP Loopbacks

These loopbacks may be activated by the network or manually (CLI). These loopbacks are OCU, CSU, and DSU. The Network may activate each loopback by sending latching or non-latching code sequences. The OCU-DP card may be configured to allow detection of each sequence for each loopback.
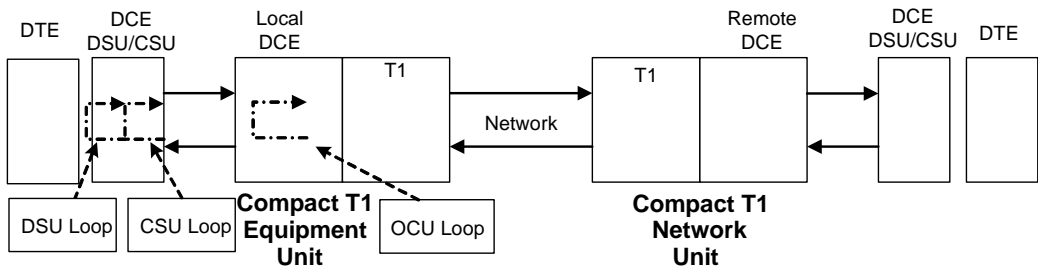
View OCU-DP Card Configuration
Where a OCU-DP card is in slot 3.

```
> show 3:1
SLOT 3:
Settings for OCUDP Port 1:
    Up/Down:                      UP
    Baudrate:                     56000
    Loopdetect Types Enabled:
                                  CSU Latching
                                  DSU Latching
                                  OCU Latching
    Error Correction:             DISABLE
    Secondary Channel:            DISABLE
```

Non-Latching Loopdetect

Enable OCU-DP Non-Latching Loopdetect

Where a OCU-DP card is in slot 3.

```
> set 3:1 loopdetect ocu nllb enable
OK

> set 3:1 loopdetect csu nllb enable
OK

> set 3:1 loopdetect dsu nllb enable
OK
```

View Status of Loopdetect

```
> show 3:1
SLOT 3:
Settings for OCUDP Port 1:
    Up/Down:                        UP
    Baudrate:                       56000
    Loopdetect Types Enabled:
                            CSU Latching
                            CSU Non-Latching
                            DSU Latching
                            DSU Non-Latching
                            OCU Latching
                            OCU Non-Latching
    Error Correction:               DISABLE
    Secondary Channel:              DISABLE
```

CSU Manual Loopback
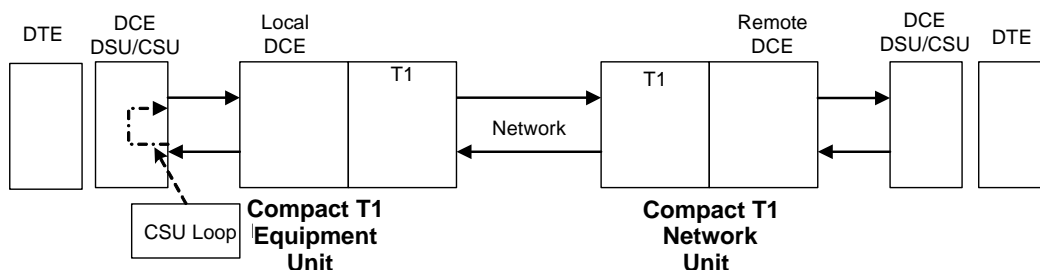
Enable CSU Manual Loopback

Where a OCU-DP card is in slot 3.

```
> set 3:1 loopback csu loopup
OK
```

View Status of Loopback

```
> status 3:1
SLOT 3:
Status for OCUDP Port 1:
    Selftest:
 Results as of 00:00:24  01/01/2001
    Datapath:               PASS
    FPGA:                   PASS
    OCU:                    PASS


    OCU Manual Loopback:    NONE
    CSU Manual Loopback:    In Progress

    OCU NonLatching Loopback:    NONE
    DSU NonLatching Loopback:    NONE
    CSU NonLatching Loopback:    NONE

    OCU Latching Loopback:    NONE
    DSU Latching Loopback:    NONE
    CSU Latching Loopback:    NONE
```

Manual OCU Loopback
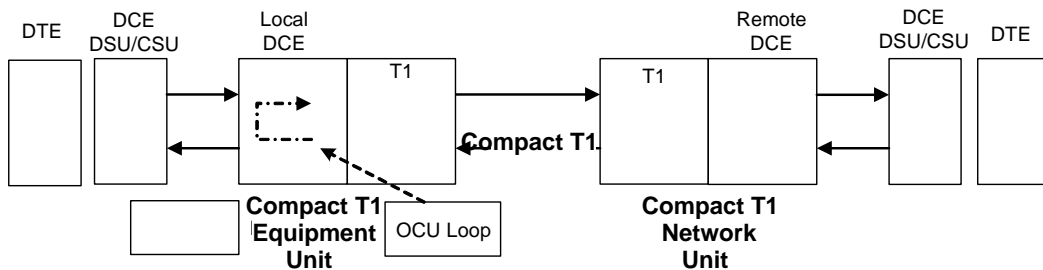
Enable Manual OCU Loopback

Where a OCU-DP card is in slot 3.

```
> set 3:1 loopback ocu loopup
OK
```

View Status of Loopback

```
> status 3:1
SLOT 3:
Status for OCUDP Port 1:
    Selftest:
 Results as of 00:00:24  01/01/2001
    Datapath:                  PASS
    FPGA:                      PASS
    OCU:                       PASS


    OCU Manual Loopback:       In Progress
    CSU Manual Loopback:       NONE

    OCU NonLatching Loopback:  NONE
    DSU NonLatching Loopback:  NONE
    CSU NonLatching Loopback:  NONE

    OCU Latching Loopback:     NONE
    DSU Latching Loopback:     NONE
    CSU Latching Loopback:     NONE
```

Router Diagnostics and Performance Tools

The Verification, Statistics and System Reports features are instrumental in diagnosing and troubleshooting the Router card.

Verification

The Verification section may be used to identify suspected communication problems between the local and remote devices. Verification options are:

LAN Port Tests

Verifies the ability of the local unit to commicate by pinging remote or local devices. See *LAN Port Tests in the Router Manual* for more information on this feature.

WAN Monitor

The WAN Monitor is a diagnostic tool that is used to review the actual data being transmitted from, or received by the local Router. When the monitoring is started, a hexadecimal display of each transmission as it occurs is shown. See *WAN Monitor in the Router Manual* for more information on this feature.

Note: The WAN Monitor decreases the throughput of the Router. It should only during installation and troubleshooting procedures, not during normal operation.

Statistics

Run-Time

TheRun-Time is used to review data transmission information between the Local (LAN) unit and Remote (WAN) devices. This option allows you to review data transmission statistics to/from remote units. This data will help you to monitor the Router's connection/performance capabilities such as throughput, compression, and errors. See *Statistics Window in the Router Manual* for more information regarding this feature.

System Reports

The System Reports menu presents data that may be useful in identifying WAN communication problems.

Events

The Events listing offers on-going historical activity for the Router, while the Alarm listing indicates events that suggest further investigation. See *Events in the Router Manual* for more information regarding this feature.

Alarms

This screen provides a listing of any Alarms that have occurred on the Router. When an Alarm is triggered, the Router LED (labeled CRD) will display a red indicator light, which will stay on until the Alarm is cleared. Each Alarm is listed separately and the Count field will display a value of 1. See *Alarms in the Router Manual* for more information regarding this feature.

Network/Servers

By sending out IPX and IP RIP (Routing Information Protocol) and IPX SAP (Service Advertising Protocol) packets and monitoring RIP and SAP packets from other devices, the Router will learn about other servers and networks. The Router will constantly monitor RIP and SAP packets to ensure that the status of the network or server has changed. Should a RIP or SAP packet indicate a change in status, the Router would update the data in the table and send the information to all enabled remotes to exchange the updated data. See *Networks/Servers in the Router Manual* for more information regarding this feature.

Address Tables

The MAC Address and IP Address Tables, along with Network Tables are used to determine if and where the Router should send packets. See *Address Tables in the Router Manual* for more information regarding this feature.

GLOSSARY

AMI	Automatic Mark Inversion
ARP	Address Resolution Protocol
ATM	Asynchronous Transfer Mode
B8ZS	Bipolar with 8 Zero Substitution
BER	Bit Error Rate
BERT	Bit Error Rate Tester
BES	Burst Errored Seconds
BIT	Binary Digit
bps	Bits Per Second
BPV	Bipolar Violation
BRI	Basic Rate Interface
CAS	Channel Associated Signaling
CCS	Common Channel Signaling

CHAP	Challenge Handshake Authentication Protocol
CIDR	Classless Inter-Domain Routing
CLASS	Custom Local Area Signaling Service
CLEI	Common Language Equipment Identification
CLI	Command Line Interface
CMG	Customer Media Gateway
CNG	Also called Auto Fax Tone or Calling Tone
CO	Central Office
CPE	Customer Provided Equipment
CRC	Cyclic Redundancy Check
CRV	Call Reference Value
CSU	Channel Service Unit
D4	The fourth generation channel bank
dB	decibel
DCS	Digital Signal Processor
DDS	Digital Data Service
DHCP	Dynamic Host Configuration Protocol
DLC	Digital Loop Carrier
DNS	Domain Naming System
DLCI	Data Link Connection Identifier

DS0	Digital Signal Level Zero (64 kbps) (1 voice channel)
DS1	Digital Signal Level 1 (1.544 Mbps)
DSU	Digital Service Unit/Data service Unit
DTE	Data Terminal Equipment
ES	Errored Seconds
ESF	Extended Superframe
FDL	Facilities Data Link
FX	Foreign Exchange
FXO	Foreign Exchange Office
FXS	Foreign Exchange Station
GS	Ground Start
GMT	Greenwich Mean Time
GRE	Generic Routing Encapsulation
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPX	Internet Packet eXchange
ISDN BRI	Integrated Services Digital Network.
LAN	Local Area Network
LLC	Logical Link Control
LBO	Line Build Out

LMI	Local Management Interface
LS	Loop Star
LULT	Line Unit Line Termination
LUNT	Line Unit Network Termination
Mbps	Million Bits Per Second
MGCP	Media Gateway Control Protocol
MLPPP	Multilink PPP
MUX	Multiplexer
MVEC	Majority Vote Error Correction
NAT	Network Address Translation
NCS	Network-based Call Signaling
NEBS	Network Equipment Building Standards
NTP	Network Time Protocol
OCU-DP	Office Channel Unit - Data Port
PAP	Password Authentication Protocol
PHY	Physical specifications
PPP	Point-to-Point Protocol.
PVC	Permanent Virtual Circuit
QoS	Quality of Service

RADIUS	Remote Authentication Dial-In Service.
RIP	Routing Information Protocol.
RTCP	Real-Time Control Protocol.
RTPSAP	Service Access Point.
SDP	Session Description Protocol.
SNMP	Simple Network Management Protocol.
STP	Spanning Tree Protocol.
T1	Trunk Level 1.
TACACS+	Terminal Access Controller Access Control System.
TDM	Time Division Multiplex.
TFTP	Trivial File Transfer Protocol.
TOS	Type of Service
VC MUX	Virtual Channel Multiplexer
VOIP	Voice over IP.
WAN	Wide Area Network.
VC	Virtual Channel.
10Base-T	The most widely installed Ethernet local area networks (LANs) use ordinary telephone twisted-pair wire. When used on Ethernet, this carrier medium is known at 10BASE-T. 10BASE-T supports Ethernet's 10 Mbps transmission speed.

100Base-TX   Also called "Fast Ethernet," it is a 100 Mbps version of Ethernet. 100Base-T transmits at 100 Mbps rather than 10 Mbps. Like regular Ethernet, Fast Ethernet is a shared media LAN. All nodes share the 100 Mbps bandwidth. 100Base-TX uses two pairs of Category 5 cabling, one pair for transmission, one pair for receiving.

analog   The telephone transmission of voice, video or image. Telephone transmission and/or switching that is not digital.

Annex D   A frame relay standard extension dealing with the communication and signaling between customer premises and equipment and frame relay network equipment for the purpose of querying network status information.

Asynchronous Transfer Mode   Very high speed transmission technology. ATM is a high bandwidth, low-delay, connection-oriented, packet-like switching and multiplexijng technique. Usable capacity is segmented into 53-byte fixed-size cells, consisting of header and information fields, allocated to services on demand. The term "asynchronous" applies, as each cell is presented to the network on a "start-stop" basis - in other words, asynchronously.

bandwidth   The width of a communications channel. Analog is typically measured in Hertz (cycles per second), a voice conversation is typically measured in bits per second.

Bipolar 8-Zero Substitution   A coding scheme that maintains ones density.

bipolar violation   BPV. A violation is declared for AMI if two successive pulses have the same polarity.

Bit   Contraction of the words "binary" and "digit".

Bit Error Rate   The number of erred bits divided by the total number of bits.

Basic Rate Interface   Basic Rate Interface (2b+d) in ISDN.

Channel Service Unit	The interface to the T1 line that terminates the local loop.
Classless Inter-Domain Routing	CIDR is a new addressing scheme for the Internet which allows for more efficient allocation of IP addresses than the old Class A, B, and C address scheme.
collision	In Ethernet, the result of two nodes transmitting simultaneously. The frames from each device impact and are damaged when they meet on the physical media.
command line	The command line is where you enter MS-DOS commands.
compander	Companding is the process of compressing the amplitude range of a signal for economical transmission and then expanding them back to their original form at the receiving end.
Domain Naming System	DNS. A mechanism used in the Internet for translating names of host computers into addresses.
Dynamic Host Configuration Protocol	DHCP is a network configuration that allows maintenance to be performed from a central site rather than by end users.
encapsulation	Carrying frames of one protocol as the data in another.
echo cancellation	A technique that allows for the isolation and filtering of unwanted signals caused by echoes from the main transmitted signal.
end point	A network element (component) at the end of the network, a transmitter or receiver, or an originating or terminating device.
Facilities Data Link	FDL supports the communication of various network information in the form of in-service monitoring and diagnostics.
filter	An operating parameter used with routers that can be set to block the transfer of packets from one LAN to another.

firewall	Any of a number of security schemes that prevent unauthorized users from gaining access to a computer network and/or may monitor the transfer of information to and from the network.
frame	A fragment of data that is packaged into a frame format, which comprises a header, payload, and trailer.
Foreign Exchange	A Central Office trunk which has access to a distant central office. Dial Tone is returned from that distant Central Office, and a location can be reached in the area of the foreign Central Office by dialing a local number. This will provide easier access for customers in that area and calls may be made anywhere in the foreign exchange area for a flat rate.
Foreign Exchange Service	Foreign exchange (FX) service is a service that can be ordered from the telephone company that provides local telephone service from a central office which is outside (foreign to) the subscriber's exchange area. Simply, a user can pick up the phone in one city and receive a dial tone in the foreign city. This kind of connection is provided by a type of trunk called foreign exchange (FX) trunk. FX trunk signaling can be provided over analog or T-1 links. Connecting POTS telephones to a computer telephony system via T-1 links requires a channel bank configured with FX type connections.
G.168	Echo cancellation
G.711	Pulse code modulation (PCM) of voice frequencies. This ITU-T Recommendation provides the rules for encoding of voice-frequency signals to and from 64 kbps PCM. It covers both "A-law" and "µ-law" encoding.
G.726	40, 32, 24, 16 kbps adaptive differential pulse code modulation (ADPCM). This ITU-T Recommendation specifies the conversions of a 64 kbps A-law and u-law PCM channel to and from ADPCM encodings of 40, 32, 24, and 16 kbps. (The PCM encoding is defined in G.711.)
gateway	An entrance and exit into a communications network
GRE tunneling	Generic Routing Encapsulation tunneling is a Layer 2 protocol that can tunnel multi-protocol traffic over IP Networks.

ground	A physical connection to the earth or other reference point.
ground start	A method of signaling on subscriber trunks in which one side of the two wire trunk (typically the ring conductor of Tip and Ring) is momentarily grounded to get dial tone
Hops	Each individual short trip that packets make from router to router, as they are routed to their destination.
impedance	The total opposition a circuit offers to the flow of alternating current. It is measured in ohms and the lower the ohmic value, the better the quality of the conductor
Integrated Services Digital Network	BRI, which is 144,000 bits per second and designed for the desktop.
Local Area Network	LAN. A short distance data communications network (typically within a building or campus) used to link together computers and peripheral devices under some form of standard control.
layer 2	In the OSI 7 layer model, layer 2 is the Data Link layer. This layer deals with procedures and protocols from operating the communications lines. It also has a way of detecting and correcting message errors
Line Build Out	LBO.
Local Link Control	A protocol developed by the IEEE 802.2 committee for data-link-level transmission control
Local Management Interface	A specification for the use of frame-relay products that define a method of exchanging status information between devices such as routers
latching	OCU-DP loopback
loopback	A diagnostic test in which a signal is transmitted across a medium while the sending device waits for its return.

MAC Address   The address for a device as it is identified at the Media Access Control layer in the network architecture

mapping   In network operations, the logical association of one set of values, such as addresses on one network, with quantities or values of another set, such as devices on another network.

Media Gateway Control Protocol   MGCP. A control and signal standard for the conversion of audio signals carried on telephone circuits (PSTN) to data packets carried over the Internet or other packet networks.

MLPPP   **M**ultiLink **PPP**. An extension to the point-to-point protocol that enables two channels to be linked together to double the throughput. It is used for ISDN transmission and channel bonding

multiplexer   Electronic equipment which allows two or more signals to pass over one communications circuit. The circuit may be analog or digital

MUX   See multiplexer

MVEC   Majority Vote Error Correction

nonlatching   OCU-DP loopback

NTP   Network Time Protocol, developed to maintain a common sense of time among Internet hosts around the world. Many systems on the Internet run NTP, and have the same time (relative to Greenwich Mean Time).

OCU-DP   Office Channel Unit - Data Port. A channel bank unit used to interface between the channel bank and a customer's DDS CSU or DSU.

packet   A packet consists of the data to be transmitted and certain control information.

PAP   Password Authentication Protocol

PAT   Port Address Translation

PHY	PHY as in physical specifications. OSI Physical Layer, which provides for transmission of cells over a physical medium connecting two ATM devices.
ping	Packet InterNet Grouper. PING is a program used to test whether a particular network destination on the Internet is online (i.e. working) by repeatedly bouncing a "signal" off a specified address and seeing how long that signal takes to complete the round trip. No return signal - site is down or unreachable. Portion is returned - trouble with the connection.
PLAR	Private Line, Automatic Ringdown. A leased voice circuit that connects two single instruments together. When either handset is lifted, the other instrument automatically rings.
PPP	Point-to-Point Protocol.
protocol	Procedure or set of rules.
PVC	Permanent Virtual Circuit. A PVC is a permanent channel connection between two ATM devices. PVC's allow network transmissions to be started without having to first establish a connection with the end point ATM device. When a PVC is constructed, the end points of the connection will agree upon a path in which data will travel, and therefore agree upon the route that data will travel to reach its destination.
QoS	Quality of Service.
RADIUS	Remote Authentication Dial-In Service. RADIUS is a client/server-based authentication software system. The software supports remote access applications, allowing an organization to maintain user profiles in a centralized database residing on an authentication server which can be shared by multiple remote access servers.

RIP	Routing Information Protocol. RIP is based on distance vector algorithms that measure the shortest path between two points on a network, based on the addresses of the originating and destination devices. The shortest path is determined by the number of "hops" between those points. Each router maintains a routing table, or routing database, of known addresses and routes; each router periodically broadcasts the contents of its table to neighboring routers in order that the entire network can maintain a synchronized database.
robbed bit	A type of analog signaling that will occasionally steal information bits used for circuit signaling coding.
RTCP	Real-Time Control Protocol.
SAP	Service Access Point.
silence suppression	A term used in voice compression for transmission whereby silence in the voice conversation is filled with other transmissions (data, video, imaging, etc.).
SNMP	Simple Network Management Protocol. SNMP is the most common method by which network managements applications can query a management agent using a supported MIB (Management Information Base). SNMP operates at the OSI application layer.
spanning tree	Spanning Tree Protocol is a link management protocol that provides path redundancy while preventing undesirable loops in the network. For an Ethernet network to function properly, only one active path can exist between two stations.
SDP	Session Description Protocol.
T1	Trunk Level 1. A digital transmission link with a total signaling speed of 1.544 Mbps. T-1 is a standard for the digital transmission in North America.
TACACS+	Terminal Access Controller Access Control System.

telnet	An Internet standard protocol that enables a computer to function as a terminal working from a remote computer
TDM	Time Division Multiplex. A technique for transmitting a number of separate data, voice and/or video signals simultaneously over one communications medium by quickly interleaving a piece of each signal one after another.
TFTP	Trivial File Transfer Protocol.
ticks	The distance between two networks, measured in time increments. Ticks may be used to designate primary and secondary routes to the same network.
trunk	A communication line between two switching systems.
tunneling	To provide a secure, temporary path over the Internet.
VC MUX	Virtual Channel Multiplexer
VoIP	Voice over IP.
WAN	Wide Area Network.
VC	Virtual Channel.

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