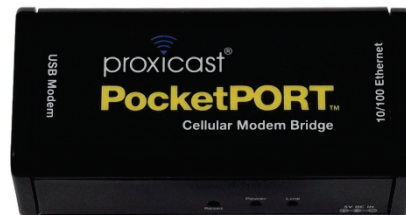


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# Proxicast PocketPORT

## Cellular Modem Bridge

### *User's Guide*



Firmware Version 1.5



# Contents

<b>1. Introducing The Proxicast PocketPORT .....</b>	<b>3</b>
1.1 What is the PocketPORT? .....	3
1.2 PocketPORT Operating Modes .....	3
1.3 QuickStart for CDMA USB Modems .....	4
1.4 QuickStart for GSM & LTE USB Modems .....	4
1.5 PocketPORT LEDs and Connectors .....	6
<b>2. Configuration Mode .....</b>	<b>7</b>
2.1 Device Status .....	8
2.2 General Settings .....	8
2.3 USB Modem Settings .....	8
2.4 Auto Ping Settings .....	8
2.5 DynDNS Settings .....	9
2.6 Virtual Cable Mode Settings .....	9
2.7 Saving PocketPORT Settings .....	9
2.8 Firmware Updates .....	10
2.9 Factory Default Reset .....	11
<b>3. IP Pass-Thru / Bridge Mode (default) .....</b>	<b>12</b>
<b>4. NAT Router Mode .....</b>	<b>13</b>
<b>5. Virtual Cable Mode .....</b>	<b>14</b>
<b>6. Accessing Remote Devices .....</b>	<b>16</b>
6.1 Static IP Address .....	16
6.2 PocketPORT Dynamic DNS .....	16
6.3 DynDNS Dynamic DNS .....	16
6.4 Port Forwarding – NAT Router Mode .....	17
6.5 Cellular Operator Restrictions .....	17
<b>7. Troubleshooting &amp; FAQ's .....</b>	<b>18</b>
7.1 Troubleshooting .....	18
7.2 Frequently Asked Questions .....	19
<b>8. Technical Specifications .....</b>	<b>21</b>
<b>9. Contacts &amp; Support .....</b>	<b>22</b>
<b>10. Legal Information .....</b>	<b>23</b>

# 1. Introducing The Proxicast PocketPORT

## 1.1 What is the PocketPORT?

PocketPORT is the world's smallest Cellular Modem to Ethernet Bridge. The PocketPORT instantly connects virtually any cellular (3G/4G) USB modem to any Ethernet device simply by plugging both devices into the PocketPORT. Any device that can be connected to a cable, DSL or satellite modem, Ethernet switch or hub can use the PocketPORT to get Internet service via an inexpensive USB modem from cellular service providers. The PocketPORT is the highly portable, simple and low-cost alternative to large, complex and expensive cellular Ethernet modems.

Use a PocketPORT wherever wired Internet service is unavailable, difficult, costly or time-consuming to install. Plug a PocketPORT into the Ethernet port of devices such as IP cameras (web cams) for security applications, programmable logic controllers (PLC) for industrial processes, digital & network video recorders (DVR/NVR) or any other equipment that needs Internet service for remote access. Have field service technicians keep a PocketPORT in their "pocket" for instant Internet access for remote equipment when they are on site visits.



Figure 1: The PocketPORT

## 1.2 PocketPORT Operating Modes

The PocketPORT has 4 distinct modes of operation:

1. IP-Pass Thru / Bridge Mode (default)
2. NAT Router Mode
3. Virtual Cable Mode
4. Configuration Mode

When first powered on (or reset to factory defaults), the PocketPORT operates in **IP-Pass Thru/Bridge Mode**. The IP address assigned to the USB modem by the cellular carrier is passed directly to the device attached to the PocketPORT's Ethernet port.

**NAT Router Mode** functions as a simple NAT router, allowing multiple devices to be connected to the PocketPORT (via an external switch or hub). The PocketPORT provides a DHCP server to assign private IP addresses to attached devices.

**Virtual Cable Mode** allows creates a fully encrypted point-to-point connection between two PocketPORT's. In this virtual private networking (VPN) mode, the devices connected to each of the PocketPORTs appear to be directly connected via an Ethernet cable.

**Configuration Mode** is entered by pressing the Reset button for 2 seconds. There the default parameters for the PocketPORT such as selecting the operating mode, IP address, dynamic DNS name, and modem-specific settings can be changed.

Please see the following sections for more information on each PocketPORT operating mode.

### 1.3 QuickStart for CDMA USB Modems

For CDMA-based modems (EV-DO, 1xRTT) from cellular carriers such as Verizon Wireless or Sprint, using the PocketPORT requires only a few simple steps:

- Insert the USB modem into a PC and use the software on the modem or the CD to activate it and make a successful connection to your cellular service provider.  
**This step is REQUIRED !**
- Configure the Ethernet device to automatically receive an IP address (DHCP)
- Connect the Ethernet device to the PocketPORT
- Insert the USB modem into the PocketPORT
- Power on the PocketPORT
- Wait 30-60 seconds for the Status LED to flash rapidly

### 1.4 QuickStart for GSM & LTE USB Modems

For GSM-based modems (LTE, UMTS, HSPA+, HSPA, HSUPA, HSDPA, EDGE, GPRS) from carriers such as AT&T Mobility, Verizon Wireless T-Mobile, Rogers Wireless, Bell Mobility, Telus, Telcel, Claro, Vodafone, O2, Orange, MTN and many others, follow the instructions below to begin using the PocketPORT:

- Obtain an activated SIM card and the required APN, Username, and Password from your cellular provider
- Connect the USB modem to the PocketPORT
- Configure a PC to automatically receive an IP address (DHCP)
- Power on the PocketPORT & wait for the **Status** LED to flash slowly
- Press the Reset button for 2 seconds (**Status** LED = solid red)
- Connect an Ethernet cable between the PC & PocketPORT
- Open the PC's web browser to: <http://192.168.1.1:8080>
- Enter the default username = **admin** and default password = **1234**
- Select *GSM/HSPA/LTE* as the **Modem Type** and enter the APN, Username and Password
- Click **Generate Configuration**, then **Write Configuration**
- Configure the Ethernet device to automatically receive an IP address and connect the device to the PocketPORT
- Wait 30-60 seconds for the Status LED to flash rapidly

**Note:** *Some cellular modems require additional PocketPORT configuration parameters in order to make a successful connection to the GSM network. Please refer to the USB Modem Configuration Guides on the Proxicast Technical Support website [http://www.proxicast.com/support/PocketPORT\\_Support.asp](http://www.proxicast.com/support/PocketPORT_Support.asp) for more information about settings for specific USB modems.*

**Note:** *Some cellular service providers operate both CDMA and GSM networks. Check your specific USB modem's capabilities.*

## 1.5 PocketPORT LEDs and Connectors



**Figure 2: Power & Ethernet**

<b>Power Jack</b>	5 VDC (see specifications)
<b>RJ45 Jack</b>	10/100 Ethernet



**Figure 3: USB & Status**

<b>USB Jack</b>	USB Cellular Modem (USB 2.0)
<b>Status LED</b>	PocketPORT Status: Solid = Configuration Mode Slow Flash = Cellular Connection Offline Rapid Flash = Cellular Connection Online



**Figure 4: Link & Reset**

<b>Reset Button</b>	Press for 2 seconds to enter Config Mode  Press for 15 seconds while applying power reset configuration to factory defaults
<b>Power LED</b>	Indicates PocketPORT on/off status
<b>Link LED</b>	Ethernet Link Status and Activity

## 2. Configuration Mode

To change PocketPORT settings such as Operation Mode (Bridge, Router or Virtual Cable), IP & DHCP settings, Auto Ping (keep-alive), Dynamic DNS and modem-specific parameters:

- Press the Reset button for 2 seconds. The **Status** LED will be solid red. The DHCP server will be enabled
- Access the PocketPORT's configuration page using a web browser at <http://192.168.1.1:8080>  
Default Username = **admin** Default Password = **1234**

Device Status		
PocketPORT Model	PP-001	Cellular USB Modem to Ethernet Bridge/Router
Serial #	001B3910C8D0	Ethernet MAC Address
Firmware Version	v1.5.2 (11/10/11)	PocketPORT software release
External IP address	166.139.37.167	IP address of the WAN interface
USB Modem Signal Quality	64%	0=No Signal 1-32=Weak 33-65=Good 66-100=Strong
General Settings		
Connection Mode	IP Pass-Through Mode	Select a connection mode
Reboot on Disconnect	No	Reboot if the 3G network fails - set this to yes for increased reliability
LAN IP Address	192.168.1.1	IP address for the LAN port
LAN IP Subnet Mask	255.255.255.0	Subnet mask for LAN
DHCP Pool Start Address	192.168.1.33	Starting DHCP IP address
DHCP Pool End Address	192.168.1.161	Ending DHCP IP address
HTTP Config Port	8080	HTTP port for configuration
HTTP Config Password	1234	HTTP password for configuration
Forward all inbound traffic to IP		IP address on LAN to receive inbound traffic (NAT Router Mode)
USB Modem Settings		
USB Modem Type	GSM/HSPA/LTE	Select the type of USB modem connected to the PocketPORT
USB Modem Port	ttyUSB4	Select the TTY port of USB modem connected to the PocketPORT
APN	internet	Enter your assigned APN (GSM/HSPA/LTE only)
APN Number	1	Enter the number of the APN to use (GSM/HSPA/LTE only)
Username		Enter your Username (if required)
Password		Enter your Password (if required)
SIM / R-UIM PIN		Enter your SIM PIN (if required)
Auto Ping Settings (NAT Router & Virtual Cable Modes Only)		
Destination Address		IP address or DNS name to ping
Ping Frequency	5	# of seconds between pings
Ping Failure Timeout	3	# of seconds to wait for a reply
Failure Tolerance	3	# of successive timeouts before failure
DynDNS Settings		
Hostname		Enter your <b>DynDNS</b> Hostname, e.g. myhost.dyndns.com
Username		Enter your DynDNS Username
Password		Enter your DynDNS Password
Virtual Cable Settings (Virtual Cable Mode Only)		
Switchboard Server Address	vc.pocketport.net:9999	Set to vc.pocketport.net:9999 to use Proxicast's server
Account Name		Enter your email address or another globally unique identifier
Network Name		Enter a unique network name (same value on both PocketPORTs)

Figure 5: Configuration Screen

## 2.1 Device Status

This section provides general information about the PocketPORT including the serial number, firmware version, current IP address and cellular signal strength of the attached USB modem. If the signal strength is not displayed, configure the USB modem settings first and then restart the PocketPORT. Note that some USB modem models may not support signal strength display.

This section also allows you to change the access password for the PocketPORT (username is fixed as "admin"). Further you can change the Configuration Management Port number if the default value of 8080 conflicts with your application requirements.

## 2.2 General Settings

The General Settings section configures the PocketPORT's Operating Mode and IP-related parameters. The Reboot On Disconnect setting, while generally not necessary, causes the PocketPORT to restart every time the cellular connection is lost.

For NAT Router and Virtual Cable Mode operation, the PocketPORT's IP address, subnet mask, and the DHCP server parameters can be modified. These settings are not applicable to IP-Pass Thru/Bridge Mode. Regardless of the IP Address setting, the PocketPORT's LAN IP address will always be 192.168.1.1 when in Configuration Mode.

When operating in NAT Router Mode, the PocketPORT can forward all "inbound" IP traffic from the Internet to a specific LAN IP address. Set this value when connecting to a device attached to the PocketPORT's Ethernet LAN segment from other remote Internet addresses. See Section 6 *Accessing Remote Devices* more information.

## 2.3 USB Modem Settings

The general type of USB modem attached to the PocketPORT (CDMA or GSM) must be selected. In some instances, the USB port number that the USB modem uses must also be defined (refer to the USB Modem Configuration Guides on the Proxicast Technical Support website: [http://www.proxicast.com/support/PocketPORT\\_Support.asp](http://www.proxicast.com/support/PocketPORT_Support.asp)).

For GSM modems, the Access Point Name (APN), username, password and PIN assigned to by the cellular service provider must also be entered. The correct values will depend upon the type of Internet service plan provisioned for the USB modem. If no SIM/R-UIM PIN is required, leave this field blank. Certain cellular modems may also require that the APN be selected from a list of profiles permanently stored in the modem. Unless the USB modem configuration guide indicates otherwise, leave the default APN Number as "1".

## 2.4 Auto Ping Settings

The PocketPORT monitors the USB modem's cellular connection and is able to detect many types of "dropped" connections. When a disconnection is detected, the PocketPORT automatically attempts to reestablish the connection.

In NAT Router and Virtual Cable Modes the PocketPORT can also help keep the cellular connection "alive" by periodically sending an ICMP (ping) packet to a designated IP address. The Destination Address is the IP address or host name to ping. For NAT Router mode, this should be a device on the Internet. For Virtual Cable mode, it should be the address of a device connected to the other PocketPORT.

Ping frequency is the time between ping packets. Ping Failure Timeout is how long to wait for an ICMP Echo Reply before considering the packet to be lost. Ping Failure Tolerance is how many consecutive packet losses to allow before considering the connection to have failed.

Once the PocketPORT detects a cellular connection failure based on the Auto Ping settings, it will drop and restart the cellular connection.



## 2.5 DynDNS Settings

Proxicast provides a unique permanent DNS name for every PocketPORT based on the device's serial number in the form of *serial#.pocketport.net*. This DNS name can be used to remotely access an Ethernet device attached to the PocketPORT.

An additional user-defined DNS name can be created for each PocketPORT using the DynDNS.com service. Please visit [www.dyndns.com](http://www.dyndns.com) for more information in setting up a DNS account and hostname. In the DynDNS Setting section of the PocketPORT configuration screen, enter the username, password and fully qualified DNS hostname as defined in your DynDNS account.

The *serial#.pocketport.net* and/or DynDNS hostnames will work whether the USB modem's cellular IP address is static or dynamic. The *serial#.pocketport.net* hostname is valid even if a DynDNS hostname is also defined. See Section 6 *Accessing Remote Devices* for more information on using DNS names with cellular dynamic IP addresses.

## 2.6 Virtual Cable Mode Settings

When configuring the PocketPORT for Virtual Cable Mode, a "switchboard" server must be defined that is used to help the ends of a virtual cable find each other on the Internet. Traffic is routed directly between endpoints whenever possible once the virtual cable connection is established.

Proxicast maintains a demo virtual cable switchboard server (*vc.pockeport.net*). If large amounts of data are to be transferred, slow data rates are experienced or many PocketPORTs must be connected together, please contact Proxicast regarding creating your own virtual cable switchboard server.

We recommend using your email address as the Account name. This ensures that your PocketPORTs will be placed on the same virtual network and will be able to see each other. This also prevents network name collisions with networks defined by other users.

Define a unique Network Name and Network Password (pre-shared key) for your virtual cable network. Two PocketPORTs will be able to reach each other only if the Account Name, Network Name and Network Password are the same on both devices. Use different Network Names to set up different virtual networks under the same account. Devices with different Networks Names are not visible to each other.

## 2.7 Saving PocketPORT Settings

After making any setting changes click the **Generate Configuration** and **Write Configuration** buttons to save any changes to the PocketPORT. You may also enter other configuration parameters into the **Generated Settings** window based on modem-specific documentation or instructions from Proxicast.

The screenshot displays the Proxicast PocketPORT configuration interface. At the top, there is a yellow bar with a 'Generate Configuration' button. Below this is a black bar with the text 'Generated Settings - edit or add parameters below if needed'. The main area is a white text box containing the following configuration parameters:

```
PM=ppp ROD=0 APN=internet ANO=1 U= P= DH= DU= DP= VA= VS=vc.pocketport.net:9999 VC= VP=
NETWORKMODE=GSM AUTOPING= APL=3 APF=5 APT=3 MYIP=192.168.1.1 MYNM=255.255.255.0
MYDHCPSTART=192.168.1.33 MYDHCPEND=192.168.1.161 FULLNATIP= PIN= DEVICEPORT=ttyUSB4 HTTPPORT=8080
HTTPPASS=1234
```

Below the text box is a yellow bar with a 'Write Configuration to Persistent Memory' button. At the bottom of the interface, there is a black bar with links for 'Device Debug', 'Modem Debug', and 'Update Firmware', and the Proxicast logo on the right.

Figure 6: Generated Configuration Settings

After pressing the **Write Configuration** button, the PocketPORT will restart with the new setting values.

## 2.8 Firmware Updates

Periodically, new PocketPORT firmware is released to add features, additional modem support, and to correct any issues reported in previous versions. Visit <http://support.proxicast.com> for more information on the availability of PocketPORT firmware updates.

**Note:** *User initiated firmware updates require PocketPORT firmware version 1.5.2 or later to already be installed on the PocketPORT. If your PocketPORT is currently running a lower version numbered firmware, contact Proxicast Support for information on how to upgrade.*

Updating the PocketPORT firmware is a two-step process. First the new firmware image must be copied to the device. Second, the new firmware must be flashed into permanent memory.

Each PocketPORT has its own firmware file based on its serial number. Once you have downloaded the correct firmware file from Proxicast, click the **Update Firmware** link at the bottom of the Configuration Screen (Figure 6). You will then be prompted to upload the firmware file for this specific PocketPORT (Figure 7).

The screenshot shows a web interface titled "PocketPORT Firmware Update". It contains the following elements:

- A header bar with the title "PocketPORT Firmware Update".
- Introductory text: "Updating the PocketPORT firmware is a two step process:"
- A numbered list:
  1. Upload the new firmware file from your computer to the PocketPORT.
  2. Flash the new firmware image onto the PocketPORT's ROM.
- A sub-header: "Step 1: Upload new firmware file".
- A "Note:" section with the text: "Firmware files are specific to each PocketPORT serial number. Ensure that you select the correct file to upload."
- A file input field with a "Browse..." button and an "Upload" button.

Figure 7: Uploading new PocketPORT firmware

Select **Browse...** to locate the firmware file, and **Upload** to copy the file to the PocketPORT. Once the file is uploaded, the screen in Figure 8 appears. Click **Begin Flashing** to update the PocketPORT's firmware. Do not interrupt the flashing process.

The screenshot shows the next step in the firmware update process. It contains the following elements:

- A header bar with the title "PocketPORT Firmware Update".
- A status message: "Firmware file upload was successful!"
- A sub-header: "Step 2: Flash new firmware onto the PocketPORT".
- A prominent warning in red text: "DO NOT REMOVE POWER FROM THE POCKETPORT OR INTERRUPT THE FLASHING PROCESS."
- Instructions: "When flashing is complete, the PocketPORT will reboot." and "Wait at least 60 seconds before accessing the PocketPORT to confirm that the new firmware was successfully loaded."
- A troubleshooting note: "If the flashing process fails, power cycle the PocketPORT and attempt to upload and flash again."
- A "Begin Flashing" button at the bottom.

Figure 8: Flashing new PocketPORT firmware

## 2.9 Factory Default Reset

To return the PocketPORT to its “factory default” configuration settings:

- Remove power from the PocketPORT
- Press and hold the Reset button
- Apply power to the PocketPORT and continue holding the Reset button for approximately 15 seconds. The **Status** LED will turn solid red.
- Release the Reset button
- The PocketPORT will then reboot and be in IP Pass-Thru/Bridge Mode. To reconfigure the PocketPORT, press the Reset button again for 2 seconds once it begins to flash slowly. Then access the Configuration Screen using a web browser at <http://192.168.1.1:8080>

### 3. IP Pass-Thru / Bridge Mode (default)

IP Pass-Thru / Bridge Mode is the simplest way to use the PocketPORT. In this mode, the PocketPORT is essentially “invisible” to the Ethernet and USB devices attached to it. The PocketPORT makes a connection through the USB modem and passes the IP address received from the cellular carrier onto the device attached to the Ethernet port.

Use IP Pass-Thru Mode when you simply want to connect an Ethernet device to the Internet and have the Ethernet device receive a public IP address from the cellular network.

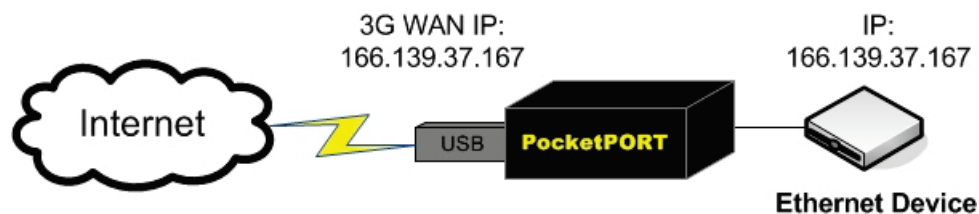


Figure 9: IP Pass-Thru / Bridge Mode

All “inbound” traffic from the Internet is automatically passed through to the attached Ethernet device. Typically, only 1 Ethernet device is attached to the PocketPORT when operating in IP Pass-Thru/Bridge Mode; however, the PocketPORT can be attached to the WAN port of another device such as a NAT router to allow the cellular Internet connection to be shared among multiple devices.

Configure the Ethernet device for DHCP to automatically receive its IP configuration information (IP address, subnet mask and default gateway). Once the PocketPORT receives the IP information from the cellular carrier, it will respond to DHCP requests from the Ethernet device with the cellular IP data. You may need to release and renew your Ethernet device’s IP setting in order to obtain the correct cellular settings.

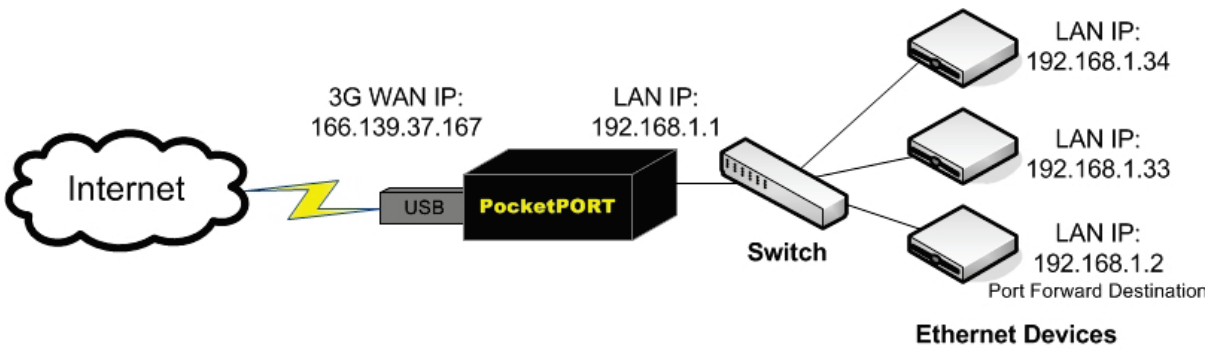
When operating in IP Pass-Thru/Bridge Mode, the PocketPORT updates its permanent DNS name with the current IP address assigned to the USB modem by the cellular carrier. The user-defined DynDNS hostname (if defined) is also updated with this IP address. Auto Ping is not applicable to IP Pass-Thru/Bridge Mode since the PocketPORT does not have its own IP address in this configuration.

The PocketPORT operates in IP Pass-Thru/Bridge mode the first time it is powered on and after being reset to its factory default settings.

4. NAT Router Mode

In NAT Router Mode, the PocketPORT acts as a simple router, providing Network Address Translation (NAT) service by converting between a range of private IP addresses on its Ethernet interface and a single public IP address assigned to the USB modem by the cellular carrier.

Use NAT Router Mode when you need the PocketPORT to provide Internet access to more than 1 Ethernet device or for additional security for a single device that does not need to be accessed remotely.



10: NAT Router Mode

The PocketPORT’s IP address and associated subnet marks can be assigned to be compatible with existing network numbering schemes. The DHCP server is also enabled so that devices attached to the network can be automatically assigned a private IP address from the PocketPORT.

When operating in NAT Router Mode, the PocketPORT updates it permanent DNS name with the current IP address assigned to the USB modem by the cellular carrier. The user-defined DynDNS hostname (if defined) is also updated with this IP address. Auto Ping is enabled to assist with maintaining a cellular connection.

To remotely access a device attached to the Ethernet side of the PocketPORT, you must configure the private IP address of that device in the “Forward All Inbound Traffic to IP” field. This setting forwards all ports and inbound traffic to the designated LAN IP address. Only 1 IP address can be configured as the port-forwarding destination. The port forwarding destination device should have a statically assigned LAN IP address (see 192.168.1.2 in Figure 10).

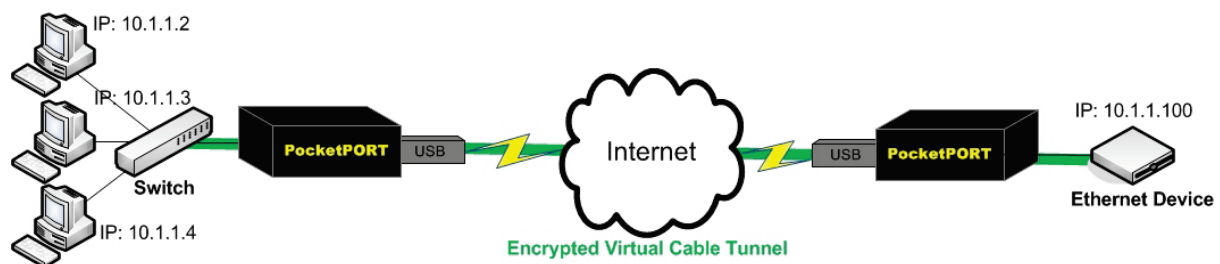
General Settings		
Connection Mode	NAT Router Mode	Select a connection mode
Reboot on Disconnect	No	Reboot if the 3G network fails - set this to yes for increased reliability
LAN IP Address	192.168.1.1	IP address for the LAN port
LAN IP Subnet Mask	255.255.255.0	Subnet mask for LAN
DHCP Pool Start Address	192.168.1.33	Starting DHCP IP address
DHCP Pool End Address	192.168.1.161	Ending DHCP IP address
HTTP Config Port	8080	HTTP port for configuration
HTTP Config Password	1234	HTTP password for configuration
Forward all inbound traffic to IP	192.168.1.2	IP address on LAN to receive inbound traffic (NAT Router Mode)

Figure 11: Sample NAT Router Mode Parameters

## 5. Virtual Cable Mode

A unique feature of the PocketPORT is “virtual cable” mode. In this mode, two or more PocketPORT’s act as a very long virtual Ethernet cable. The cellular network is completely transparent to the user; the ends appear to be directly connected via cable. Any application that works over a direct Ethernet cable also works over the PocketPORT’s Virtual Cable system.

Virtual Cable Mode is especially useful for software applications that expect external LAN hardware to be on same physical Ethernet segment (i.e. “flat networks”). For example, some PLC programming and monitoring applications send out probe packets to locate their associated hardware. These packets typically do not traverse routed networks or the Internet, but will be forwarded to the remote equipment when it is connected via Virtual Cable Mode, even across a cellular Internet connection.



**Figure 12: Virtual Cable Mode**

The PocketPORT uses end-to-end encryption on all Virtual Cable connections. Networks are protected by a shared password (pre-shared key), known only to the participating nodes. No software needs to be installed on any device, so users can comply with security policies regarding third-party software installations. Closed systems such as cameras and PLC’s can have fully protected connections over the Internet even though they can’t run VPN software. The PocketPORT is completely self-contained and autonomous.

**Note:** *Beginning with PocketPORT firmware version 1.5.2, Virtual Cable Mode throughput performance can be increased by not providing a Network Password value on each PocketPORT. This disables encryption – all data will be transferred between nodes in its native format. All nodes must have the same (or no) Network Password in order to communicate.*

**Unlike traditional VPNs where the networks on each side of a connection are in different subnets, the network addresses on both sides of a Virtual Cable connection must be in the same subnet (see Figure 12).**

To use Virtual Cable mode, assign the Ethernet device(s) attached to the PocketPORT its own private IP address that is in the same subnet as the device(s) connected to the other PocketPORT. Take care when assigning IP addresses on each side of the Virtual Cable connection to avoid IP address duplication. Services such as DHCP and BootP will traverse a Virtual Cable connection, so remote devices can obtain their IP address information from a central DHCP server to ease remote IP management issues. Once the Virtual Cable connection is established, devices on either side of the connection can be accessed as if they are plugged into the same local Ethernet switch.

Virtual Cable Settings (Virtual Cable Mode Only)		
Switchboard Server Address	vc.pocketport.net:9999	Set to <i>vc.pocketport.net:9999</i> to use Proxicast’s server
Account Name	user@mydomain.com	Enter your email address or another globally unique identifier
Network Name	TestNet	Enter a unique network name (same value on both PocketPORTs)
Network Password	Password1234	Enter an encryption key to secure your private network

**Figure 13: Sample Virtual Cable Mode Parameters**  
(must be the same on both PocketPORTs)

When in Virtual Cable Mode, the PocketPORT functions as an Ethernet bridge. The LAN IP and DHCP settings in the General Configuration section do not apply and can be left at their default values. Figure 13 shows an example of the Virtual Cable Mode settings for both PocketPORT devices.

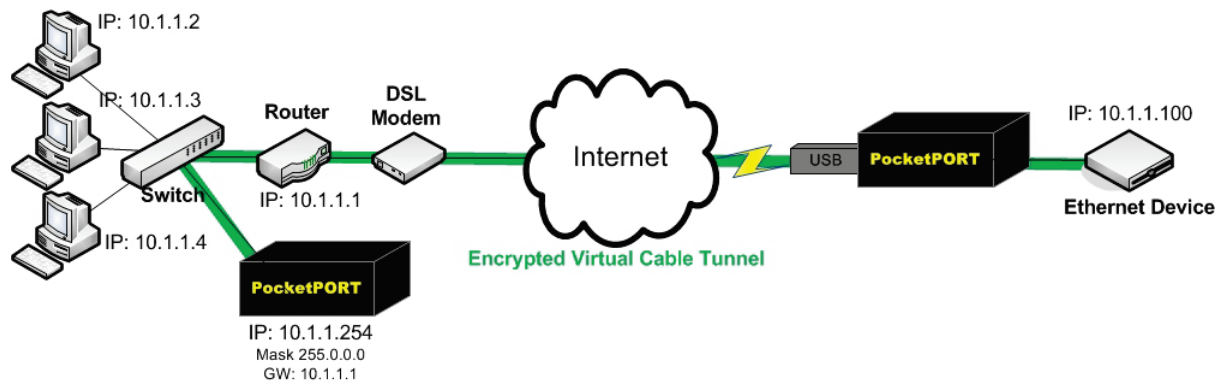


Figure 14: Virtual Cable Network Extension

If your existing networks already have Internet connections, it is not necessary to have a USB modem attached to the PocketPORT in order to create a Virtual Cable connection to the other PocketPORT (see Figure 14). After generating the PocketPORT configuration, add the following configuration directives to the Generated Settings field:

IP=x.y.z.t, NM=a.b.c.d, DG=e.f.g.h

Where:

x.y.z.t is a private static IP address assigned to the PocketPORT

a.b.c.d is the appropriate subnet mask

e.f.g.h is the IP address of a default gateway which has Internet access on the local network

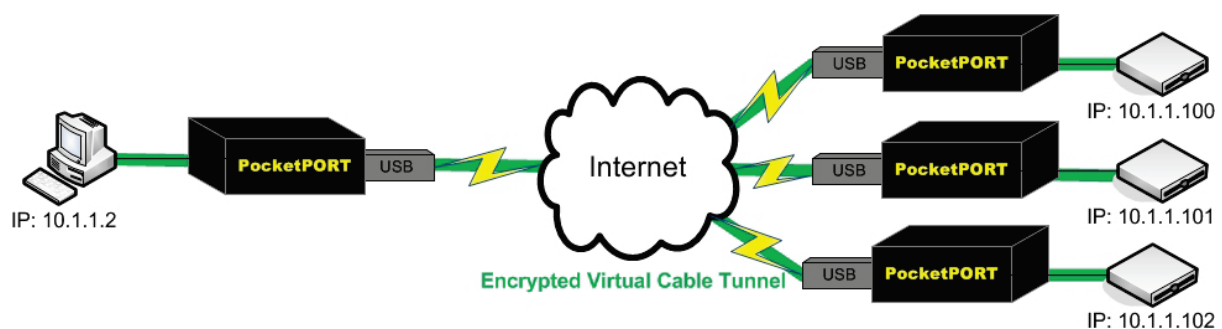


Figure 15: Multiple Virtual Cable VPN Connections

It is also possible to connect many Virtual Cable PocketPORTs together into a complete VPN spanning several sites. As long as all of the PocketPORTs have the same Virtual Cable network names and passwords and their attached Ethernet devices are in the same subnet, they will be visible to each other in a flat “virtual” network configuration (see Figure 15).



## 6. Accessing Remote Devices

A common use for the PocketPORT is to provide access to remote Ethernet equipment from other locations on the Internet. For IP Pass-Thru/Bridge Mode and NAT Router Mode, there are three ways to remotely access Ethernet devices connected to the PocketPORT.

1. Static IP Address
2. PocketPORT Dynamic DNS Name
3. DynDNS Dynamic DNS Name

When operating in Virtual Cable Mode, remote devices can be accessed by their “private” IP address, just as if they were connected to your local Ethernet network.

### 6.1 Static IP Address

Some cellular service providers offer a “static” or “permanent” public IP address that is assigned to the USB modem. There is often an additional fee for this feature.

If the USB modem has been assigned a static IP address, the PocketPORT will automatically receive that IP address when it connects to the cellular network – no special configuration is required. Use assigned static IP address to access remote Ethernet devices.

### 6.2 PocketPORT Dynamic DNS

Most cellular service providers assign a random (dynamic) IP address to the USB modem every time a new connection is made. This makes it impossible to use the modem’s cellular IP address to access remote devices. The solution to this problem is a technique called “dynamic DNS”. With dynamic DNS, a unique “fully qualified domain name” (FQDN) is defined to represent the device with a dynamic IP address. Software on the device then updates the DNS system with the FQDN’s new IP address every time that it changes.

Proxicast maintains a dynamic DNS service which assigns each PocketPORT a unique and permanent FQDN based on the PocketPORT’s serial number in the form: ***serial#.pocketport.net*** (e.g. *001B39AB12CD.pocketport.net*). The IP address for this DNS name is updated automatically every time the PocketPORT makes a new cellular connection.

Use this FQDN to access an Ethernet device connected to the PocketPORT from anywhere on the Internet. For example, if the Ethernet device has an embedded web server, you can access it with a web browser by using the address: *http://001B39AB12CD.pocketport.net*

### 6.3 DynDNS Dynamic DNS

If you wish to define your own (perhaps more memorable) FQDN, the PocketPORT supports the widely used DynDNS.com dynamic DNS service. DynDNS.com offers both free and low-cost options for creating fully-qualified domain names.

Visit DynDNS.com to create a username, password and hostname. Enter these values into the DynDNS section of the PocketPORT’s configuration page (see Section 2. Configuration Mode). The PocketPORT will automatically update the DynDNS.com servers every time a new cellular IP address is assigned. Use the defined hostname (e.g. *myhost.dyndns.com*) to remotely access the Ethernet device attached to the PocketPORT.



## 6.4 Port Forwarding – NAT Router Mode

To remotely access an Ethernet device when operating the PocketPORT in NAT Router Mode, the “private” IP address of the Ethernet device must be defined as the Port Forwarding destination for the NAT Router.

Enter the IP address of the target Ethernet device in the “Forward all incoming traffic to IP” field in the PocketPORT’s Configuration page (see Section 2. Configuration Mode). If no IP address is configured in this field, the Ethernet device cannot be remotely accessed. Only a single IP address can be configured as the Port Forwarding destination. All ports are forwarded to this IP address – the PocketPORT does not perform any packet/port filtering.

## 6.5 Cellular Operator Restrictions

Some cellular service providers assign “private” IP addresses to USB modems in the ranges of:

- 10.0.0.0 – 10.255.255.255
- 172.16.0.0 – 172.31.255.255
- 192.168.0.0 – 192.168.255.255

Private IP addresses cannot be used in remote access applications (except in Virtual Cable Mode). Request that the cellular carrier provide a routable “public” IP address for your modem. For GSM modems, this may involve changing the Access Point Name (APN) used to connect to the GSM network.

Also, some cellular service providers may block certain (or all) “inbound” traffic from the Internet based on the type of service to which you have subscribed. Check with the service provider for more information on your options for unblocking inbound connections from the Internet to the PocketPORT. If you are unable to obtain an unblocked cellular connection, consider using Virtual Cable Mode which uses “outbound” connections to link two sites into a virtual private network.

### Note for Verizon Wireless 4G/LTE Users:

*Currently, the Verizon Wireless LTE network assigns only private IP addresses. In order to use the Verizon Wireless LTE network for remote access and/or control applications, you must utilize two or more PocketPORTs in Virtual Cable Mode to create an Ethernet bridge between the devices. This is a restriction in how the Verizon Wireless LTE network is implemented and not a limitation of the PocketPORT. See Section 5. Virtual Cable Mode above for more information.*

## 7. Troubleshooting & FAQ's

### 7.1 Troubleshooting

#### USB modem does not go online (Status LED flashes slowly)

- There may be poor cellular signal strength at your location. Go into Configuration Mode and check the Signal Strength. Move to a different location or attach an external antenna and/or amplifier to the USB modem.
- The USB modem configuration settings may be incorrect. Go into Configuration Mode and check the settings against the modem-specific settings on Proxicast's Technical Support website ([http://www.proxicast.com/support/PocketPORT\\_Support.asp](http://www.proxicast.com/support/PocketPORT_Support.asp)). For modems not listed, try using DEVICEPORT=ttyUSB1 or DEVICEPORT=ttyACM0.

#### Ethernet device does not receive an IP address

- Confirm that the Ethernet device is configured to request an IP address via DHCP.
- Release/renew the Ethernet device's DHCP settings.
- Unplug and re-insert the Ethernet cable
- Restart the Ethernet device.
- In Virtual Cable Mode, you must manually assign the Ethernet device an IP address (or request an IP address from a remote DHCP server).

#### Configuration Mode web page not displayed

1. Remove power from the PocketPORT
2. Remove the USB modem
3. Apply power and wait for the Status LED to flash slowly
4. Enter Configuration Mode (hold Reset button for 2 seconds)
5. Check your PC's IP settings (PocketPORT will be at 192.168.1.1:8080)

#### Signal strength not shown (value = ???)

- The USB modem's interface settings (e.g. DevicePort) must be set correctly before the cellular signal strength can be displayed. Configure the USB Modem settings, then restart the PocketPORT to display the signal strength. Not all USB modems are able to report their signal strength. Refer to the modem-specific settings on Proxicast's Technical Support website (<http://support.proxicast.com>). For modems not listed, try using DEVICEPORT=ttyUSB1 or DEVICEPORT=ttyACM0.
- Signal strength is always displayed as ??? when configuring the PocketPORT remotely.

#### USB modem will not power up or powers on and off intermittently

- The PocketPORT requires 5 VDC ( $\pm 5\%$ ) for proper operation of the USB modem. Use the power supply provided with the PocketPORT or ensure that the input power is well regulated.

## 7.2 Frequently Asked Questions

**Q: Can the USB modem be inserted/removed while the PocketPORT is powered on (Hot-Plug)?**

A: No. To protect the PocketPORT and the USB modem, Proxicast recommends powering the PocketPORT off before inserting or removing the USB modem. Removing or inserting a modem while the PocketPORT is powered on may cause the PocketPORT to lock-up.

**Q: Can the configuration of one PocketPORT be copied to another PocketPORT?**

A: Yes. After confirming that the configuration settings are correct, enter Configuration Mode and click the Generate Settings button. Copy the generated settings into a temporary file on a computer. Enter Configuration Mode on the second PocketPORT and paste the saved settings into the Generated Settings window and click the Write Configuration button.

**Q: Can more than 1 remote device be accessed in IP Pass-Thru Mode or NAT Router Mode?**

A: No. In IP Pass-Thru/Bridge Mode, the PocketPORT is transparent to the Internet connection. All traffic is passed directly to the attached Ethernet device. In NAT Router Mode, only 1 IP address can be defined as the destination for port-forwarding. However, in either mode, if the PocketPORT's Ethernet port is connected to the WAN port of an external NAT router, multiple devices behind the router can be reached remotely by using the Port Forwarding feature of the router.

**Q: What IP address should be used for the Auto Ping Destination?**

A: Any IP address or Fully-Qualified Domain Name may be used as the Destination Address. Proxicast recommends using a Destination Address which has very high availability or is under your direct control. If the Destination Address fails to respond within the designated times, the PocketPORT will drop its cellular connection. Typical choices are the public IP address of your company's mail or web server, the address from which you try to connect, or a DNS server on the cellular network to which the PocketPORT is connected.

**Q: In Virtual Cable Mode can the PocketPORT also access the Internet (e.g. Split Tunneling)?**

A: Not directly. All traffic from the Ethernet side of the PocketPORT is routed to the matching PocketPORT through the encrypted virtual cable tunnel. In order to access resources on the Internet, another gateway would have to be present somewhere on the network.

**Q: Can third-party VPN products (hardware or software) connect to a Virtual Cable Mode VPN?**

A: No. Virtual Cable Mode connections can only be made between PocketPORT devices.

**Q: Can the PocketPORT be configured remotely?**

A: Yes with PocketPORT firmware version 1.4 and later. The Configuration Screen can be accessed by entering the DDNS name (or IP address) of the PocketPORT into any Internet-connected web browser. You can configure the remote management port number on the Configuration Screen. The default remote management port is 8080, so a PocketPORT can be managed by entering <http://serial#.pocketport.net:8080> into a web browser.

**Q: How can cellular connection “uptime” be maximized?**

A: Proxicast recommends the following settings:

- Maximize the signal strength available to the USB modem. Consider an external antenna and/or amplifier if signal strength is weak. See Proxicast's TechNote: [Cellular Antenna Issues](#) on our web site for more information on selecting and installing external antennas. Optionally, use a USB extension cable to relocate just the USB modem to a more favorable location.
- Enable the Reboot On Disconnect feature.
- Use Auto Ping to a high availability destination, preferably on the cellular carrier's network (DNS and mail servers run by the carrier are good choices). Set the ping frequency to a maximum of 10 seconds.

## 8. Technical Specifications

<b>Mechanical</b>	
<b>Dimensions</b>	69mm x 32mm x 24mm 2.75in x 1.25in x 0.94in
<b>Weight</b>	50 grams
<b>Operating Temperature</b>	0° C ~ 35° C
<b>Operating Humidity</b>	10% ~ 90% RH
<b>Storage Temperature</b>	0° C ~ 50° C
<b>Storage Humidity</b>	5% ~ 95% RH
<b>Electrical</b>	
<b>Operating Voltage</b>	5 VDC (regulated to $\pm 5\%$ )
<b>Power Consumption</b>	0.10 W without USB modem 0.25 W (typical) with USB modem
<b>Power Jack</b>	1.3mm ID barrel - center pin positive
<b>Interfaces</b>	1x USB 2.0 (3G modem) 1x RJ45 (10/100 Ethernet)
<b>Certifications</b>	FCC Class B, CE
<b>External Power Adapter</b>	15 W (5 VDC @ 3A), 100~240 VAC input, interchangeable blades
<b>Software Features</b>	
<b>Operating Modes</b>	IP Pass-Through/Bridge NAT Router Virtual Cable (VPN)
<b># LAN Devices Supported</b>	1 (IP Pass-Through/Bridge mode) 250 (NAT Router mode) Unlimited (Virtual Cable mode)
<b>User Definable IP Address</b>	Yes
<b>DHCP Server</b>	Yes, user configurable (NAT Router mode)
<b>Dynamic DNS Support</b>	Permanent dynamic DNS hostname: <i>serial#</i> .pocketport.net User-definable DynDNS.com hostname
<b>Encryption Algorithm</b>	Twofish, 128 bit keys (Virtual Cable mode)
<b>Authentication</b>	Pre-shared Key (Virtual Cable mode)
<b>Connection Behind Firewalls</b>	Yes
<b>SIM / RUIM Pin Support</b>	Yes
<b>Device Configuration</b>	Web-browser based (HTTP)
<b>3G/4G Features</b>	
<b>Modems Supported</b>	Most USB form-factor CDMA, GSM, LTE, EVDO, HSPA, UMTS modems
<b>Connection Monitoring</b>	Yes w/ automatic ICMP (ping) keep-alive heartbeat function
<b>Connection Types</b>	Static IP, Dynamic IP, Custom APN
<b>Signal Strength Display</b>	Yes, dependent on USB modem's capabilities

## 9. Contacts & Support

### Online Web Support

Please refer to <http://support.proxicast.com> for additional support documentation and access to our Knowledgebase which contains many resources such as TechNotes, Frequently Asked Questions, sample configurations and software updates.

### E-Mail Support

Support E-mail: [support@proxicast.com](mailto:support@proxicast.com)

Please provide the following information when you contact customer support:

- Product model and serial number
- Current firmware version running on your device
- Brief description of the problem and the steps you've taken to try to solve it

### Return Merchandise Authorizations (RMA)

If you need to return a product for service, you must contact Technical Support and request an RMA Number. Returns will not be accepted without an RMA Number on the outside of the shipment.

Please return only the main product unit (no accessories) unless otherwise directed by Proxicast Technical Support.

Securely pack and insure the product. Return shipping costs are the responsibility of the customer.

### Corporate Headquarters

- Sales E-mail: [sales@proxicast.com](mailto:sales@proxicast.com)
- Telephone: 877-777-7694 (412-213-2477)
- Fax: 412-492-9386
- Web Site: [www.proxicast.com](http://www.proxicast.com), [support.proxicast.com](http://support.proxicast.com)
- Regular Mail & RMA Shipments:  
Proxicast, LLC  
312 Sunnyfield Drive, Suite 200  
Glenshaw, PA 15116-1936

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The device complies with Part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operations.

This device 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 in a residential installation. This device 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.

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Version 3, 29 June 2007

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## INDEX

**A**

Access Point Name (APN), 8  
Accessing Remote Devices, 15

**B**

Backup, 18  
Bridge Mode, 3, 11

**C**

CDMA QuickStart, 4  
Cellular Operator Restrictions, 16  
Certifications, 22  
Configuration Mode, 3  
    Auto Ping Settings, 8  
    Device Status, 8  
    DynDNS Settings, 9  
    Factory Default Reset, 10  
    Saving PocketPORT Settings, 9  
    Screen, 7  
    USB Modem Settings, 8  
    Virtual Cable Mode Settings, 9  
Connection reliability, 19  
Connectors, 6  
Copyright, 22

**D**

Default IP Address, 7  
Disclaimer, 22  
Dynamic DNS, 8, 15  
DynDNS Dynamic DNS, 15

**F**

Factory Reset, 11  
Frequently Asked Questions, 18

**G**

GSM QuickStart, 4

**H**

Hot-Plug, 18

**I**

IP Pass-Thru / Bridge Mode, 3, 11

**K**

Keep-Alive, 8

**L**

LEDs, 6  
Legal Information, 22

**M**

Maximize uptime, 19  
Modes of Operation, 3

**N**

NAT Router Mode, 3, 12  
Network Address Translation (NAT), 12

**O**

Operating Modes, 3

**P**

PAT, 16  
PocketPORT Dynamic DNS, 15  
Port Forwarding, 16  
Power, 6

**Q**

QuickStart, CDMA, 4  
QuickStart, GSM, 4

**R**

Remote Access, 15  
Reset Button, 6, 10  
Returns, 21

**S**

Sales contact, 21  
Software License, 23  
Specifications, 20  
Static IP Address, 15  
Status LED, 6  
Support contact, 21

**T**

Technical Specifications, 20  
Technical Support, 21  
Trademarks, 22  
Troubleshooting, 17

**U**

Uptime, 19

**V**

Virtual Cable Mode, 3, 13  
VPN, 9, 13

**W**

Warranty, 22