POINTRED TECHNOLOGIES BROADBAND WIRELESS ACCESS SYSTEM

CPE Manual

rev 1.5

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Legal Notice

FCC Emission Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Hazard Warning

To ensure compliance with FCC RF exposure requirements, this device must be professionally installed outdoors on a permanent structure with an antenna that is separated from all persons by a minimum of two meters. Using higher gain antennas and types of antennas not covered under FCC certification of this product is not allowed. Installers of the radio and end users of the system must adhere to instructions provided in this manual.

Safety

Warning: To avoid shock, do not open or attempt to service the unit or its associated power supply. This unit is not a user serviceable device.

Warning: Do not touch antennas when transmission is in progress. Possible adverse health affects can occur.

Warning: Explosive device proximity warning-do not operate your wireless network device near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use.

Caution: This instrument transmits radio frequency energy during normal operation. Do not stand or work in close proximity for extended periods of time to avoid possible harmful exposure. The long-term health effects of exposure to radio frequency energy are not fully understood.

Caution: When performing antenna installation and grounding ensure that it presents no threat to people and property. Verify that the antenna mast is grounded properly and is protected from voltage surges and static charges. Observe all regional and national building and safety regulations.

Contacting PointRed Technologies for Information or Support

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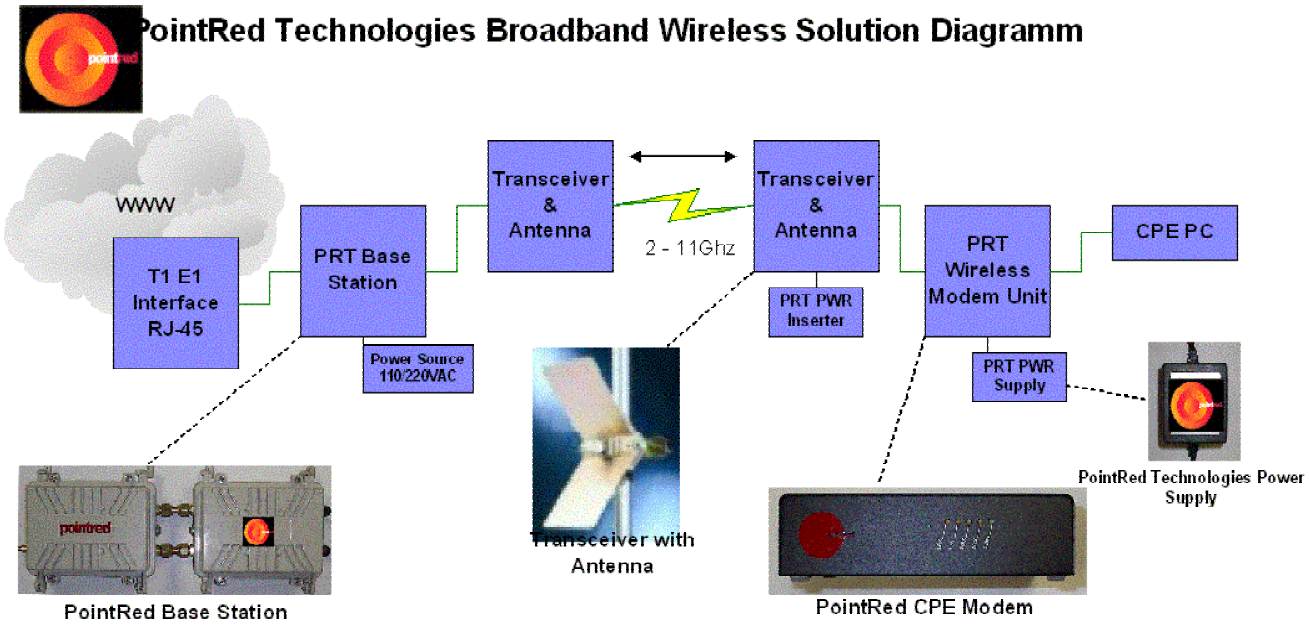
Chapter

1

PointRed Technologies System Overview

The MicroRed™ is a family of wireless equipment for the broadband connection of endpoint users to the Internet or other electronic destinations . The system operates at microwave frequency in either point to multipoint (PtMP) or Point to Point (PtP) configurations.

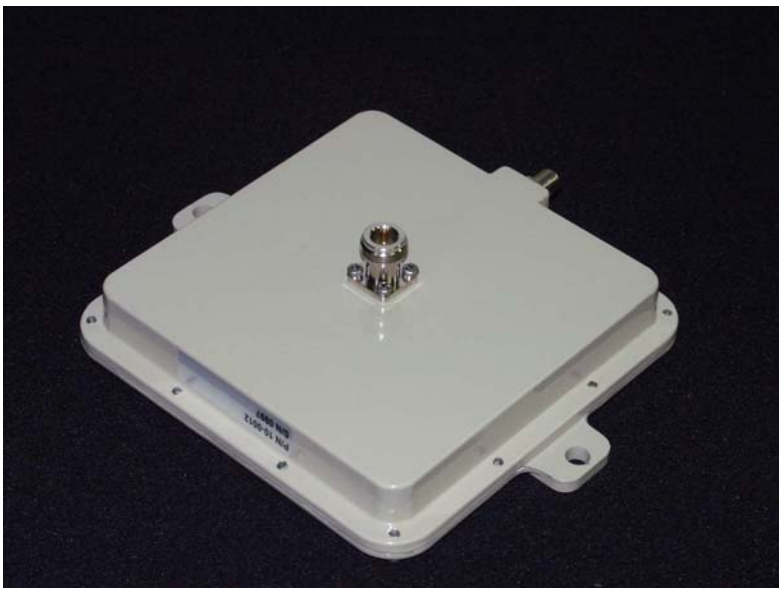


The system consists of a Base Station, with its transmit/receive unit (transceiver) and antenna, and one or many Customer Premise Equipment (CPE) sets each with its associated transceiver and antenna. The system provides "Wireless" operators the ability to quickly deploy Broadband Access PicoCells in dense population areas. Unlike SuperCells, the Base Station generates a focused approach to Wireless access systems. Operators may choose to target specific areas in their market to generate end user sales rapidly or incorporate the Solution into a SuperCell to provide coverage to otherwise blocked customer areas. The system operator can then "pick and choose" where to deploy the PointRed PICO CELL in a far more profitable manner. The systems "Pay as you Grow" concept is key to keeping system subscriber acquisition costs low.

The CPE Modem

The Customer Premise Equipment (CPE) Modem functions as the endpoint user interface to the Internet or other media types. The CPE is an easily configurable subscriber Modem unit. That provides a 10BaseT connection type for multiple applications such as Data, Voice, and Video. The CPE is partnered with a Power supply that operates at 110VAC or 220VAC.

The Transceiver Unit



The Tranceiver unit functions as the RF interface for both the Base Station (BTS) and the CPE Modem endpoints. The Transceiver can be configured with various antenna gain combinations and models and is powered over the single connecting RF cable by either the CPE Modem or the BTS.

Chapter

2

Installing the CPE Modem and Tranceiver

Pre-Installation Requirements:

1. Suitable CPE Modem and Transceiver Installation Location
2. Suitable 110/220VAC source
3. Customer Endpoint Computer or NAT Router
4. Basic hand tools

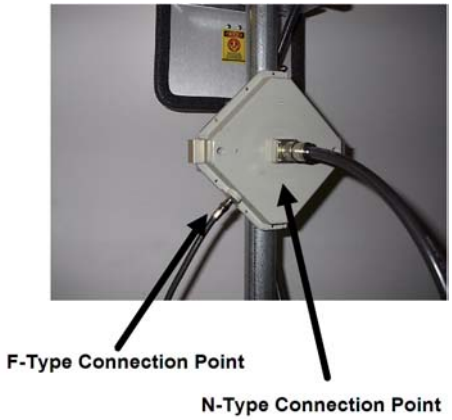
Component Inspection:

1. Carefully unpack the CPE/Transceiver package and inspect the units for physical damage.
2. Verify that all the components are present against the shipping information or Purchase order.

Immediately contact PointRed Technonogies Support if any portion of the package is missing or damaged. Call +1-408-383-0153 or send an email to support@pointredtech.com

Mounting the CPE-Tranceiver

1. Mount the Tranceiver Unit with the F-Type connector downward using the supplied clamp.

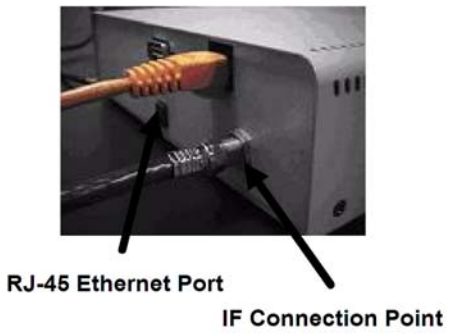


2. Mount the NON-integrated antenna (verify polarization is the same as the BTS antenna that covers this sector!!!) to the Mounting location above the Tranceiver unit and connect the N-Type 50Ohm coax cable to the N-Type connection on the Tranceiver. Then, connect a F-Type 75ohm cable to the Tranceiver F-Type connection.

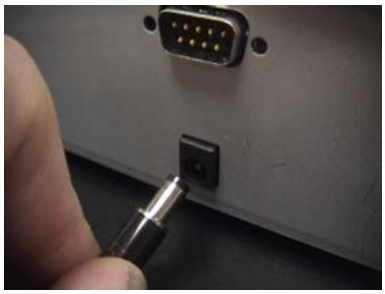
CAUTION: DO NOT CONNECT the other end of the coax cable to any device yet.

3. Once you have mounted the Tranceiver, Route the 75ohm coax cable to the CPE Modem.

4. At the CPE location, Connect the 75Ohm coax cable connector to the CPE "IF" connection port on the back of the CPE



5. Connect the Supplied Power Supply to the CPE Modem as pictured below. The Transformer end of the Power Supply must be connected to a 110/220 VAC, 50-60Hz compliant power source.



6. This completes the Physical installation of the CPE Modem and Tranceiver.

IT IS NOW safe to connect the System components to the power source

7. Point the CPE antenna in the general direction of the BTS.

8. To align the CPE antenna to the BTS use the qinfo command. More details on how to use the qinfo command can be found in section 4 and appendix A.

Chapter

3

Connecting to the System

Pre-Configuration Requirements:

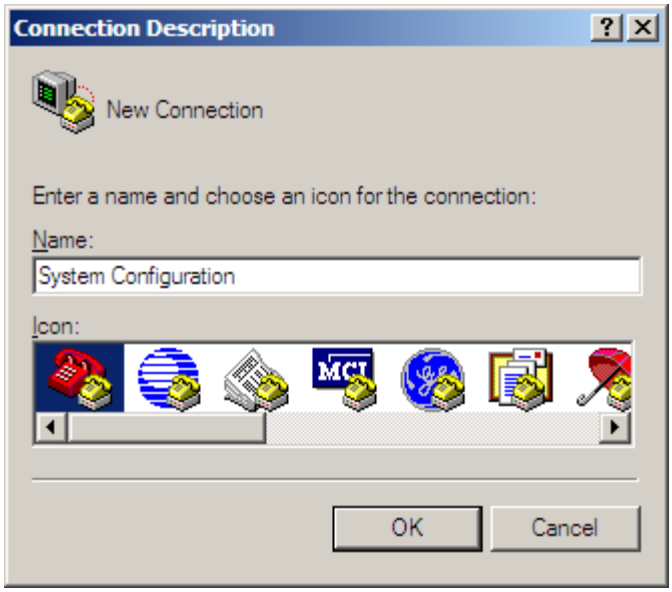
1. Installed BTS and CPE Modem
2. PC with Win 95/98/2000 or XP, 128megRam, Pentium II, with Serial Port
3. 9-pin RS-232 Serial Cable with Null Modem 9pin
4. Ethernet 10baseT Crossover Cable
5. Test Server PC

Connecting to the CPE console port

1. Connect the RS-232 Null Modem cable to the CPE Modem RS-232 Port.
2. Connect the other end of the Null Modem cable to the RS-232 port of the PC.
3. Left Click, Start>Programs>Accessories>Communications>Hyper terminal
4. Click to Open Hyper terminal.
5. At the Hyper Terminal Window you will see a dialog box (Connection description). Enter a useful description for example: "System Configuration"

Here is an image of the Dialog Box "Connection Description"

Cont.



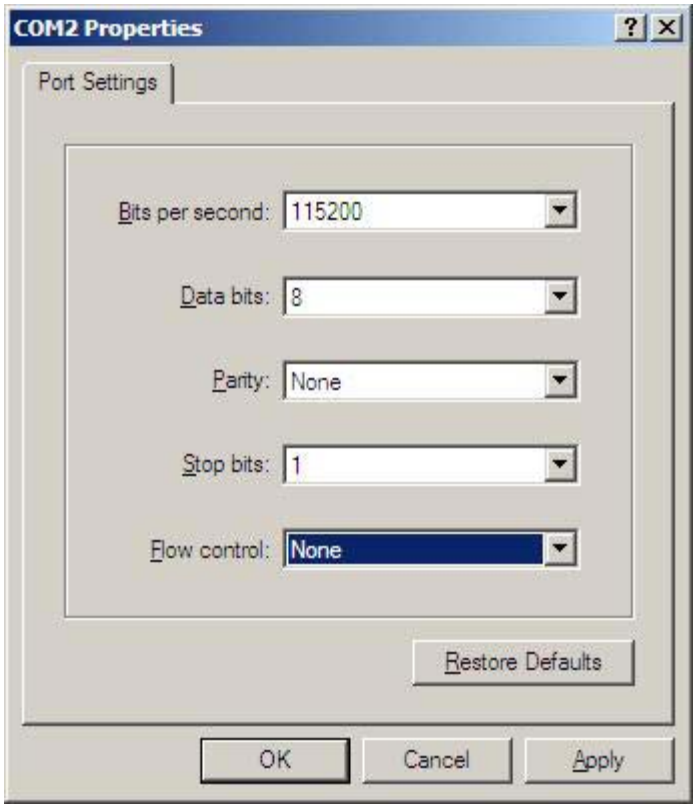
6. Click OK. You should see a dialog box named "Connect To". Select the proper COM port connected to the RS-232 Serial cable.

Here is an image of the Dialog Box "Connect to"

7. Click OK. You should see a dialog Box named "Com (your com port)"

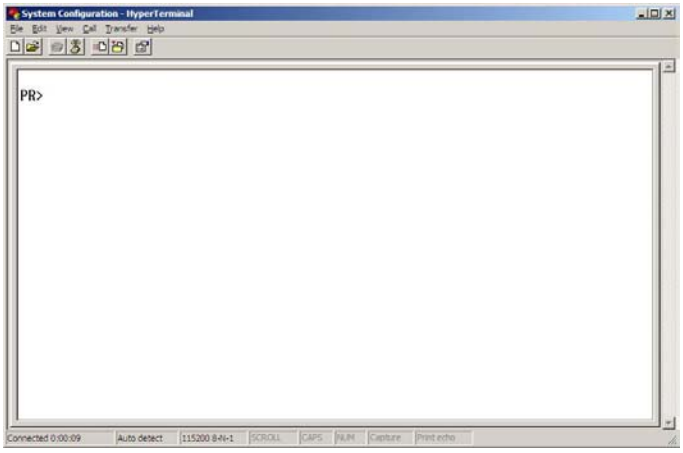
Select the following settings: 115,200 Bits per second, 8 Data bits, None Parity, 1 Stop bit and None for Flow control. Also assign your PC's Com Port. If you are unsure of you COM port, click Start>Control Panel>Ports to find your Com Port configuration

Here is an image of the Dialog Box with " COM2 Properties"



8. Click OK. You should now return to the hyper terminal window. Hit the "Enter" key, you should now see the Point Red Configuration Prompt.

9. Here is an image of the Hyper Terminal Window: Hit the "Enter" key to see the PR> prompt.



10. You are now ready to configure the Network Settings for the PointRed System.

Chapter

4

Configuring the System

This Chapter describes all the commands available for the user to view the system settings. This document also provides the commands syntax and system response for each command.

The system commands are:

1. "help" or "help info"

The "help" or "help info" commands introduce all available commands.

On the CPE-MODEM system:

Command:

```
PR> help<ENTER>
or
PR> help info<ENTER>
```

Response:

```
PointRed info commands:
     help      - Show this help menu
     version   - Display version information
     systime   - System time
     state     - show current station setup
     show      - show configuration information
     listcpe   - List CPEs in the system
     qinfo     - Queue information
     trstate   - Transceiver State
     enable    - Enable login to the system
Also try 'help [info|ping]
PR>
```

2. "version"

This command displays the firmware version installed in the CPE. This information might be requested if you contact customer support at PointRed.

Command:

```
PR> version<ENTER>
```

Response:

```
PointRed Technologies, Inc. PartNo: 13-0020, Version 3.0
Compiled: Thu Jan 23 19:25:3
PR>
```

3. "systime"

The "systime" command shows the system time and CPU Load. To exit from the systime function you need to retype systime.

Command:

```
PR> systime<ENTER>
```

Response:

```
[06:56:32] CpuLoad=29%
```

4. "state"

The "state" command allows the user to see the current system configuration.

Command:

```
PR> state<ENTER>
```

Response:

```
CPE Station
LAN IPAddress:  10.0.0.1  LAN Subnet Mask:255.255.255.0
WAN IPAddress:  192.0.0.1 WAN Subnet Mask:255.255.255.0
Default Gateway:0.0.0.0 MAC Address: 0.c0.11.1a.39.c0
Transceiver Application.
```

5. "show"

The "show" command opens up a menu with a variety of subcommands that allow the user to see but not modify the system settings.

Command:

```
PR> show<ENTER>
```

Response:

```
PointRed show commands:
  cpes         - Display CPEs in single line format
  config       - Display Running configuration
  slice        - Slice information
  status       - Print the CPE Status
  routes       - Route entry list
  qinfo        - Queue information
  ratelimit    - Rate limiting CPE info
  upload       - Show Code Upload Status
```

a. *Command:*

```
PR> show cpes<ENTER>
```

Response:

```
LanIP 10.0.0.1 LanMask 255.255.255.0 Mac 0.c0.11.1a.39.c0
WanIP 192.0.0.2 WanMask 255.255.255.0
```

b. *Command:*

```
PR> show config<ENTER>
```

Response:

```
CPE Station
PointRed Technologies, Inc. PartNo: 13-0020, Version: 3.0
Compiled: Thu Jan 23 19:25:32 2003
Lan IP Address  10.0.0.1/255.255.255.0
Default Gateway 0.0.0.0
Wan IP Address  192.0.0.2/255.255.255.0
Mac Address     0.c0.11.1a.39.c0
DNS Server(s)   0.0.0.0, 0.0.0.0, 0.0.0.0
DHCP Server(s)  0.0.0.0, 0.0.0.0
Board ID: 0xc0111A39
Transceiver Application
Watchdog ON
4Mbps System
Scrambler OFF
CPE receiving Non-Rate limit messages
```

c. *Command:*

```
PR> show slice<ENTER>
```

Response:

```
Base Station Time Slice: 7
CPE Time Slice         : 7
WAIT Time Slice        : 0
Current Trace Value    : 0
Prints Not Blocked     : 16512
```

d. *Command:*

```
PR> show status<ENTER>
```

Response:

```
This command is only for the Base Station.
```

e. *Command:*

```
PR> show qinfo<ENTER>
```

Response:

```
route_bq) len: 0, min: 0, max: 0
route_cq) len: 0, min: 0, max: 0
cpe->hipriq) len: 0, min: 0, max: 0
cpe->lopriq) len: 2, min: 0, max: 2
```

f. *Command:*

```
PR> show ratelimit<ENTER>
```

Response:

```
Rate Limit is not enabled in the System
```

g. *Command:*

```
PR> show upload<ENTER>
```

Response:

```
Upload Completed or not Started ..
```

6. "listcpe"

The "listcpe" command shows to the user all the CPE's that are configured in the system.

Command:

```
PR> listcpe<ENTER>
```

Response:

```
CPE list:
     Number of CPE(s) : 2

[CPE 1]
   Mac address 0.11.22.33.44.c2
   LanIP   10.0.1.1        WanIP   192.0.0.3

   Number of packets sent  : 0
   Number of bytes sent    : 0

[CPE 2]
   Mac address 0.11.22.33.44.c8
   LanIP   10.0.0.1        WanIP   192.0.0.2

   Number of packets sent  : 38440
   Number of bytes sent    : 53989430
```

7. "qinfo"

The "qinfo" command lets the user view the activity on the system. This command is also used to align the CPE antenna. To align the CPE antenna type qinfo 0 to reset the counters and then type qinfo and compare the sent and received number for the control packages. Align antenna until the packet loss is 0.

Command:

```
PR> qinfo<ENTER>
```

Response:

```
Max Bytes Sent: 0, Pkts sent: 0
8012580]  Total number of Free buffers avail: 100
Number of control pkts sent: 0, rcvd: 0
Number of data pkts sent: 0, rcvd: 0
```

8. "trstate"

The "trstate" command lets the user view all the settings of the transceiver. Following the example of a 2.5GHz transceiver.

Command:

```
PR> trstate<ENTER>
```

Response:

```
2.5GHz Transceiver ON
Transceiver Setup: Power=182, Frequency=2593
```

9. "help ping"

The help ping command shows all the commands that can be used with the CPE internal ping utility.

Command:

```
PR> help ping<ENTER>
```

Response:

```
PointRed ping commands:
ping         - Ping [host] [#times]
```

```
endping      - terminate the current ping session
pstats       - display statistics about ping
delay        - set milliseconds to wait between pings
host         - set default active IP host
length       - set default ping packet length
```

10. "ping"

The following is an example on how to use the ping command with it's associated sub commands.

Command:

```
PR> length 100<ENTER>  (Set's the length of the ping package to 100bytes)

PR> delay 800 <ENTER>  (Set's the delay between pings to 800ms)
set inter-ping delay to (approx) 800 ms.

PR> ping 10.0.0.10 25 <ENTER> (Set's the ping address and the number of times the
address is to be pinged, in this example the address will be pinged 25 times.)
```

Response:

```
Pinging 10.0.0.1 with 100 bytes of data:
 PR> Reply from 10.0.0.1: bytes=100 seq=0 time<2ms
  Reply from 10.0.0.1: bytes=100 seq=1 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=2 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=3 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=4 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=5 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=6 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=7 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=8 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=9 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=10 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=11 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=12 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=13 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=14 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=15 time<2ms
  Reply from 10.0.0.1: bytes=100 seq=16 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=17 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=18 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=19 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=20 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=21 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=22 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=23 time<1ms
  Reply from 10.0.0.1: bytes=100 seq=24 time<1ms
 Ping statistics for 10.0.0.1
       Packets: Sent = 25, Received = 25, Lost = 0
```

11. "enable"

The "enable" command let's the administrator log on to the system to change settings and ad or delete other users. Ones the administrator has logged on he can use the help command as described before and he will get a longer list of commands to choose from.

Command:

```
PR> Enable<enter>
```

Response:

```
Enter Passwd: *****
PR>
```

Chapter

5

Advanced configuration for the system administrator

This Chapter describes all commands available to the system administrator to view and modify the system settings. This document also provides the commands syntax and system response for each command.

The system commands are:

1. "help"

The "help" command introduces all available commands. In this section we will only discuss the commands that are useful to the administrator and have not been available to the user.

Command:

```
PR> help<ENTER>
```

Response:

```
PointRed info commands:
help          - Show this help menu
  version       - Display version information
  systime       - System time
  state         - Show current station setup
  show          - Show configuration information
  listcpe       - List CPEs in the system
  qinfo         - Queue information
  trstate       - Trasceiver State
  enable        - Enable login to the system
Also try 'help [info|network|config|upload|tranceiver|ping|voice|debug]'
```

2. "help network"

The "help network" command provides the administrator with all subcommands required for the network configuration.

Command:

```
PR> Help network<ENTER>
```

Response:

```
PointRed network commands:
  lanip         - Set LAN IP Address
  gateway       - Set Default LAN Gateway IP Address
  wanip         - Set PWAN IP Address
  dns           - Set DNS Server IP Addresses
  dhcp          - Set DHCP Server IP Address for Relay
  nslookup      - do DNS gethostbyname()
  route         - CPE Routing information table
  portrule      - Set/See Hi priority Port numbers
```

a. *Command:*
PR> lanip 10.0.0.1

Response:
New Configuration:

```
CPE Station
LAN IP Address : 10.0.0.1  LAN Subnet Mask: 255.255.255.0
WAN IP Address : 192.0.0.2 WAN Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0 MAC Address: 0.c0.11.1a.39.c0
Transceiver Application.
```

b. *Command:*
PR> gateway 0.0.0.0 Command only required if multiple networks behind one CPE.

Response:
New Configuration:

```
CPE Station
LAN IP Address : 10.0.0.1  LAN Subnet Mask: 255.255.255.0
WAN IP Address : 192.0.0.2 WAN Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0 MAC Address: 0.c0.11.1a.39.c0
Transceiver Application.
```

c. *Command:*
PR> wanip 192.0.0.3

Response:
New Configuration:

```
CPE Station
LAN IP Address : 10.0.0.1  LAN Subnet Mask: 255.255.255.0
WAN IP Address : 192.0.0.3 WAN Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0 MAC Address: 0.c0.11.1a.39.c0
Transceiver Application.
```

d. *Command:*
PR> dns Command only used on BTS.

e. *Command:*
PR> dhcp Command only used on BTS.

f. *Command:*
PR> port rule Command only used on BTS.

3. "help config"

The "help config" command provides the administrator with all subcommands required for the configuration set-up.

Command:
PR> help config<ENTER>

Response:

```
PointRed config commands:
   addcpe       - Add CPE to the system
   delcpe       - Remove CPE from the system
```

```
findcpe      - Find the CPE in the Cell
cperoute     - Fixed routing entry for the CPE
pollratio    - Show/Set the poll ratio
commit       - Save configuration to the FLASH
ratelimit    - Show/Set Rate limit for specific CPE
prset        - Set Parameters
sync         - Synchronize non-volatile parameters
nvset        - Set non-volatile parameters
nvedit       - Edit non-volatile parameters
useradd      - Show/Set/Delete users in the system
passwd       - Change Password
reset        - Reset System
```

a. *Command:*
`PR> addcpe` Command only used on BTS.

b. *Command:*
`PR> delcpe` Command only used on BTS.

c. *Command:*
`PR> findcpe` Command only used on BTS.

d. *Command:*
`PR> cperoute` Command only used on BTS.

e. *Command:*
`PR> pollratio` Command only used on BTS.

f. *Command:*
`PR> commit <ENTER>`

Response:
`PR>` Commits changes to non volatile memory.

g. *Command:*
`PR> ratelimit` Command only used on BTS.

h. *Command:*
`PR> prset` Changes the startup configuration.

i. *Command:*
`PR> sync` Command only used on BTS.

j. *Command:*
`PR> nvset` Command only used on BTS.

k. *Command:*
`PR> nvedit` Command only used on BTS.

l. *Command:*
`PR> useradd` Command only used on BTS.

m. *Command:*
`PR> passwd` Command only used on BTS.

n. *Command:*

```
PR> reset <ENTER>
```

Response:

```
Executing "go 0xBFC00000" Command...
```

Resets the CPE.

4. "help tranceiver"

The "help tranceiver" command provides the administrator with all subcommands required for the configuration of the transceiver.

Command:

```
PR> help tranceiver<ENTER>
```

Response:

```
PointRed tranceiver commands:
 trnscvr  -Set Transceiver/Set Cable mode
 trpwr    -Change Tx power level use
 trfrq    -Change frequency
 trmode   -Chose frequency mode in GHz (2.4, 2.5, 2.7, etc...)
```

a. *Command:*

```
PR> trnscvr
```

Toggles the CPE configuration between wireless and cable application.

Response:

```
Transceiver Application or Cable Application
```

b. *Command:*

```
PR> trpwr 102
```

Any integer between 0 and 202; with 202 representing maximum transmit power

Response:

```
Transceiver Power Changed: Old=202, New=102
```

c. *Command:*

```
PR> trfrq 2551.00
```

Check the transceiver you have installed for the appropriate frequency range before you change the frequency as described here.

Response:

```
Transceiver Frequency Changed: Old=2593, New=2551
```

d. *Command:*

```
PR> trmode
```

Response:

```
Usage: trmode <parameter>
Current trmode is: 1
 Use trmode 0 for "2.4GHz"
 Use trmode 1 for "2.5GHz"
 Use trmode 2 for "2.7GHz"
 Use trmode 3 for "2.7GHz-Wide"
 Use trmode 5 for "2.2GHz"
 Use trmode 6 for "2.0GHz"
```

Verify that the displayed trmode corresponds to the label on the transceiver unit.

5. "help debug"

The "help debug" command provides the administrator with all subcommands required for the debugging of the CPE.

Command:

```
PR> help debug <ENTER>
```

Response:

```
PointRed debug commands:
  trace        - Enables trace level functionality
  memps        - ThreadX Byte pool info
  jump         - Jump to specified location
  txtest       - Tx link test
  rxtest       - Rx link test
  prtest       - Test the menu
  loopcmd      - Execute Commands in loop
  dbytes       - Dump block of memory
  z            - Block/Unblock trace printouts
  getinfo      - Get information about CPE(s)
```

a. *Command:*

```
PR> memps
```

Runs a system memory check utility.

b. *Command:*

```
PR> txtest 100 AA 192.0.0.3
```

Test the transmitter of the CPE.

Response:

```
Send packets test[192.0.0.3]: Msgs=100 Delay=8 Len=100 Data=0x0A
Tx Quality: 100.00%, Packets recv/sent: 100/100
```

c. *Command:*

```
PR> loopcmd txtest 100 AA 192.0.0.3
```

Endless loop of the CPE transmitter test, can also be used with other commands. Has to be stopped by hitting the esc key.

Response:

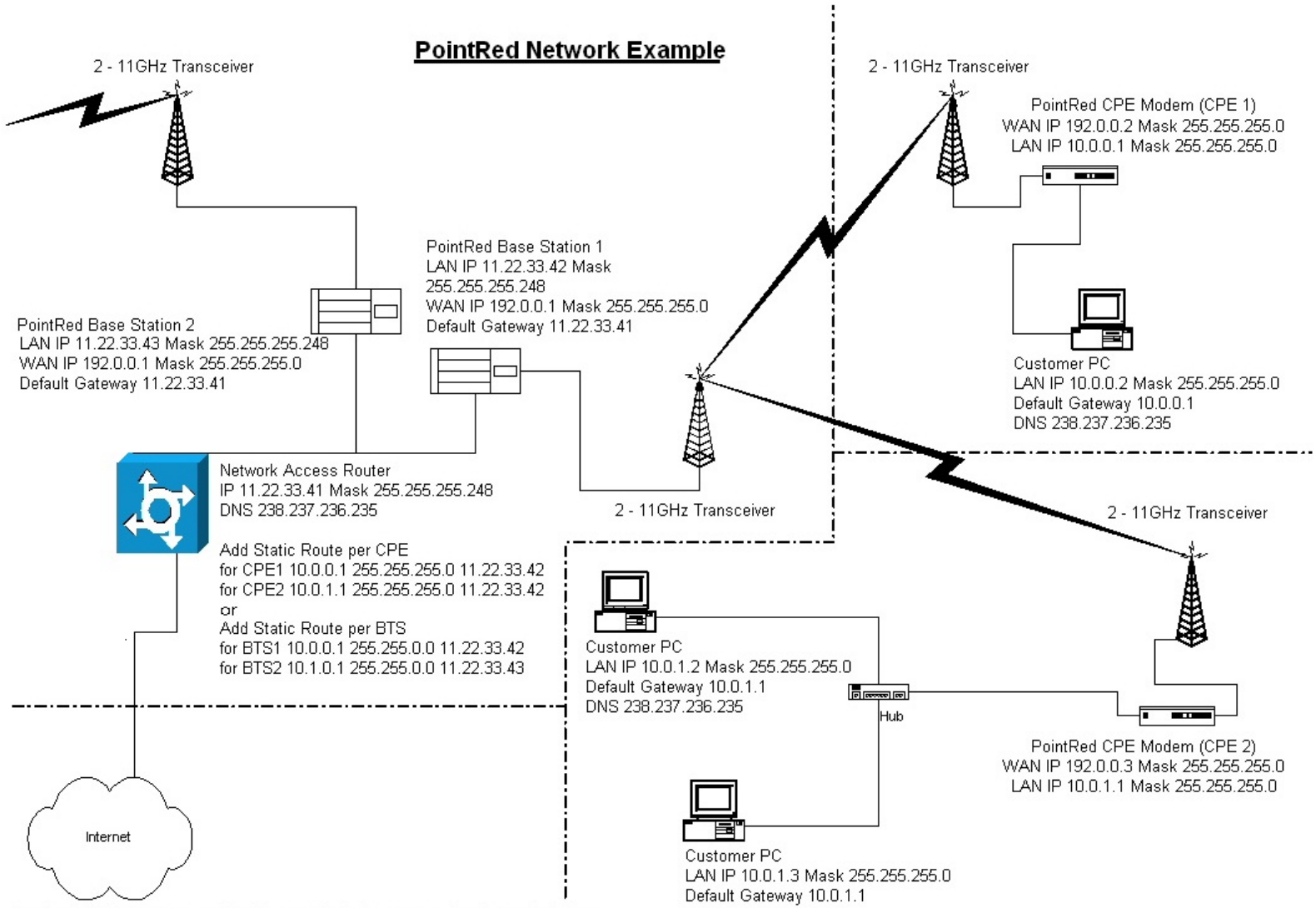
```
Send packets test[192.0.0.1]: Msgs=100 Delay=8 Len=100 Data=0x0A
Tx Quality: 100.00%, Packets recv/sent: 100/100
Tx Quality: 100.00%, Packets recv/sent: 100/100
Tx Quality: 100.00%, Packets recv/sent: 100/100
PR>
```

d. *Command:*

```
PR> getinfo
```

Command only used on BTS.

Appendix A Deployment Example



Caution: Default Gateway and LanIP must be in the same subnet for each device.
Caution: Subnets on different CPE's are not aloud to overlap!
Caution: Only the 10.X.X.X and 192.X.X.X IP addresses are public, all other IP addresses used in this example are privat addresses and have to be exchanged against addresses on your network.

Example Configuration

The following example will explain how to configure CPE2 from the Network diagram on the previous page. This will include the use of the qinfo command for the alignment of the antennas.

1. Complete physical installation as described in Chapter 2.

2. Connect with your PC to the CPE as described in Chapter 3.

3. Verify the default configuration:

```
PR> show config<ENTER>

CPE Station
PointRed Technologies, Inc. PartNo: 13-0020, Version: 3.0
Compiled: Thu Jan 23 19:25:32 2003
Lan IP Address  10.0.0.1/255.255.255.0
Default Gateway 0.0.0.0
Wan IP Address  192.0.0.2/255.255.255.0
Mac Address     0.c0.11.1a.39.c0
DNS Server(s)   0.0.0.0, 0.0.0.0, 0.0.0.0
DHCP Server(s)  0.0.0.0, 0.0.0.0
Board ID: 0xc0111A39
Transceiver Application
Watchdog ON
4Mbps System
Scrambler OFF
CPE receiving Non-Rate limit messages
```

4. Set the LANIP address:

```
PR> enable<ENTER>
Enter Passwd: *****<ENTER>
PR> lanip 10.0.1.1 255.255.255.0<ENTER>
New Configuration:

CPE Station
LAN IP Address : 10.0.1.1  LAN Subnet Mask: 255.255.255.0
WAN IP Address : 192.0.0.2 WAN Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0 MAC Address: 0.c0.11.1a.39.c0
Transceiver Application.
```

5. Set the WANIP address:

```
PR> wanip 192.0.0.3 255.255.255.0
New Configuration:

CPE Station
LAN IP Address : 10.0.1.1  LAN Subnet Mask: 255.255.255.0
WAN IP Address : 192.0.0.3 WAN Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0 MAC Address: 0.c0.11.1a.39.c0
Transceiver Application.
```

6. Set the transceiver parameters:

```
PR> enable<ENTER>
Enter Passwd: *****<ENTER>
PR> trstate
2.5GHz Transceiver ON
Transceiver Setup: Power=0, Frequency=380
PR> trpwr 202<ENTER>
Transceiver Power Changed: Old=0, New=202
PR> trfrq 2551.0<ENTER>
Transceiver Frequency Changed: Old=380, New=2551
PR> 2.5GHz Transceiver ON, Frequency=2551, Power=202
PR> commit<ENTER>
PR> reset<ENTER>
Executing "go 0xBFC80000" Command...
```

7. Aligning the antenna using the qinfo and qinfo 0 command:

```
PR> qinfo<ENTER>
  Max Bytes Sent: 143, Pkts sent: 1
[351546]  Total number of Free buffers avail: 100
  Number of control pkts sent: 583497, rcvd: 371304
  Number of data pkts sent: 19, rcvd: 7
PR> qinfo 0<ENTER>
  Max Bytes Sent: 143, Pkts sent: 1
[420342]  Total number of Free buffers avail: 100
  Number of control pkts sent: 715786, rcvd: 423947
  Number of data pkts sent: 23, rcvd: 7
PR> qinfo<ENTER>
  Max Bytes Sent: 0, Pkts sent: 0
[429255]  Total number of Free buffers avail: 100
  Number of control pkts sent: 17138, rcvd: 15437
  Number of data pkts sent: 0, rcvd: 0
PR> qinfo<ENTER>
  Max Bytes Sent: 0, Pkts sent: 0
[436523]  Total number of Free buffers avail: 100
  Number of control pkts sent: 31125, rcvd: 27647
  Number of data pkts sent: 0, rcvd: 0
PR> qinfo
  Max Bytes Sent: 76, Pkts sent: 1
[444953]  Total number of Free buffers avail: 100
  Number of control pkts sent: 47325, rcvd: 42231
  Number of data pkts sent: 4, rcvd: 0
PR> qinfo 0<ENTER>
  Max Bytes Sent: 76, Pkts sent: 1
[463499]  Total number of Free buffers avail: 100
  Number of control pkts sent: 82909, rcvd: 76815
  Number of data pkts sent: 4, rcvd: 0
```

```
PR> qinfo<ENTER>
  Max Bytes Sent: 0, Pkts sent: 0
[470729]  Total number of Free buffers avail: 100
  Number of control pkts sent: 13898, rcvd: 13898
  Number of data pkts sent: 0, rcvd: 0
PR> qinfo<ENTER>
  Max Bytes Sent: 0, Pkts sent: 0
[475837]  Total number of Free buffers avail: 100
  Number of control pkts sent: 23718, rcvd: 23718
  Number of data pkts sent: 0, rcvd: 0
```

The way to work with the qinfo and qinfo 0 command is to first configure the unit completely then resetting the internal packet counters to zero by issuing the qinfo 0 command. Following the reset you pan the antenna and issue the qinfo command from time to time and compare the number of control packets sent and received. When the numbers become to hard to compare for a quality improvement reset the counters again with the qinfo 0 command. Repeat this process until you have aligned the antenna in the direction where the packet loss is 0.