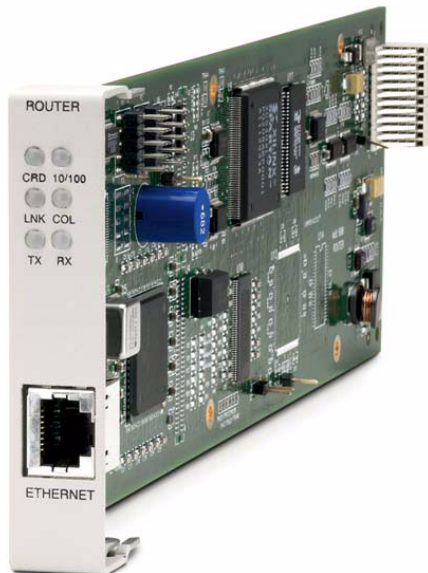


# ***IP Router***

## ***QUICK START GUIDE***

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Part Number: 002-0118-0180

Product Release: 1.8

May 2004

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**Supporting Software Version:**

Adit Controller Release 8.0  
IP Router Release 1.8

# QUICK START GUIDE

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## **In this Guide**

- Installation
- Basic Setup
- 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
- Back-to-Back with PPP
- Back-to-Back with Multi-Link PPP
- Back-to-Back with Frame Relay

## Installation

Installation of the router card into the chassis.

- Unit can be on or off
- Router card will work in any slot
- Slide card into slot until fully seated
- Router has completed it's boot cycle when CRD light is solid

**The following setups are all executed with CLI**

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**NOTE:** Configuration can be done with the following CLI commands or with the Router Menu-Driven Software.

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## Basic Setup

Command	Description
<code>set {ds0-addr} type data</code>	Confirm DS0 is set to type data. ds0-addr = {slot:port:channel} of DS0 Example: set a:1:1-24 type data
<code>connect {slot:port:trunk} {slot:port:channel}</code>	Cross-connect T1 to router card. Example: connect a:1:1-24 6:1:1 (router in slot 6)
<code>set {router-addr} proxy</code>	Disable/enable router proxy. router-addr = {slot:port} of router card. Example: set 6:1 disable.
<code>set {slot:port} up</code>	Set Router LAN as In-Service. Example: set 6:1 up
<code>telnet {router_card-addr}</code>	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 <code>reinitialize</code>	To enable any configuration changes, the card must be reinitialized.

# PPP Internet Connection and Public IP Address Routing

## Router in Slot 1

ISP Router that provides the Internet connection.

Command	Description
<code>set clock1 a:1</code>	Set primary master transmit clock source
<code>set 1 default</code>	Set Router to default settings
<code>disconnect a:1</code>	Disconnect all connections to the T1 on the Controller (slot a)
<code>disconnect 1</code>	Disconnect all connections to the router in slot 1
<code>set a:1:all type data</code>	Set the T1-1 of the Controller, Type to Data
<code>connect a:1:all 1:1:1</code>	Connect all of T1-1 to the Router that is in slot 1
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
<code>rename 1 "RemoteUnit" "wan1"</code>	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
<code>set 1:1 ip address 215.168.21.14 255.255.255.0</code>	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
<code>add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1</code>	Adds a static IP network (route) to the WAN interface
<code>set 1 "wan1" trunk 1</code>	Set the WAN interface named "wan1" to be mapped to trunk 1
<code>reset 1</code>	Reboot the router, to enable all configurations set

# Frame Relay Internet Connection and Public IP Address Routing

## Router in Slot 1

ISP Router that provides the Internet connection.

Command	Description
<code>set clock1 a:1</code>	Set primary master transmit clock source
<code>set 1 default</code>	Set Router to default settings
<code>disconnect a:1</code>	Disconnect all connections to the T1 on the Controller (slot a)
<code>disconnect 1</code>	Disconnect all connections to the router in slot 1
<code>set a:1:all type data</code>	Set the T1-1 of the Controller, Type to Data
<code>connect a:1:all 1:1:1</code>	Connect all of T1-1 to the Router that is in slot 1
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
<code>rename 1 "RemoteUnit" "wan1"</code>	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
<code>set 1:1 ip address 215.168.21.14 255.255.255.0</code>	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
<code>add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1</code>	Adds a static IP network (route) to the WAN interface
<code>set 1:1:1 encapsulation fr</code>	Set the encapsulation on trunk 1 to Frame Relay
<code>set 1 lmi annexd</code>	Disable LMI to Annex D
<code>set 1 "wan1" trunk 1</code>	Set the WAN interface named "wan1" to be mapped to trunk 1
<code>set 1 "wan1" dlci 101</code>	Set the DLCI number
<code>reset 1</code>	Reboot the router, to enable all configurations set

# Internet Connection using PPP, NAT/PAT and Firewall Filters

## Router in Slot 1

ISP Router that provides the Internet connection. Router with NAT/PAT and Firewall Filters.

Command	Description
<code>set clock1 a:1</code>	Set primary master transmit clock source
<code>set 1 default</code>	Set Router to default settings
<code>disconnect a:1</code>	Disconnect all connections to the T1 on the Controller (slot a)
<code>disconnect 1</code>	Disconnect all connections to the router in slot 1
<code>set a:1:all type data</code>	Set the T1-1 of the Controller, Type to Data
<code>connect a:1:all 1:1:1</code>	Connect all of T1-1 to the Router that is in slot 1
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
<code>rename 1 "RemoteUnit" "wan1"</code>	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
<code>set 1:1 ip address 192.168.21.14 255.255.255.0</code>	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
<code>set 1 "wan1" nat enable</code>	Set the WAN interface named "wan1" enable NAT mapping
<code>set 1 "wan1" nat address 216.174.44.2 1</code>	Set the WAN interface named "wan1" NAT address
<code>add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1</code>	Adds a static IP network (route) to the WAN interface
<code>add 1 "wan1" firewall 1 pass incoming log telnet 192.168.21.14/32 xxx.xxx.xxx.xxx/32</code>	Adds a Firewall rule to the WAN. Where xxx.xxx.xxx.xxx is the host's IP address at the far end that will be able to ping or telnet to the router. 0.0.0.0/0 will allow any other host at the far end to ping and/or telnet to the router.

## Quick Start Guide

### Internet Connection using PPP, NAT/PAT and Firewall Filters

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Command	Description
<pre>add 1 "wan1" firewall 2 pass inout nolog ping 192.168.21.14/32 xxx.xxx.xxx.xxx/32</pre>	Adds a Firewall rule to the WAN. Where xxx.xxx.xxx.xxx is the host's IP address at the far end that will be able to ping or telnet to the router. 0.0.0.0/0 will allow any other host at the far end to ping and/or telnet to the router.
<pre>add 1 "wan1" firewall 3 pass inout nolog ping 0.0.0.0/0 0.0.0.0/0</pre>	Adds a Firewall rule to the WAN.
<pre>add 1 "wan1" firewall 4 pass inout nolog tcp 1-65535 0.0.0.0/0 0.0.0.0/0</pre>	Adds a Firewall rule to the WAN.
<pre>add 1 "wan1" firewall 5 pass inout nolog udp 1-65535 0.0.0.0/0 0.0.0.0/0</pre>	Adds a Firewall rule to the WAN.
<pre>set 1 "wan1" trunk 1</pre>	Set the WAN interface named "wan1" to be mapped to trunk 1
<pre>reset 1</pre>	Reboot the router, to enable all configurations set



# Internet Connection using NAT and Static NAT Addresses

## Router in Slot 1

ISP Router that provides the Internet connection. Router with NAT and Static NAT addresses.

Command	Description
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the from "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set ethernet ip address 192.168.21.15 255.255.255.0	Set the Ethernet IP address and Subnet Mask, for the
set 1:1 ip address 192.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
set 1 "wan1" nat enable	Set the WAN interface named "wan1" enable NAT mapping
set 1 "wan1" nat address 216.174.44.2 1	Set the WAN interface named "wan1" NAT address
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
add 1 "wan1" static nat address 192.168.21.14 216.174.44.232	Add static NAT bi-directional mapping to wan1

## Quick Start Guide

### Internet Connection using NAT and Static NAT Addresses

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Command	Description
<code>add 1 "wan1" static nat address 192.168.21.15 216.174.44.233</code>	Add static NAT bi-directional mapping to wan1
<code>add 1 "wan1" static nat address 192.168.21.16 216.174.44.234</code>	Add static NAT bi-directional mapping to wan1
<code>add 1 "wan1" static nat address 192.168.21.17 216.174.44.235</code>	Add static NAT bi-directional mapping to wan1
<code>set 1:1:1 encapsulation fr</code>	Set the encapsulation on trunk 1 to Frame Relay
<code>set 1 lmi annexd</code>	Disable LMI Annex D
<code>set 1 "wan1" trunk 1</code>	Set the WAN interface named "wan1" to be mapped to trunk 1
<code>set 1 "wan1" dlci 101</code>	Set the DLCI number
<code>reset 1</code>	Reboot the router, to enable all configurations set

216.174.44.232 is the static NAT address assigned to the router.

216.174.44.233 is the static NAT address assigned to the controller.

216.174.44.234 is the static NAT address for a server\*.

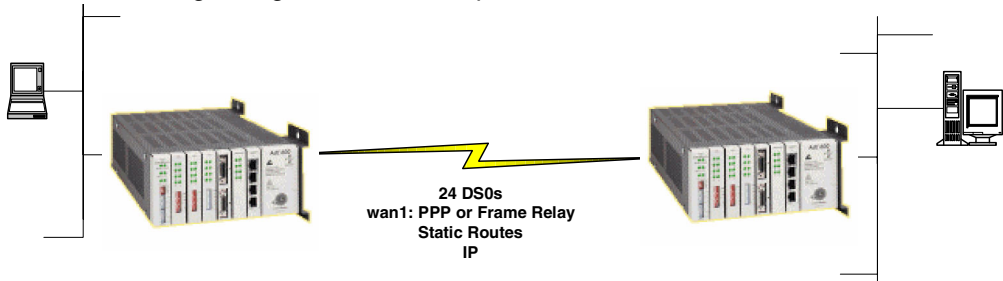
216.174.44.235 is the static NAT address for a host\*.

\*In the private network that can be reached from the outside world.

There can be up to 16 static NAT addresses, therefore the actual range can be 216.174.44.232 to 216.174.44.247. Only 4 were used in this example.

## **Back-to-Back with PPP**

The following configuration will set up two Adit 600 Routers back-to-back with PPP.



### **Boulder Router in Slot 1**

Command	Description
<code>set 1 default</code>	Set Router to default settings
<code>disconnect a:1</code>	Disconnect all connections to the T1 on the Controller (slot a)
<code>disconnect 1</code>	Disconnect all connections to the router in slot 1
<code>set a:1:all type data</code>	Set the T1-1 of the Controller, Type to Data
<code>connect a:1:all 1:1:1</code>	Connect all of T1-1 to the Router that is in slot 1
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
<code>rename 1 "RemoteUnit" "wan1"</code>	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
<code>set 1:1 ip address 1.1.1.1 255.255.255.0</code>	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
<code>set 1:1 phy auto</code>	Set the Physical Specifications to auto-negotiate
<code>add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1</code>	Adds a static IP network (route) to the WAN interface
<code>set 1 "wan1" trunk 1</code>	Set the WAN interface named "wan1" to be mapped to trunk 1
<code>reset 1</code>	Reboot the router, to enable all configurations set

## **Denver Router in Slot 1**

<b>Command</b>	<b>Description</b>
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set clock1 a:1	Set primary master transmit clock source
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Denver"	Rename the from "LocalUnit" (default) to "Denver" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 2.2.2.1 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
set 1:1 phy auto	Set the Physical Specifications to auto-negotiate
add 1 "wan1" static ip network 1.1.1.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk 1	Set the WAN interface named "wan1" to be mapped to trunk 1
reset 1	Reboot the router, to enable all configurations set

## **Back-to-Back with Multi-Link PPP**

The following configuration will set up two Adit 600 Routers back-to-back with Multi-Link PPP.

### **Boulder Router in Slot 1**

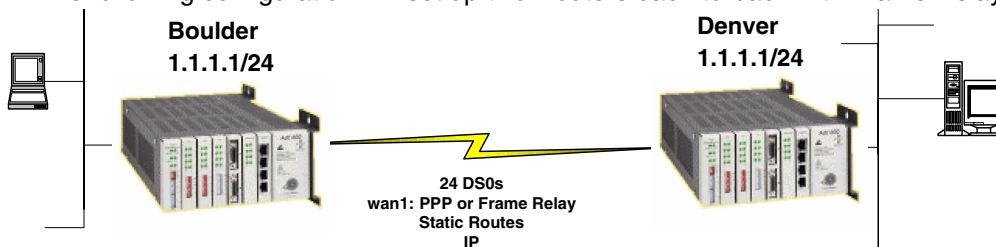
<b>Command</b>	<b>Description</b>
<code>set 1 default</code>	Set Router to default settings
<code>disconnect a:1</code>	Disconnect all connections to the T1 on the Controller (slot a)
<code>disconnect 1</code>	Disconnect all connections to the router in slot 1
<code>set a:1:all type data</code>	Set the T1-1 of the Controller, Type to Data
<code>connect a:1:all 1:1:1</code>	Connect all of T1-1 to the Router that is in slot 1
<code>connect a:2:all 1:1:2</code>	Connect all of T1-1 to the Router that is in slot 1
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
<code>set 1:1:1-2 multilink group 1</code>	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
<code>rename 1 "RemoteUnit" "wan1"</code>	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
<code>set 1:1 ip address 1.1.1.1 255.255.255.0</code>	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
<code>add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1</code>	Adds a static IP network (route) to the WAN interface
<code>set 1 "wan1" trunk multilink group 1</code>	Set the WAN interface named "wan1" to be mapped to trunk multilink group 1
<code>reset 1</code>	Reboot the router, to enable all configurations set

## Denver Router in Slot 1

Command	Description
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set clock1 a:1	Set primary master transmit clock source
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
connect a:2:all 1:1:2	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Denver"	Rename the Adit 600 from "LocalUnit" (default) to "Denver" (LAN)
set 1:1:1-2 multilink group 1	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 2.2.2.1 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
add 1 "wan1" static ip network 1.1.1.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk multilink group 1	Set the WAN interface named "wan1" to be mapped to trunk multilink group 1
reset 1	Reboot the router, to enable all configurations set

## Back-to-Back with Frame Relay

The following configuration will set up two Routers back-to-back with Frame Relay.



### Boulder Router in Slot 1

Command	Description
<code>set clock1 internal</code>	Set primary master transmit clock source
<code>set 1 default</code>	Set Router to default settings
<code>disconnect a:1</code>	Disconnect all connections to the T1 on the Controller (slot a)
<code>disconnect 1</code>	Disconnect all connections to the router in slot 1
<code>set a:1:all type data</code>	Set the T1-1 of the Controller, Type to Data
<code>connect a:1:all 1:1:1</code>	Connect all of T1-1 to the Router that is in slot 1
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename the Adit 600 from "LocalUnit" (default) to "Boulder" (LAN)
<code>rename 1 "RemoteUnit" "wan1"</code>	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
<code>set 1:1 ip address 1.1.1.1 255.255.255.0</code>	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
<code>add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1</code>	Adds a static IP network (route) to the WAN interface
<code>set 1:1:1 encapsulation fr</code>	Set the encapsulation on trunk 1 to Frame Relay
<code>set 1 lmi disable</code>	Disable LMI (Local Management Interface)
<code>set 1 "wan1" trunk 1</code>	Set the WAN interface named "wan1" to be mapped to trunk 1
<code>set 1 "wan1" dlci 101</code>	Set the DLCI number
<code>reset 1</code>	Reboot the router, to enable all configurations set

## Denver Router in Slot 3

Command	Description
set 3 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 3	Disconnect all connections to the router in slot 1
set clock1 a:1	Set primary master transmit clock source
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 3:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 3 "LocalUnit" "Denver"	Rename the from "LocalUnit" (default) to "Denver" (LAN)
rename 3 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 3:1 ip address 2.2.2.1 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
add 3 "wan1" static ip network 1.1.1.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 3:1:1 encapsulation fr	Set the encapsulation on trunk 1 to Frame Relay
set 3 lmi disable	Disable LMI (Local Management Interface)
set 3 "wan1" trunk 1	Set the WAN interface named "wan1" to be mapped to trunk 1
set 3 "wan1" dlci 101	Set the DLCI number
reset 3	Reboot the router, to enable all configurations set



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