CDM-650PRO FAE manual

Wireless CDMA Docking Station

INEW Digital Company

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1. Regulatory Notices

This device is compliant with Parts 15, 22 and 24 of the FCC Rules.
Operation of this device is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesirable operations.

FCC RF EXPOSURE COMPLIANCE

In August 1996 the Federal Communications Commission (FCC) of the United States with its action in Report and Order FCC 96-326 adopted an updated safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC regulated transmitters. Those guidelines are consistent with the safety standard previously set by both U.S. and international standards bodies. The design of this phone complies with the FCC guidelines and these international standards.

Use only the supplied or an approved antenna. Unauthorized antennas, modifications, or attachments could impair call quality, damage the phone, or result in violation of FCC regulations.

This device should not be operated in conjunction with another transmitter in order to comply with the FCC's RF Exposure requirements.

During operation, a 20 cm separation distance should be maintained between the antenna, whether extended or retracted, and the user's/bystander's body (excluding hands, wrists, feet, and ankles) to ensure FCC RF exposure compliance.

CAUTION

Unauthorized modification or change not expressly approved by INEW Digital Company could void compliance with regulatory rules and thereby your authority to use this equipment.

WARNING (EMI)

This equipment has been tested and found to comply with the limits pursuant to Part 15, 22 & 24 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

2. Safety and Notices

Important Notice

Because of the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors), or be totally lost.

Although significant delay or losses of data are rare when wireless devices such as the CDM-650PRO are used in a normal manner with a well-constructed network, they should be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss or property.

INEW Digital Company accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the CDM-650PRO or failure of CDM-650PRO to transmit or receive such data.

Safety and Hazards

Do not operate the CDM-650PRO in areas where blasting is in progress, where explosive atmospheres may be present, near medical equipment, life support equipment, or any equipment which may be susceptible to any form of radio interference.

In such areas, the CDM-650PRO **MUST BE POWERED OFF**.

It can transmit signals that could interfere with this equipment.

Do not operate the CDM-650PRO in any aircraft, whether the aircraft is on the ground or in flight.

In aircraft, the CDM-650PRO **MUST BE POWERED OFF**.

When operating, it can transmit signals that could interfere with various onboard systems.

The driver or operator of any vehicle should not operate the CDM-650PRO while in control of a vehicle. Doing so will detract from the driver or operator's control and operation of that vehicle. In some jurisdictions, operating such communications devices while in control of a vehicle is an offense.

POTENTIALLY UNSAFE AREAS

Posted facilities

-Turn off this modem in any facility or area when posted notices require you to do so.

Blasting areas

- Turn off Modem where blasting is in progress. Observe restrictions and follow any regulations or rules.

Potentially explosive atmospheres: Turn off Modem when you are in any area with a potentially explosive atmosphere. Obey all signs and instructions.

Sparks in such areas could cause an explosion or fire, resulting in bodily injury or death.

Areas with a potentially explosive atmosphere are often but not always clearly marked.

They include:

- fuelling areas such as gas or petrol stations
- below deck on boats
- transfer or storage facilities for fuel or chemicals
- vehicles using liquefied petroleum gas, such as propane or butane
- areas when the air contains chemicals or particles such as grain, dust or metal powders
- any other area where you would normally be advised to turn off your Modem.

Copyright

Purpose

This manual includes how to configure and use the CDM-650PRO.

1. INTRODUCTION

1.1 OVERVIEW

CDM-650PRO, wireless mobile docking station with an Ethernet and an USB Host interface performs data communication functions between wired-LAN (Local Area Network) and wireless WAN (Wide Area Network) using 1X EV-DO DUAL-BAND Cellular station wirelessly for Small Office Home Office.

CDM-650PRO incorporates an 32-bit MCU, system memories, an 10/100 Ethernet, an USB Host, an Embedded OS, various network protocols, and supports an external USB type wireless 1X EV-DO DUAL-BAND modem for wireless internet or network.

CDM-650PRO has some special function on wireless mobile network like always on-line, demands on-line etc.

CDM-650PRO has various input voltage range that can support it from 6~30 [VDC] which provides compatibility for platforms utilizing various industry applications.

1.2 APPERANCE

Below are the appearance and the each part of name of CDM-650PRO.

[Picture1. Each part name of CDM-650PRO]

1.3 MAIN FEATURE

- Wireless Internet/Network
- External wireless mobile 1X EV-DO DUAL-BAND modem adaptable
- A 10/100Mbps Ethernet Port
- A 32-bit RISC Network System on Chip
- Adopt Embedded Operating System
- System clock 100MHz(CPU) and 96MHz(BUS)
- User friendly Web-based Management Tool
- 3-Status LED indicates of the modem status
- Support various Network Protocol
  - PPP, PPPoE for wireless mobile network
- Support 10/100M Auto-sensing
- An external power switch
- DHCP Server
  - Getting IP address automatically from internal DHCP Server
- NAT(Network Address Translation)
- SNMP
- S/W upgrade
  - Remote updating via HTTP or TFTP is available
- Wide Range supply voltage
  - Supplying voltage from 6 to 30[VDC]

1.4 SPECIFICATION

1.4.1 Mechanical Specification

Dimension	124 x 146 x 28 mm
Weight	166 g (+ 29 g including stand)
Housing material	Plastic (Ploy-carbonate)

[Table1. Mechanical specification]

1.4.2 Environment Specification

Operating Temp/Humi	0 ~ + 50 [°C], 85% at 50 [°C]
Storage Temp	- 20 ~ + 70 [°C]

[Table2. Environment specification]

1.4.3 Electrical Specification

Tested by supply = +12[VDC], Temp = 25[°C]

DC input voltage	+ 6 ~ +30 [VDC]
Maximum current	Under 750 [mA] @ 12[V]
Internal voltage	+ 1.8, + 3.0, + 3.3, + 5 [VDC]
Operating current	
Ior = - 75 [dBm]	Under 350 [mA] @ 12 [VDC]
Ior = -104 [dBm]	Under 550 [mA] @ 12 [VDC]

[Table3. Electrical specification]

1.4.4 Hardware specification

Item	Description
Product Name	CDM-650PRO
User MCU	32-bit Network Processor
Program Memory	4M Bytes (Flash)
Data Memory	16M Bytes (SDRAM)
Wireless Interface	USB 1.1 Host interface
24-Pin Diagnostic Port	1 Test port
Ethernet	1 Port 10/100Mbps Ethernet
Display	3-state LED

[Table4. Hardware specification]

1.4.5 Software Specification

Item	Description
Boot loader	Boot loader for CDM-650PRO Flash erase/write for storing image Built-in commands
Kernel	Linux Kernel v2.4.28
Applications	PPP/PPPoE for wireless mobile network NAT - RFC 1631 - Up to 253 users DHCP server - RFC 2131 - Assigning local host IP automatically RIP v1/v2 - RFC 1058/1723 - Static or Dynamic routing information SNMP Agent/Trap(MIB I/II) - RFC 1157 - Manage & Monitoring network equipment SNTP Client - RFC 1769 - Synchronize computer clocks in global Internet ICMP - RFC 792 - Checking error and sending message User-friendly Web-based Management with CGI - Managing & Monitoring Network equipment

[Table5. Software specification]

1.5 PROTOCOL INFORMATION

1.5.1 PPP (Point-to-Point Protocol)

PPP (Point-to-Point Protocol) is a protocol for communication between two computers using a serial interface, typically a personal computer connected by phone line to a server. For example, your Internet server provider may provide you with a PPP connection so that the provider's server can respond to your requests, pass them on to the Internet, and forward your requested Internet responses back to you. PPP uses the Internet protocol (IP) (and is designed to handle others). It is sometimes considered a member of the TCP/IP suite of protocols. Relative to the Open Systems Interconnection (OSI) reference model, PPP provides layer 2 (data-link layer) service. Essentially, it packages your computer's TCP/IP packets and forwards them to the server where they can actually be put on the Internet.

PPP is a full-duplex protocol that can be used on various physical media, including twisted pair or fiber optic lines or satellite transmission. It uses a variation of High Speed Data Link Control (HDLC) for packet encapsulation.

PPP is usually preferred over the earlier de facto standard Serial Line Internet Protocol (SLIP) because it can handle synchronous as well as asynchronous communication. PPP can share a line with other users and it has error detection that SLIP lacks. Where a choice is possible, PPP is preferred.

1.5.2 PPPoE (point-to-point protocol over Ethernet)

PPPoE (Point-to-Point Protocol over Ethernet) is a specification for connecting multiple computer users on an Ethernet local area network to a remote site through common customer premises equipment, which is the telephone company's term for a modem and similar devices. PPPoE can be used to have an office or building-full of users share a common Digital Subscriber Line (DSL), cable modem, or wireless connection to the Internet. PPPoE combines the Point-to-Point Protocol (PPP), commonly used in dialup connections, with the Ethernet protocol, which supports multiple users in a local area network. The PPP protocol information is encapsulated within an Ethernet frame.

PPPoE has the advantage that neither the telephone company nor the Internet service provider (ISP) needs to provide any special support. Unlike dialup connections, DSL and cable modem connections are "always on." Since a number of different users are sharing the same physical connection to the remote service provider, a way is needed to keep track of which user traffic should go to and which user should be billed. PPPoE provides for each user-remote site session to learn each other's network addresses (during an initial exchange called "discovery"). Once a session is established between an individual user and the remote site (for example, an Internet service provider), the session can be monitored for billing purposes. Many apartment houses, hotels, and corporations are now providing shared Internet access over DSL lines using Ethernet and PPPoE.

1.5.3 DHCP (Dynamic Host Configuration Protocol)

DHCP (Dynamic Host Configuration Protocol) is a communications protocol that lets network administrators centrally manage and automate the assignment of Internet Protocol (IP) addresses in an organization's network. Using the Internet Protocol, each machine that can connect to the Internet needs a unique IP address, which is assigned when an Internet connection is created for a specific computer. Without DHCP, the IP address must be entered manually at each computer in an organization and a new IP address must be entered each time a computer moves to a new location on the network. DHCP lets a network administrator supervise and distribute IP addresses from a central point and automatically sends a new IP address when a computer is plugged into a different place in the network.

DHCP uses the concept of a "lease" or amount of time that a given IP address will be valid for a computer. The lease time can vary depending on how long a user is likely to require the Internet connection at a particular location. It's especially useful in education and other environments where users change frequently. Using very short leases, DHCP can dynamically reconfigure networks in which there are more computers than there are available IP addresses. The protocol also supports static addresses for computers that need a permanent IP address, such as Web servers.

DHCP is an extension of an earlier network IP management protocol, Bootstrap Protocol (BOOTP). DHCP is a more advanced protocol, but both configuration management protocols are commonly used and DHCP can handle BOOTP client requests. Some organizations use both protocols, but understanding how and when to use them in the same organization is important. Some operating systems, including Windows NT/2000, come with DHCP servers. A DHCP or BOOTP client is a program that is located in (and perhaps downloaded to) each computer so that it can be configured.

1.5.4 NAT (Network Address Translation or Network Address Translator)

NAT (Network Address Translation or Network Address Translator) is the translation of an Internet Protocol address (IP address) used within one network to a different IP address known within another network. One network is designated the *inside* network and the other is the *outside*. Typically, a company maps its local inside network addresses to one or more global outside IP addresses and un-maps the global IP addresses on incoming packets back into local IP addresses. This helps ensure security since each outgoing or incoming request must go through a translation process that also offers the 5opportunity to qualify or authenticate the request or match it to a previous request. NAT also conserves on the number of global IP addresses that a company needs and it lets the company use a single IP address in its communication with the world.

NAT is included as part of a router and is often part of a corporate firewall. Network administrators create a NAT table that does the global-to-local and local-to-global IP address mapping. NAT can also be used in conjunction with *policy routing*. NAT can be statically defined or it can be set up to dynamically translate from and to a pool of IP addresses. Cisco's version of NAT lets an administrator create tables that map:

- A local IP address to one global IP address statically
- A local IP address to any of a rotating pool of global IP addresses that a company may have
- A local IP address plus a particular TCP port to a global IP address or one in a pool of them

- A global IP address to any of a pool of local IP addresses on a round-robin basis

NAT is described in general terms in RFC 1631, which discusses NAT's relationship to Classless Inter-domain Routing (CIDR) as a way to reduce the IP address depletion problem. NAT reduces the need for a large amount of publicly known IP addresses by creating a separation between publicly known and privately known IP addresses. CIDR aggregates publicly known IP addresses into blocks so that fewer IP addresses are wasted. In the end, both extend the use of IPv4 IP addresses for a few more years before IPv6 is generally supported.

1.5.5 RIP v1/v2 (Routing Information Protocol)

RIP (Routing Information Protocol) is a widely-used protocol for managing router information within a self-contained network such as a corporate local area network or an interconnected group of such LANs. RIP is classified by the Internet Engineering Task Force (IETF) as one of several internal gateway protocols (Interior Gateway Protocol).

Using RIP, a gateway host (with a router) sends its entire routing table (which lists all the other hosts it knows about) to its closest neighbor host every 30 seconds. The neighbor host in turn will pass the information on to its next neighbor and so on until all hosts within the network have the same knowledge of routing paths, a state known as *network convergence*. RIP uses a hop count as a way to determine network distance. (Other protocols use more sophisticated algorithms that include timing as well.) Each host with a router in the network uses the routing table information to determine the next host to route a packet to for a specified destination.

RIP is considered an effective solution for small homogeneous networks. For larger, more complicated networks, RIP's transmission of the entire routing table every 30 seconds may put a heavy amount of extra traffic in the network.

The major alternative to RIP is the Open Shortest Path First Protocol (OSPF).

1.5.6 SNMP (Simple Network Management Protocol)

Simple Network Management Protocol (SNMP) is the protocol governing network management and the monitoring of network devices and their functions. It is not necessarily limited to TCP/IP networks.

1.5.7 SNTP (Simple Network Time Protocol)

Simple Network Time Protocol (SNTP) is a protocol that is used to synchronize computer clock times in a network of computers. Developed by David Mills at the University of Delaware, SNTP is now an Internet standard. In common with similar protocols, SNTP uses Coordinated Universal Time (UTC) to synchronize computer clock times to a millisecond, and sometimes to a fraction of a millisecond.

Accurate time across a network is important for many reasons; even small fractions of a second can cause problems. For example, distributed procedures depend on coordinated times to ensure that proper sequences are followed. Security mechanisms depend on coordinated times across the network. File system updates carried out by a number of computers also depend on synchronized clock times. Air traffic control systems provide a graphic illustration of the need for coordinated times, since flight paths require very precise timing (imagine the situation if air traffic controller computer clock times were not synchronized).

UTC time is obtained using several different methods, including radio and satellite systems. Specialized receivers are available for high-level services such as the Global Positioning System (GPS) and the governments of some nations. However, it is not practical or cost-effective to equip every computer with one of these receivers. Instead, computers designated as *primary time servers* are outfitted with the receivers and they use protocols such as SNTP to synchronize the clock times of networked computers. Degrees of separation from the UTC source are defined as strata. A radio clock (which receives true time from a dedicated transmitter or satellite navigation system) is stratum-0; a computer that is directly linked to the radio clock is stratum-1; a computer that receives its time from a stratum-1 computer is stratum-2, and so on.

The term SNTP applies to both the protocol and the client/server programs that run on computers. The programs are compiled by the

user as an SNTP client, SNTP server, or both. In basic terms, the SNTP client initiates a time request exchange with the time server. As a result of this exchange, the client is able to calculate the link delay, its local offset, and adjust its local clock to match the clock at the server's computer. As a rule, six exchanges over a period of about five to 10 minutes are required to initially set the clock. Once synchronized, the client updates the clock about once every 10 minutes, usually requiring only a single message exchange. Redundant servers and varied network paths are used to ensure reliability and accuracy. In addition to client/server synchronization, SNTP also supports broadcast synchronization of peer computer clocks. SNTP is designed to be highly fault-tolerant and scalable.

1.5.8 ICMP (Internet Control Message Protocol)

ICMP (Internet Control Message Protocol) is a message control and error-reporting protocol between a host server and a gateway to the Internet. ICMP uses Internet Protocol (IP) data-grams, but the messages are processed by the IP software and are not directly apparent to the application user.

2. BASIC INFORMATION

2.1 Hardware composition

All hardware for CDM-650PRO is composed below.

1. CDM-650PRO

2. UTP Cable (Direct)

3. 12 [VDC] Adapter

(These images will be updated)

Note.

1. CDM-650PRO : Wireless 1X EV-DO DUAL-BAND Docking Station
2. UTP Cable: Connecting cable between Host PC and CDM-650PRO.
3. 12 [VDC] Adapter: Supply + 12 [VDC] power.

2.2 SOFTWARE COMPOSITION

All software for CDM-650PRO is composed below.

2.2.1 Web-based configuration page

CDM-650PRO has a web-based configuration page that user can set the function of CDM-650PRO for user's purpose.

2.2.2 Firmware

Firmware is the program operating the CDM-650PRO.

Firmware: Version CDM-650PRO-1.0.5

(Current: This name will be changed)

2.3 DESCRIPTION OF EACH PART

2.3.1 3-Status LED

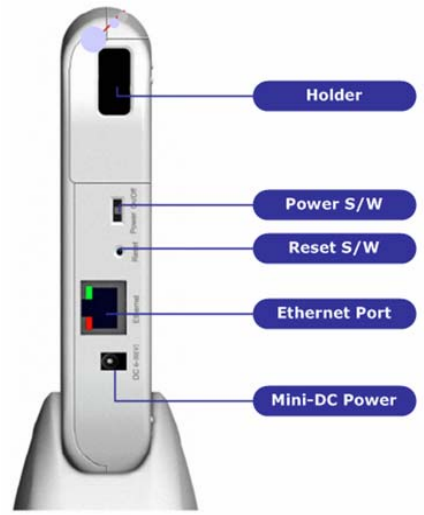
CDM-650PRO has 3-State LED for indicating the current state.

[Picture2. Front of CDM-650PRO]

LED	Display	Description
POWER	ON	Indicate the main power on.
	Blinking	Indicate the wireless modem re-booting. Be keep going is the external modem is empty.
	OFF	Indicate the main power off.
Connection	ON	
	BLINK	Indicate wireless data incoming or outgoing
	OFF	Indicate the wireless network disconnected.
Signal Strength	ON	Indicate the RF sensitivity status is good. (RSSI<-75dBm)
	BLINK	Indicate the RF sensitivity is not good. (-85<RSSI<90dBm)
	OFF	Indicate the RF sensitivity is bad (RSSI>-90dBm)

[Table6. 3-State LED indication]

Below is the back of CDM-650PRO.



[Picture3. Back of CDM-650PRO]

2.3.2 Mini-DC Power

User can supply the power range from + 6 to + 30 [VDC]

2.3.3 Ethernet Port

User can connect CDM-650PRO with Host PC, HUB, Router etc, via 10/100 Ethernet port. The RJ-45 connector (Ethernet port) has two Link-LED. Below the table 9 shows the each state of LAN connection.

LED	State	Description
Green	ON	Indicate 10Mbps LAN connected.
	BLINK	Indicate data incoming via10Mbps LAN.
	OFF	Indicate 10M LAN disconnected.
Orange	ON	Indicate 100Mbps LAN connected.
	BLINK	Indicate data incoming via100Mbps LAN.
	OFF	Indicate 100M LAN disconnected.

[Table7. Ethernet Link LED on RJ45]

2.3.4 Power switch

Turn the power on or off.

2.3.5 Reset switch

Reset the CDM-650PRO to go to initialization.

2.4 OPERATION MODE

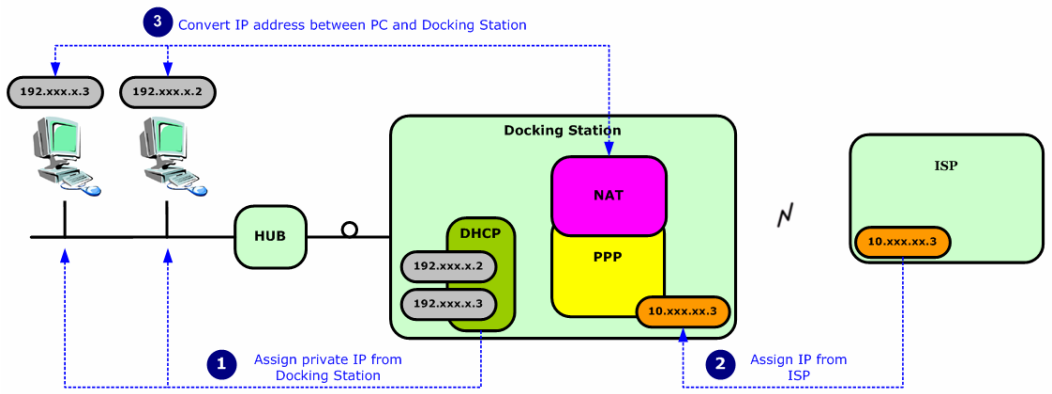
There are two-way of CDM-650PRO operation.

One is PPP auto mode and the other one is Bridge mode.

User can choose this mode of CDM-650PRO for their purpose.

2.4.1 PPP auto mode

On PPP auto mode, CDM-650PRO has the IP from ISP (Internet Service Provider) then CDM-650PRO keeps the IP and shares the IP with connected Host PC via NAT. Below picture shows CDM-650PRO how to operate on PPP auto mode.

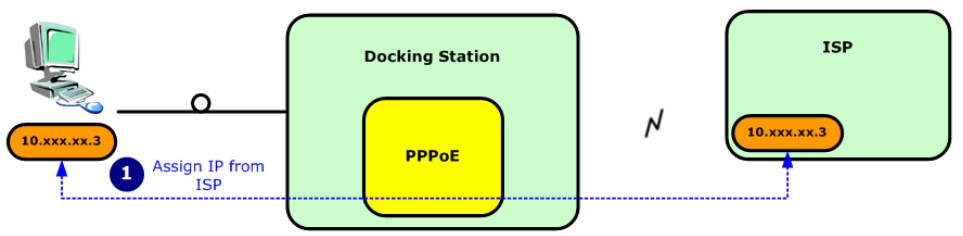


[Picture4. PPP auto mode operation]

First, Host PCs get each private IP (IP-1) from DHCP server in CDM-650PRO. Second, the CDM-650PRO gets public/Private IP (IP-2) from ISP via 1X EV-DO DUAL-BAND network. Then the CDM-650PRO has two kinds of IP, one is from ISP and the other ones are for Host PCs. Third, NAT converts network data between IP-1 and IP-2.

2.4.2 Bridge mode

On Bridge mode, CDM-650PRO has no IP but the Host PC gets the IP from ISP directly through CDM-650PRO.



[Picture5. Bridge mode operation]

CDM-650PRO has a PPPoE Authenticator internally and this function can communicate with PPPoE client on PC or other Router.

As different on PPP auto mode, the IP from ISP goes to Host PC directly. CDM-650PRO converts the protocols between PPP to PPPoE, the Host PC processes all network protocols.

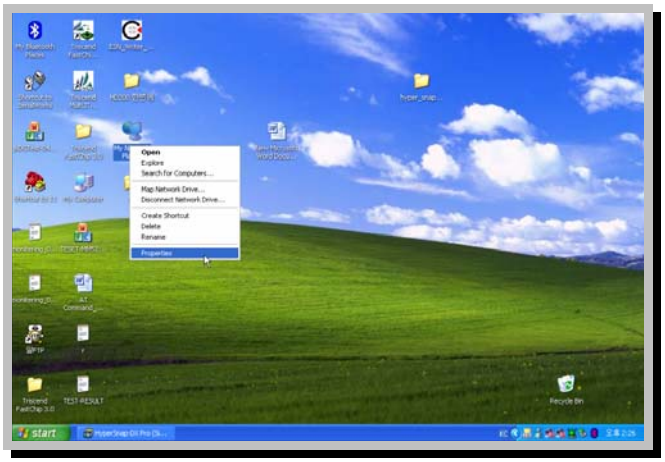
This mode is used for connection to be needed by the direct IP from ISP.

2.5 SETTING HOST PC

CDM-650PRO is set by PPP auto mode on factory default. So just connect an UTP cable (Ethernet cable) between PC and CDM-650PRO. Set the network environment of the host PC as automatically.

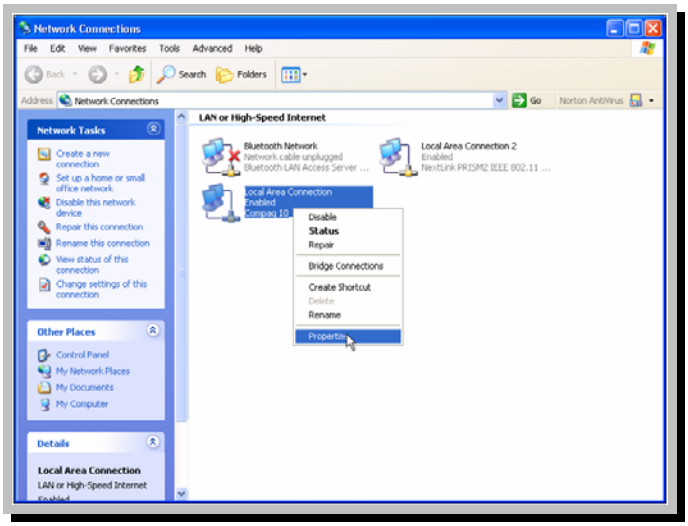
2.5.1 Setting Host PC's network environment

2.5.1.1 We assumed that the user uses the Windows XP. For connect between PC and CDM-650PRO, click "My Network Places" choose the [properties].



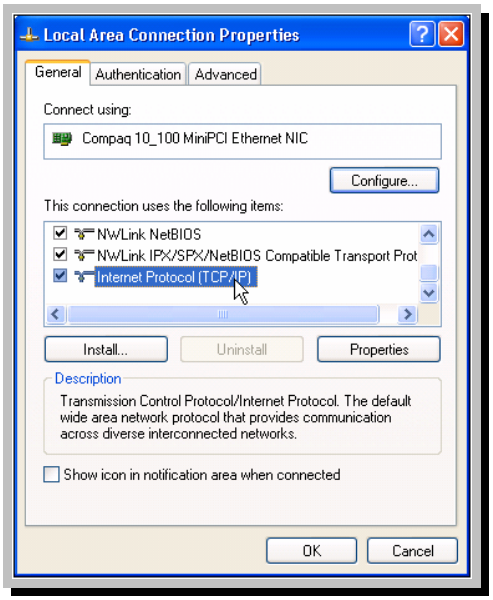
[Picture6. The first step of setting the Host PC]

2.5.1.2 Check the "Local Area Connection" then click the mouse right button then [Properties].



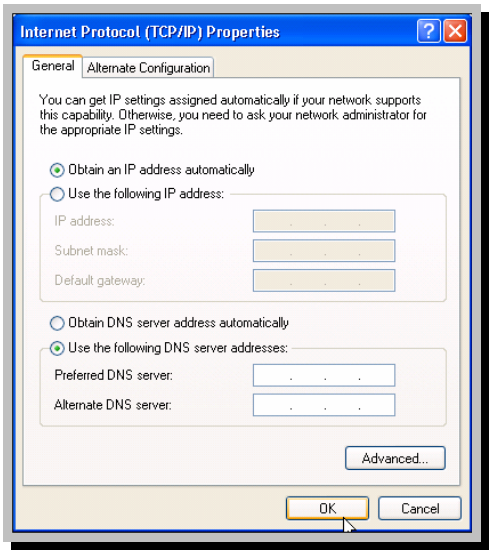
[Picture7. The second step of setting the Host PC]

2.5.1.3 Double click the "Internet Protocol [TCP/IP]" item.



[Picture8. The third step of setting the Host PC]

2.5.1.4 Check the "Obtain an IP address automatically" then click the [OK] button.



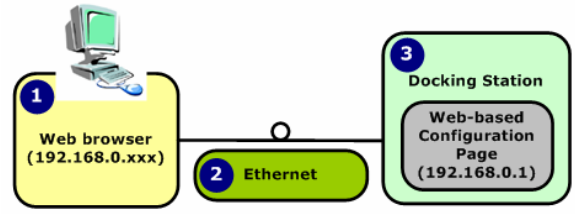
[Picture9. The forth step of setting the Host PC]

2.5.1.5 Host PC's setting is finished. Connect the power and an Ethernet cable on CDM-650PRO. Wait for the Connection LED blinking then access Internet wirelessly.

2.6 WEB-BASED CONFIGURATION PAGE

2.6.1 Overview

User can configure some functions of CDM-650PRO for user's purpose by web-based configuration page in CDM-650PRO. This web-based configuration page is simplified and easy setup. Below picture shows the brief image of CDM-650PRO's configuration.

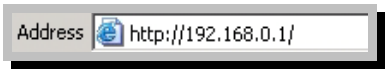


[Picuture10. Configuration of CDM-650PRO]

2.6.1.1 Connect the power cable on CDM-650PRO.

2.6.1.2 Connect the Ethernet cable between Host PC and CDM-650PRO.

2.6.1.3 Launch the web browser like Internet explore then write IP address, 192.168.0.1 (Set by default).



[Picture11. Web-based configuration page address]

2.6.1.4 The pop-up window of login page appears.

[Picture12. Log-in window]

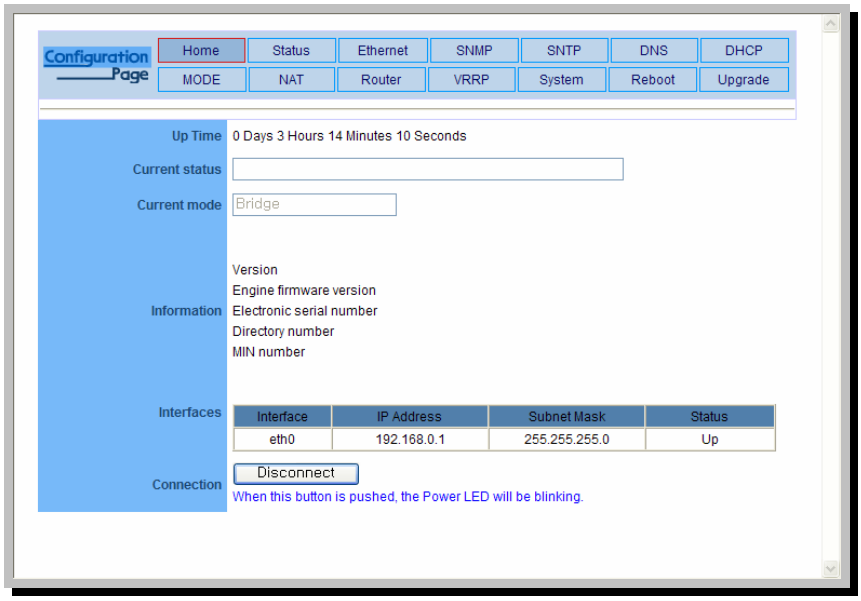
Note.

Default setting is User name: **admin**, Password: **admin**. But user can change this option on System tab in the web-based configuration page.

2.6.2 Web-based configuration page description

2.6.2.1 Home tab

Home tab shows the basic information about CDM-650PRO.



[Picture13. Home tab page]

ITEM	Description
Up Time	Operation time after power on
Current status	1X EV-DO DUAL-BAND information like connection time, current network and RSSI
Current mode	Current operation mode
Information	1X EV-DO DUAL-BAND information
Interface	eth0: CDM-650PRO's private IP address ppp0: Status of 1X EV-DO DUAL-BAND IP address (After getting IP from ISP, this IP will appear)
Connection	Connect or disconnect wireless network

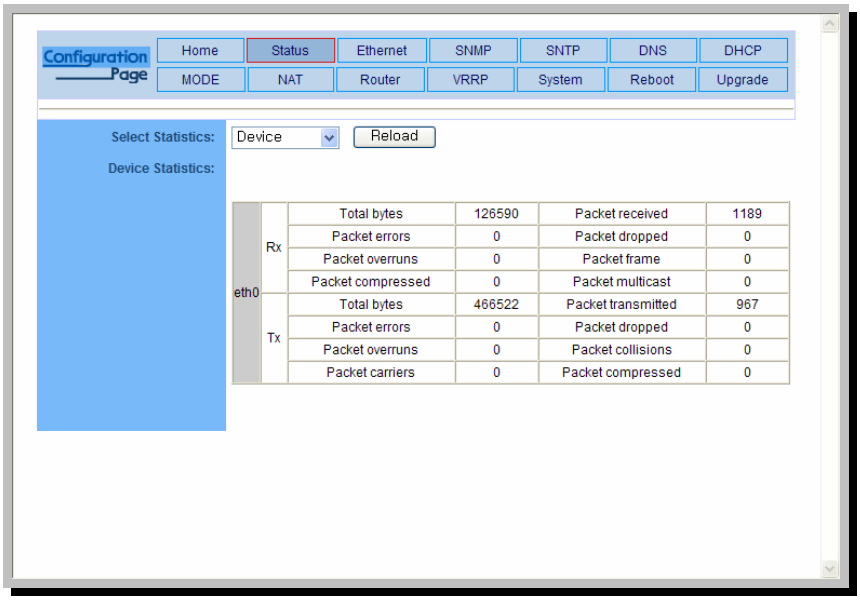
[Table8. Home tab information]

Note.

IF the eth0 and ppp0 do not appear, the connection may not be established. So check the cable, Host PC and 1X EV-DO DUAL-BAND modem.

2.6.2.2 Status tab

Status tab shows information like Device, ARP, ICMP, IP, Route, Sys log, UDP, TCP.



[Picture14. Device item in status tab]

ITEM	Description
Select Statistics	Select item like Device, ARP, ICMP, IP, Route, Sys log, UDP, TCP
Device Statistics	Detail information for the each item

[Table9. Device item information]

2.6.2.2.1 Device item

This option shows a quantity of transferring and receiving data.

2.6.2.2.2 ROUTE item

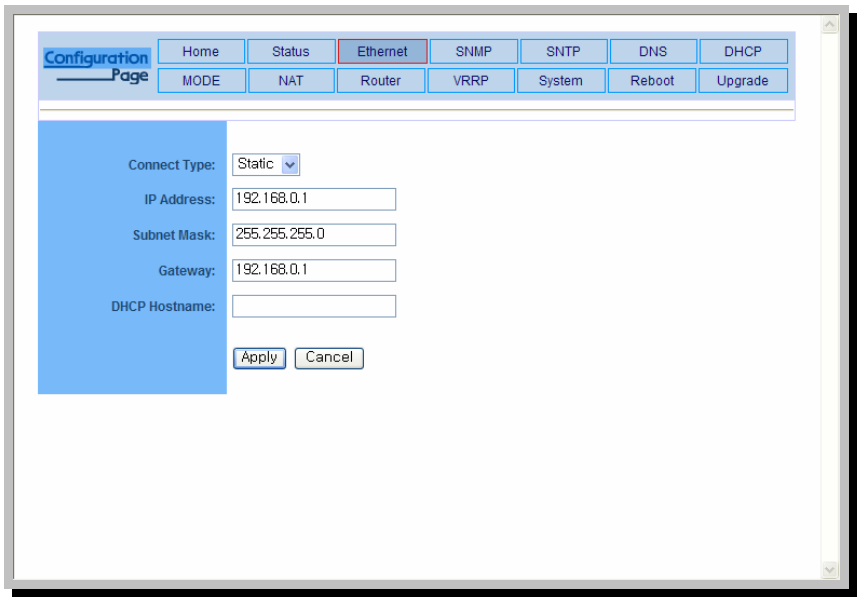
This item displays routing table that CDM-650PRO has and default gateway received from ISP.

2.6.2.2.3 Syslog item

This item shows detail information about CDM-650PRO's process, getting IP etc. User can check the CDM-650PRO state via Syslog item.

2.6.2.3 Ethernet tab

Ethernet tab is set by the options of a CDM-650PRO's Ethernet port like static or DHCP, IP address, Subnet Mask, Gateway and DHCP host name.



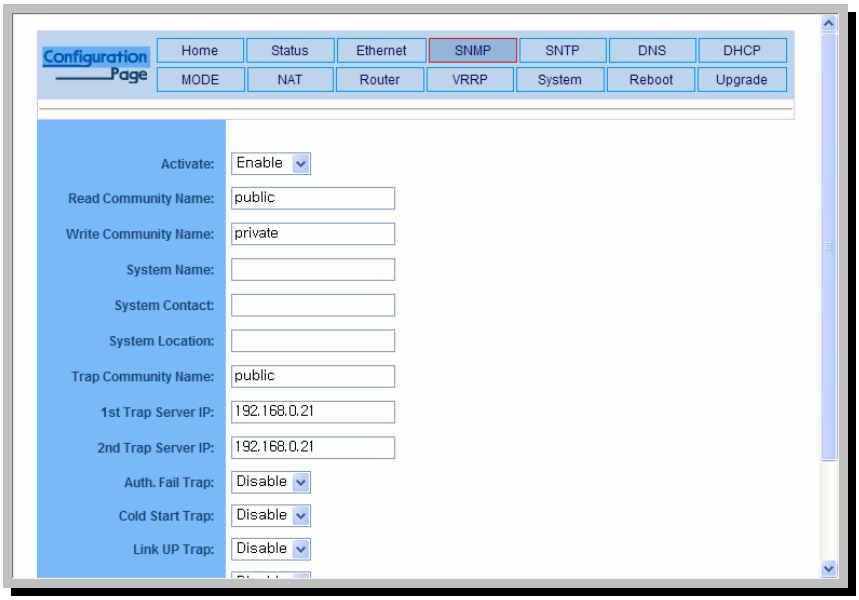
[Picture15. Ethernet tab]

ITEM	Description
Connect Type	CDM-650PRO's IP type - Static: Setting the IP statically(User can set a IP) - DHCP: Setting the IP dynamically (do not set this)
IP Address	IP address (If user select DHCP, this option will be inactive)
Subnet Mask	Subnet mask (If user select DHCP, this option will be inactive)
Gateway	Gateway address (If user select DHCP, this option will be inactive)
DHCP Hostname	DHCP server host name

[Table10. Ethernet tab information]

2.6.2.4 SNMP tab

SNMP tab is set for SNMP (Simple Network Management Protocol) agent, if this option is selected, remote SNMP manager can connect to SNMP agent and get the CDM-650PRO's network information.



[Picture16. SNMP tab]

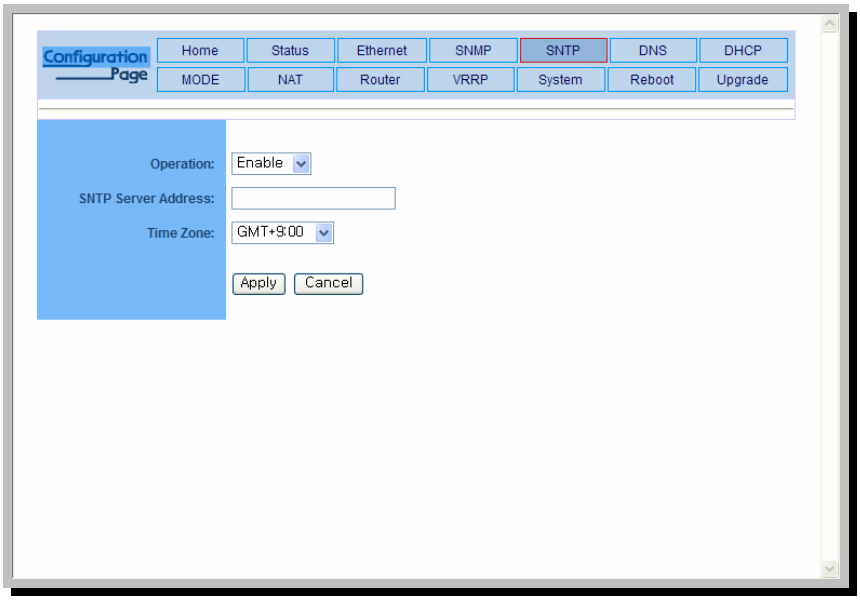
ITEM	Description
Activate	Setting the SNMP enable/disable - Enable: Enable SNMP - Disable: Disable SNMP
Read Community Name	Setting SNMP public or private - Public: Reading community string available - Private: Reading community string disable
Write Community Name	Setting SNMP public or private - Public: Writing community string available - Private: Writhing community string disable
System Name	User defines SNMP agent system name
System Contact	User defines SNMP agent contact name
System Location	User defines SNMP agent location
Trap Community Name	Setting SNMP public or private - Public: Four Trap event available - Private: Four Trap event disable ** Four Trap: Auth. Fail, Cold Start, Link up/down trap*
1st Trap Server IP	IP address of the first trap server
2nd Trap Server IP	IP address of the second trap server
Auth. Fail Trap	Authentication Failure event enable/disable - Enable: Generate fail event of authentication - Disable: Not generate fail event of authentication ** Trap means that special event is generated from Agent to Manager*
Cold Start Trap	Limited temperature event enable/disable - Enable: Generate cold start event when it is below the limited temperature. - Disable: Not generate cold start event.
Link UP Trap	Link of the Ethernet port up event enable/disable

	- Enable: Generate Link up event - Disable: Not generate Link up event
Link Down Trap	Link of the Ethernet port down event enable/disable - Enable: Generate Link down event - Disable: Not generate Link down event

[Table11. SNMP tab information]

2.6.2.5 SNTP tab

SNTP tab is set for choosing the option of SNTP (Simple Network Time Protocol) server.



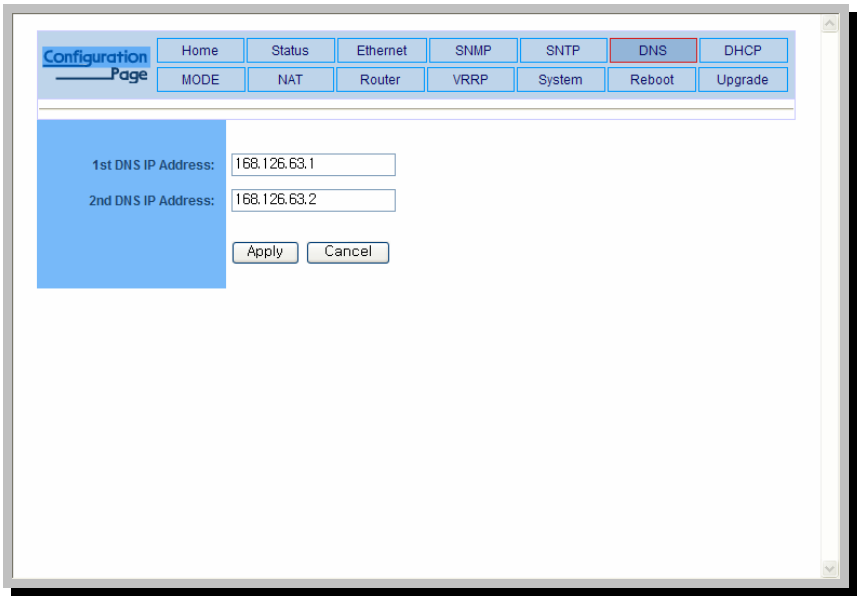
[Picture17. SNTP tab]

ITEM	Description
Operation	Setting the SNTP enable/disable - Enable: Enable SNTP - Disable: Disable SNTP
SNTP Server Address	IP address of SNTP server
Time Zone	Time stamp from GMT(Green Mean Time)

[Table12. SNTP tab information]

2.6.2.6 DNS tab

DNS tab is set for choosing the DNS(Domain Name Service) server.



[Picture18. DNS tab]

ITEM	Description
1st DNS IP Address	Setting the first DNS server IP address
2st DNS IP Address	Setting the second DNS server IP address

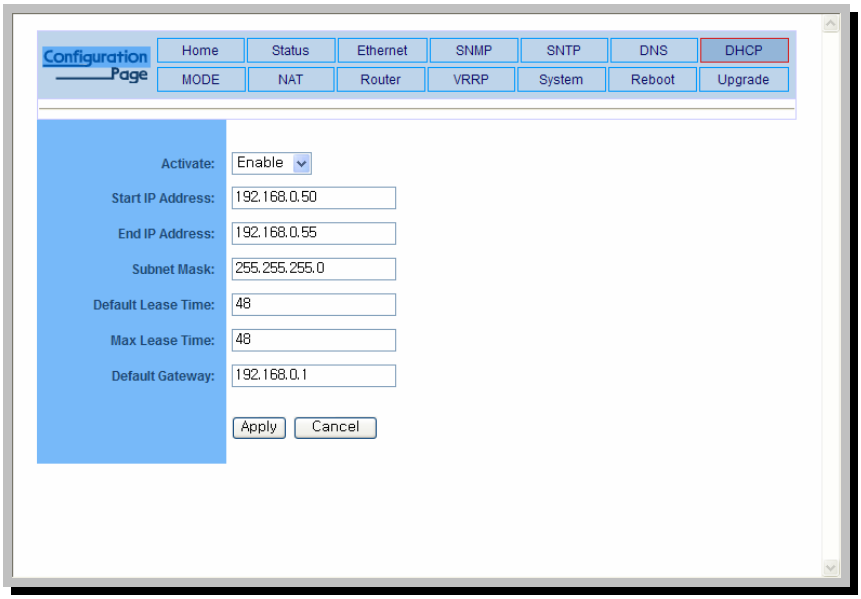
[Table13. DNS tab information]

Note.

CHS-628PRO gets the two DNS Addresses from ISP and uses them fundamentally but if the DNS is not effective then try to connect to user DNS what they set.

2.6.2.7 DHCP tab

DHCP tab is set for choosing the option of DHCP(Dynamic Host Configuration Protocol) server. This tab is affected by PPP auto mode.



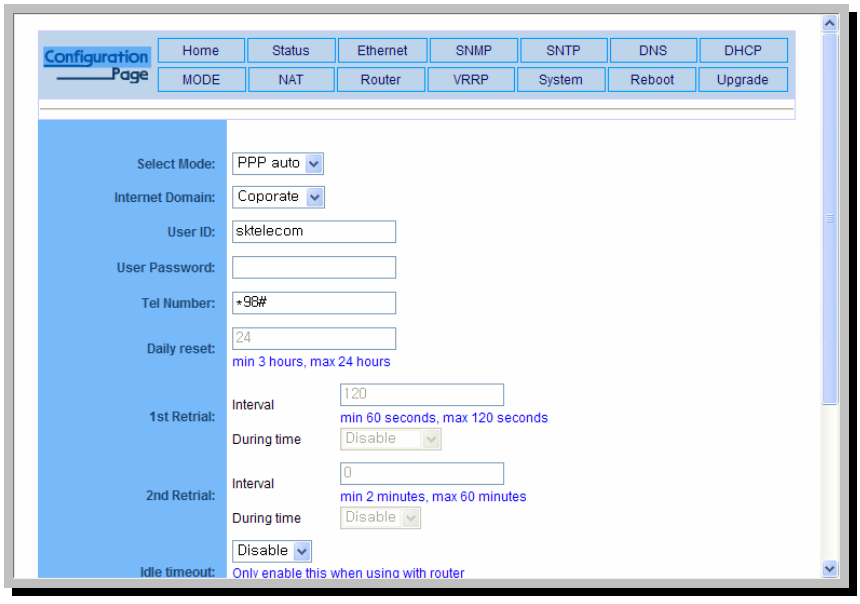
[Picture19. DHCP tab]

ITEM	Description
Activate	Setting the DHCP server enable/disable - Enable: Enable DHCP server - Disable: Disable DHCP server
Start IP Address	Range of the start IP address which DHCP sets
End IP Address	Range of the end IP address which DHCP sets
Subnet Mask	Subnet mask
Default Lease Time	Time to lease IP Address by DHCP server(Per second) Range: 0 ~ 65536(65536 means disable lease time)
Max Lease Time	Maximum time to lease IP address
Default Gateway	CDM-650PRO's Ethernet gateway IP address

[Table14. DHCP tab information]

2.6.2.8 MODE tab

MODE tab selects method that CDM-650PRO how to connect on the internet. For more detail, refer to the chapter "2.4 Operation mode".



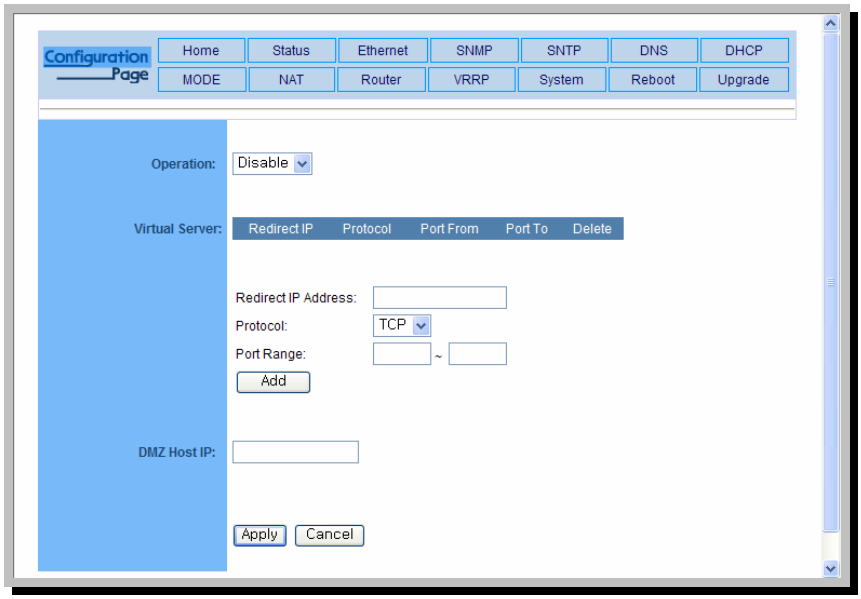
[Picture20. MODE tab]

ITEM	Description
Select Mode	Selecting the connecting mode - PPP auto: PPP connection via 1X EV-DO DUAL-BAND network - Bridge: PPPoE connection with PC. **In this case user is needed dial-up connection*
Internet Domain	Select Domain.
User ID	User's name authorized from ISP (Internet Service Provider)
User Password	User's password authorized from ISP
Tel Number	Telephone number that ISP offered
Daily reset	Turn off and on the 1X EV-DO DUAL-BAND modem per day Set from 3 hour to 24 hour
1st Retrial	Retrial when the wireless network disconnected Interval: Retrial interval time (Second) During time: Continuing time (Minute)
2nd Retrial	Retrial after 1st Retrial Interval: Retrial interval time (Minute) During time: Continuing time (Hour)
Idle timeout	This option is only for Router When set enable this option, disconnect the wireless network in 5 minutes after there is no data on Ethernet port
Ethernet Link	Enable: After detecting the Ethernet cable first then connect/disconnect the wireless network Disable: When the power is supplied try to connect always ignoring the Ethernet cable.

[Table15. MODE tab information]

2.6.2.9 NAT tab

NAT tab is set for choosing the option of NAT (Network Address Translation) protocol. This tab is affected by PPP auto mode.



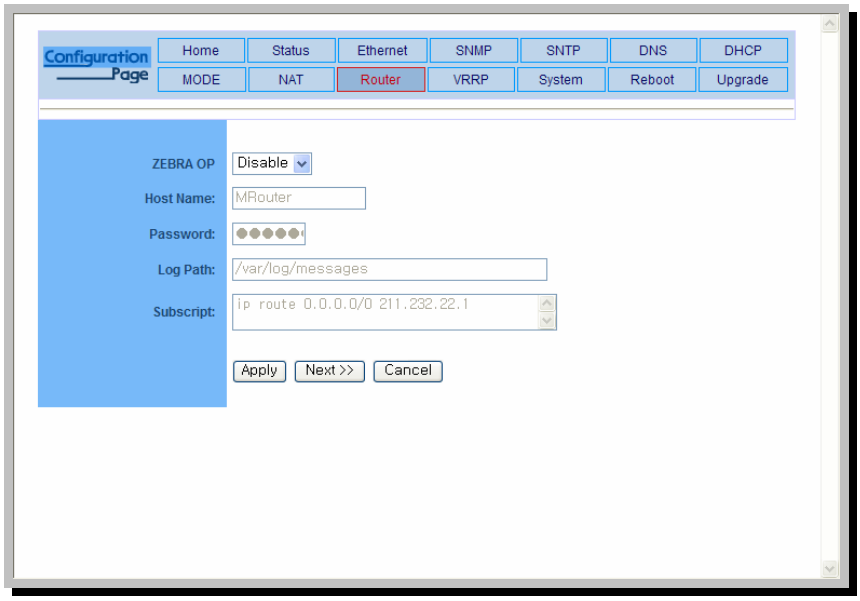
[Picture21. NAT tab]

ITEM	Description
Operation	Setting the NAT enable/disable - Enable: Enable NAT - Disable: Disable NAT
Virtual Server	Virtual server can be used to set your PC on your private network to connect it outside. - Redirect IP Address: IP address of the target device - Protocol: Select protocol like TCP, UDP or both - Port Range: Range of port address to redirect IP ** Target device: means like PC connected CDM-650PRO's Ethernet port.*
DMZ Host IP	IP Address of the target device using all port service.

[Table16. NAT tab information]

2.6.2.10 Router tab

User can set the routing option manually. There are Zebra, RIP, OSPF option and you can see each one if you push the Next >> button.



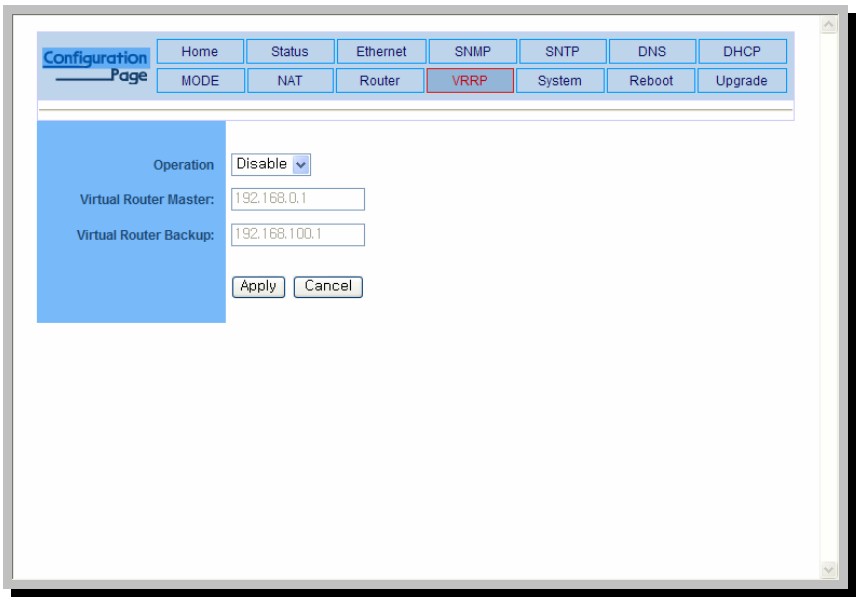
[Picture22. Router tab]

ITEM	Description
ZEBRA OP	Setting Zebra protocol. Enable: Enable Zebra Disable: Disable Zebra
Host Name	Zebra demon host name
Password	Zebra demon host password
Log Path	The pass of zebra log message located
Substance	Setting scripts for user's network

[Table17. Router tab information]

2.6.2.11 VRRP tab

VRRP (Virtual Router Redundancy Protocol) is used for back-up network.



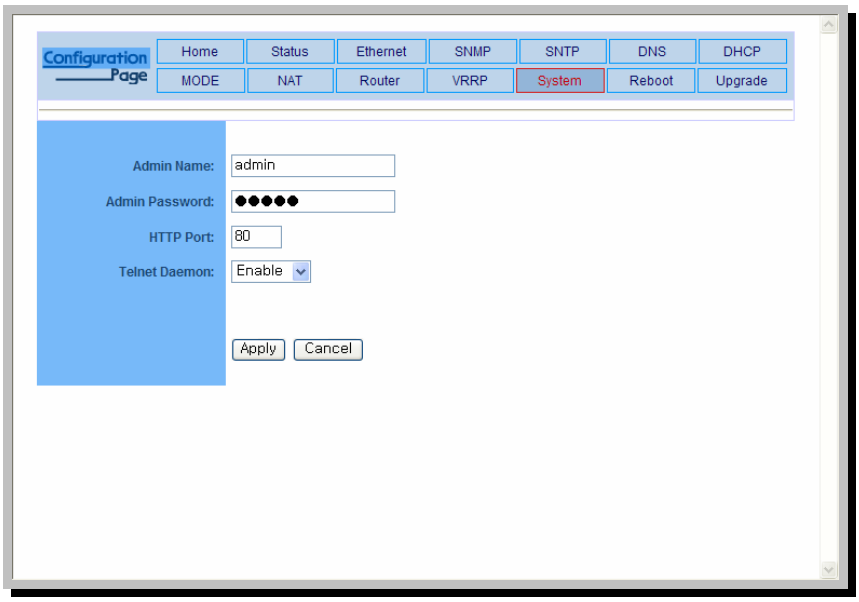
[Picture23. VRRP tab]

ITEM	Description
Operation	Set Enable/Disable
Virtual Router Master	Set Master IP address
Virtual Router Backup	Set Backup IP address (Blank available)

[Table18. VRRP tab information]

2.6.2.12 System tab

System tab is set for setting the option of the configuration page like admin name, password etc.



[Picture24. System tab]

ITEM	Description
Admin Name	Administrator ID for login
Admin Password	Administrator Password for login
HTTP Port	web-based configuration page port used
Telnet Daemon	Setting the Telnet server enable/disable - Enable: Enable Telnet server - Disable: Disable Telnet server

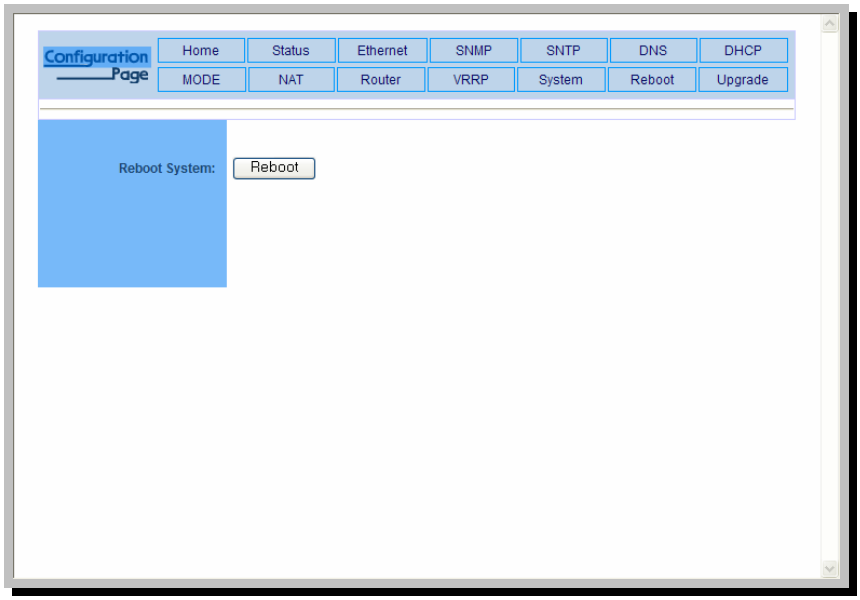
[Table19. System tab information]

Note.

Not only web-based configuration also telnet-based configuration is available. Telnet daemon is for this option but usually web-based configuration is used because of its convenience.

2.6.2.13 Reboot tab

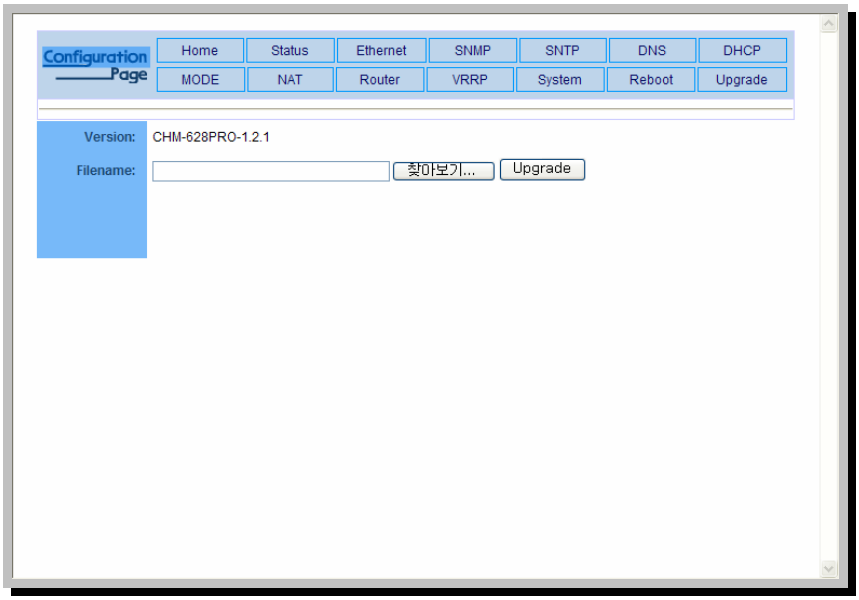
Reboot tab is used for rebooting CDM-650PRO via web-based configuration page. To apply information that is selected, user should reset CDM-650PRO using the hardware reset button, power on/off or this option.



[Picture25. Reboot tab]

2.6.2.14 Upgrade tab

Upgrade tap is used for upgrading CDM-650PRO's firmware.



[Picture26. Upgrade tab]

** Select the new firmware.*

** During upgrading the new own, 3 state LED turns on and off in order then the LEDs are blinking together when it has finished.*

** After upgrading finish, user should reset CDM-650PRO.*

3. USAGE

3.1 OPERATION MODE

CDM-650PRO operates two modes. One is PPP auto mode and the other one is Bridge mode.

User can change the function of CDM-650PRO by web-based configuration page for user's purpose.

3.1.1 PPP auto mode

3.1.1.1 Connect Power cable on CDM-650PRO.

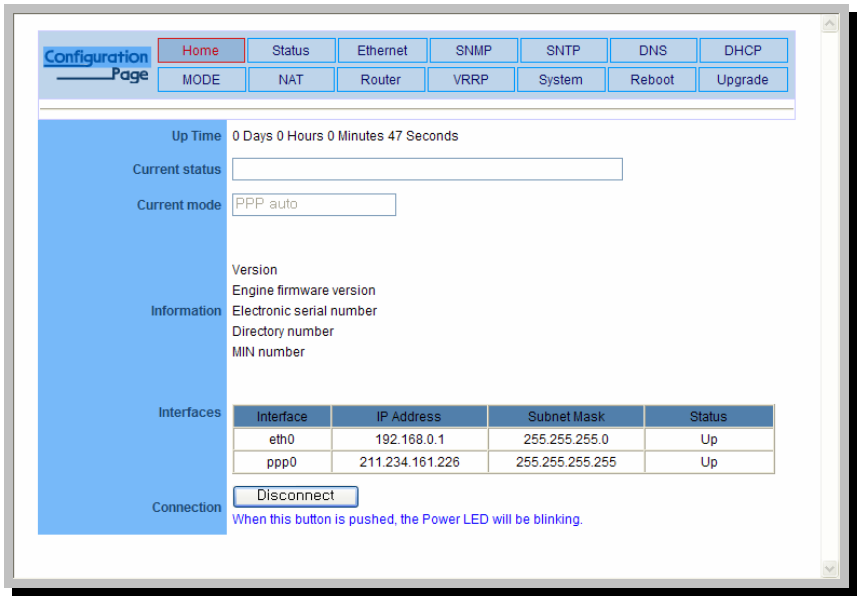
3.1.1.2 Execute Internet Explore then connect "192.168.0.1", web-based configuration page.

[Picture27. To connect web-based configuration page]

3.1.1.3 Log-in windows appears, set User name: admin, Password: admin then click the [OK] button.

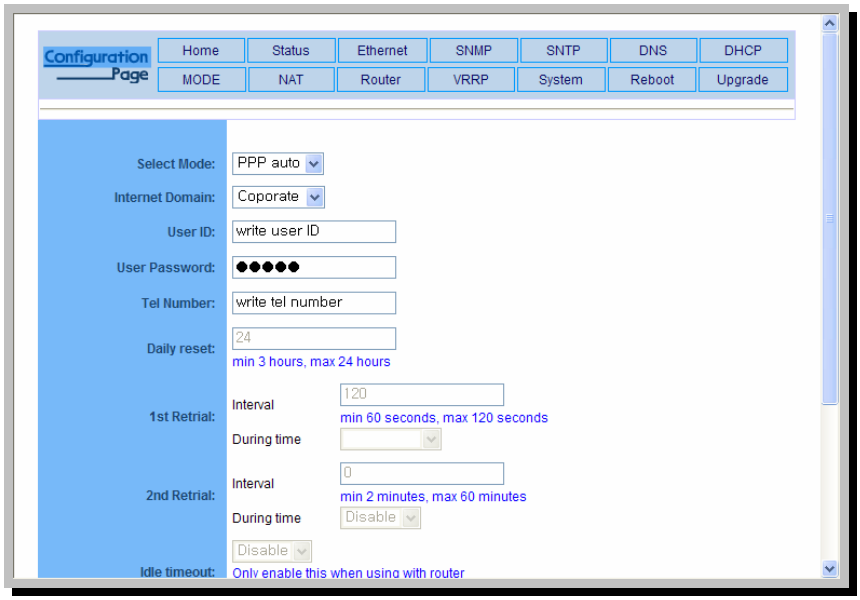
[Picture28. Log-in window]

3.1.1.4 Home tab will be appeared. If the operation is correct, eth0 and ppp0 will appear in Interfaces item. Select the MODE tab.



[Picture29. Home tab]

3.1.1.5 Select PPP auto then choose the Internet Domain. (If you choose "Coporate", write "User ID" and "Password", Tel number. Click the Apply button.



[Picture30. MODE tab]

3.1.1.6 Go to Reboot or reset CDM-650PRO.

3.1.2 Bridge mode

On Bridge mode, user should use the dial-up modem connection application.

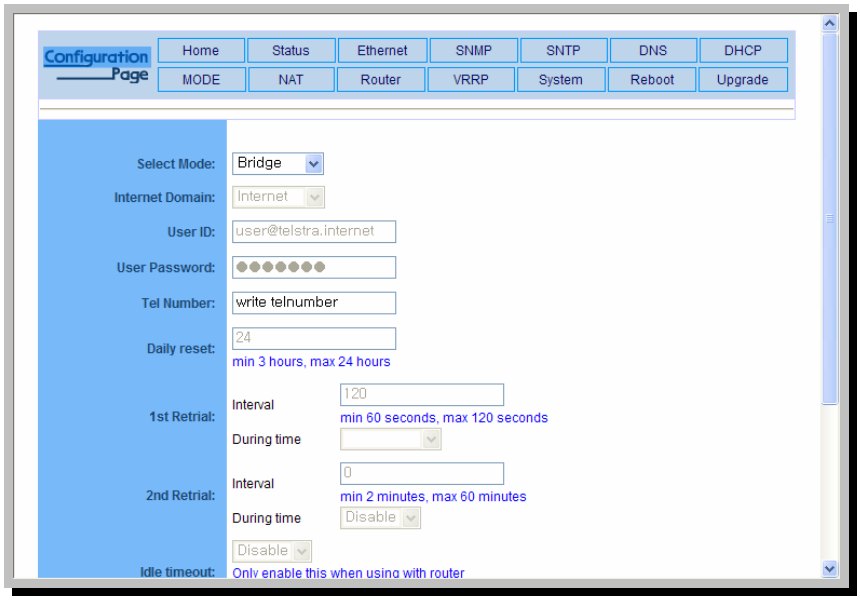
3.1.2.1 Connect the power cable on CDM-650PRO.

3.1.2.2 Execute Internet Explore then connect "192.168.0.1", web-based configuration page.

3.1.2.3 Log-in windows appears, set User name: admin, Password: admin then click the [OK] button.(This is default setting)

3.1.2.4 Home tab appears. If the operation is correct, eth0 and ppp0 will appear in Interfaces item. Select the MODE tab for setting CDM-650PRO as PPP auto mode.

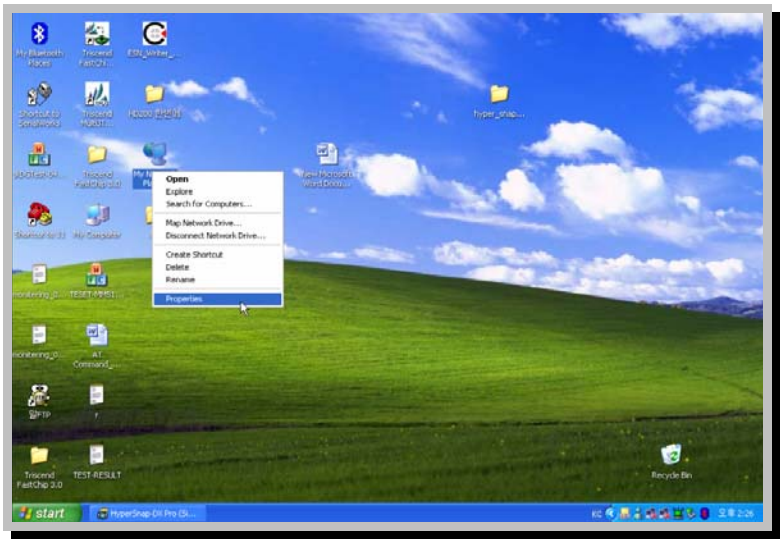
3.1.2.5 Selecting Bridge in MODE tab below window appears then click the Apply button.



[Picture31. MODE Page]

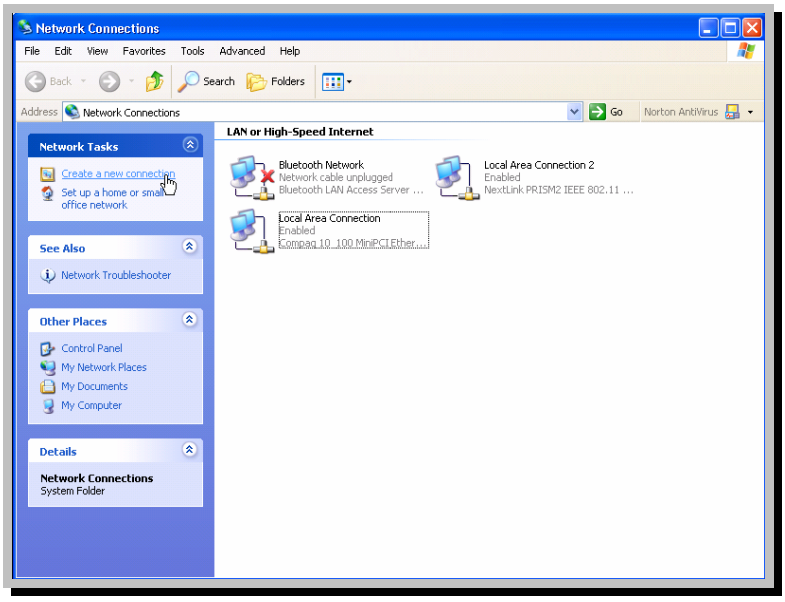
3.1.2.6 All setting finished then select Reboot tab. Click the [Reboot] button or push the reset button on left side of CDM-650PRO.

3.1.2.7 To use CDM-650PRO on the Bridge mode, should establish the PPPoE connection. In this example, we assumed that user uses the Windows XP. For connect between PC and CDM-650PRO, click the right button of mouse on the "My Network Places" icon, and choose the [properties].



[Picture32. First step of setting the Host PC]

3.1.2.8 For establishing PPPoE connection, click the "Create a new connection"



[Picture33. First step of creating a PPPoE dialer connection]

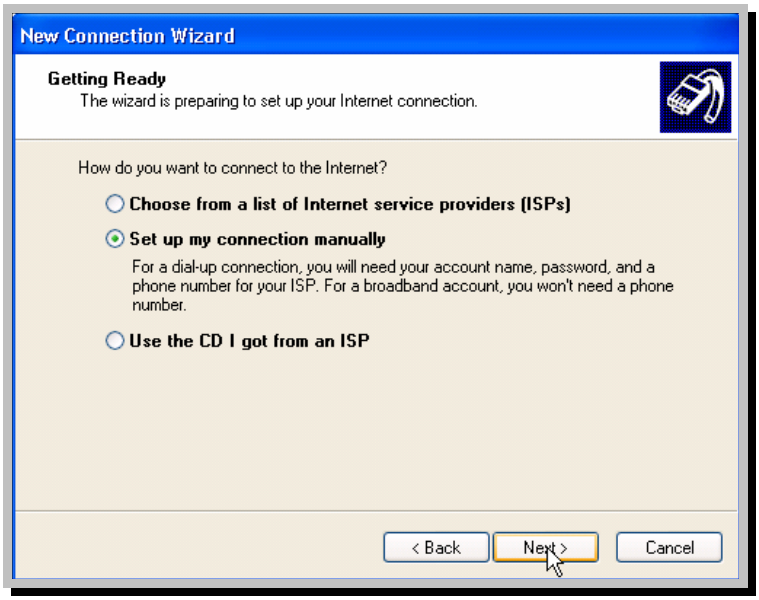
3.1.2.9 The New Connection Wizard appears then click [Next] button.

[Picture34. Second step of creating a PPPoE dialer connection]

3.1.2.10 Check the "Connect to the Internet" item, then click [Next] button.

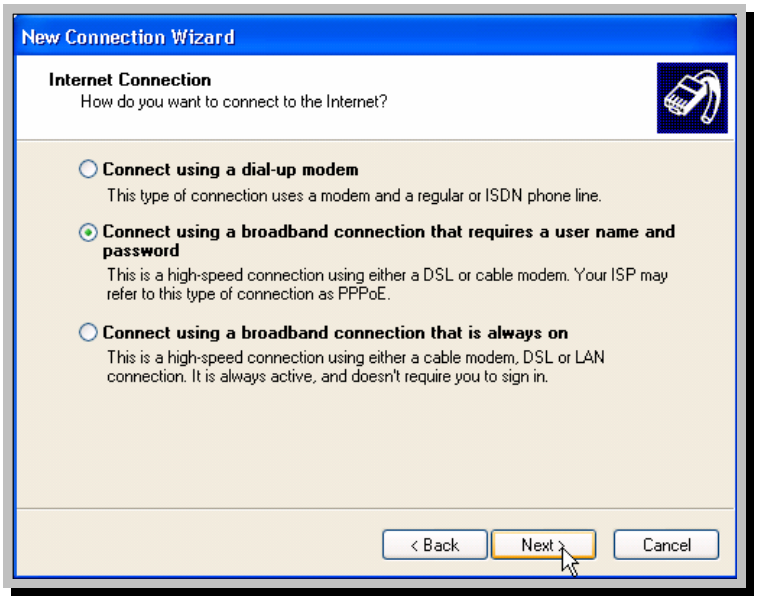
[Picture35. Third step of creating a PPPoE dialer connection]

3.1.2.11 Check the "Set up my connection manually" then click [Next] button.



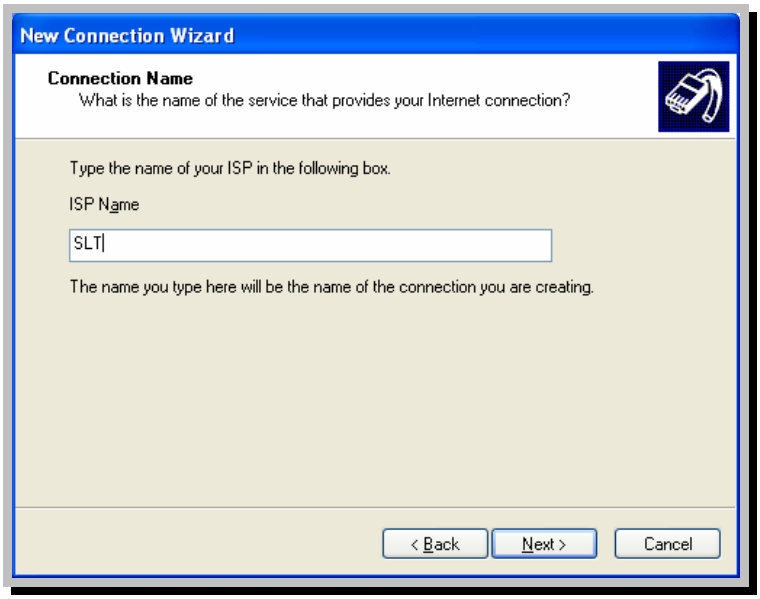
[Picture36. Forth step of creating a PPPoE dialer connection]

3.1.2.12 Check the "Connect using a broadband connection that requires a user name and password" item then click [Next] button.



[Picture37. Fifth step of creating a PPPoE dialer connection]

3.1.2.13 Write the ISP Name what you want then click [Next] button.



[Picture38. Sixth step of creating a PPPoE dialer connection]

3.1.2.14 Write User name/Password/Confirm password what you use. Then click [Next] button.

[Picture39. Sixth step of creating a PPPoE dialer connection]

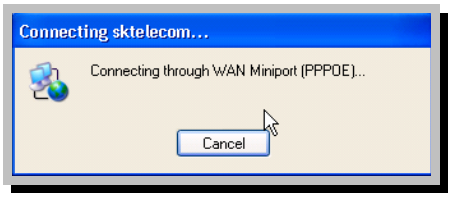
3.1.2.15 All setting is finished correctly, check "Add a shortcut to connection and close this wizard, click Finish" then click [Finish] button.

[Picture40. Seventh step of creating a PPPoE dialer connection]

3.1.2.16 Click the PPPoE shortcut icon on my desktop, then PPPoE dialer connection program appears then click [Connect] button.

[Picture41. PPPoE dialer connection application program]

3.1.2.17 Connecting window appears, trying to connect CDM-650PRO on Internet.



[Picture42. Connecting between PC and CDM-650PRO]

3.1.2.18 After the connection between PC and CDM-650PRO is established, then go to the verifying stage.

[Picture43. Verifying username and password]

3.1.2.19 On the Registering stage the Host PC is connecting on the network.

[Picture44. Registering PC on the network]

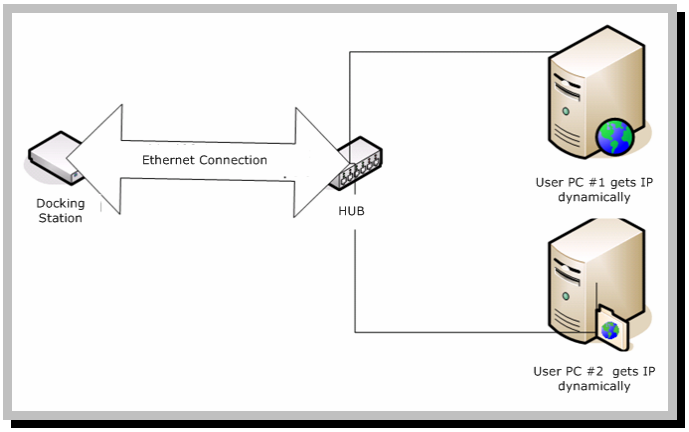
3.1.2.20 Execute web browser and explore internet.

3.2 ADVANCED SETTING

User can connect CDM-650PRO with other network device. User can change the function of CDM-650PRO by web-based configuration page for user's purpose.

3.2.1 Connecting with HUB

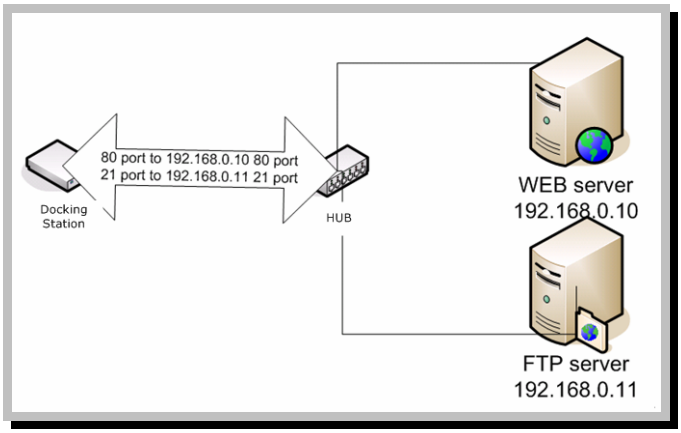
When user want to connect CDM-650PRO with HUB, select the CDM-650PRO mode PPP auto mode.



[Picture45. CDM-650PRO connected with other PCs via HUB]

3.2.2 Setting virtual Server

Virtual server that is port forwarding can be used to set up public the local server connecting outside network. When remote users send requests for accessing the local server, CDM-650PRO can forward those requests to the appropriate server to handle the requests.



[Picture46. CDM-650PRO connected with two server that use difference port]

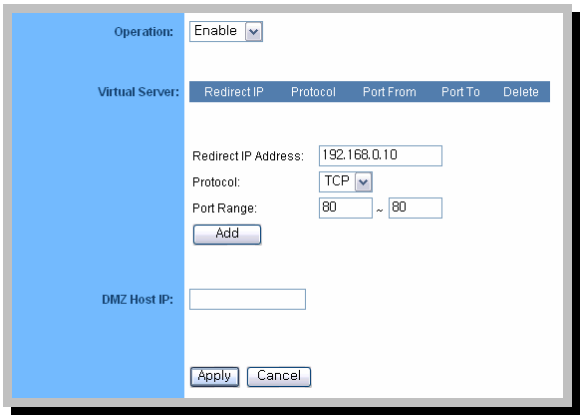
3.2.2.1 Connect Power cable on CDM-650PRO.

3.2.2.2 Execute Internet Explore then connect "192.168.0.1", on the web-based configuration page.

3.2.2.3 Log-in windows appears, set User name: admin, Password: admin then click the [OK] button.(This is default setting)

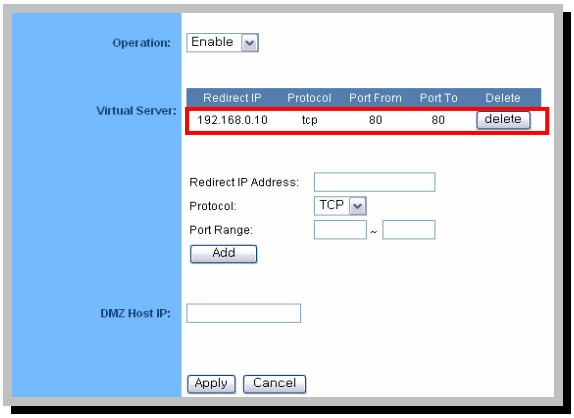
3.2.2.4 Home tab appears. If the operation is correct, eth0 and ppp0 will appear in Interfaces item. Select PPP auto mode in the MODE tab.

3.2.2.5 Select Operation item: Enable, Redirect IP Address: 192.168.0.10, Protocol: TCP, Port Range: 80 => 80, then click Add button.



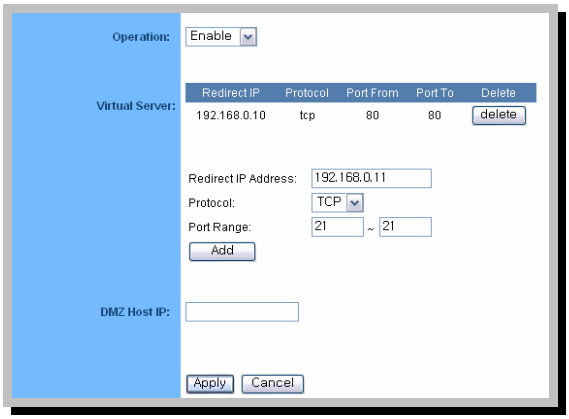
[Picture47. Setting virtual server of WEB server]

3.2.2.6 The WEB server is established.



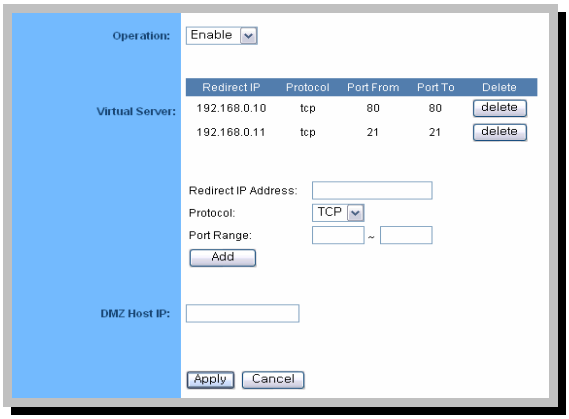
[Picture48. Set by virtual server of WEB server]

3.2.2.7 Select the Redirect IP Address: 192.168.0.11, Protocol: TCP, Port Range: 21 => 21, then click Add button.



[Picture49. Setting virtual server of FTP server]

3.2.2.8 The WEB server is added.



[Picture50. Set by virtual server of FTP server]

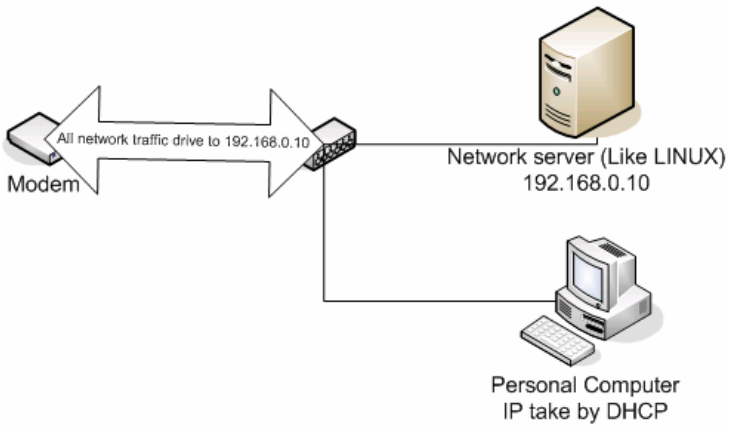
3.2.2.9 All setting finished then select Reboot tab. Click the [Reboot] button or push the reset button on left side of CDM-650PRO.

Note.

To operate virtual server function, should set CHS-628PRO mode as PPP auto mode and Bridge mode does not support this function.

3.2.3 Setting DMZ Host

DMZ Host function make connected network device like a computer including all port service be seen by remote computer.



[Picture51. CDM-650PRO connected with a server and a PC via DMZ Host]

3.2.3.1 Connect Power cable on CDM-650PRO.

3.2.3.2 Execute Internet Explore then connect "192.168.0.1", web-based configuration page.

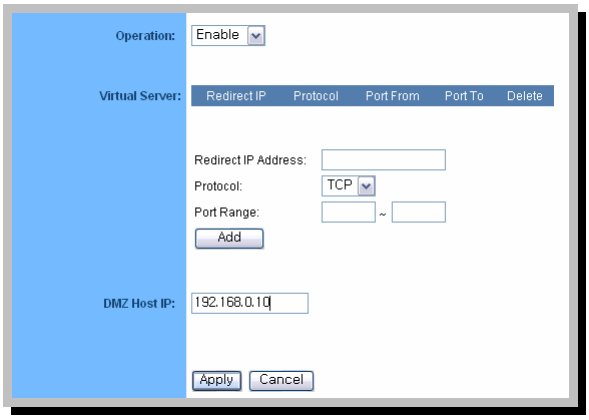
3.2.3.3 Log-in windows appears, set User name: admin, Password: admin then click the [OK] button.(This is default setting)

3.2.3.4 Home tab appears. If the operation is correct, eth0 and ppp0 will appear in Interfaces item. Select the MODE tab.

3.2.3.5 Select PPP auto then write User ID and Password, Tel number. Click the Apply button.

3.2.3.6 Click the NAT tab.

3.2.3.7 Select Operation item: Enable, DMZ Host IP: 192.168.0.10, then click Apply button.



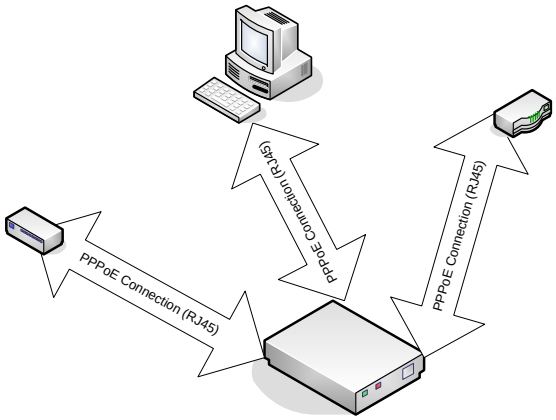
[Picture52. Setting DMZ Host server]

3.2.3.8 All setting finished then select Reboot tab. Click the [Reboot] button or push the reset button on left side of CDM-650PRO.

3.2.4 Connecting with xDSL, VPN, Router via PPPoE

There may be needed to connect with network device like xDSL modem, VPN, PC supported by PPPoE.

User should select CDM-650PRO as Bridge mode.



[Picture53. CDM-650PRO connected with xDSL, VPN, PC by PPPoE]

Note.

PPPoE connection supports the only 1:1 direct connection.

Personal Com

VPN

4. TROUBLESHOOTING

4.1 CHECKING HARDWARE

4.1.1 Power LED does not turn on.

4.1.1.1 Please check that the power adapter supports voltage range from 6 to 30 [VDC].

4.1.1.2 Please check whether the power adapter cable has not been damaged.

4.1.2 Power LED is blinking continuously.

4.1.2.1 Blinking this LED means there is no external USB modem or when the modem initializing.
So if this LED is blinking continuously please the external USB modem is adapted correctly.

4.1.3 Link LED on RJ45 port does not work.

4.1.3.1 Please check whether the UTP cable is direct or crossover. The UTP cable should be direct.

4.1.3.2 Please check whether the UTP cable is connected at both ends.

4.1.3.3 Please check the PC's LAN card.

4.1.3.4 If you connect cross HUB with CDM-650PRO, use the cross UTP cable.

4.1.3.5 Please check whether the UTP cable is correctly or not.

4.1.4 Link LED on RJ-45 port is always green but does not connect on Internet.

4.1.4.1 In this case, the connected PC's LAN card supports only 10Mbps but PC OS (Operating System) is set by 100Mbps. So change the PC environment for supporting 10Mbps.

4.1.4.2 It means the PC LAN card supporting 100Mbps that It Link LED on RJ-45 port is yellow.

4.1.5 Reset button does not work.

4.1.5.1 Please check whether the reset button is pushed always because of tight case or dust etc.

4.1.6 Console data does not appear on hyper terminal.

4.1.6.1 Please check the connection between PC and CDM-650PRO correctly.

4.1.6.2 Please check the 24 to 24 pin cable correctly.

4.1.6.3 Please check whether the serial cable is cross or not. The cross cable is correct.

4.1.6.4 Please the communication speed is set at 57600bps on hyper terminal.

4.1.7 CDMA modem does not recognize via Debugging board.

4.1.7.1 Please check the CDMA modem driver installed on PC.

4.1.7.2 Please check that the mode select switches on Debugging board are correct.

4.1.8 Signal Strength LED does not work.

4.1.8.1 Please check whether CDMA antenna is connected correctly or not.

4.1.8.2 Please check that CDMA network service is available in your residence.

4.1.8.3 Please check the RF cable inside whether is connected well or not.

4.2 CHECKING SOFTWARE

4.2.1 Connection LED does not work and does not connect on Internet.

4.2.1.1 Please go the web-based configuration page. Then click the Status tab and select the Syslog.

If "Failed to open /dev/ttyACM0: Invalid argument" message is coming out, the USB connection between CDM-650PRO and the external USB modem is abnormal.

4.2.2 Connection LED is blinking but does not connect on Internet.

4.2.2.1 Please go the web-based configuration page. Then click the Status tab and select the Syslog.

If the message is coming out below, the mobile network normal state.

Jan 1 00:00:19 syslog: Connect: ppp0 <--> /dev/WLAN0

Jan 1 00:00:19 syslog: Using interface ppp0

Jan 1 00:00:19 syslog: using channel 1

Jan 1 00:00:19 syslog: Serial connection established.

4.2.2.2 Find the message that there is "CHAP authentication failed" or not. This message means that User name or password is wrong. Please check the name or password again, then correct them in MODE tab. Please don't forget reset CDM-650PRO after this.

4.2.3 I can't access the CDM-650PRO's the web-based configuration page.

4.2.3.1 Please check that the connection between PC and CDM-650PRO is correct or not.

4.2.3.2 Please check that the Power LED is on or blinking.

4.2.3.3 Please check that the Host PC's network environment is set by dynamically.

4.2.4 I need to set up a server connecting with CDM-650PRO.

4.2.4.1 To use a server like a web, ftp, or mail server, you need to know the respective port numbers they are using. For example, port 80 (HTTP) is used for web; port 21 (FTP) is used for FTP, and port 25 (SMTP outgoing) and port 110 (POP3 incoming) are used for the mail server. You can get more information by viewing the documentation provided with the server you installed. Follow these steps to set up port forwarding through the Modem's Web-based Utility. We will be setting up web, ftp, and mail servers.

Application	Start and End	Protocol
HTTP	80 to 80	All
VPN Pass-through	50 to 51	All
VPN IPSEC	500 to 500	UDP
SMTP	25 to 25	All
POP3	110 to 110	All
FTP server	21 to 21	TCP
SSH	22 to 22	TCP

Telnet	23 to 23	TCP
DNS	53 to 53	UDP
Gopher	70 to 70	TCP
POP3	110	TCP

[Table20. Example of the Port Forwarding per application]

4.2.4.2 These are for online game hosting service or other applications.

Application	Start and End	Protocol
UT	7777 to 27900	All
Halflife	27015 to 27015	All
PC Anyware	5631 to 5631	UDP

[Table21. Example of the Port Forwarding per application]

The best way to get the information of applications like game hosting using the port number is to go to the website of the service provided then check it, please.

4.2.4.3 Please refer to the chapter 3.2.2 Connecting virtual server.

4.2.5 I can't connect the Internet game, special server, or any application.

4.2.5.1 If you are having difficulties of connecting some on-line game, special server, or application, those application may use special port so you should know the port. If you don't know the used port, you can use DeMilitarized Zone (DMZ) hosting function. This option is available when an application requires too many ports or you are not sure which port services used. Make sure you disable all the forwarding entries if you want to successfully use DMZ hosting, since forwarding has priority over DMZ hosting. Follow these steps to set DMZ hosting.

4.2.5.2 Please refer to the chapter "3.2.3 Setting DMZ Host".

5. FAQ

5.1 What is the maximum number of IP address that the CDM-650PRO supports?

The CDM-650PRO supports up to 253 Internet Protocol address.

5.2 Does the CDM-650PRO support IPX or Apple Talk?

No, The CDM-650PRO does not support IPX and Apple Talk.

But if the CDM-650PRO is set by Bridge mode and ISP supports IPX or Apple talk, passing through with those protocols may be possible.

** IPX, a NetWare communications protocol used only the route messages from one node to another.*

** Apple Talk, a communication protocol used on Apple and Macintosh networks, can be used for LAN to LAN connection.*

5.3 What is the Network Address Translation and what is it used for?

Please refer to the chapter 1.5.4 NAT (Network Address Translation or Network Address Translator).

NAT allows the CDM-650PRO to be used with low cost Internet accounts. Although only one IP address is provided by the ISP, user can share the single IP address with many private IP addresses by NAT.

5.4 How do I do when FTP downloading is blocked?

CDM-650PRO allows all out-going FTP ports. So if you are experiencing this problem, please check the FTP client program or change another FTP program.

5.5 The web page hangs; downloads are corrupt, or nothing but junk characters are being displayed on the screen. What do I need to?

This problem may be appear when the LAN card is too old.

Force your LAN card change to 10Mbps or half duplex mode, and turn off the "Auto-negotiate" feature of your LAN card as a temporary measure. Make sure that your proxy setting is disable in your browser.

5.6 Will the CDM-650PRO support a Macintosh environment?

Yes, but CDM-650PRO's web-based configuration pages are accessible only through Internet Explorer 5.0 and Netscape Navigator 4.5 or higher. MSU does not support MAC windows.

5.7 What is DMZ Host?

Demilitarized Zone (DMZ) allows one IP address to be exposed to the Internet. Some applications require multiple ports to be open. It is recommended that you set your computer with virtual server function if you know the port number.

5.8 Is the CDM-650PRO cross-platform compatible?

Any platform that supports Ethernet and TCP/IP is compatible with the CDM-650PRO.

5.9 How many ports can be simultaneously forwarded?

In theory, CDM-650PRO can establish 4,000 sessions at the save time, but you can only forward 25 range of ports.

5.10 Where can I get a static or Dynamic IP address?

Public IP is from ISP and Private IP is from DHCP in CDM-650PRO.

(All document finished)

If your questions are not here, contact us
www.cmotech.com

Thank you.