



**DSPMOD-CP-S/CDMA & DSPMOD-CP/CDMA
External CDMA Modem Kit**

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Product Registration Information

If applicable the ESN number may be found on the label on the bottom of the router. Note ESN number below. If not yet activated, the ESN number will be required to do so. Retain this manual, along with proof of purchase, to serve as a permanent record of your purchase.

MODEL NUMBER

ESN NUMBER

DATE OF PURCHASE

POINT OF SALE COMPANY

DISCLAIMER

All information and statements contained herein are accurate to the best of the knowledge of Cellular Specialties, Inc. (CSI), but Cellular Specialties makes no warranty with respect there to, including without limitation any results that may be obtained from the products described herein or the infringement by such products of any proprietary rights of any persons. Use or application of such information or statements is at the users sole risk, without any liability on the part of Cellular Specialties, Inc. Nothing herein shall be construed as licence or recommendation for use, which infringes upon any proprietary rights of any person. Product material and specifications are subject to change without notice. Cellular Specialties' standard terms of sale and the specific terms of any particular sale apply.

Document Purpose / Intended Users

The purpose of this document is to provide a basic procedure to help the technician/engineer install the CSI External Modem Kit for use with CSI's Digital Repeaters. Following the procedures outlined will minimize risks associated with modifying a live system and preclude service interruptions. This document assumes the technician/engineer understands the basic principles and functionality involved with repeater and in-building systems. When required, see the Modem Activation Process Section, found later in this manual, for modem activation and activation verification.

Application

This guide should be applied whenever a need exists to activate and/or add a wireless modem capability to Digital Repeater in an existing system or when this capability is being included with a new installation.

Safety Guidelines

The general safety information in this guideline applies to both operating and service personnel. Failure to comply with these precautions violates safety standards of design, manufacture, and intended use of equipment. Cellular Specialties, Inc. assumes no liability for the customer's failure to comply with these requirements:

Grounding

The External Modem Kit in conjunction with the Digital Repeater system is designed to use 110 VAC and should always be operated with the ground wire properly connected. Do not remove or otherwise alter the grounding lug on any power cord.

Explosive Atmospheres

To avoid explosion or fire, do not operate modem and repeater in the presence of flammable gases or fumes.

Lightning Danger

Do not install or make adjustments to the modem or repeater during an electrical storm. Use of a suitable lightning arrester, such as CSI's model number CSI-CAP, is very strongly recommended.

If you suspect a malfunction with this product, call your dealer or the Cellular Specialties Support Line at: **(603) 626-6677, Toll Free (USA) 1-877-844-4274.**

CSI CDMA External Modem Kit for Use With Digital Repeater Installations

Warning: CSI digital repeaters, with software version 2.3.1 or higher are designed to support the integration of the CSI CDMA External Modem Kits. Check your repeater's Status Page for software version and contact CSI if you need an update. See Repeater Login Section for information on how to get to the System Status Page to verify your software version.

Adding one of the CDMA external modem kits to a CSI digital repeater installation is simple and straight forward. The kits contain the following items:

DSPMOD-CP-S/CDMA

1. (1) 375-1014-001 - Modem
2. (1) 375-1013-001 - 5 port Ethernet Switch
3. (1) 960-1047-003 - CSI Installation Manual
4. (1) CS54-3506-47 - N Type Male to N Type Male 1' RF jumper
5. (1) 820-2028-001 - 3' N Male to SMA Male Jumper
6. (1) CS05-102-429 - 10dB Directional Coupler
7. (1) 820-2122-014 - 14' Ethernet Cable
8. (2) 820-2122-001 - 7' Ethernet Cable

DSPMOD-CP/CDMA

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Product Introduction

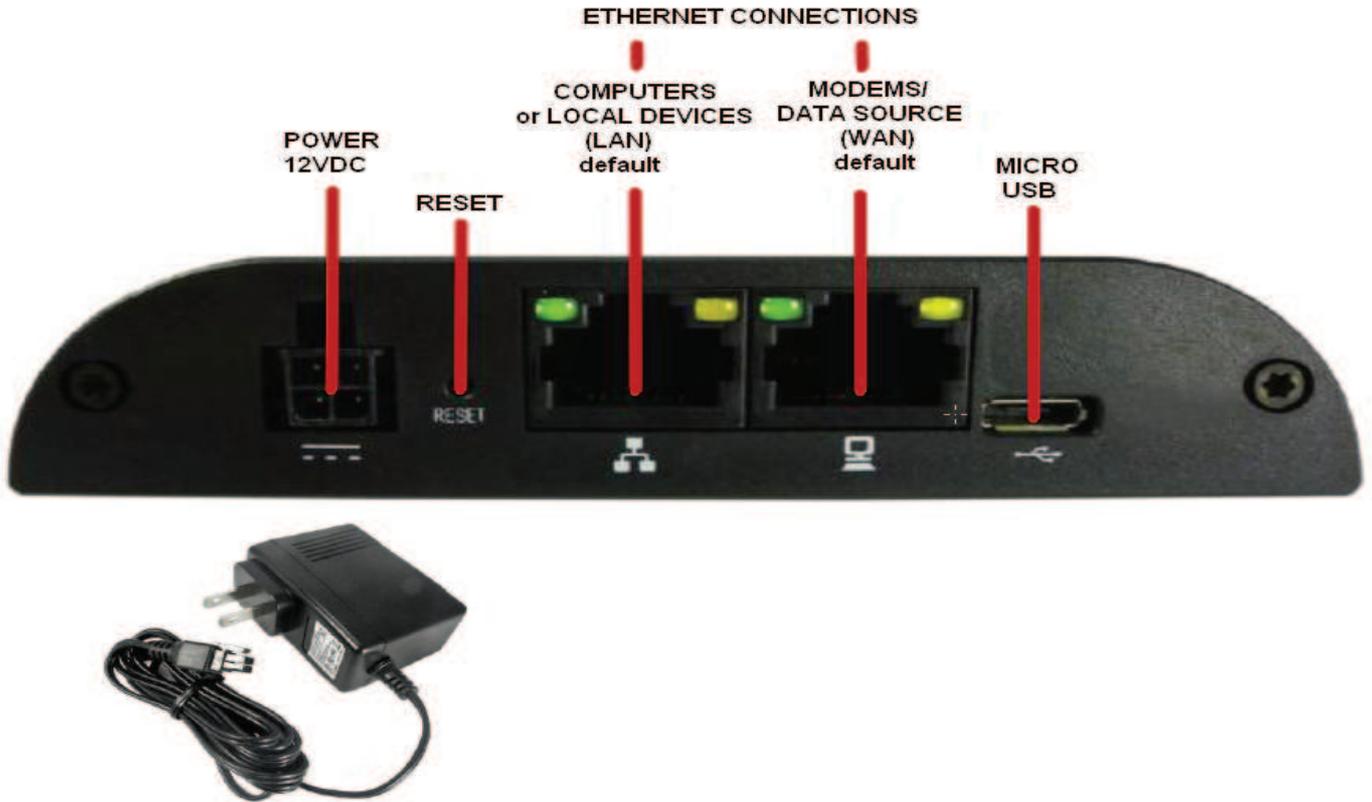
This document describes the CradlePoint IBR650E Setup Instructions for Verizon Wireless DSP Deployments.

Prior to Installation

Verify all the required components from the lists above are on hand prior to starting the installation process. If you are missing parts contact Cellular Specialties, Inc. 670 N. Commercial St. Manchester NH 03101, Tel: 603-626-6677, Toll Free (USA): 877-844-4274, Fax: 603-626-6042 as soon as possible.

CradlePoint IBR650E Hardware Overview

Ports, LED's and Switches



Power 12VDC: The power connector includes two pins for power and two pins for GPIO (General Purpose Input/Output) functionality. The included power adapter, however, only connects to the power pins. You will need a separate adapter for GPIO functionality.

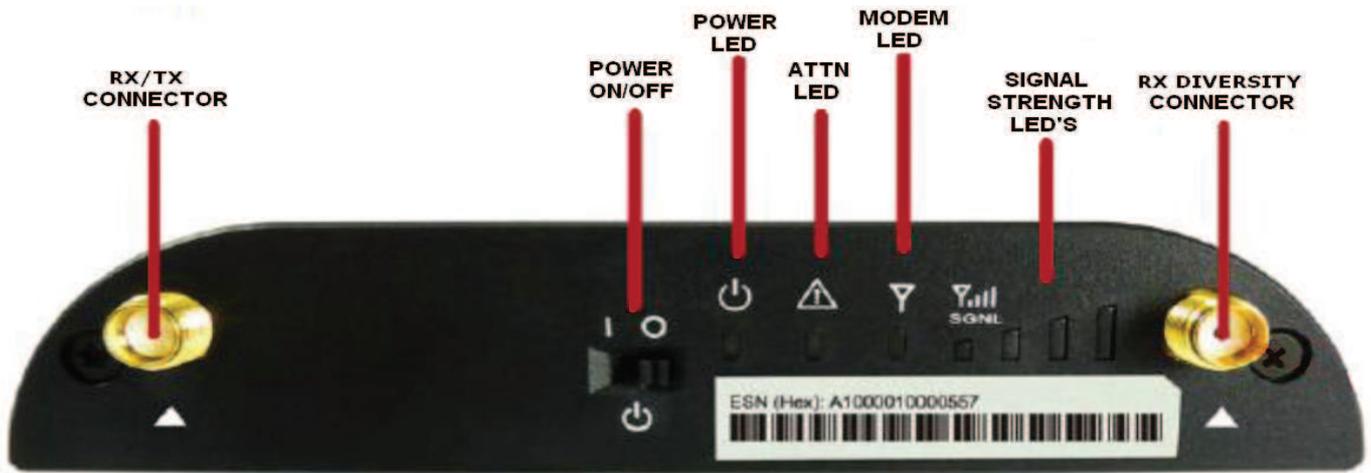
Reset: You can return your router to factory default settings by pressing and holding the Reset button. This button is recessed, so it requires a pointed object such as a paper clip to press. Press and hold for 10 seconds to initiate reset.

Ethernet Ports: By default, the IBR650 has one WAN (Wide Area Network—your internet source) port and one LAN (Local Area Network) port. Each of these ports can be reconfigured, however, if you need two LAN or two WAN Ethernet ports.

Ethernet LED:

- Solid Green – connected
- Blinking Green – data transfer activity

Micro USB: This port can be used to to attach a direct, manual firmware upgrade if necessary.



Power On/Off:

- I = On
- O = Off

Power LED:

- Blue = On
- No light = Off

ATTN LED:

- Used with Modem LED for additional LED indications below.

Modem LED:

- Green = On and operating normally
- Blinking Green = Connecting
- Amber = Not available (idle, for example)
- Blinking Amber = Cellular data connection error
- No light = Off

Additional LED Indications:

- Factory reset button detected = ATTN and modem LED's blink amber twice
- Error during USB firmware upgrade = ATTN and modem LED's blink red

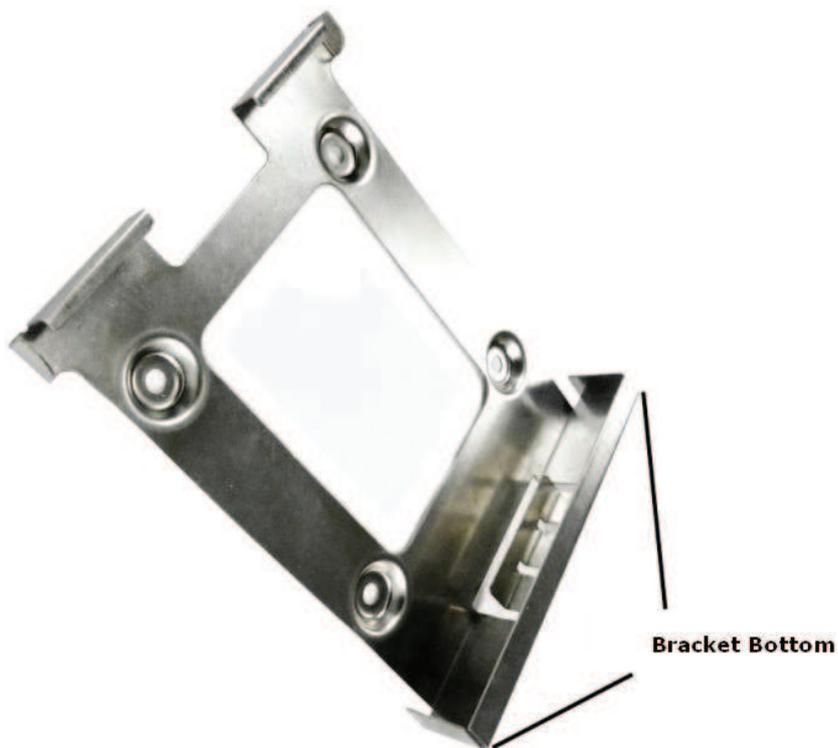


Modem Antennas: The IBR650 comes with two modem antennas to enhance reception for the embedded modem. These antennas are simple to attach and adjust. In most typical installation cases only one antenna will be installed on the RX Diversity port.

Mounting Bracket



Attaching the IBR650 to the Mounting Bracket



1) Attach the bracket to the wall or other surface with screws. NOTE: Screws are not provided because the type of screw required depends on the mounting surface

2) Place the router's edge against the bottom of the bracket.



3) Press the router down firmly, then push it inside the bracket. It should latch.

Removing the IBR650 from the Mounting Bracket

From the top of the bracket, press down firmly on the router using your thumb(s) and pull the device out.



Basic Setup

1. Attach one modem antenna to the RX Diversity Port.



2. Plug the power supply into an electrical outlet and connect it to the IBR650.



3. Make sure the power is switched on.



O = OFF I = ON

Modem Activation

NOTE: CradlePoint IBR650E modems purchased from CSI will be pre-configured; however, if your modem has lost its configuration, you can load a configuration file or manually set up your modem. The default configuration file is included on the CD that shipped with your modem kit. Alternatively, you can request a configuration file from productsupport@cellularspecialties.com

The default configuration has the following parameters:

- DHCP is off
- Port forwarding is set up for http (port 80), SNMP (ports 161/162) & SSH (port 22) for 2 devices
- Both Ethernet 0 & Ethernet 1 should be set to Local Network (LAN).
- Routing mode is NAT and Access Control for both the Primary & Guest LAN is set to Admin Access

CradlePoint IBR650E Setup Instructions for Verizon Wireless DSP Deployments

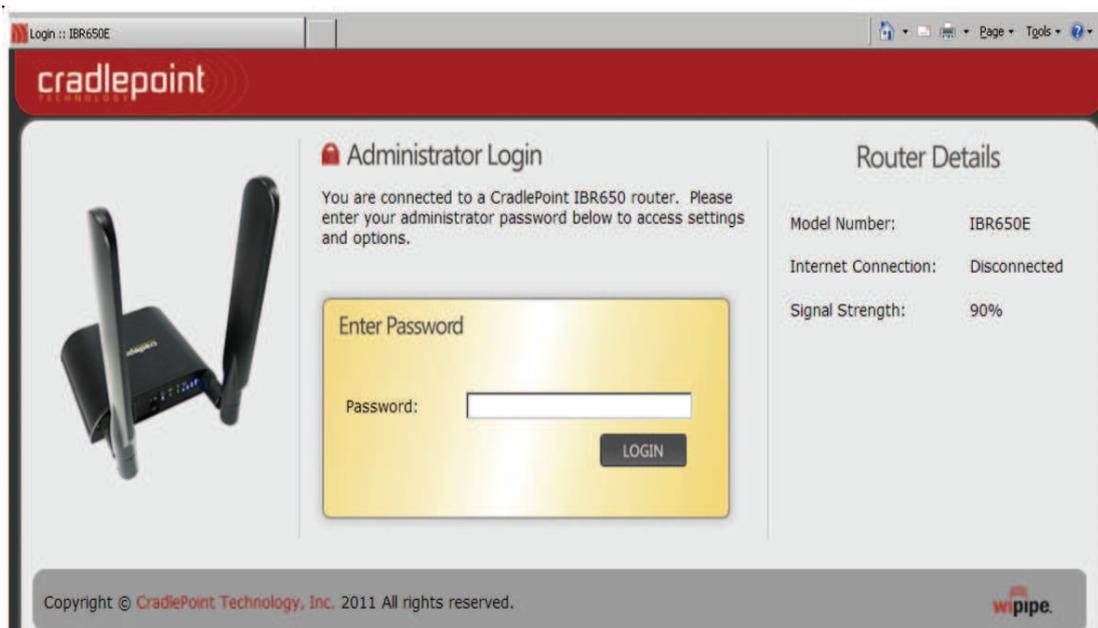
Step 1 - Getting the modem ready for OTASP (Over the air service provisioning)

NOTES: Do not make any changes to the DSP Local Network, Remote Network or SNMP Configuration in the DSP interface UNLESS the DSP has already been configured for use with a CSI Remote Monitoring Kit using a USB connection. If this is the case, log into the DSP, click on the Remote Network tab, choose "Disabled," click on "Change Settings" and then reboot the DSP prior to proceeding.

Manually set your computer's IP address to 192.168.1.2.

Connect a straight through ethernet patch cable from to your laptop ethernet port to the "COMPUTERS or LOCAL DEVICES (LAN) default" port of the CradlePoint IBR650E. If you need assistance changing your network settings, please refer to the "Additional Tips" section of the DSP user's manual or to your OS documentation.

Go to **192.168.1.1** in your browser to launch the setup GUI. You should see the following screen:



Enter the default password, which is **csi1234**.

Step 2: Activating the CradlePoint IBR650E on the Verizon Wireless Network:

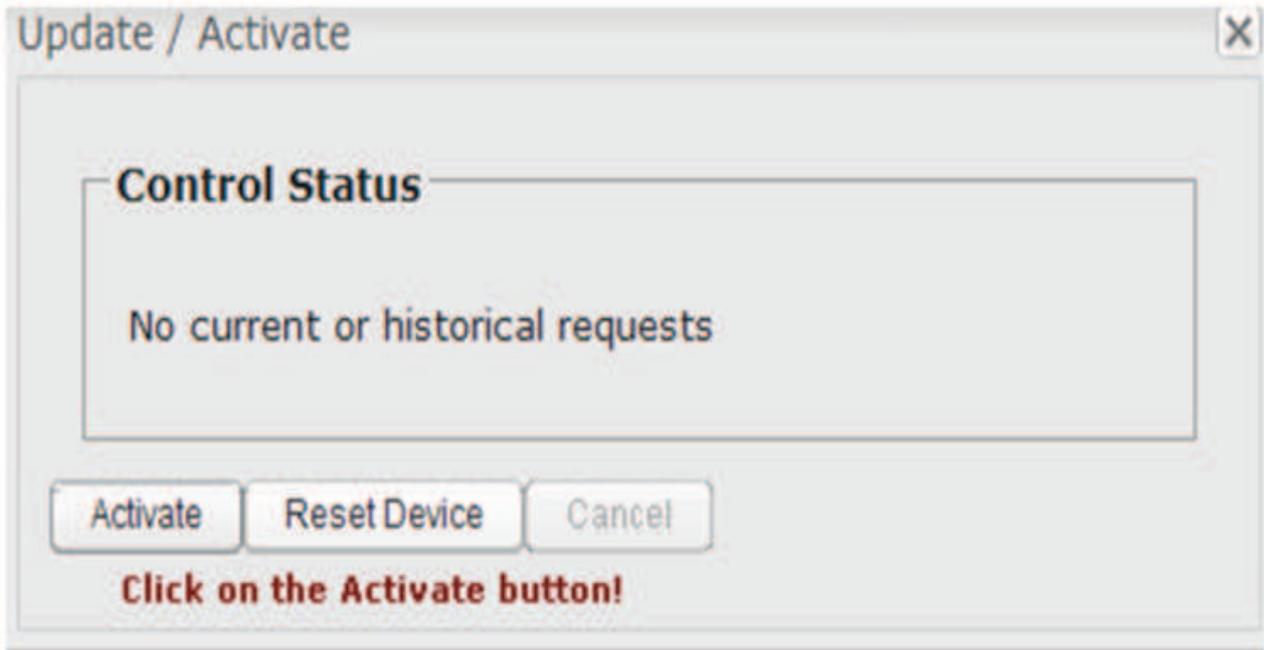
Click on the Internet tab, then select Connection Manager

The screenshot shows the CradlePoint Connection Manager interface. The top navigation bar includes "Internet Connections" and "Logout". Below the navigation bar, there are tabs for "Getting Started", "Status", "Network Settings", "Internet", and "System Settings". The "Internet" tab is selected, and a dropdown menu is open, showing options: "Connection Manager", "Data Usage", "GRE Tunnels", and "VPN Tunnels". The main content area is titled "Internet / Connection Manager" and contains a "WAN Interfaces" section. This section has a table with columns: "Device", "State", "Load Balance", and "Enabled". The table lists two devices: "Ethernet" (State: Unplugged) and "Modem: Internal EVDO" (State: Not activated). Below the table is an "ADVANCED Configuration Rules" section. On the right side, there is a text box explaining failover: "The router can establish an uplink via the Ethernet WAN port, modems plugged into a modem port. If Load Balance is enabled, multiple WAN devices may be plugged in and each may establish a link. If the WAN connection fails the router will automatically attempt to bring up a new link on another device. This feature is called failover."

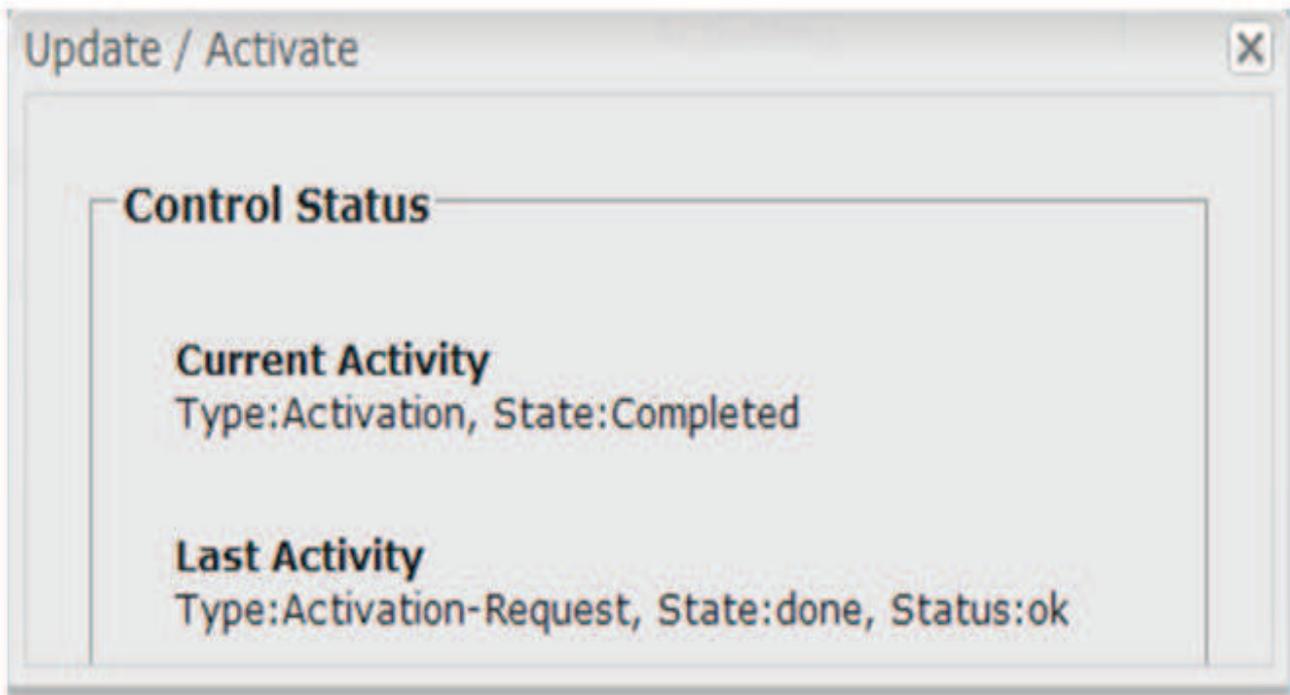
Next, highlight "Modem: Internal EVDO" and then click on Control

This screenshot shows the "WAN Interfaces" section of the CradlePoint Connection Manager. The "Modem: Internal EVDO" row is highlighted in blue. A red circle highlights the "Control" button in the top-left corner of the table. A red arrow points from the text "Click on the Control button to activate the modem" to the "Control" button. The table has columns: "Device", "State", "Load Balance", and "Enabled". The "Modem: Internal EVDO" row shows "State: Not activated", "Port: usb2", and "UID: 7f3f5f41". Below the table, there is a "Stats" section showing "0 bytes IN / 0 bytes OUT". The "Ethernet" row is also visible below the modem row.

Click on the Activate button



The modem will now contact the Verizon Wireless Network for authentication. If the ESN has been set up with an active account, the modem will respond activated within 3-5 minutes.



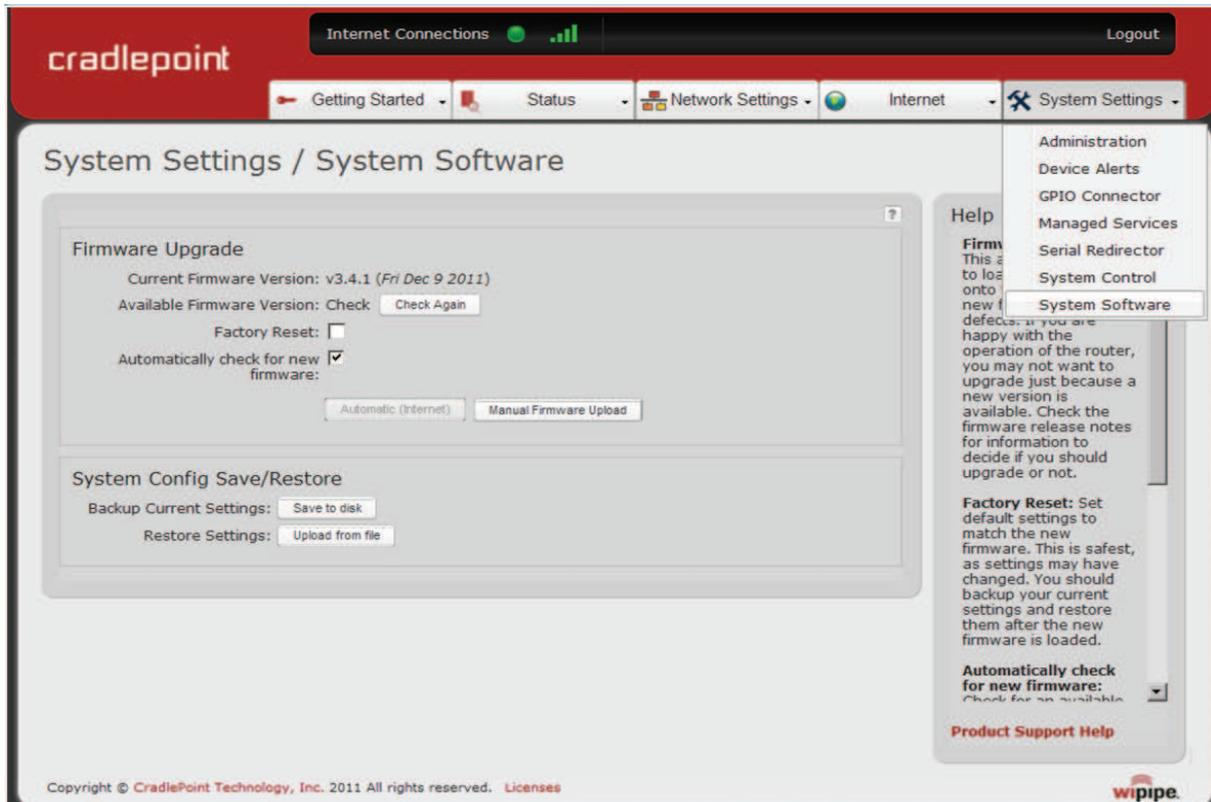
Once you see the above message, reset or power cycle the modem using the on/off switch.

Step 3: Configuring your modem for port forwarding, to support one or multiple devices:

CradlePoint IBR650E modems purchased from CSI will be pre-configured; however, if your modem has lost its configuration, you can load a configuration file or manually set up your modem. The default configuration file is included on the CD that shipped with your modem kit. Alternatively, you can request a configuration file from productsupport@cellularspecialties.com.

If your modem is already pre-configured, you needn't proceed past activation unless you wish to change the default settings.

To load a saved configuration, click on the System Settings tab and select System Software. Click "Restore Settings, Upload from file" and point to the saved configuration file. Suggestion: If you do not already have a configuration file, create one by visiting this screen of a pre-configured modem UI. Go to "Backup Current Settings, Save to disk" to do so.



Port Forwarding

Even if you are only connecting a single device, port forwarding is used.

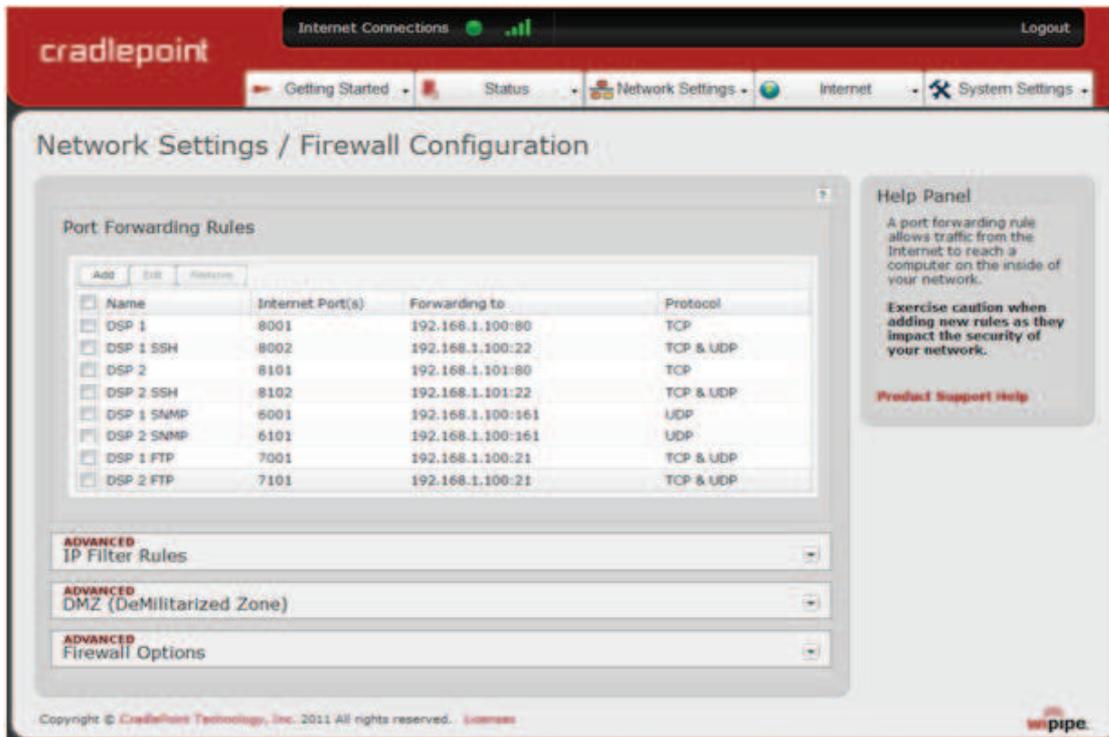
The modem's GUI has remote port 8080 associated with it. To access the modem UI remotely, you will enter the IP address provided by the wireless service provider, followed by ":8080." Example:

<http://166.1xx.2xx.3xx:8080/>

To access each DSP/device remotely, you will enter the IP address that is assigned to the modem, followed by a colon (:) and the External Port that you assigned to that DSP. If you have access to the internet, test this before leaving the site. (For example, to access the web interface for DSP/device 1, enter [http://166.1xx.2xx.3xx:8001.](http://166.1xx.2xx.3xx:8001/))

To access a device via SSH, enter the correct corresponding port into your SSH client (preconfigured to use 8022 for device 1).

If you are connecting multiple repeaters and/or devices, it is recommended that the "External" port for each device be as unique as possible. For example, in a two DSP setup, use 600x, 700x & 800x for DSP 1, and 610x, 710x & 810x for DSP 2. Each DSP/device will need to have a unique IP address in addition to the unique port assignment. DSP "1" will keep the default IP address of 192.168.1.100. For each additional DSP, visit "Local Networking" and change the IP address to 192.168.1.101, 192.168.1.102, etc. Please label each repeater with its changed IP address to prevent local connection problems in the future. When changing or re-configuring Port Forwarding, you must use the correct IP Address for each device. If only one or two devices are being monitored, no switch is required. Either port on the modem will work. A modem with default port forwarding will look like the following screen.



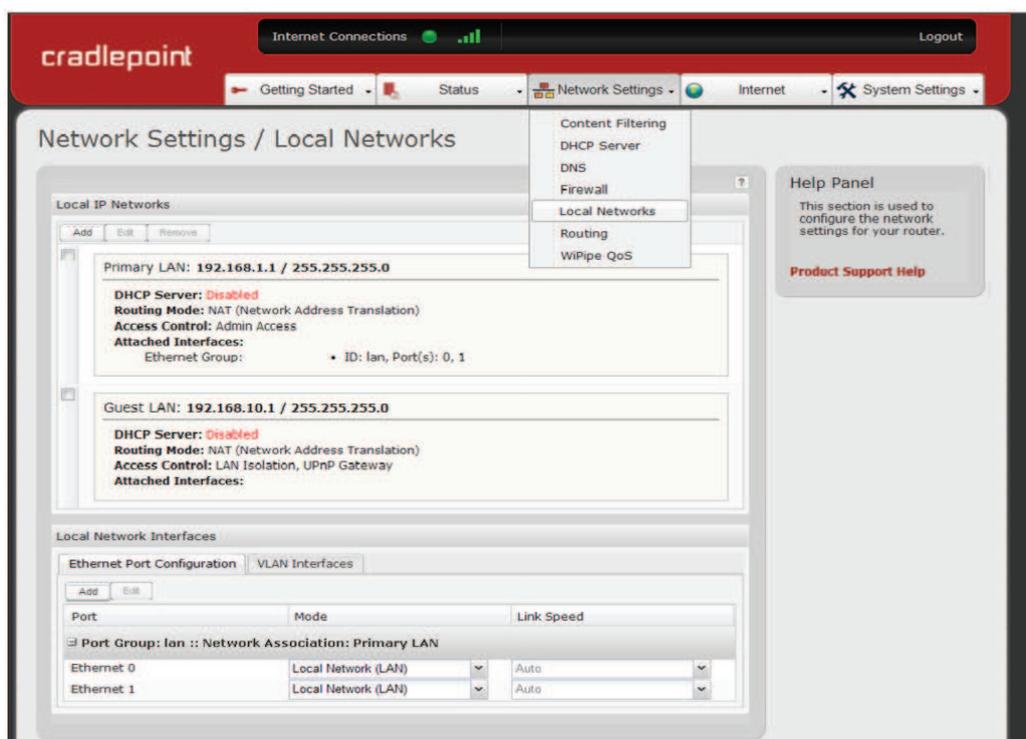
LAN Settings

Under Network Settings, select Local Networks. On both Primary & Guest LAN, DHCP Server should be disabled to prevent misuse of the modem.

You may change the Guest LAN IP Address at this point. The Guest LAN IP can be used to monitor other DAS equipment on a different network/subnet. You will also need to change the IP address of the computer that you are using if you wish to access the modem on the Guest LAN (see section under "LAN Settings" for more information).

For Ethernet Port Configuration, both Ethernet 0 & Ethernet 1 should be set to Local Network (LAN).

Routing mode is NAT and Access Control for both the Primary & Guest LAN should be set to Admin Access.



Additional Features

System Automatic Reboot – The CradlePoint IBR650E allows you to set an automatic reboot daily, weekly or monthly. Go to System Settings, System Control to utilize this feature.

The screenshot displays the CradlePoint web interface for System Settings / System Control. The top navigation bar includes the CradlePoint logo, Internet Connections status, and a Logout button. The main navigation menu shows Getting Started, Status, Network Settings, Internet, and System Settings. The System Settings menu is expanded, showing options like Administration, Device Alerts, GPIO Connector, Managed Services, Serial Redirector, System Control (highlighted), and System Software.

The main content area is titled "System Settings / System Control" and contains several sections:

- Device Control:** Includes buttons for "Restore To Factory Defaults" and "Reboot The Device".
- ADVANCED Advanced Control:** Contains the "System Automatic Reboot" section with a "Scheduled Reboot" dropdown menu (set to "Never") and a checked "Enable Watchdog Reboot" checkbox. "Apply" and "Undo" buttons are present.
- Ping Test:** Includes a text input field and a "Ping" button.

A "Help" sidebar on the right provides definitions for "Reboot The Device", "Scheduled Reboot", "Watchdog Reboot", and "Ping Test". At the bottom, there is a "Product Support Help" link, a copyright notice for CradlePoint Technology, Inc. (2011), and the wipipe logo.

Dual LAN

The CradlePoint IBR650E allows the use of 2 distinct LAN's, which is useful when connecting equipment that already has an established subnet (a fiber DAS network for example). Either Ethernet port will support either LAN. The Guest LAN IP Address can be changed to support your requirement. Click on the checkbox next to Guest LAN, then click on Edit. A box will open where you can change the IP address.

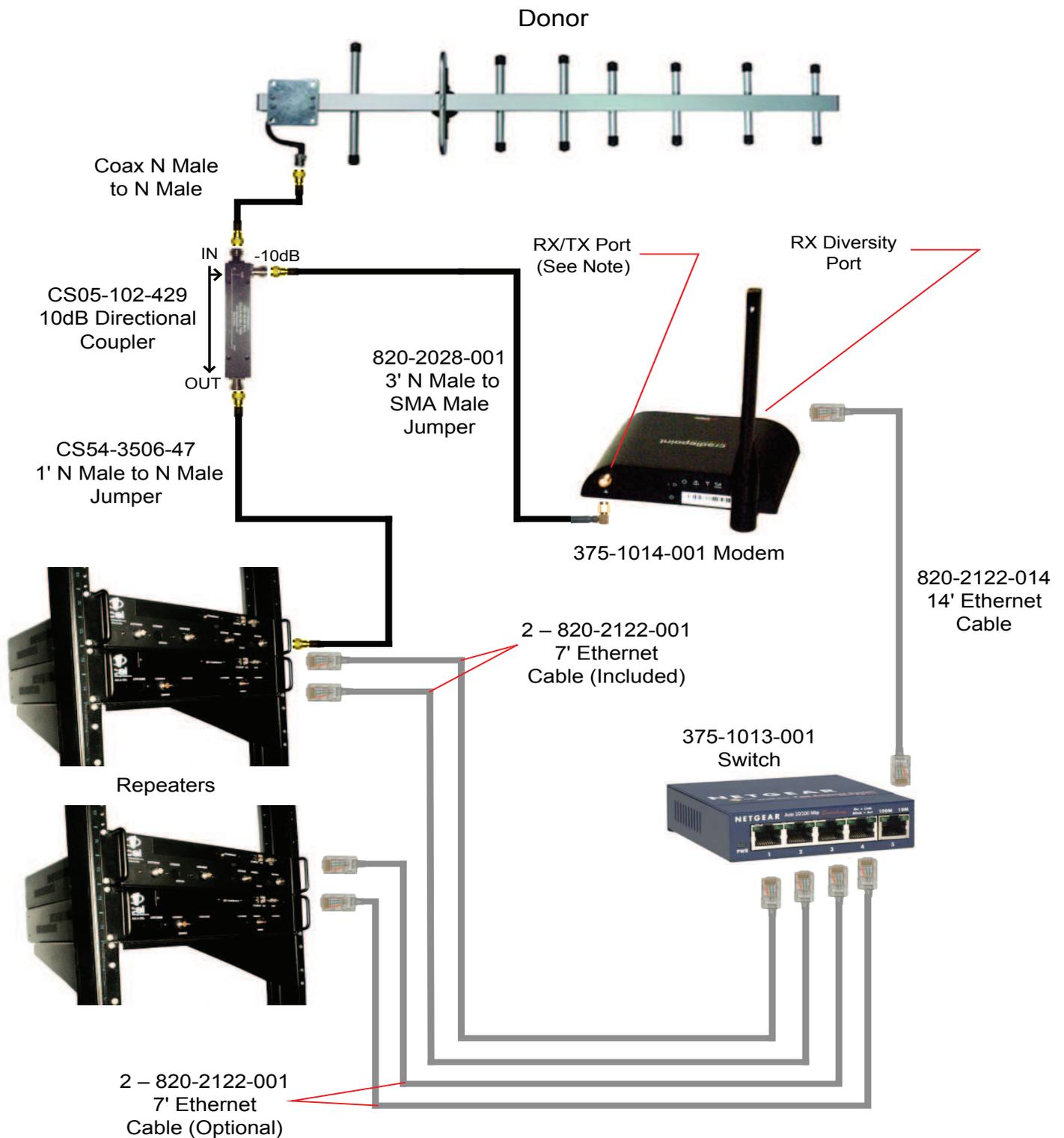
The screenshot displays the CradlePoint Network Settings interface. The main window is titled "Network Settings / Local Networks". It shows a list of "Local IP Networks" with columns for "Add", "Edit", and "Name". Two networks are listed: "Primary LAN: 192.168.1.1 / 255.255.255.0" and "Guest LAN: 192.168.10.1 / 255.255.255.0". The "Guest LAN" entry has a checkbox checked and an "Edit" button highlighted. A red arrow points from the "Edit" button to the "Local Network Editor" dialog box. The dialog box is titled "Local Network Editor" and has tabs for "IP Settings", "Interfaces", "Access Control", and "DHCP Server". The "IP Settings" tab is active, showing fields for "Name" (Guest LAN), "Hostname" (cp), "IP Address" (192.168.10.1), "Netmask" (255.255.255.0), and "Routing Mode" (NAT (default)). There are "Submit" and "Cancel" buttons at the bottom of the dialog box. A red text overlay on the dialog box says "Check the box, select 'Edit'".

Step 4: Connecting the modem to the repeater

Your modem comes with a kit that includes everything you need to connect it in line with the donor antenna & DSP. The donor cable should connect to the "Input" Port of the directional coupler, and the provided NM-NM jumper should be used to connect the "Through" Port of the directional coupler to the donor input port on the DSP. If your site uses separate Cellular Band & PCS band donor antennas, please ask the Wireless Service Provider which donor to connect the modem in line with. The NM-SMAM jumper should be connected between the "Coupled" Port of the directional coupler and one of the antenna ports on the modem (the included paddle antenna can be connected to the other port). Connect the supplied ethernet patch cable between the modem and the repeater. (You may also use a cross-over ethernet cable if necessary).

NOTE: If you are connecting to another brand of repeater or other device (i.e. DAS gear), that devices default gateway must match the modem's (192.168.1.1 by default).

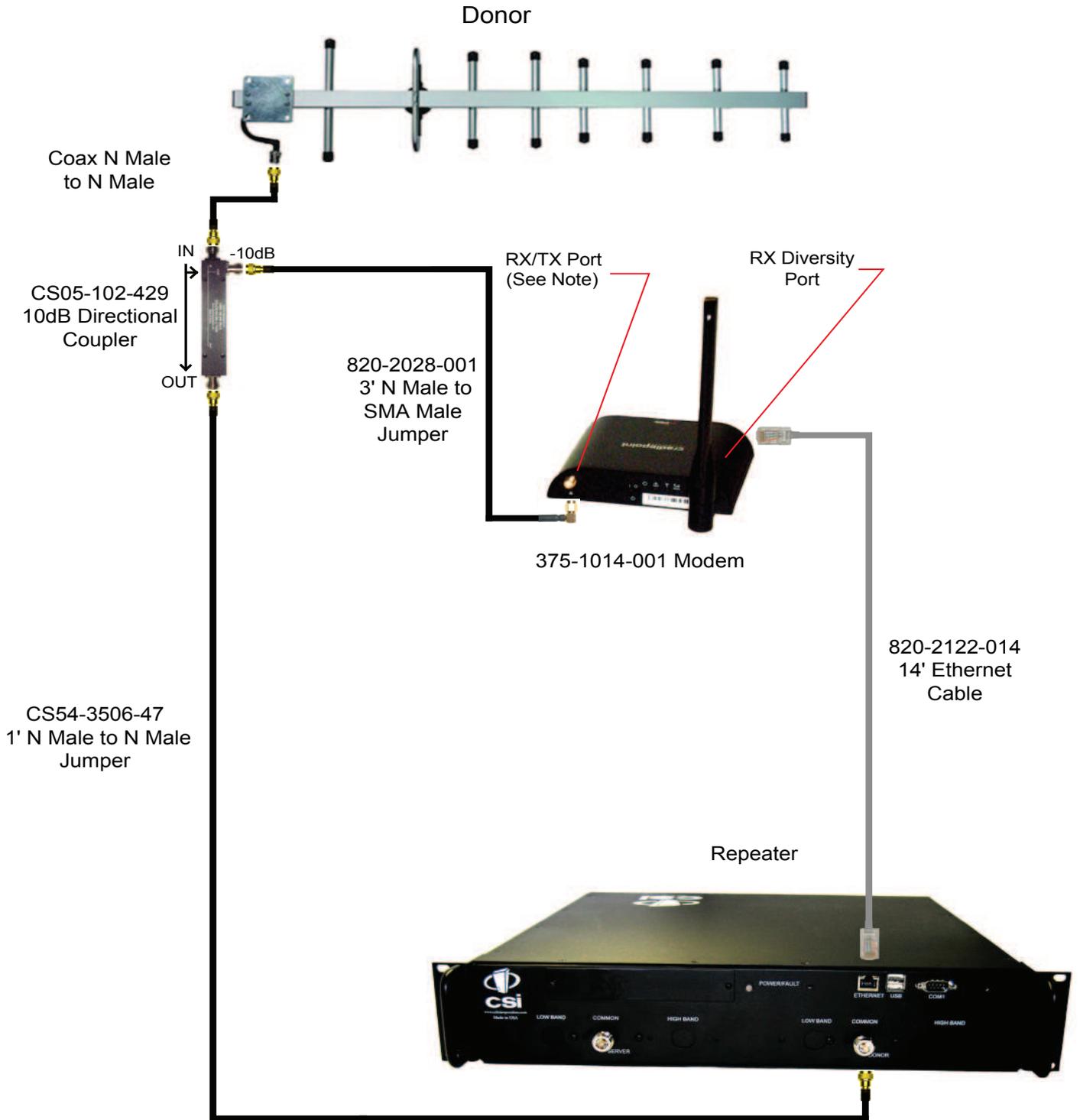
Typical Connection Plan For the DSPMOD-CP-S/CDMA



Note: Donor must be connected to the RX/TX port only.

Donor antenna, coax down lead and repeaters are sold separately.

Typical Connection Plan For the DSPMOD-CP/CDMA



Note: Donor must be connected to the RX/TX port only.
Donor antenna, coax down lead and repeaters are sold separately.

Functionality Test

You must be connected to the internet for the following steps.

Once you've made your physical connections, connect your laptop to the internet and attempt to log in to the DSP over the air (through the modem). Remember, you will type in the IP address that Wireless Service Provider assigned to your modem, followed by a colon and the port number that is assigned to each protocol. Example: To access the Web UI, enter `http://166.xxx.xx.xxx:8001`

Reminder Please make sure that the Wireless Service Provider has the correct port assignment for SNMP (usually port 161 on each device).

If required by the Wireless Service Provider in your market, you can visit the System Health screen after logging in and click on "Trigger Test Alarm" under Band 1 and/or Band 2 to verify that alarm monitoring is working. Once the Wireless Service Provider representative has confirmed receipt of the alarm, you must clear it to stop the alarm from reporting.

NOTES:

- 1, Please leave this manual, the DSP manual and any other necessary materials at the site for future service visits.
2. It may be necessary to reboot the modem and/or DSP after configuration. Please do so if you do not gain remote access upon completion of the configuration steps above.
3. Please remember to document the User Name and Password, and provide this to the Wireless Service Provider representative who is monitoring the DSP.
4. Additional documentation can be found @: <http://www.cradlepoint.com/products/machine-to-machine-routers/cor-ibr650-3g-router-no-wifi>

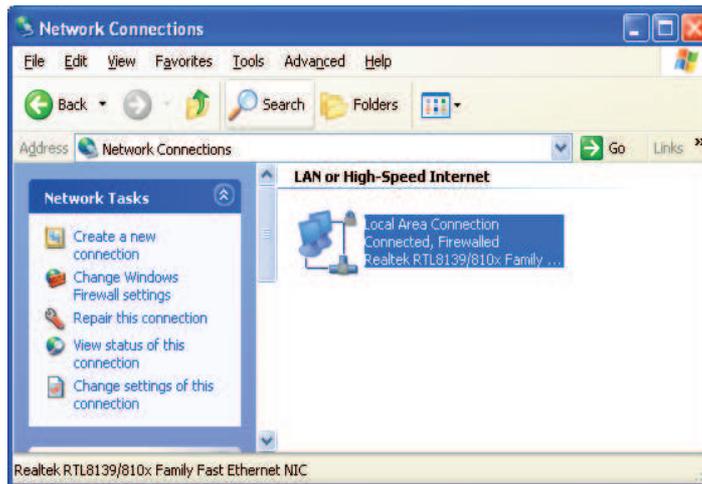
Additional Tips

Instructions to change TCP/IP settings on your Windows computer.

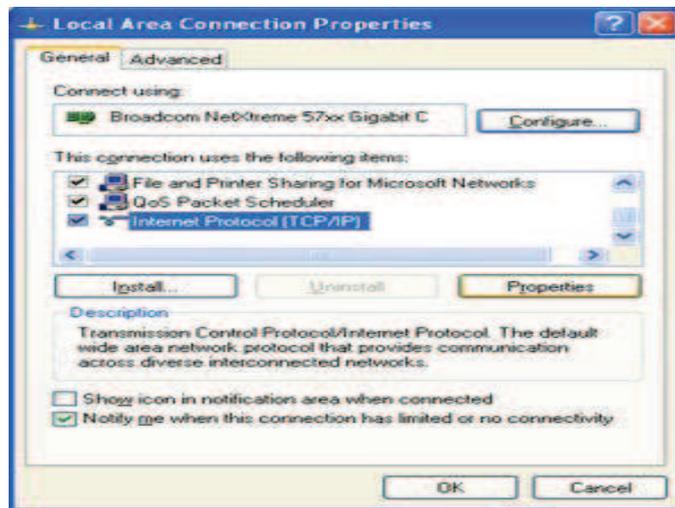
Click in the Network Connections Icon in the Control Panel. See below.



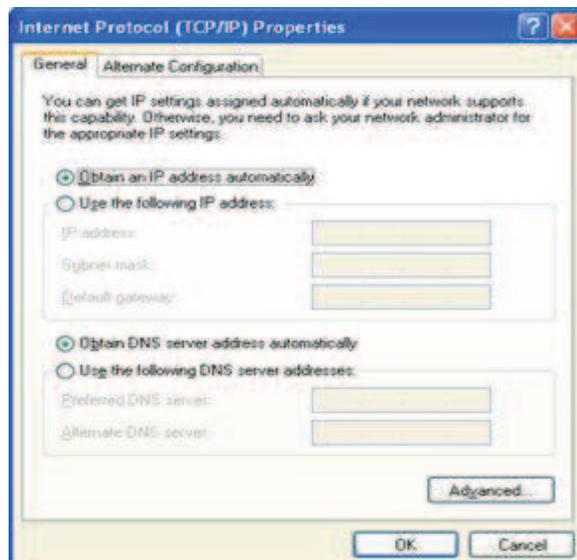
Right click on Local Area Connection - and select "Properties".



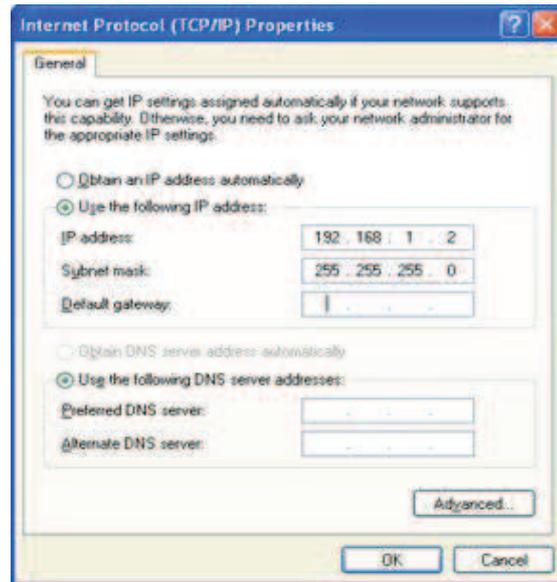
Scroll down and highlight "Internet Protocol (TCP/IP) and click on the "Properties" button.



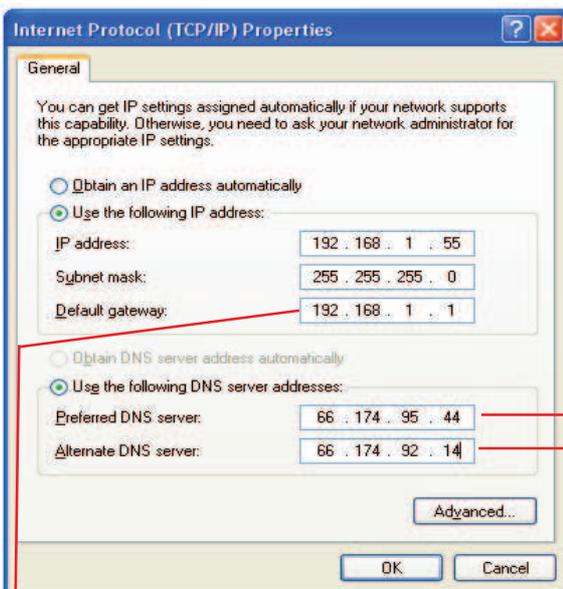
If you are set up to use DHCP, the window shown below will be displayed.



Select "Use the following IP address:" and enter "192.168.1.2." The subnet mask should automatically populate to "255.255.255.0."



While most devices automatically detect DNS, you can set the DNS to the settings shown on the Dashboard screen of the modem user interface. Default Gateway of computer has to = the IP Address of the modem Preferred DNS servers = modem DNS Servers #1 Alternate DNS server = modem DNS Servers #2.



Nothing else will need to be chosen or entered. Click "OK", then "OK" again and retry connection.

A crossover Ethernet cable (supplied) must be used for Web Interface access. As a reminder, you must verify the Ethernet port on your laptop is powered. If your laptop is on battery power, the Ethernet port may be inactive by default. If this is the case simply plug in the laptop to a 110vac source or change the power settings to enable the Ethernet port when the laptop is using battery power.

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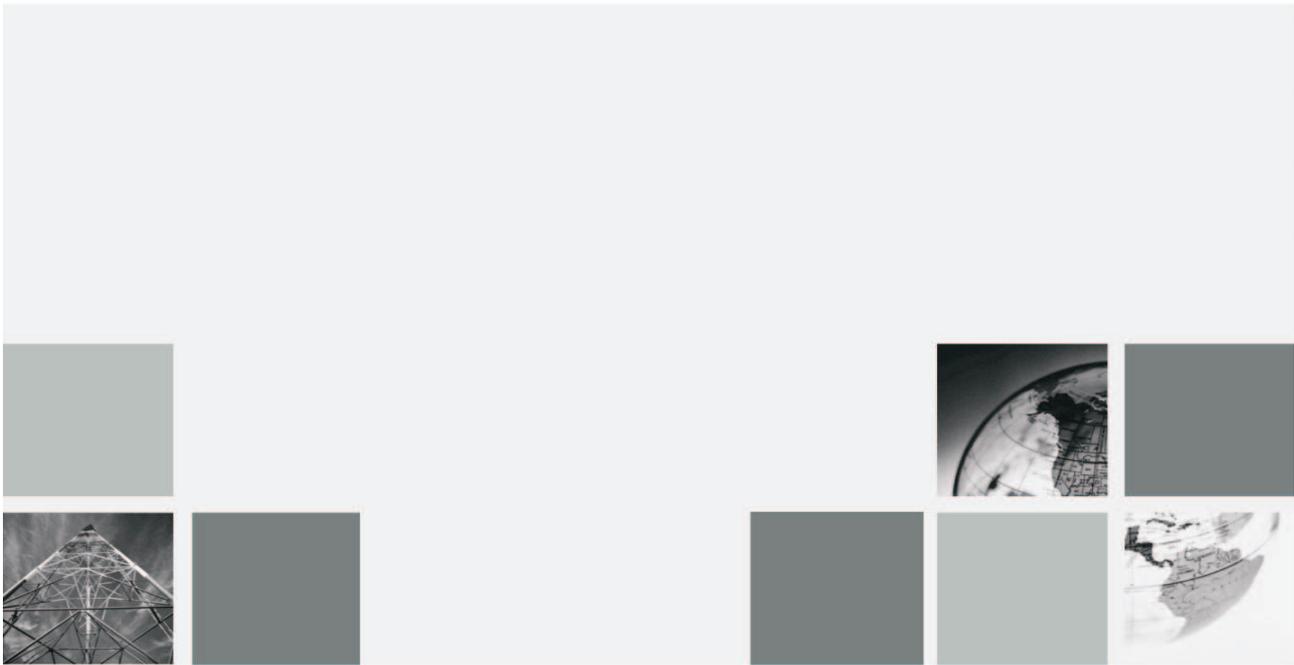
Warranty 25

Warranty

This is a one year limited warranty. Seller warrants that its products are transferred rightfully and with good title; that its products are free from any lawful security interest or other lien or encumbrance unknown to Buyer; and that for a period of one year from the date of installation or fifteen months from the date of original shipment, whichever period expires first, such products will be free from defects in material and workmanship which arise under proper and normal use and service. Buyer's exclusive remedy hereunder is limited to Seller's correction (either at its plant or at such other place as may be agreed upon between Seller and Buyer) of such defects by repair or replacement at no cost to Buyer. Transportation costs in connection with the return of products to Seller's plant or designated facility shall be paid by Buyer. The provisions of this warranty shall be applicable with respect to any product which Seller replaces pursuant to it. SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, OTHER THAN AS SPECIFICALLY STATED ABOVE. EXPRESSLY EXCLUDED ARE THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE. THE FOREGOING SHALL CONSTITUTE ALL OF SELLER'S LIABILITY (EXCEPT AS TO PATENT INFRINGEMENT) WITH RESPECT TO THE PRODUCTS. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES, INSTALLATION COSTS, LOST REVENUE OR PROFITS, OR ANY OTHER COSTS OF ANY NATURE AS A RESULT OF THE USE OF PRODUCTS MANUFACTURED BY THE SELLER, WHETHER USED IN ACCORDANCE WITH INSTRUCTIONS OR NOT. UNDER NO CIRCUMSTANCES SHALL SELLER'S LIABILITY TO BUYER EXCEED THE ACTUAL SALES PRICE OF THE PRODUCTS PROVIDED HEREUNDER. No representative is authorized to assume for Seller any other liability in connection with the products.

Notes

Notes



960-1147-003 rev A ECO 2707



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