ATTACHMENT E.

- USER MANUAL -

WiMAX Indoor Repeater

INSTALLATION GUIDE

Version 1.0
(GSR-2630D-SPR)

GS Teletech Inc.

Contents of Box

Contents	Picture	Quantity
Repeater		1EA
Installation Guide Book ver 1.0		1EA
CD which Contains User Manual Ver 1.0 And Installation Guide Ver 1.0		1EA
Ethernet Cable 6.6ft(2m)		1EA
Power Cord 10ft (3m)		1EA
Ground Cable 10ft (3m)		1EA

Contents	Picture	Quantity
Ground Cable 6.6ft (2m)		1EA
Ground Sems Screw M4 x 0.31" (M4 x 8mm)		4EA
Bracket Sems Screw M6 x 0.63" (M6 x 16mm)		4EA
Lag Screw Size: 1/2" x 2"		4EA
Anchor Bolt Set 1/2" x 2"		4EA

This publication provides instruction for installing WiMAX 24dBm, 30dBm, and 33dBm repeaters.

The images for the User Interface in this publication may vary from the repeater's depending on its S/W version.

Copyright

Version Revision History:

Date	Version	Changes
07/2008	Draft	

Certification
UL/FCC: This equipment complies with UL and FCC

Warnings and Hazards

WARNING! ELECTRIC SHOCK
Opening the BDA (bi-directional amplifier) could result in electric shock and may cause severe injury.

WARNING! EXPOSURE TO RF
Working with the repeater while in operation, may expose the technician to RF electromagnetic fields that exceed FCC rules for human exposure. Visit the FCC website at http://www.fcc.gov/oet/rfsafety to learn more about the effects of exposure to RF electromagnetic fields.

WARNING! DAMAGE TO EQUIPMENT
Operating the BDA with antennas in very close proximity facing each other could lead to severe damage to the repeater.

RF EXPOSURE & ANTENNA PLACEMENT
Actual separation distance is determined upon gain of antenna used.
Please maintain a minimum safe distance of at least 8inch while operating near the donor and the server antennas. Also, the donor antenna needs to be mounted outdoors on a permanent structure.

WARRANTY
Opening or tampering the BDA will void all warranties.

⚠ CAUTION: REPEATER SHOULD BE INSTALLED AS CLOSE AS POSSIBLE TO POWER SOURCE.

⚠ CAUTION: THIS REPEATER IS FOR INDOOR USE ONLY AND SHOULD BE LOCATED INSIDE OF BUILDING.

⚠ CAUTION: RISK OF EXPLOSION IF BATTERY ON CONTROLLER BOARD IS REPLACED WITH AN INCORRECT TYPE.

Mounting Repeater

Masonry Wall

1. Using a pencil, mark the location of each of the mounting bracket's four mounting holes on the wall.
2. Drill holes in the wall at the locations marked in step 1.
3. Set the anchors in the wall using a hammer.
4. Locate the four mounting bolts and place a lock washer and flat washer on each bolt.
5. Place the mounting bracket over the four holes with anchors, making sure that the washers are on the repeater side of the mounting bracket. Tighten bolts until secure.

Anchor Bolt Set 1/2" x 2"

Masonry Wall

Mounting Bracket
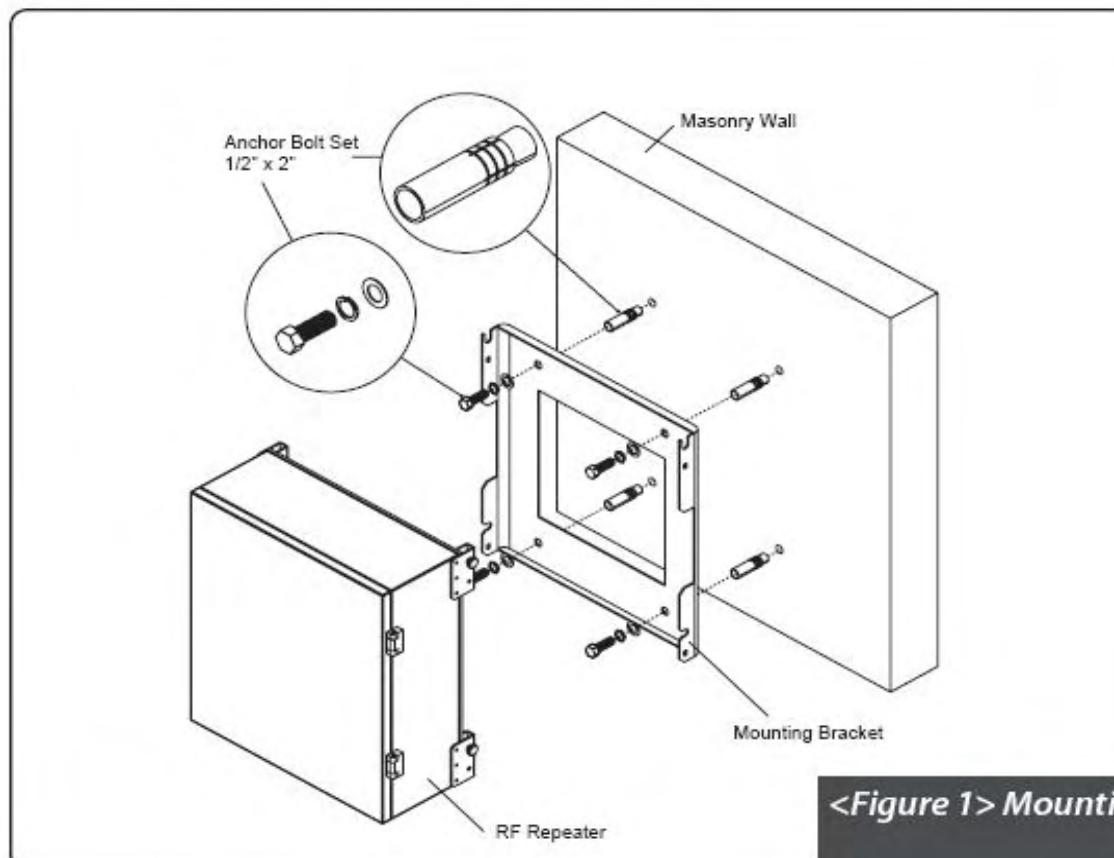
RF Repeater

<Figure 1> Mounting the Repeater on a Masonry Wall

Mounting Repeater

Wood-Framed Wall

1. It is recommended to first attach a sheet of plywood to the wall. The sheet of plywood should be anchored to the studs in the wall.
2. Using a pencil, mark the location for each of the mounting bracket's four mounting holes on the plywood.
3. Place the mounting bracket over the four lag screws heads.
4. Thread a lag screw at the positions marked in step 1.

<figure>
Wood-Framed Wall

Lag Screw
1/2" x 2"

Mounting Bracket

RF Repeater

<Figure 2> Mounting the Repeater on a Wood-Framed Wall
</figure>
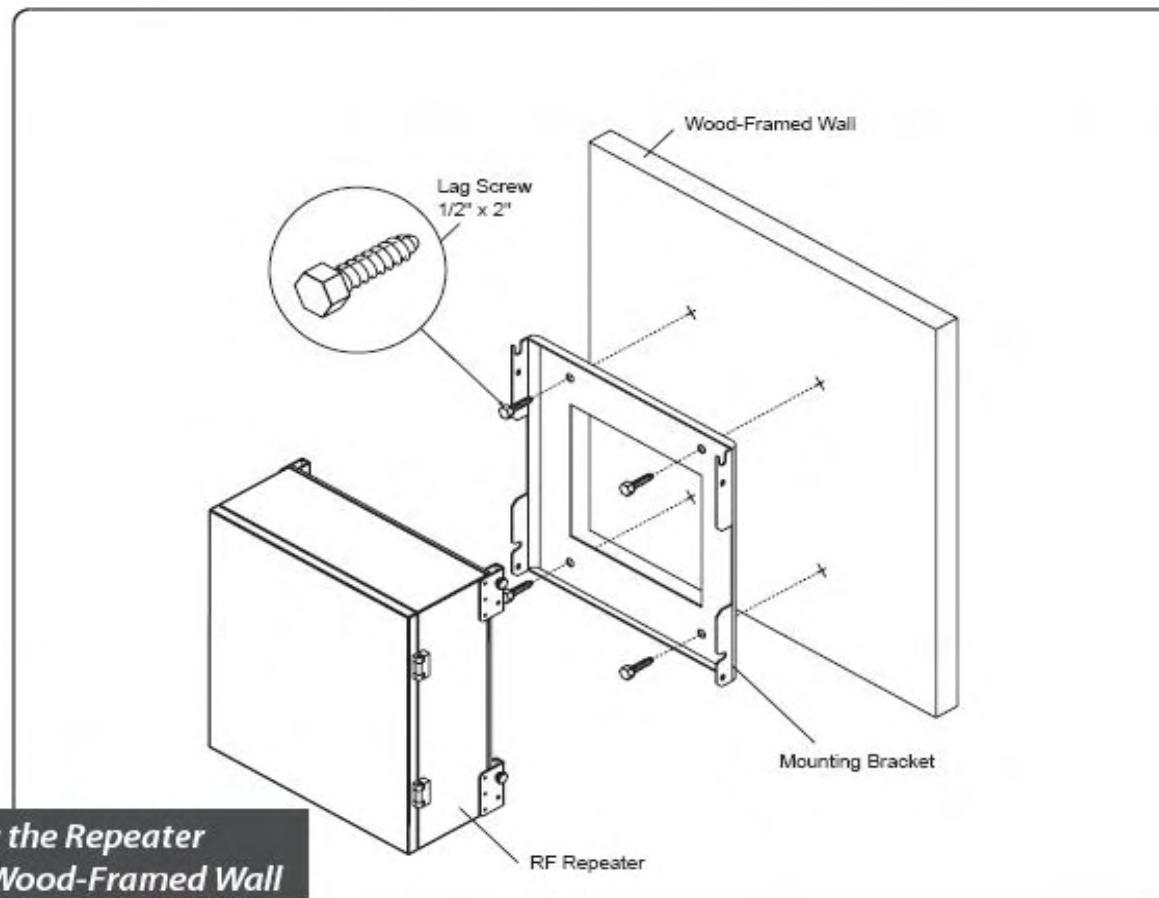
Hanging and Grounding

1. Hang the Repeater from the mounting bracket.
2. Locate the four Bracket Sems Screws with installed washers. Tighten bolts until secure.
3. Locate the ground lug on the underside(or side) of the repeater.
4. Crimp the ground cable to the ground lug.
5. Route the free end of the ground cable to an approved(per local code or practice) ground source.

⚠ **CAUTION**
Ground cable must be properly grounded to provide both EMI and voltage surge protection for the repeater.

Bracket Sems Screw
M6 x 16 mm

Ground lug detail drawing

To approved ground source

Ground Sems Screw
M4 x 8 mm
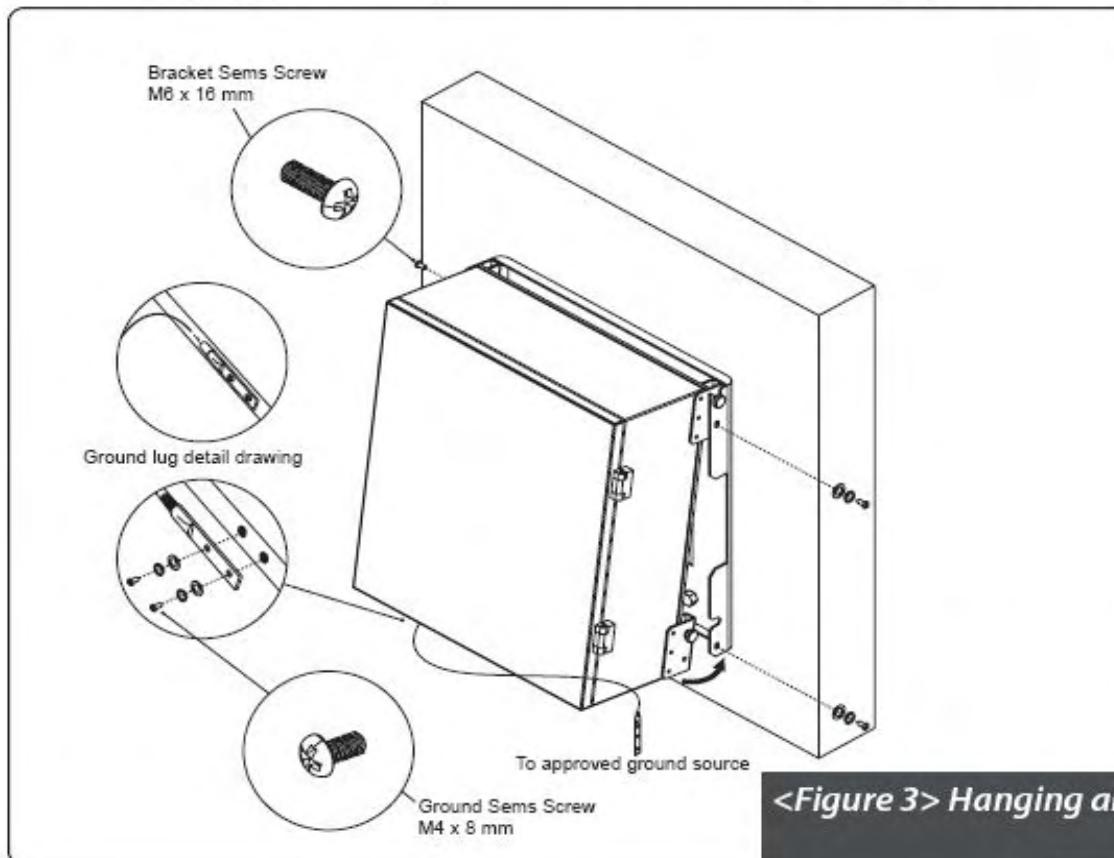
<Figure 3> Hanging and Grounding the Repeater

Position Antenna

- Customer specifications should be followed for positioning the antennas properly.

<Figure 4> An installer is directing Donor Antenna to nearby BTS to receive strong input signal.

WiMAX Repeater External Port Design
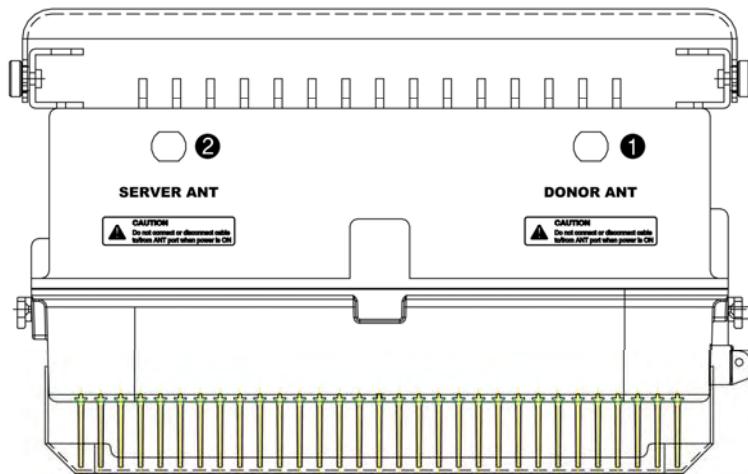
<Figure 5> ANT Port Display
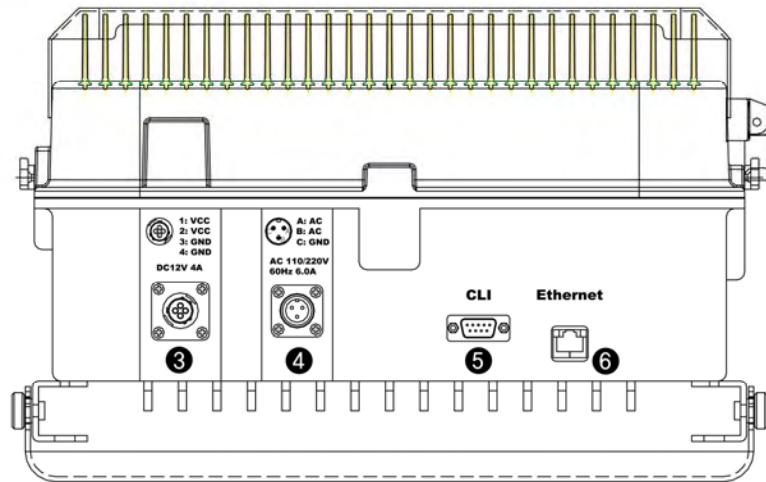
<Figure 6> Port Display (Bottom side)

NO	PORT	NO	PORT
①	DONOR ANT PORT	④	AC POWER PORT
②	SERVER ANT PORT	⑤	CLI PORT
③	DC POWER PORT	⑥	ETHERNET PORT

<Figure 7> WIMAX_33dBm External Port Title

Cable Connections

• **Connect Donor and Server Antennas**

⚠️ **CAUTION**
Do not connect or disconnect cable from ANT port when power is ON

<Figure 8> Donor ANT Port Connection

<Figure 9> Server ANT Port Connection

WiMAX Repeater External Design

<Figure 10> WiMAX Repeater External Design

Connecting Power Cable
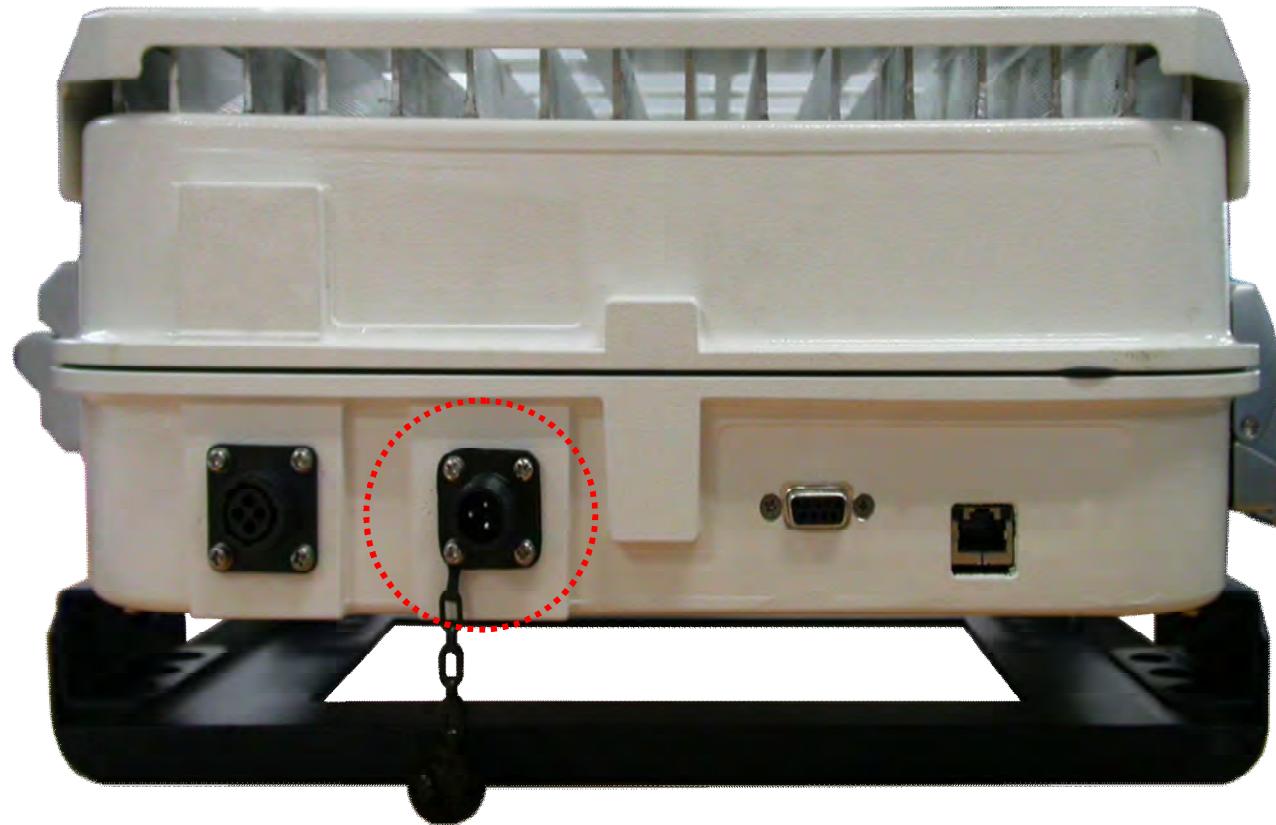
<Figure 11> *AC Power Port Connection*

Web UI

- Before connecting to repeater, disable wireless networking functions and remove wireless broadband card.
- Connect Ethernet Crossover cable from repeater to laptop.
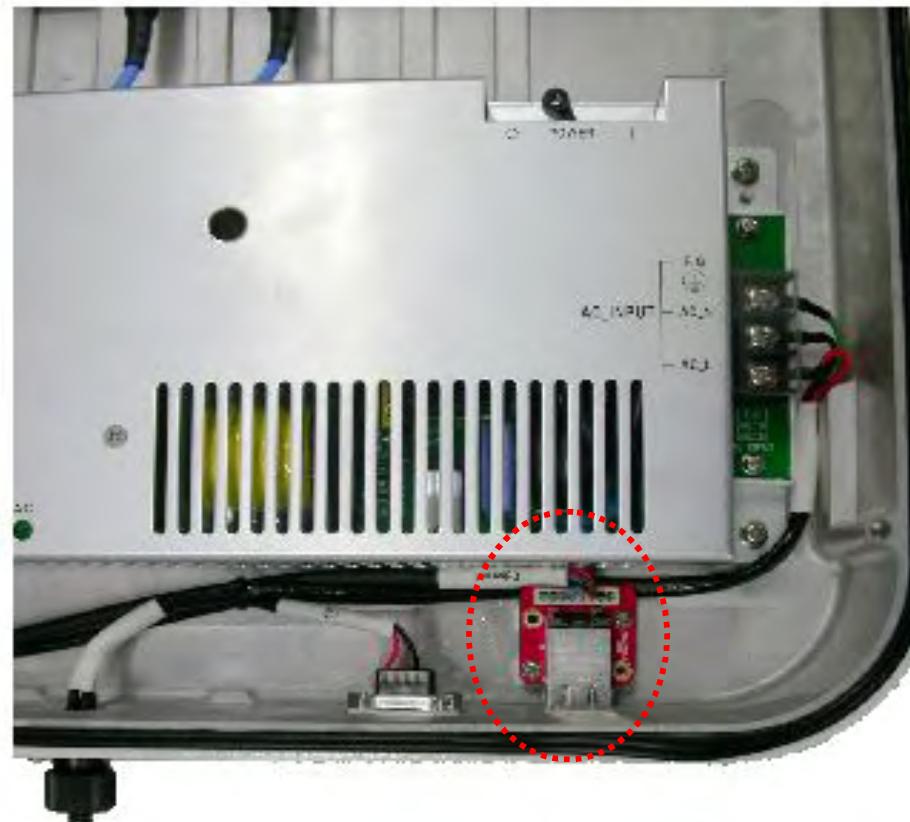
<Figure 12> Ethernet Port

Connecting to Web UI

1. Start->Control Panel->Network and Internet Connections
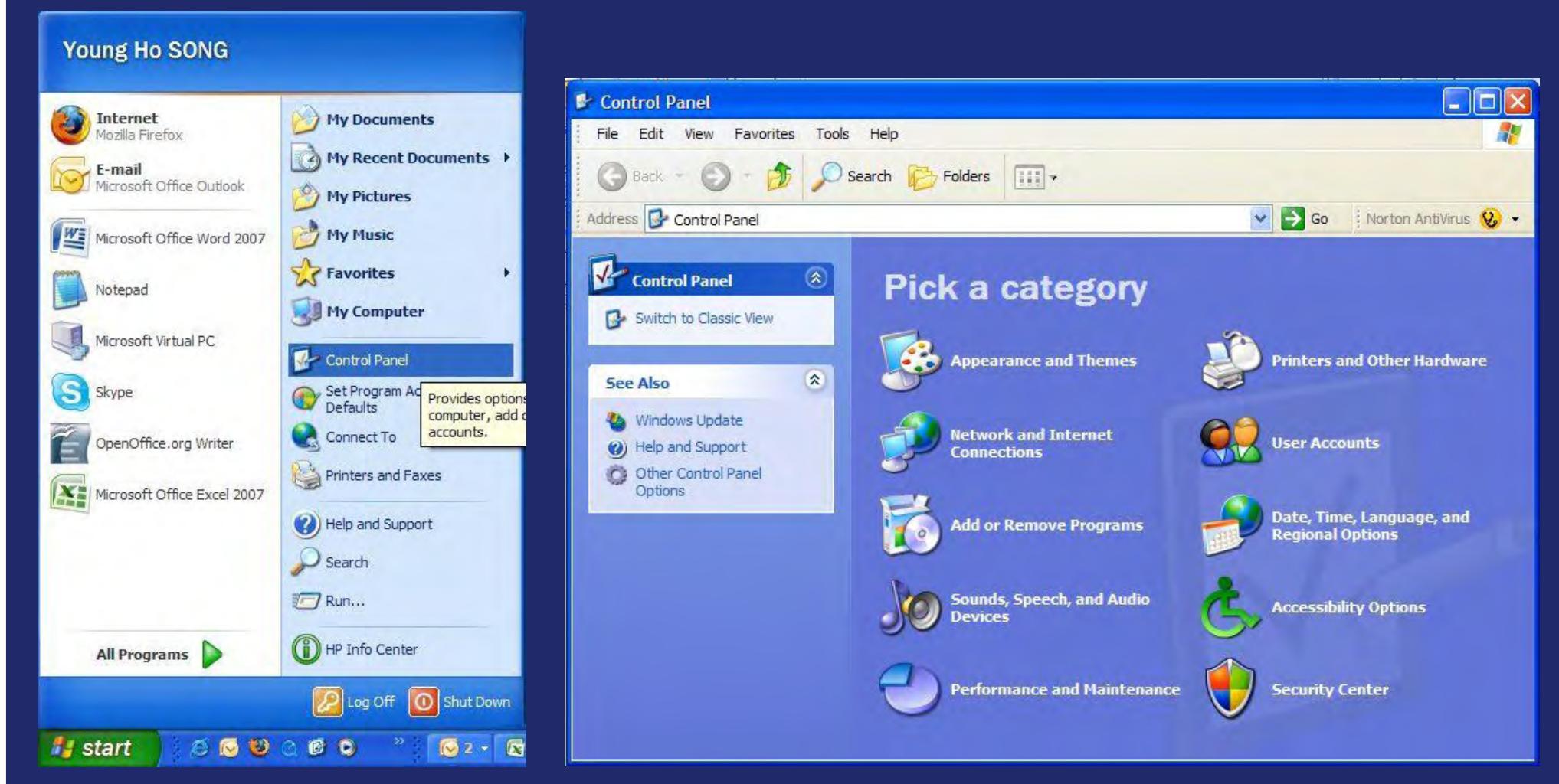
⚠ **CAUTION**
Disable wireless connections and remove wireless broadband card.

Connecting to Web UI

2. Right click Local Area Connections and choose Properties
3. Click Internet Protocol (TCP/IP) on General tab and click Properties
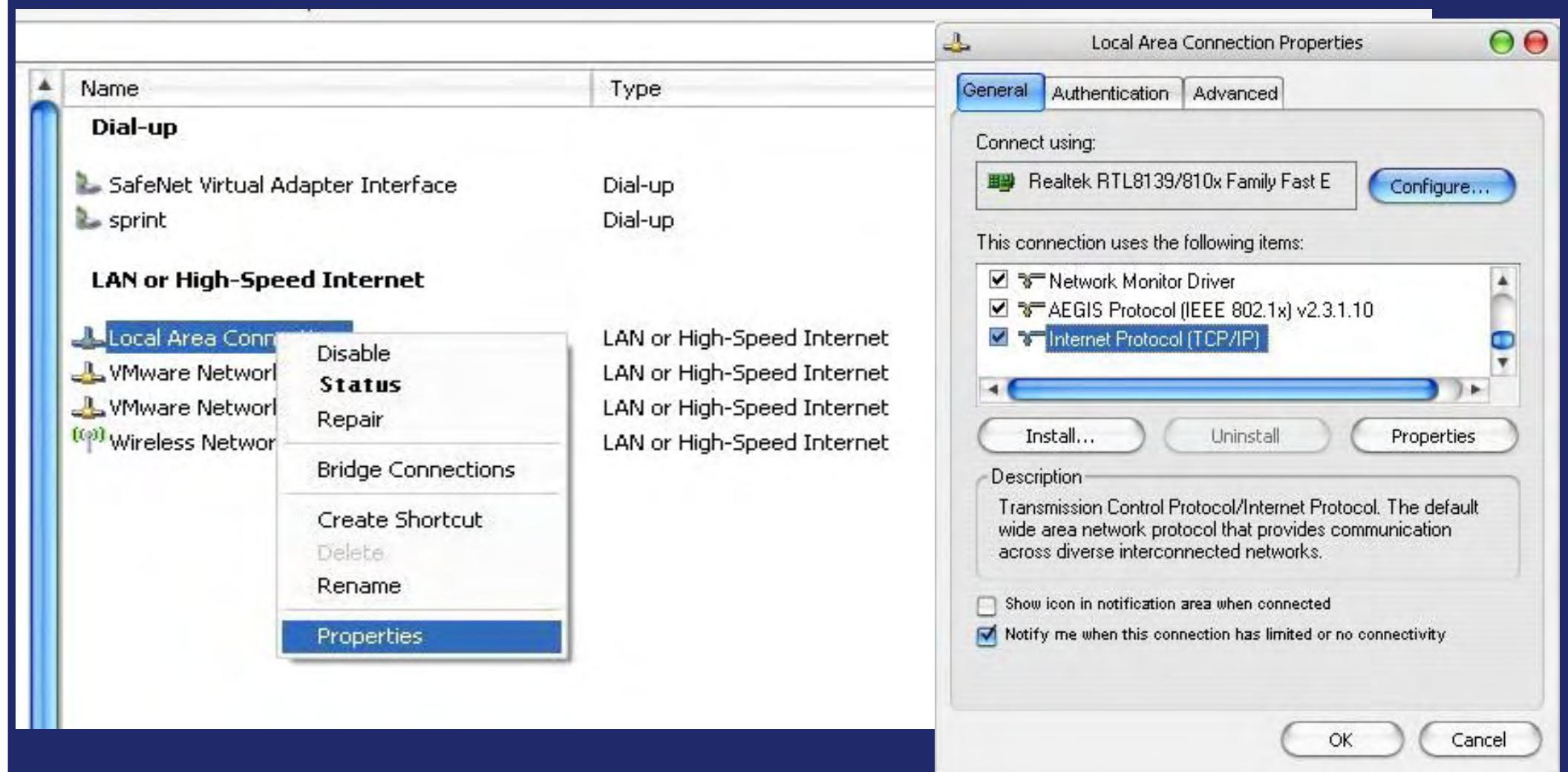
On General Tab
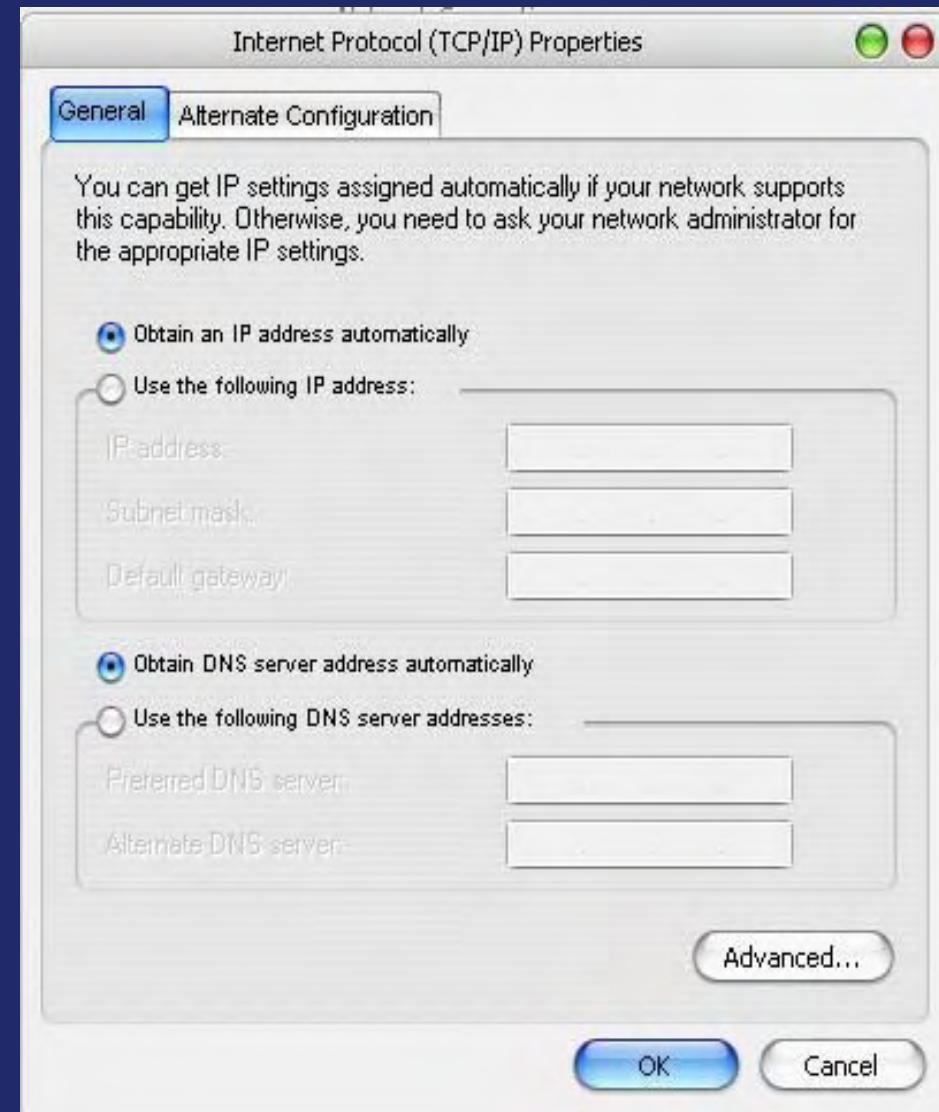
4. *Choose "Obtain an IP address automatically"*

5. *Choose "Obtain DNS server address automatically"*

6 . *Click "OK" to close Properties*

7. *Click "OK" to close Properties*

Connecting to Web UI

8. Right click Local Area Connections and choose Status
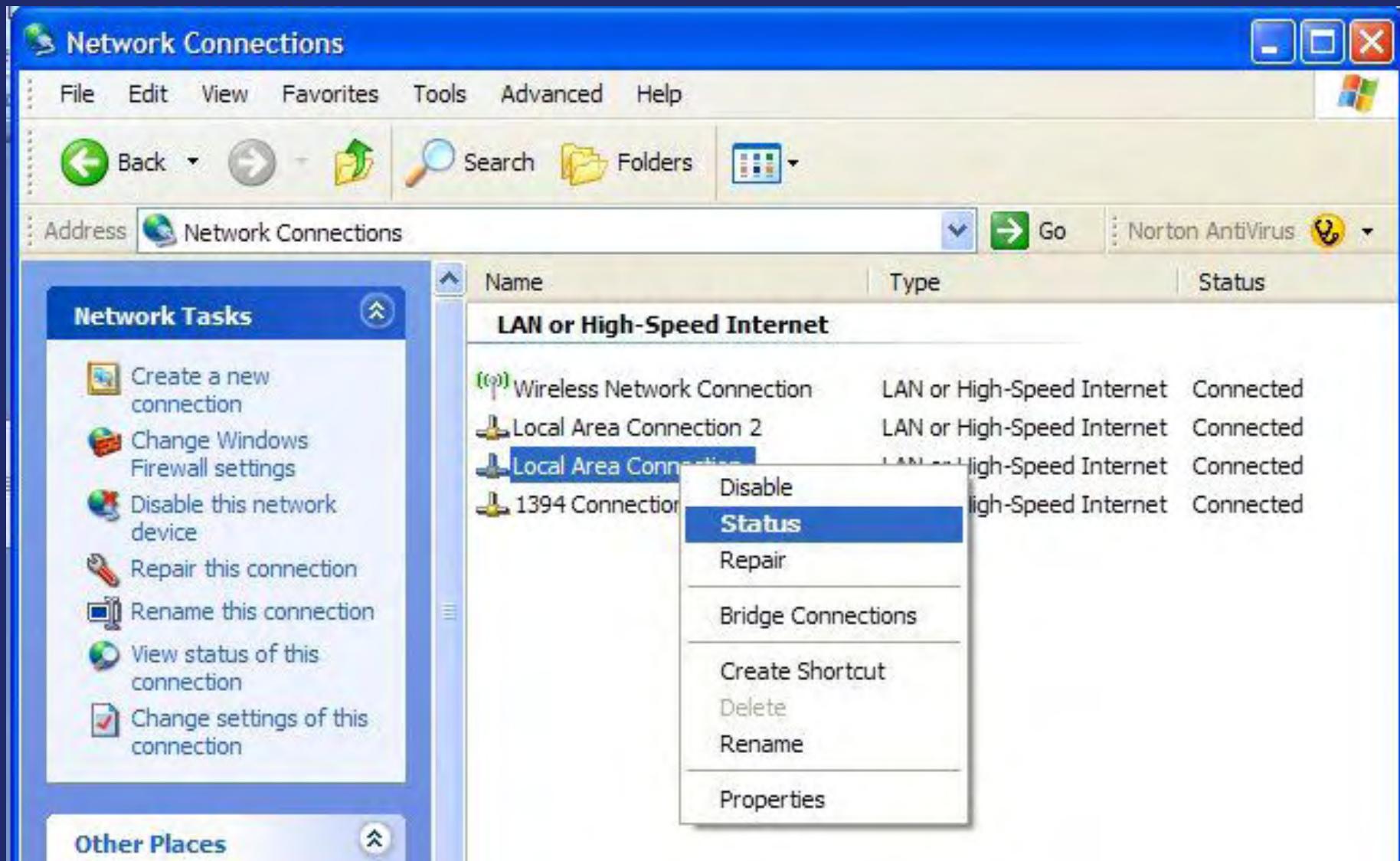
Verify Assigned IP Address
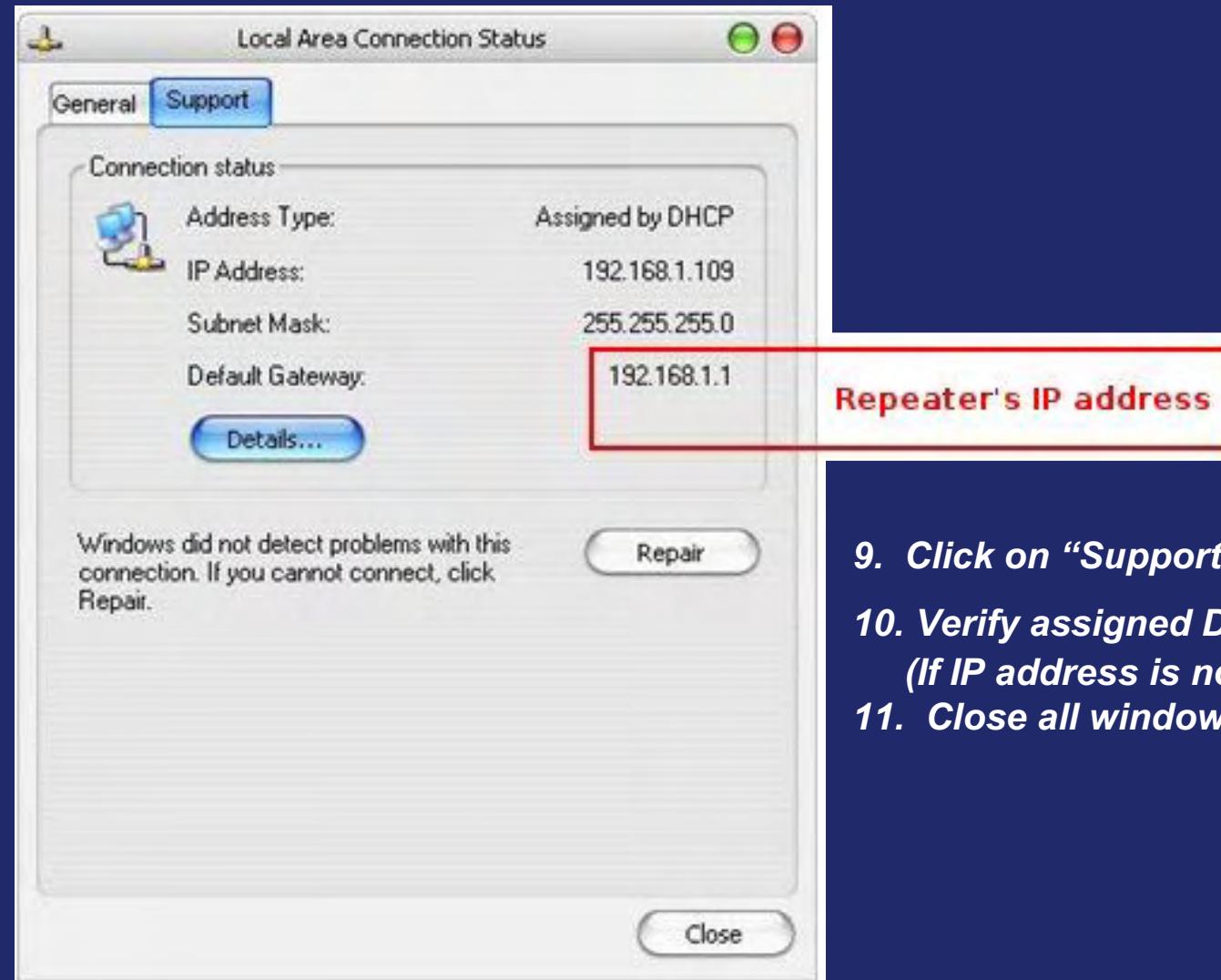
9. Click on "Support" tab.

10. Verify assigned Default Gateway at local connection.
    (If IP address is not assigned, click repair)

11. Close all windows when finished.

Internet Explorer Option Settings

• Proceed step by step as indicated in the following slides to delete all temporary internet files and records.

1. Open Internet Explorer -> Tools -> Internet Options
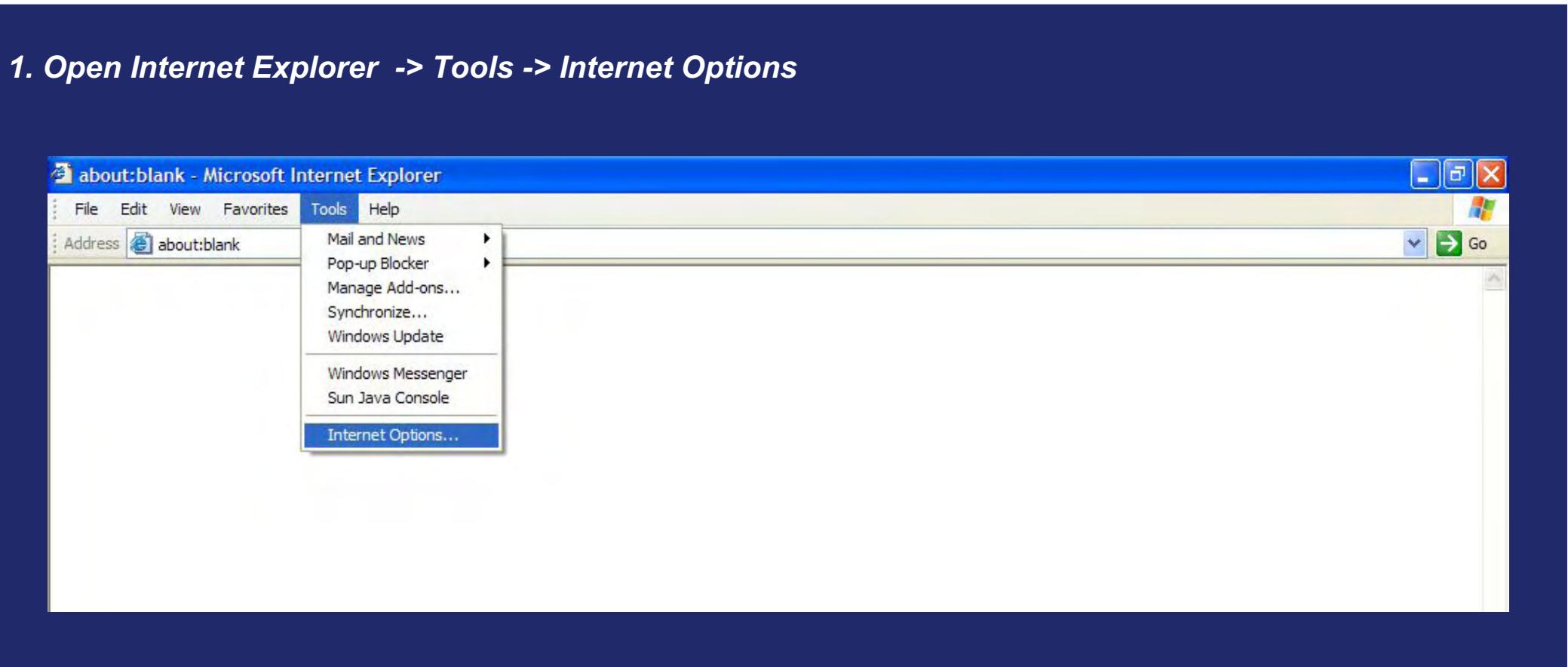
Browser History Options

On the "General" tab,
In the "Temporary Internet Files" section:

2. Click "Delete Cookies" → "OK"

3. Click "Delete Files" → "OK"

4. Click "OK"

Login Screen
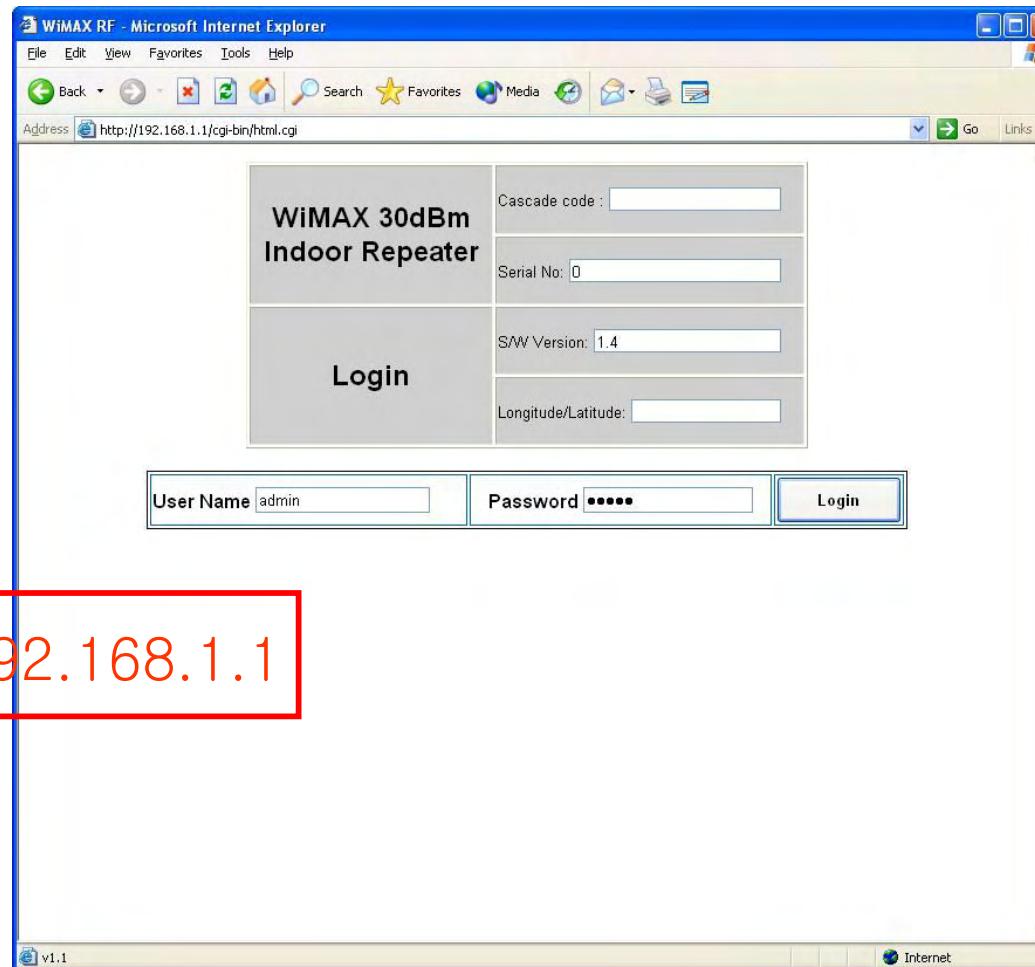
Enter Default Gateway's IP address into address bar as previously described, you will be redirected to Login.

Default User Name is 'admin', and default Password is 'admin'. You may need to change password as described

in the User Management section. Cascade Code and Longitude/Latitude will initially be blank, you can input

Cascade Code and Longitude/Latitude as described in the Communications Configuration section.

List Menu

• After you log in, you can see various menu page links related to the equipment.
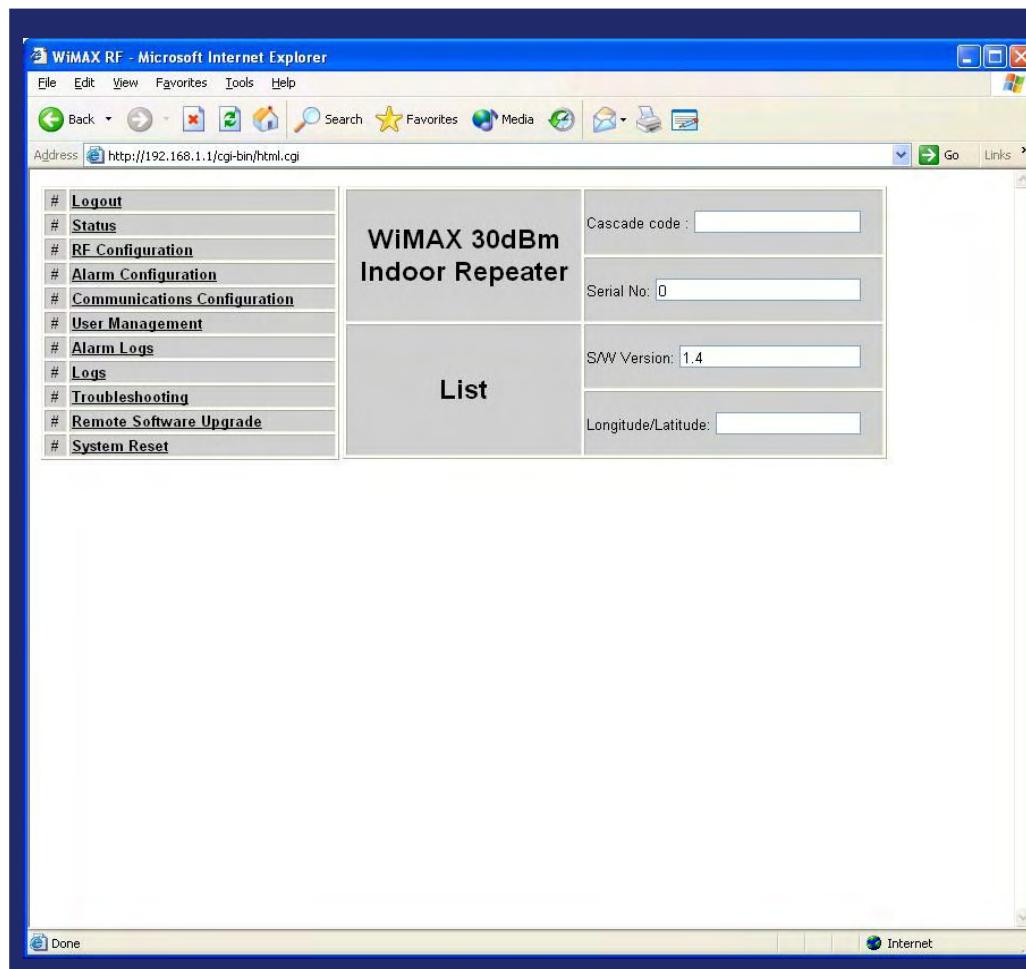
Status Page

• Default D/L and U/L are set at minimum Gain.

•The default values in various fields will differ with different models of WiMAX Repeaters.

• In order to view other pages, you can click the desired menu on the top-left corner of all pages.

• Changes can be made on the Status Page. This page is for checking the repeater's conditions and settings.

Status Page

Communications Configuration

- Click on the Communications Configuration link.
- On this page you can change various values related to IP network. Because Web UI is based on IP network, incorrect configuration may make it impossible to connect to Web UI

Communications Configuration

• In case that screen resolution is 1024 x 768, you may need to use scroll bars to view all. The installer can input Cascade Code into Repeater ID field, and change current time (see last 2 fields). Changes will not be take effect until you click "Apply" button.
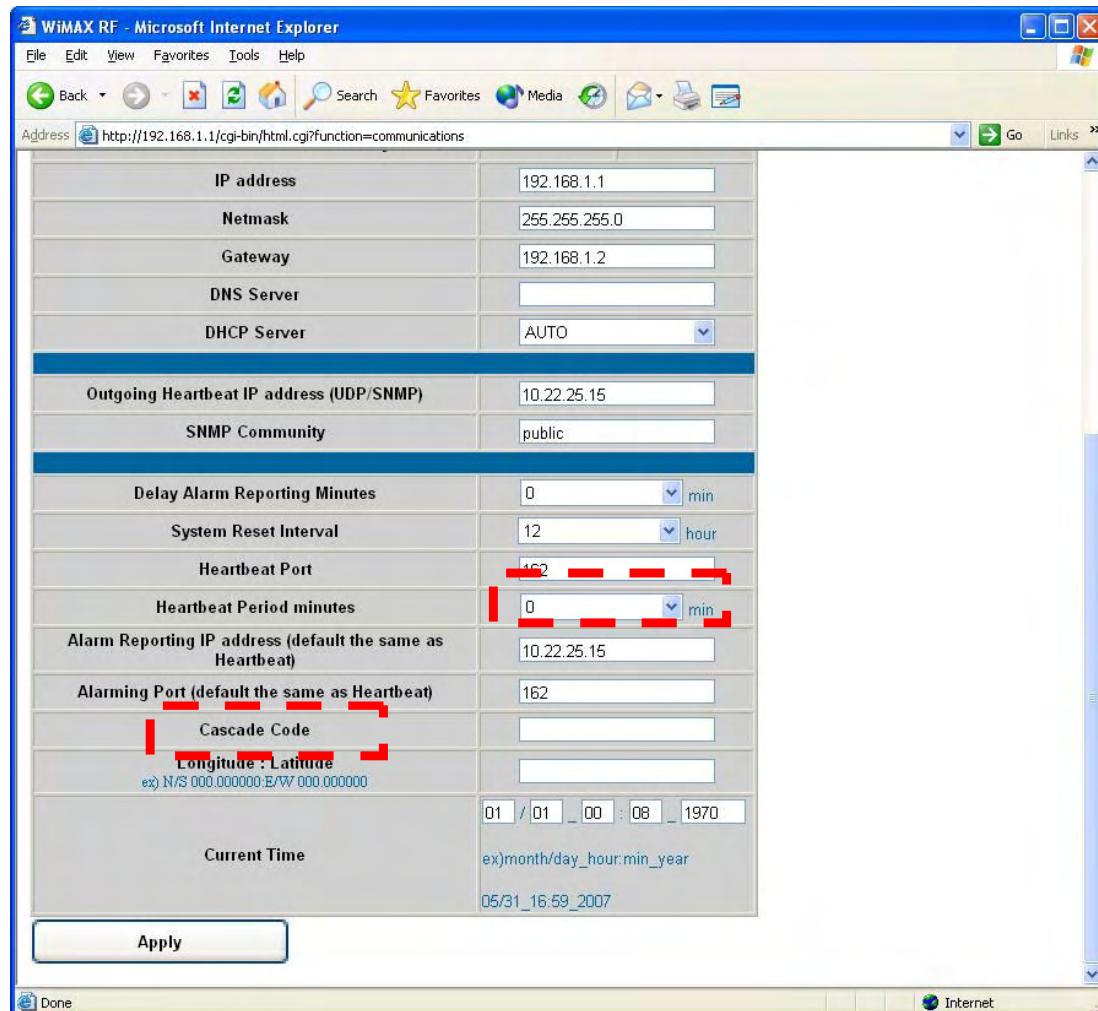
• Caution : Please, follow the example

When heartbeat period minutes is 2 -> User should input Cascade Code, Longitude, and Latitude information of the site to turn HPA on

When heartbeat period minutes is 0 -> User does not have to input Cascade Code, Longitude, and Latitude information of the site to turn HPA on. (HPA is automatically ON)

RF Configuration

• Click the RF Configuration link.

• This menu is where installer will actually configure the Repeater.

• You can change various RF values of the equipment on this page.

• In case that screen resolution is 1024 x 768, you may need to use scroll bars to view all.

• Changes will not take effect until you click "Apply" button.

•The default values in various fields will differ with different models of WiMAX RF Repeaters.

Automatic Setup Using AGS Function

Set AGS Control to 'ON' and click Apply

AGS Flow Chart

Alarm Configuration

• Click Alarm Configuration link.

•In case that Report Alarms is OFF, all alarms will be disabled. In case that Report Alarm is ON, you can enable and disable individual alarms.
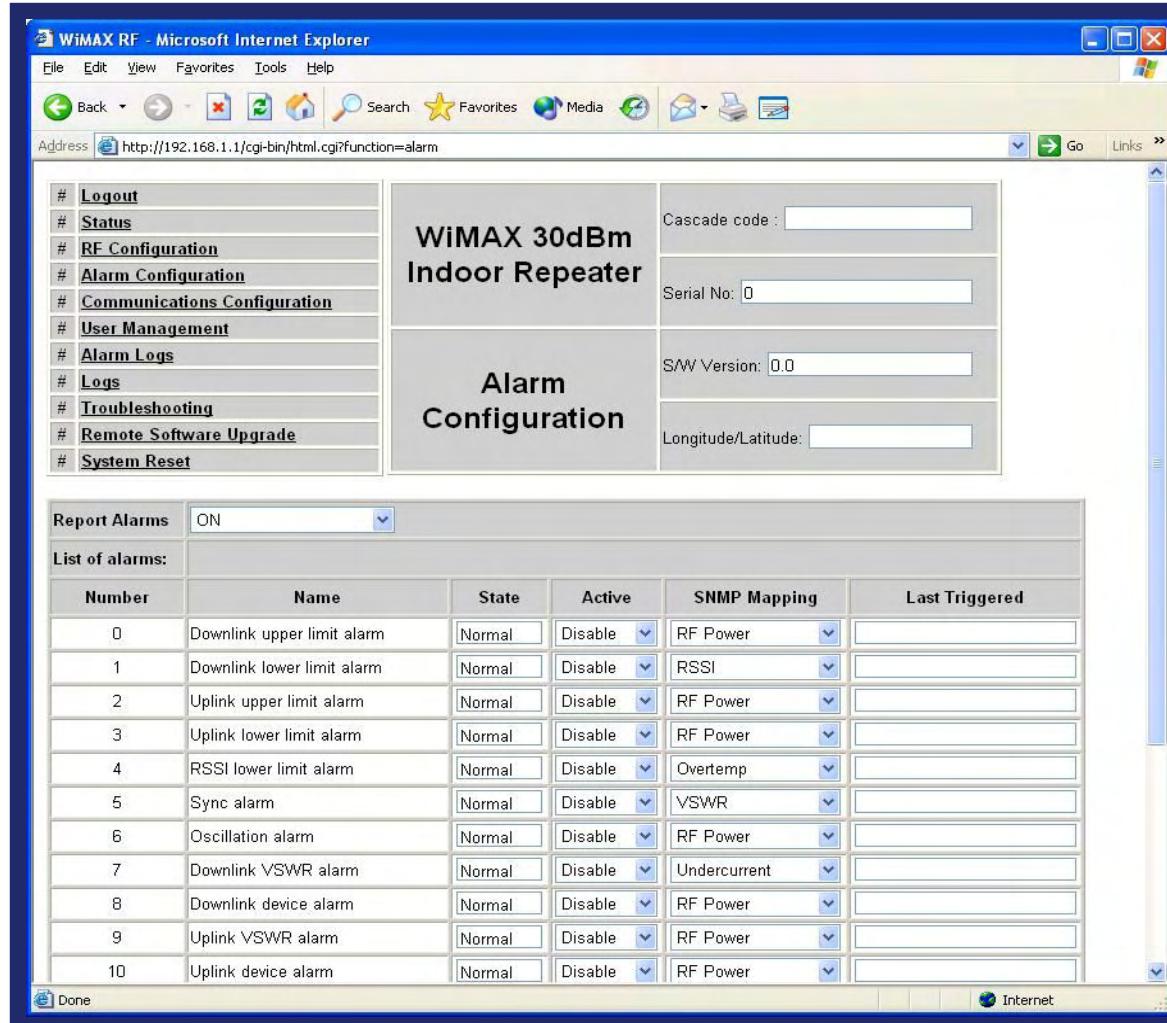
Alarm Configuration

- In case that screen resolution is 1024 x 768, you may need to use scroll bars to view all.

  Changes will not be made effective until you click "Apply" button.

User Management

- Click on the User Management link.
- On this page you can create and delete users, change passwords, and assign authorities to individual users.
- Read/Write Authority means that the user can change various values.
- Super User is very similar to an Administrator account.
- **Caution: DO NOT DELETE 'admin'.**
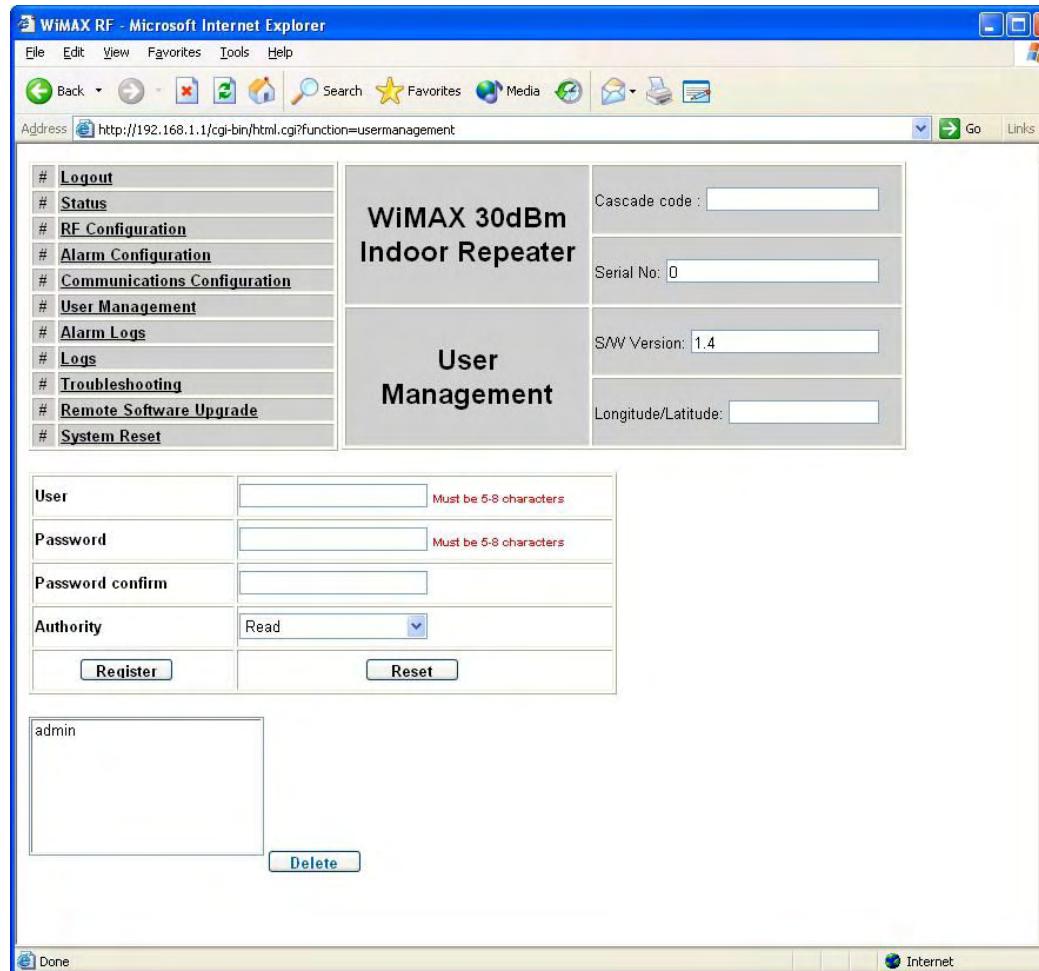
Alarm Logs

• Click on the Alarm Logs link.

• You can see Alarm Logs regarding Web UI operation. Alarm Logs will maintain a history of up to 30 operations.
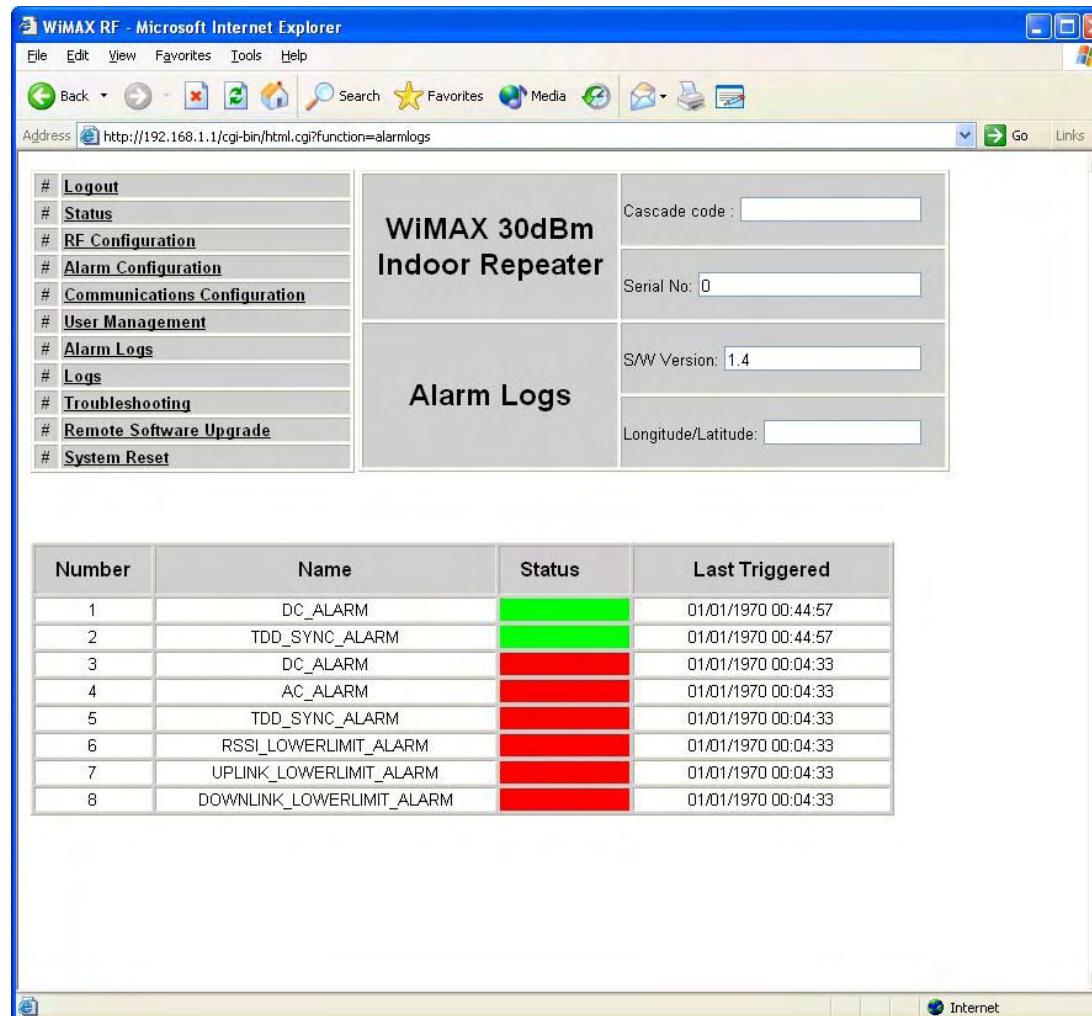
Logs

• Click on the Logs link.

• You can see Logs regarding Web UI operation. Logs will maintain a history of up to 30 operations.
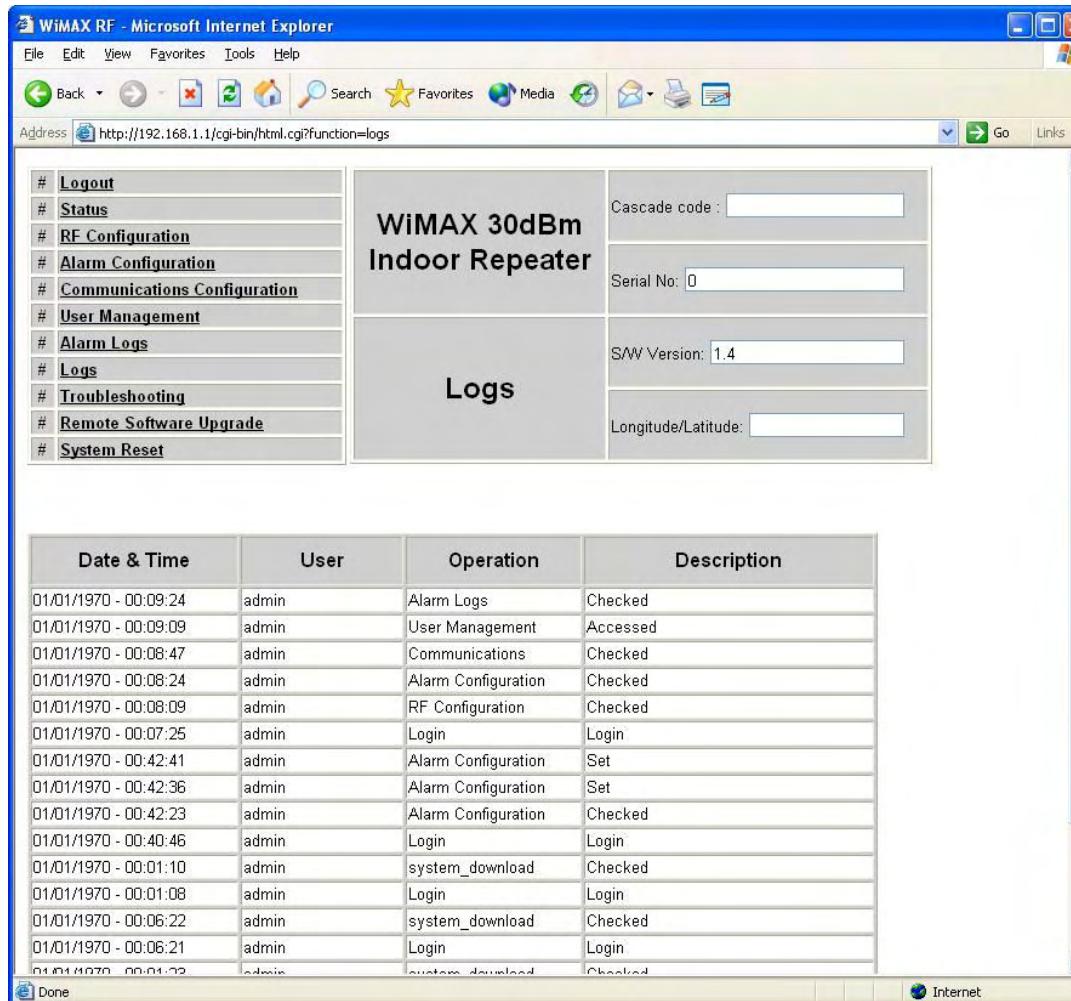
Troubleshooting Guide

• Click on the Troubleshooting link.
• You can refer to this page for a general troubleshooting guide.
• In case that screen resolution is 1024 x 768, you may need to use scroll bars to view all.
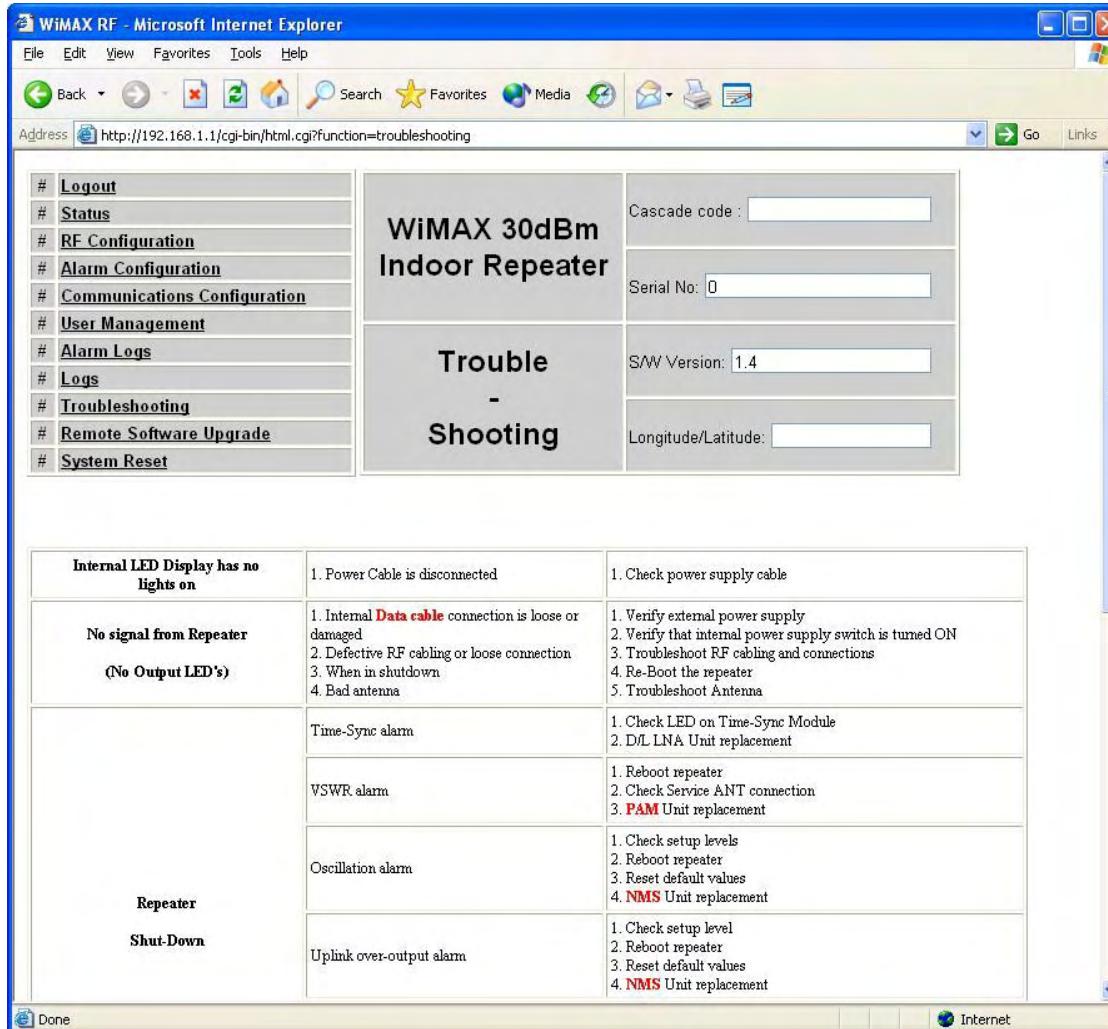
Software Upgrade

• Click on the Remote Software Upgrade link.

• In case that software upgrade is needed, you should use this page.

• Click Browse button to select the file to upgrade from the laptop.
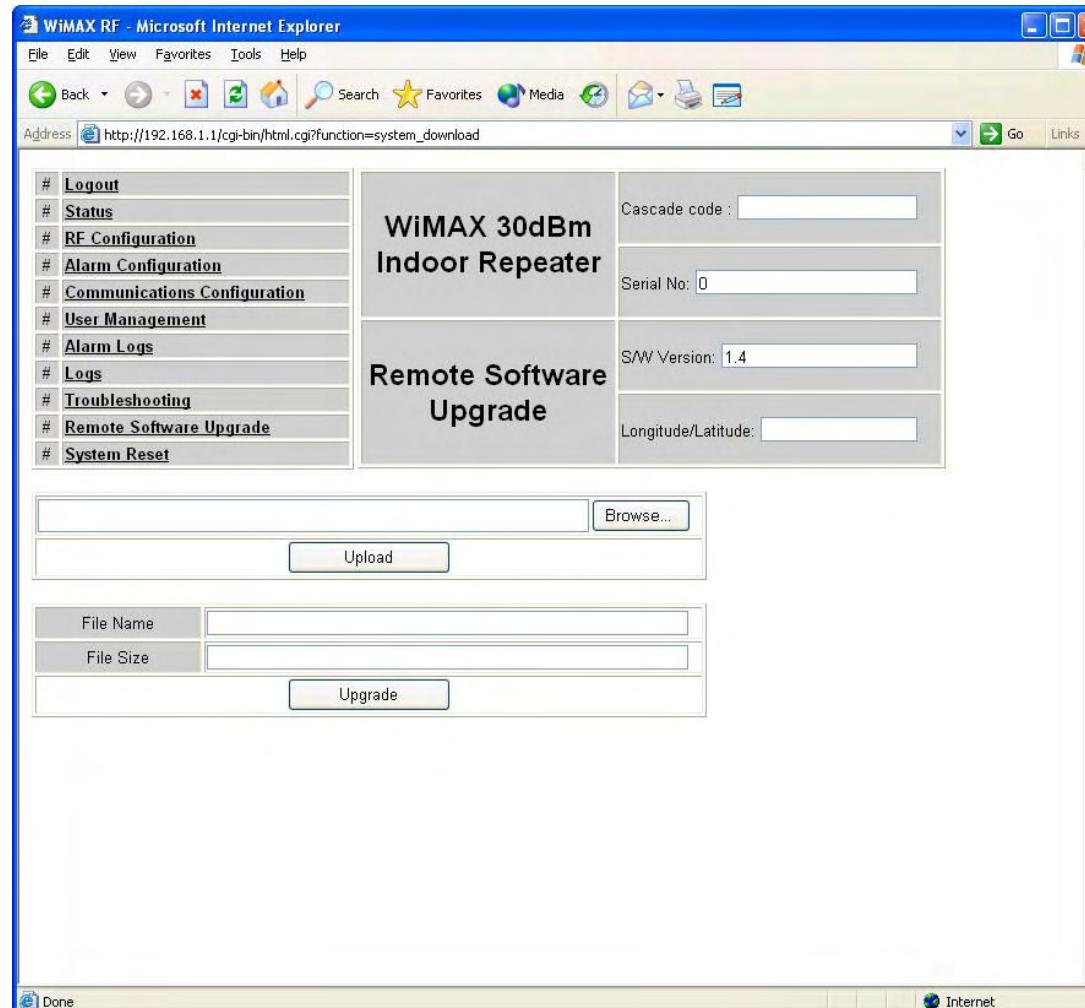
Software Upgrade

• Choose the file to upgrade provided by GST. After you choose the file, click "upload" to send the file from your laptop to the Repeater.
• Be careful not to unplug the crossover Ethernet cable during software upgrade.

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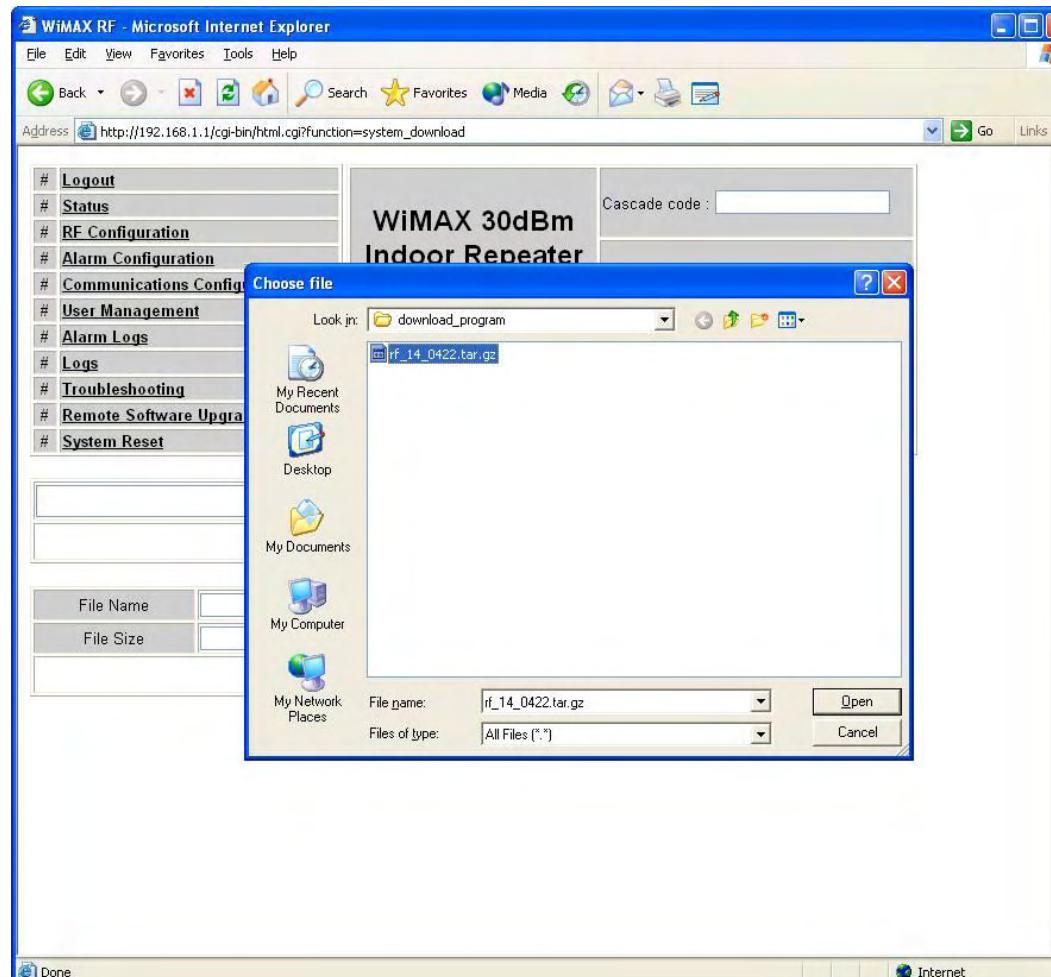
Software Upgrade

• After uploading is finished, verify that the File Name and the File Size is correct, click "Upgrade" button. Installer should wait about 2 minutes for upgrade to initialize.
• User may then be prompted to log back in to the Repeater.
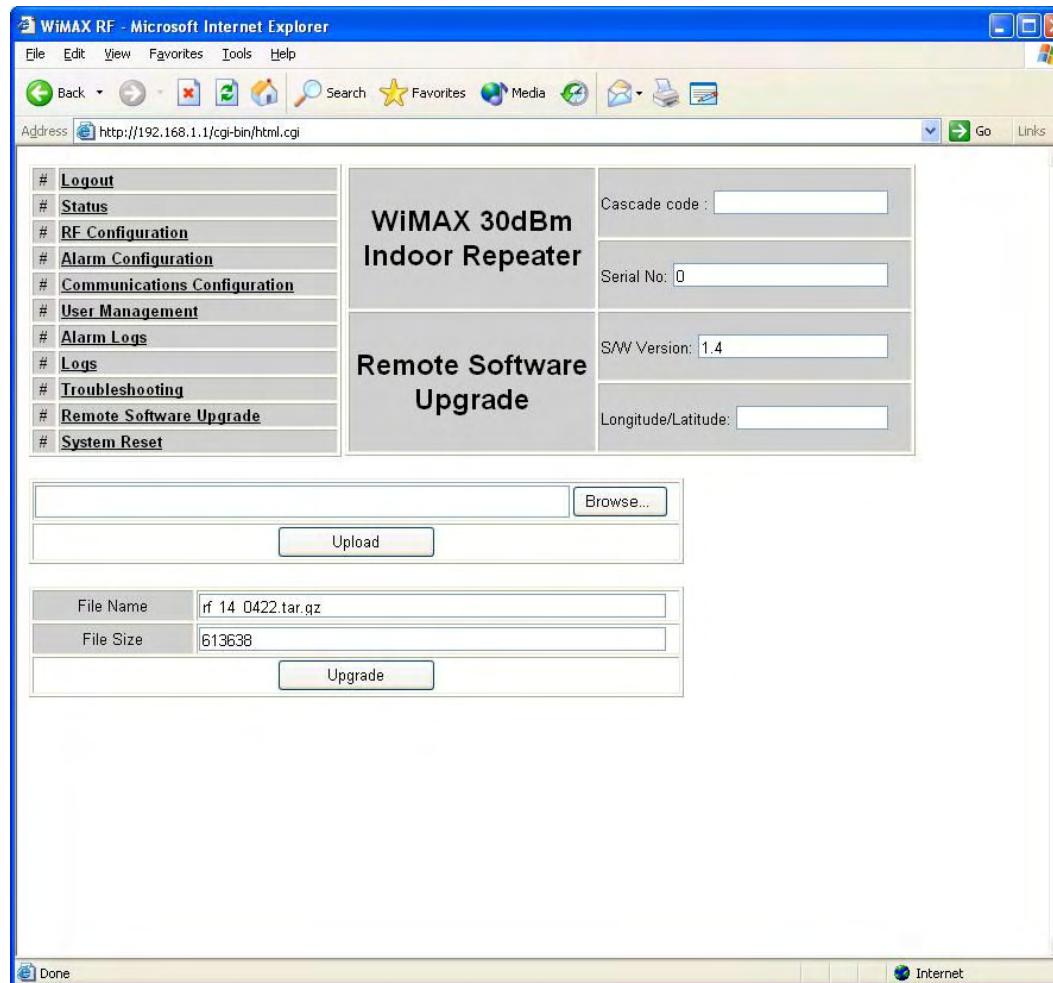
Software Reset

- A software reset is a "soft reboot" of the repeater. To reset the software, click on 'Software Reset' and then click 'Yes' to reset the software.
- Resetting the software is a good way to clear current alarms.
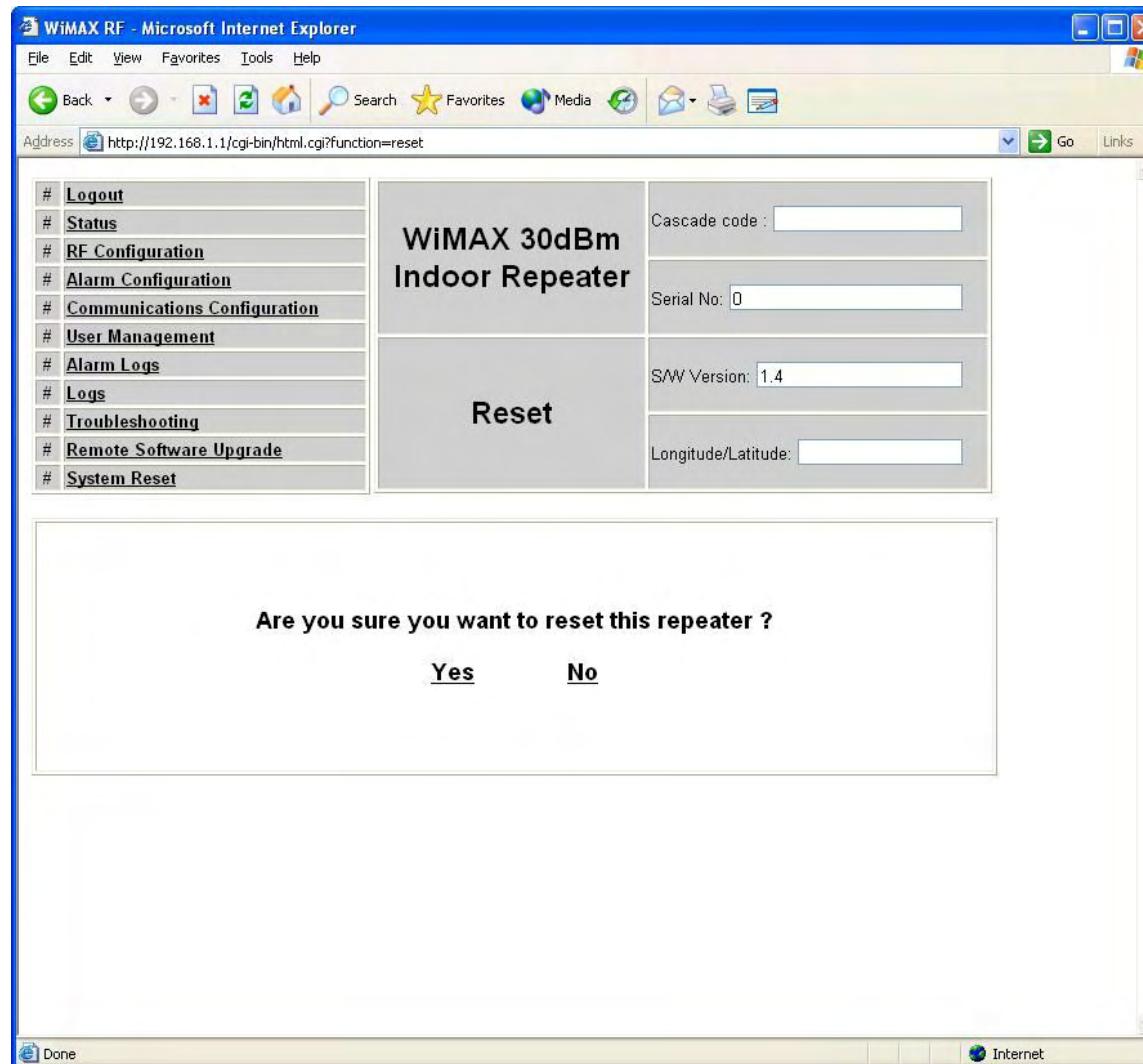
CLI (Command Line Interface)

• In case that you cannot reach Web UI, you should use CLI. Connect the Repeater's CLI port to your laptop's serial port using RS-232 cable. In case that your laptop does not have a serial port, you may need to use USB to Serial conversion cable. Caution: RS-232 cable or USB to Serial conversion cable is not provided with the equipment. After connection, you can access CLI using HyperTerminal.

• To open HyperTerminal, click "Start", then "Accessories", then "Communications", then "HyperTerminal".
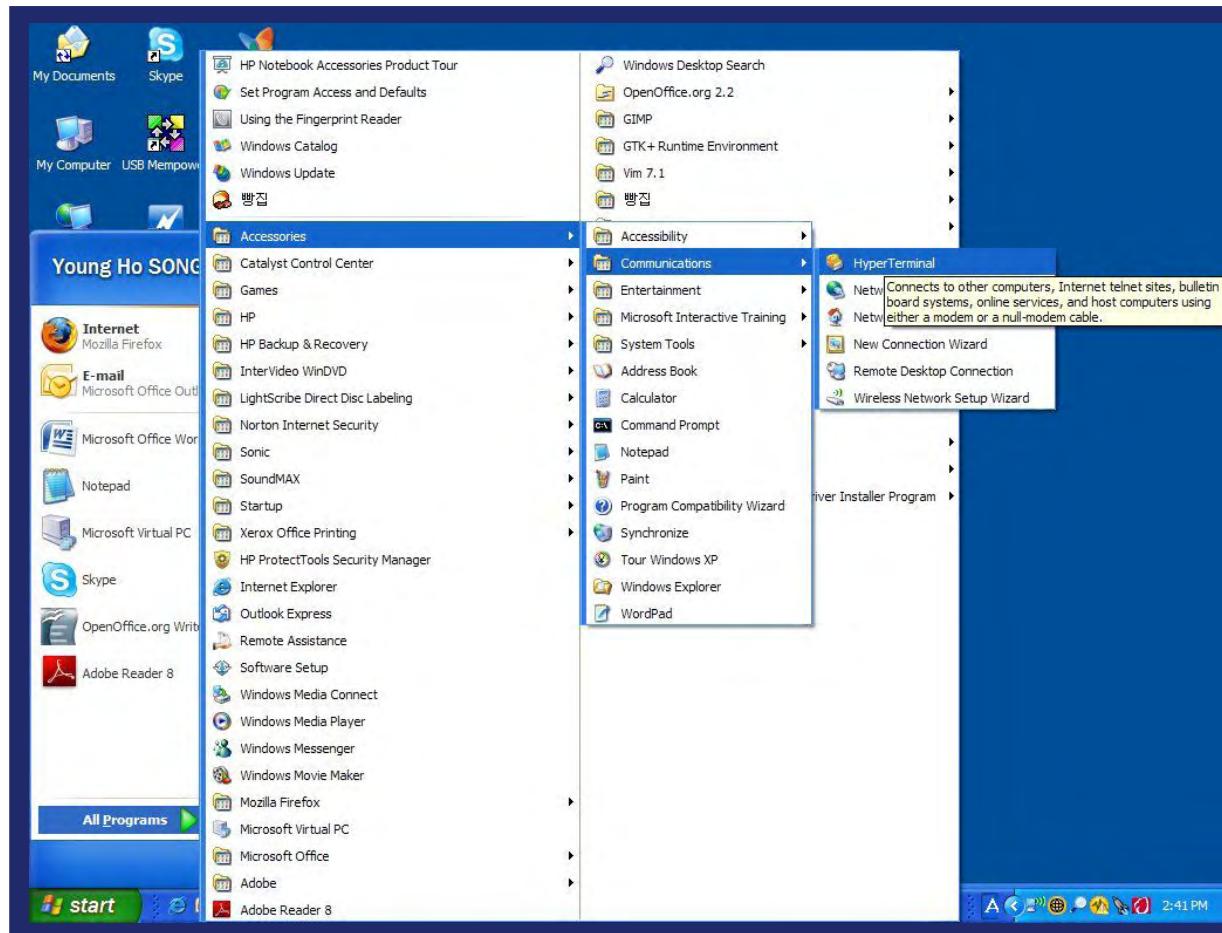
CLI

- "Bit per second" drop down menu, select "115200".
- "Flow control" drop down menu, select "None".
- Click "Apply".
- Click "OK".
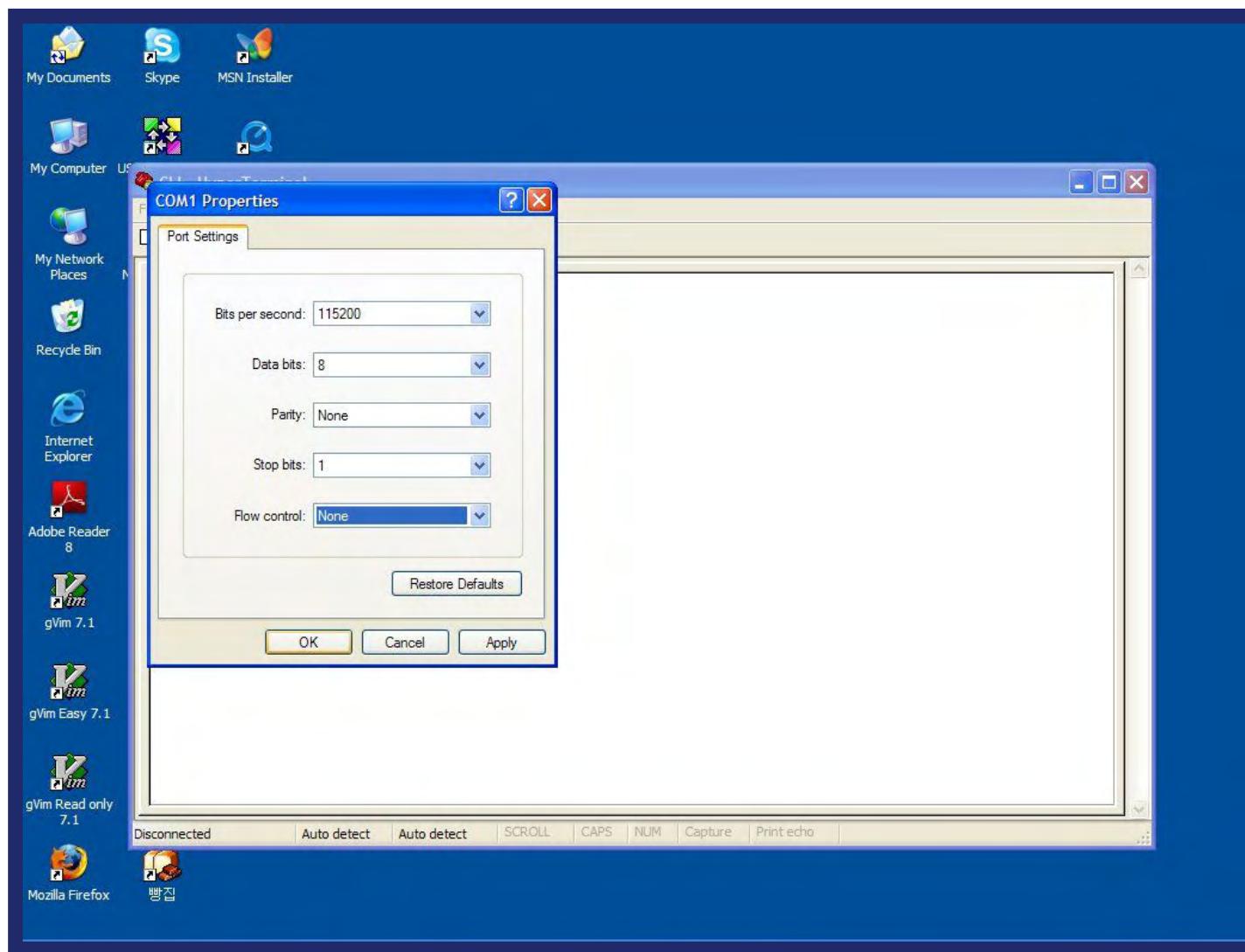
CLI

• To verify and/or change port number, open "Control Panel", then "System", then "Hardware Tab", then "Device Manager". Double click "Ports", then double click "Serial Cable" then click "Port Settings" tab, click "Advanced", in the COM Port drop down menu, select "COM 1", click "OK".
• After verification of port number, open HyperTerminal.
• Enter CLI.
• Click "OK".
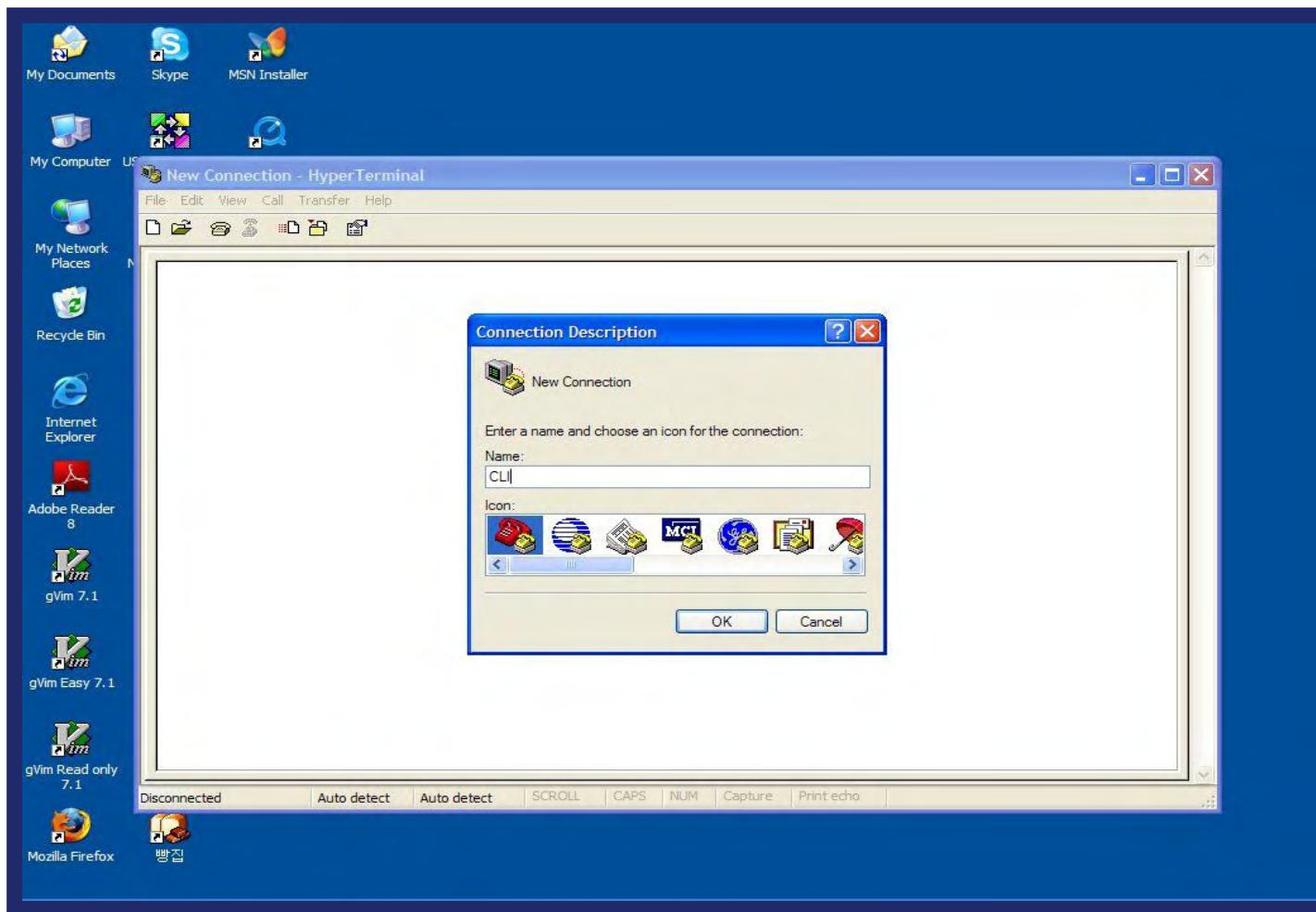
CLI

• In the "Connect using" drop-down menu, select "COM1".
• Click "OK".
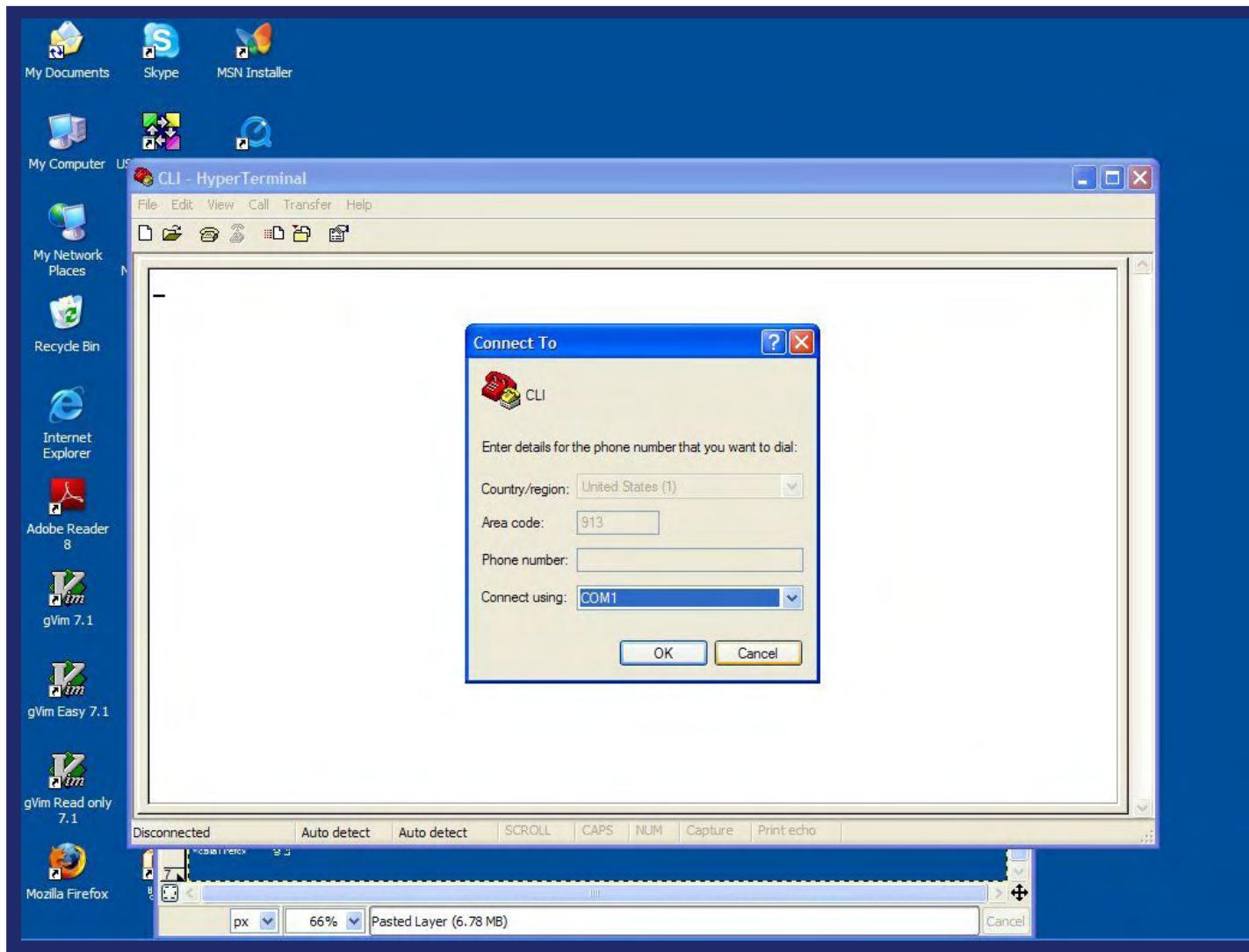
CLI

• Click "File", choose "Properties"
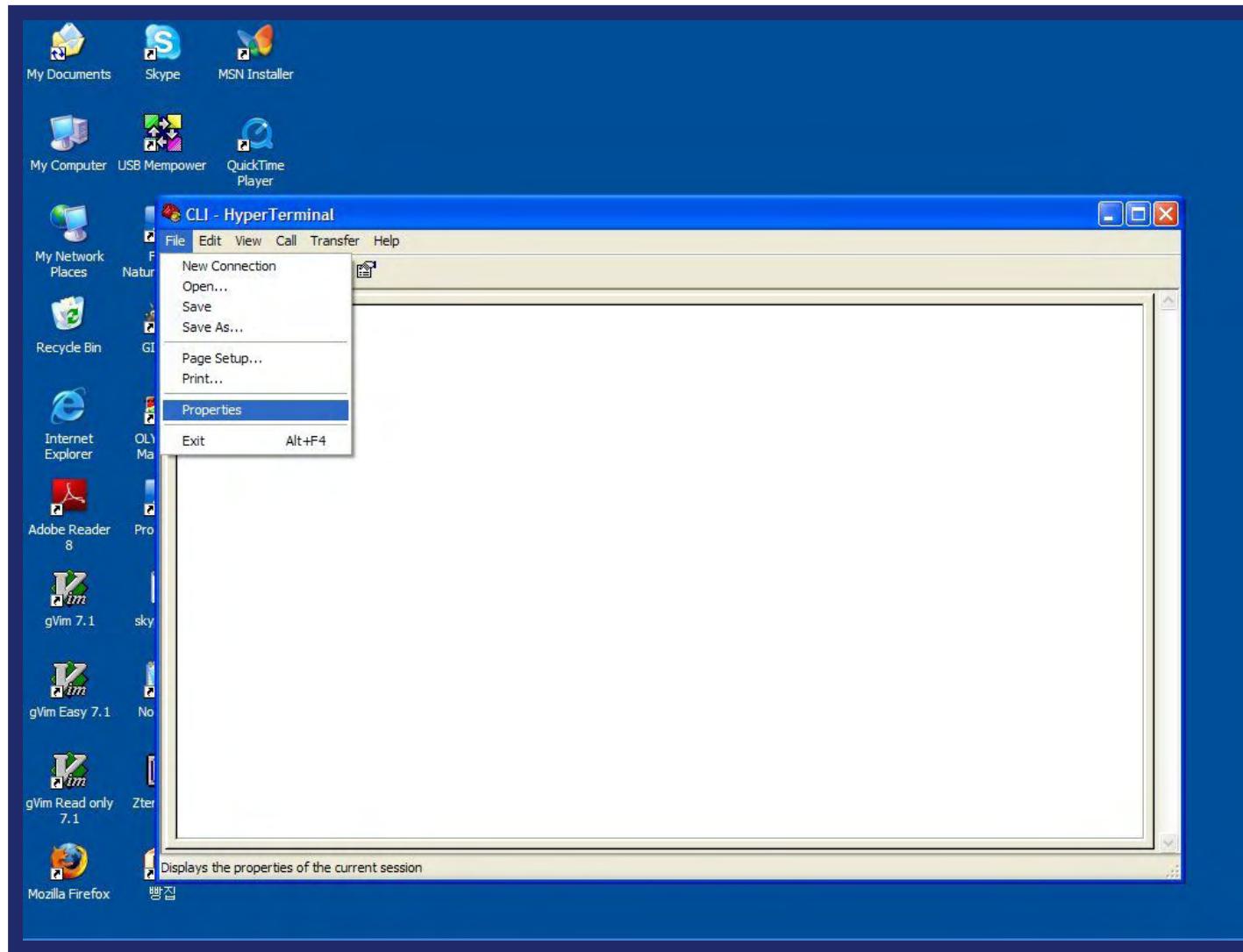
CLI

- On "Settings" tab
- "Emulation" drop down menu, select "VT100"
- Click "OK"
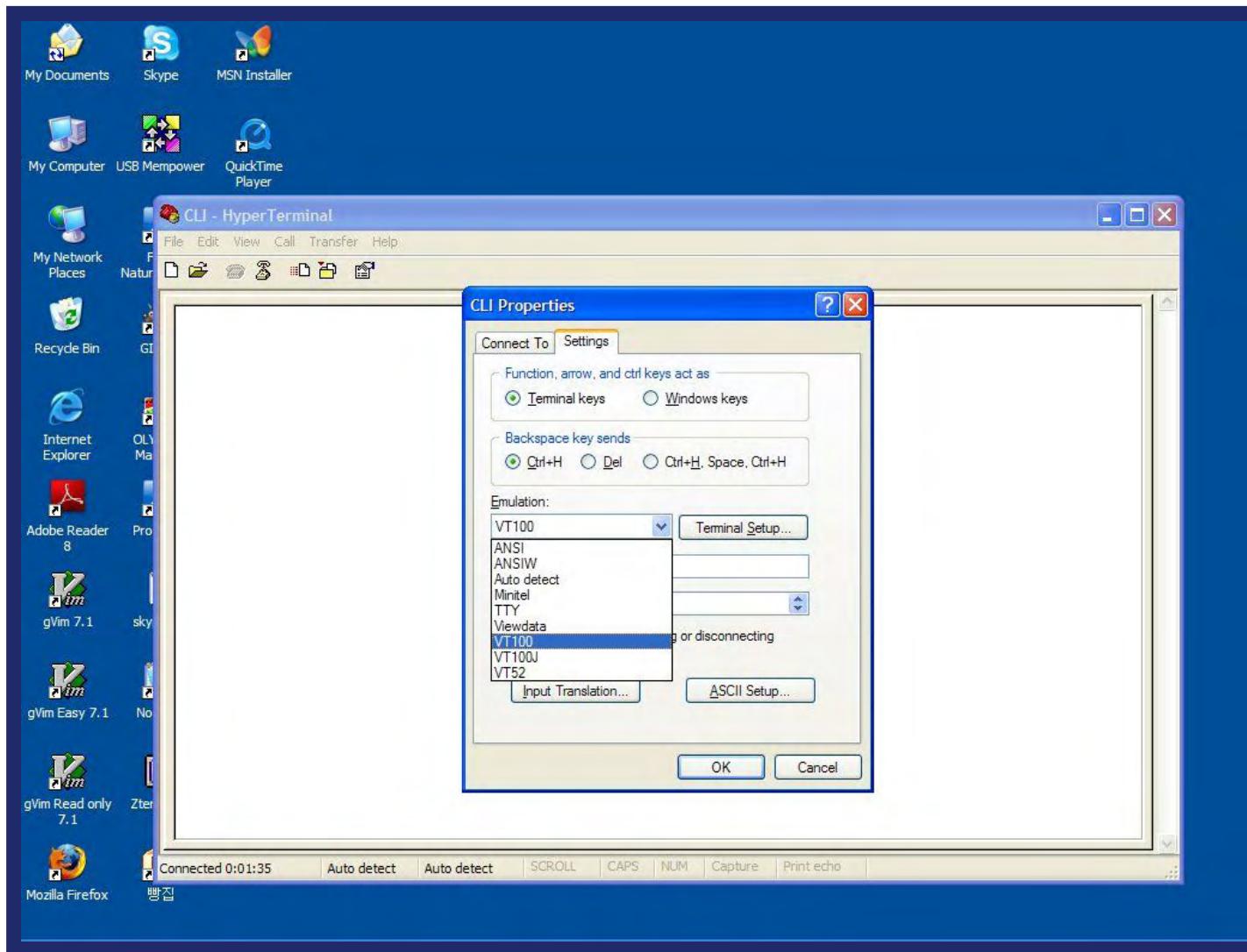
CLI

• In case that you cannot see login prompt, just press enter key several times.
  Login is "admin" and Password is "admin".
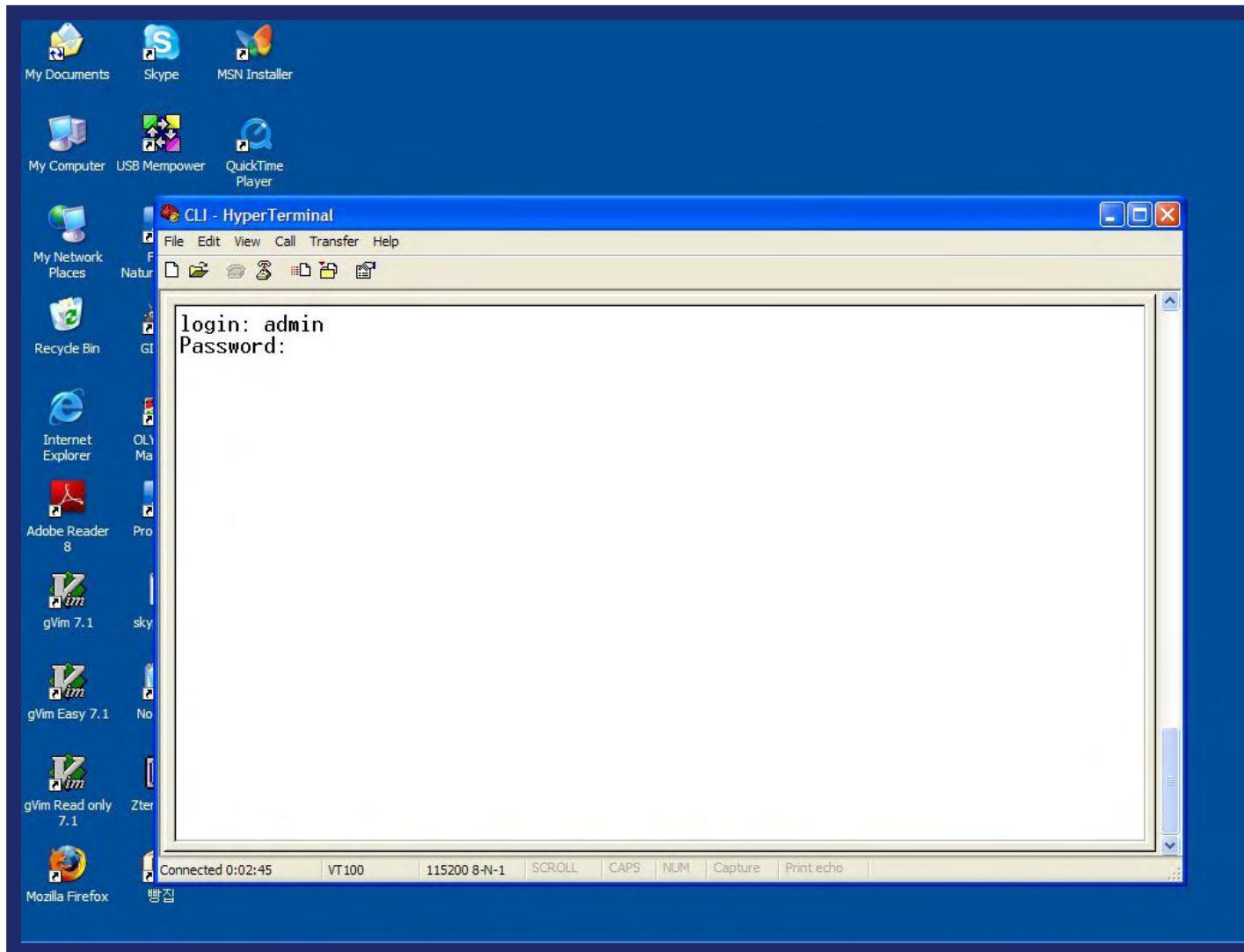
CLI

• In order to verify IP network configuration, you should type "communication".
• Press enter-key.
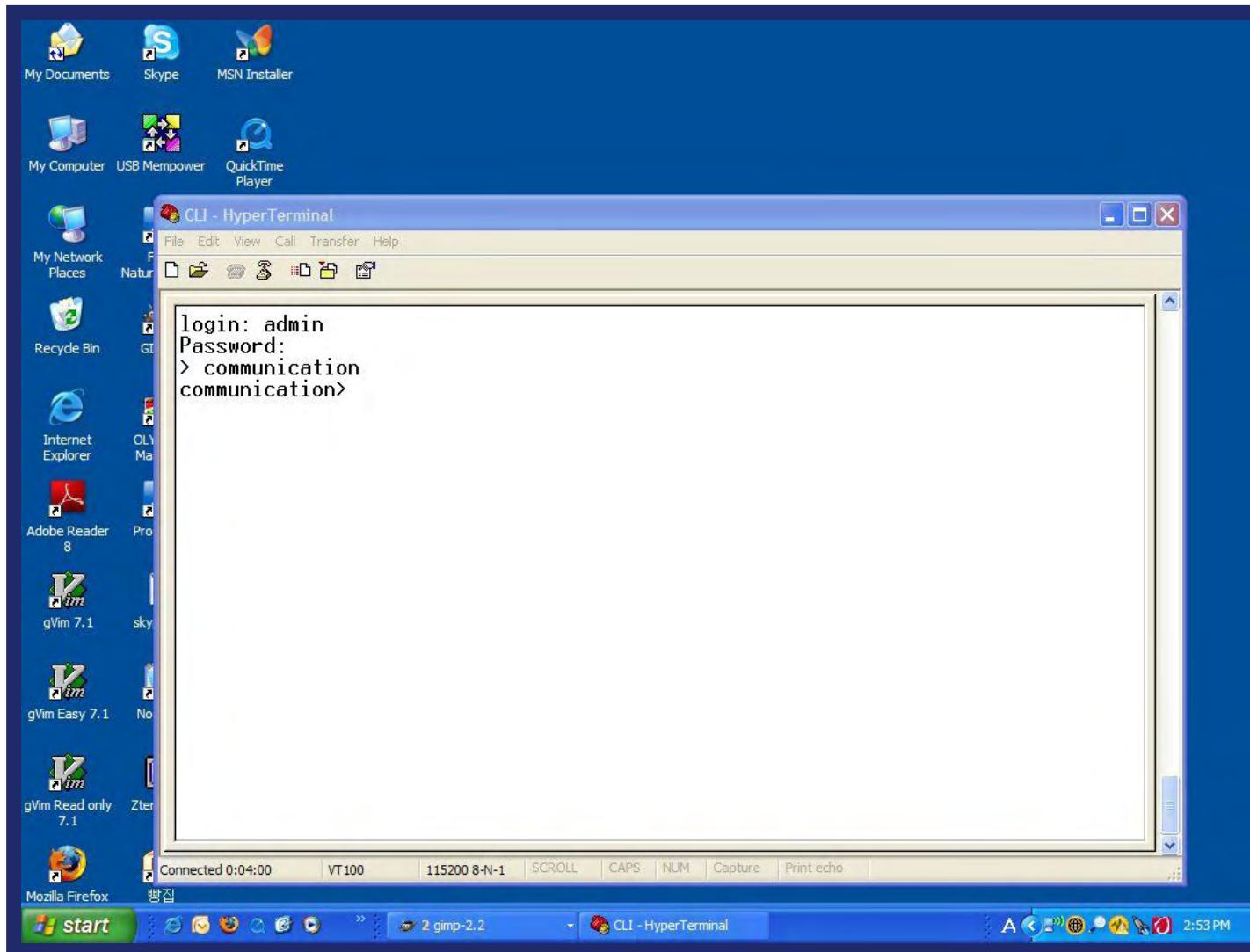
CLI

• In order to see values, you should type "get all", and then press Enter-key.

• You can use LAN_Port_IP_Address to access Web UI as described page 17.

• In case DHCP_Server is OFF, after "communication>" enter the following text : "set DHCP_Server ON", then press enter-key.

• Then enter "commit" text, then press enter-key.


```
CLI - HyperTerminal                                        _ □ ×
File  Edit  View  Cal  Transfer  Help

login: admin
Password:
> communication
communication> get all
LAN_port_IP_address: 192.168.1.1
Obtain_an_IP_Address_automatically: STATIC
IP_Address: 192.168.1.1
Netmask: 255.255.255.0
Gateway: 192.168.1.2
DNS_Server:
DHCP_Server: OFF
communication> set Obtain_an_IP_Address_automatically DHCP
Obtain_an_IP_Address_automatically: DHCP
communication> set DHCP_Server ON
DHCP_Server: ON
communication> commit_
```

• DHCP ON: Repeater would provide IP address to notebook computer as a DHCP server.

• DHCP OFF: Static IP address will be assigned to repeater.

• Dynamic: Repeater would set to receive IP address from external network equipment.

	Warning: Exposure to Radio Frequency Radiation The radiated output power of this device is far below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna should not be less than 40cm during normal operation. The gain of the antenna is 12 dBi. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.