Product Overview

PBmaX is a full function PBX system with extra built-in features like auto-attendant, voicemail, VoIP (Internet Phone), and various network services. It provides a solid, uniform platform for both voice communications as well as network communications. Built on state-of-the-art embedded technology, PBmaX offers a seamlessly integrated solution for the telecommunication needs of modern times. Its versatile and expandable design makes PBmaX an ideal choice for companies of small to medium sizes.

PBmaX provides up to 32 analog ports to interface with CO lines (also called outside lines or trunk lines) and extension lines (also called inside lines or station lines) in any combination. For example, you can have 8 CO lines and 24 extension lines, or 12 CO lines and 20 extension lines. Since all ports are analog, no extra hardware is needed to connect analog devices such as modems and fax machines. Furthermore, PBmaX allows the use of regular telephones instead of expensive digital telephones, resulting in even more cost savings.

PBmaX's conventional telephony functions are implemented over the POTS (Plain Old Telephone Service) wiring infrastructure. In most facilities, this infrastructure is already in place and costs nothing to use. PBmaX does not utilize the network for conventional telephony functions, therefore it adds no load to the network and is not subject to network conditions/failures. This means that the voice quality will be consistently high regardless of the network condition, and the phone system will still be working when the network goes down.

A few examples of PBmaX's conventional telephony function are auto attendant, voicemail with personal greeting message, automatic roll over, call forwarding, CO line usage logging, toll restriction and etc.

For VoIP functions, PBmaX provides four "H.323" IP phone resources as standard, with option to a total of eight or sixteen resources per system. VoIP functions are transparently integrated with conventional telephony functions in the PBmaX design, and a uniform user interface is provided for both conventional and VoIP functions.

For network functions, PBmaX provides router service, IP sharing (NAT), firewall, DHCP server and QoS support.

Although we may call PBmaX an IP-PBX, it not a true one. It is actually an alternative to IP-PBX with the following advantages over an IP-PBX:

1. It replaces old PBX directly without requiring any new wiring to be put in. An IP-PBX requires that all extensions have a network connection, but actually in many companies there are places where only a phone connection, but not a network connection, is available.

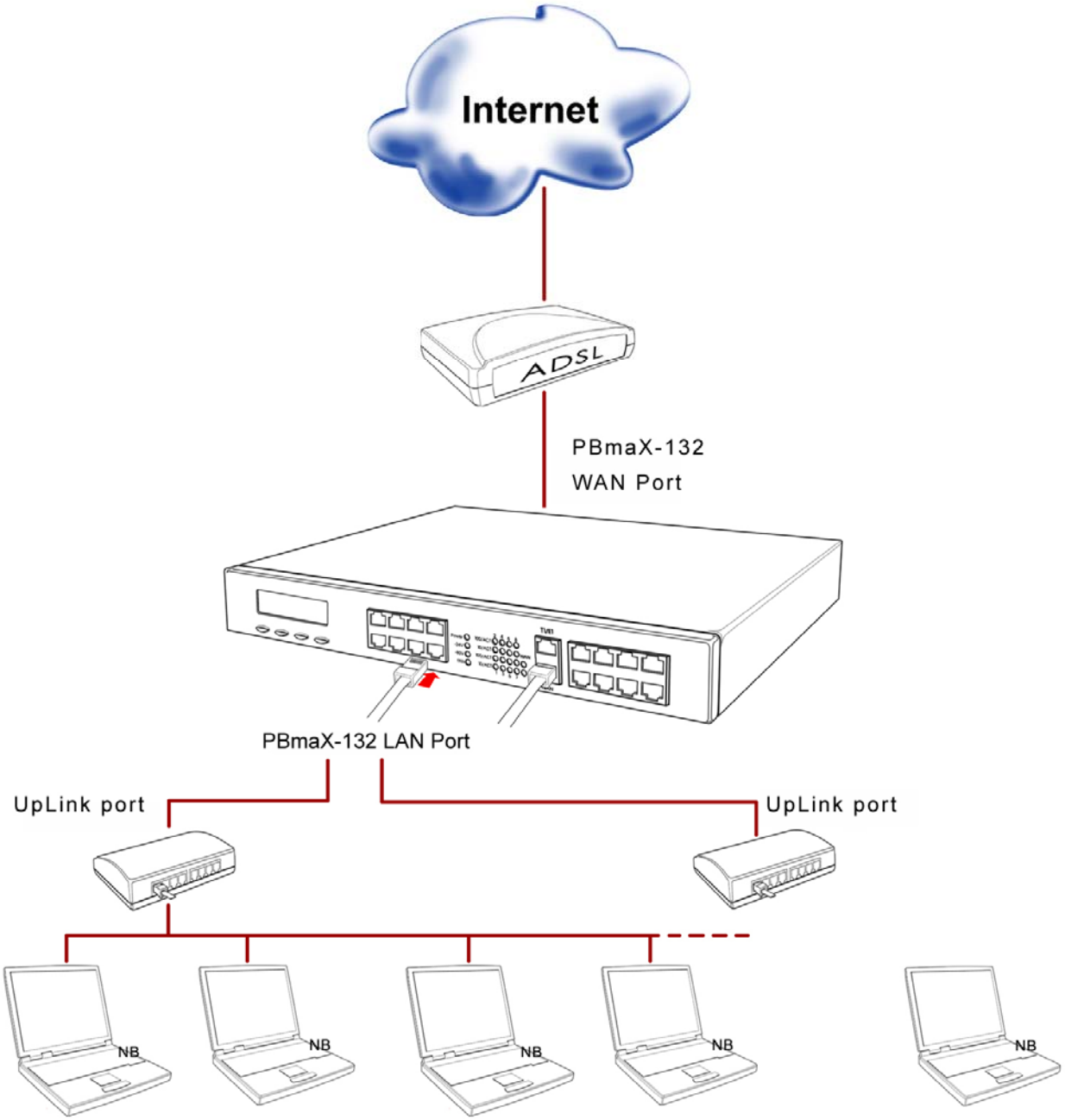
2. It does not require the purchase of new digital telephones - a huge savings over IP-PBX. Also, no additional hardware module is needed to connect modems and fax machines - even more savings.

3. It does not depend on the network to operate - the phone system will still work even if the network is down. When you use an IP-PBX, you are putting both eggs of communication (telephone and data) in the same basket. Can you image what will happen when both of your communication links are broken at the same time?

4. The voice quality is better and not subject to network conditions (except for VoIP calls).

5. It does not add any load to the network except when VoIP calls are made. Network overload is a hidden cost to many companies in terms of wasted employee time. It is often overlooked until the problem gets out of control, when it has cost the company dearly over the time.

The following diagram illustrates a typical wiring scheme using PBmaX as a PBX/router/hub.

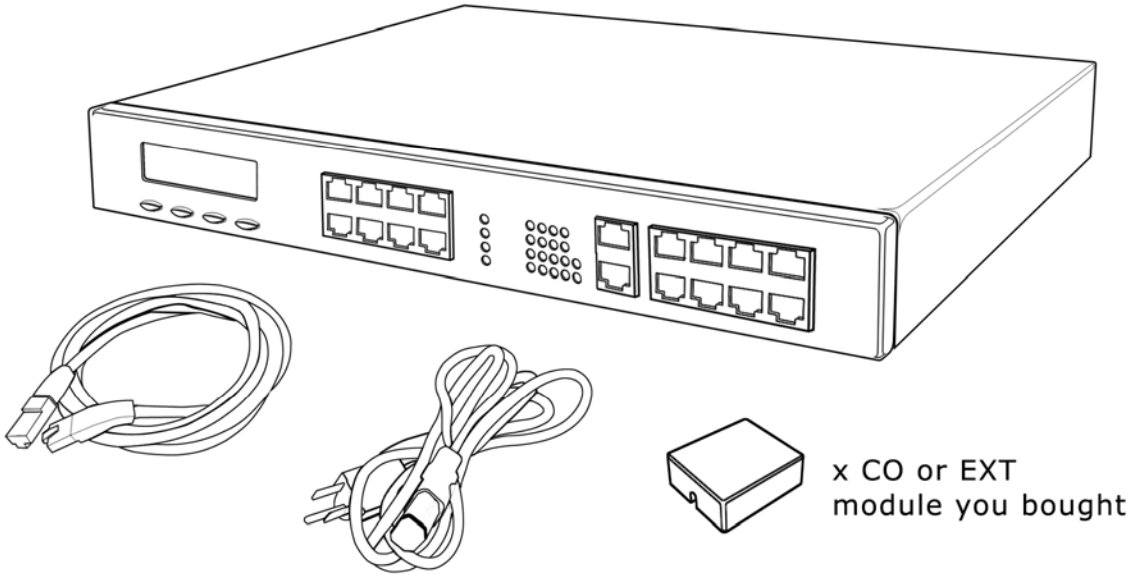


Installation

Installation can be done easily by following the steps outlined below.

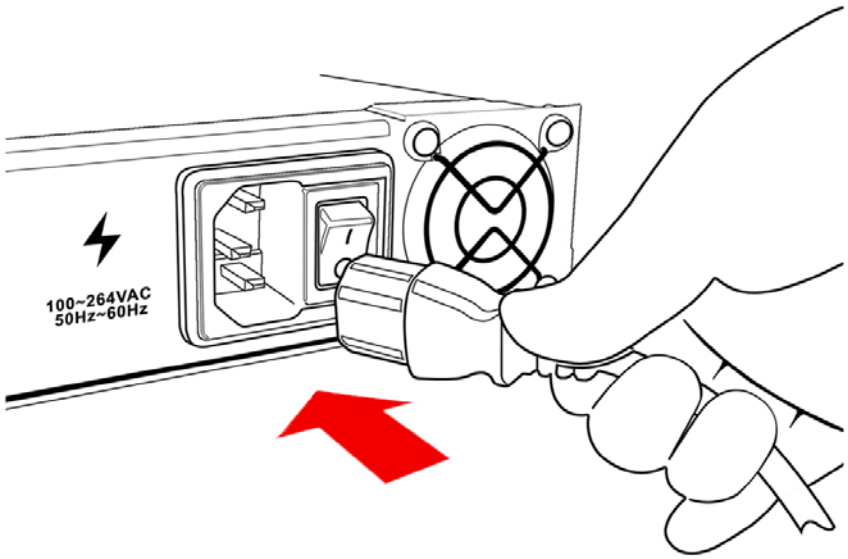
Step 1: Checking items

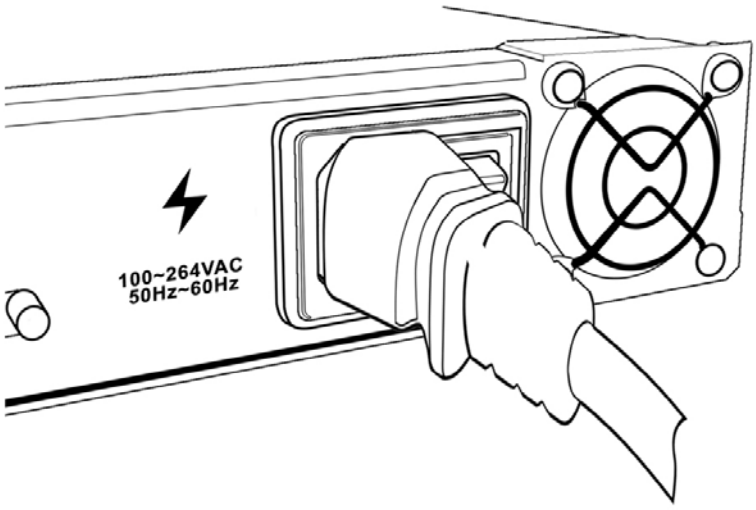
Make sure the following items are present: main unit, Ethernet UTP cable, power cord, and conversion jacks.



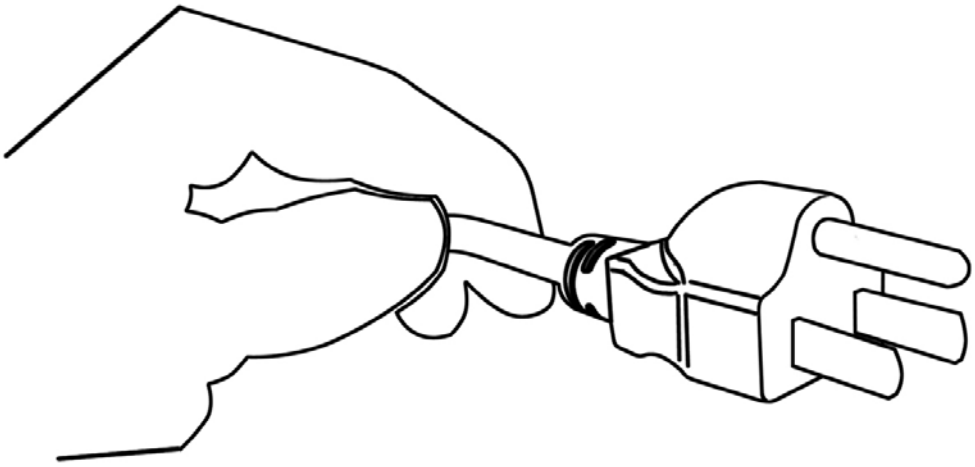
Step 2: Connecting power

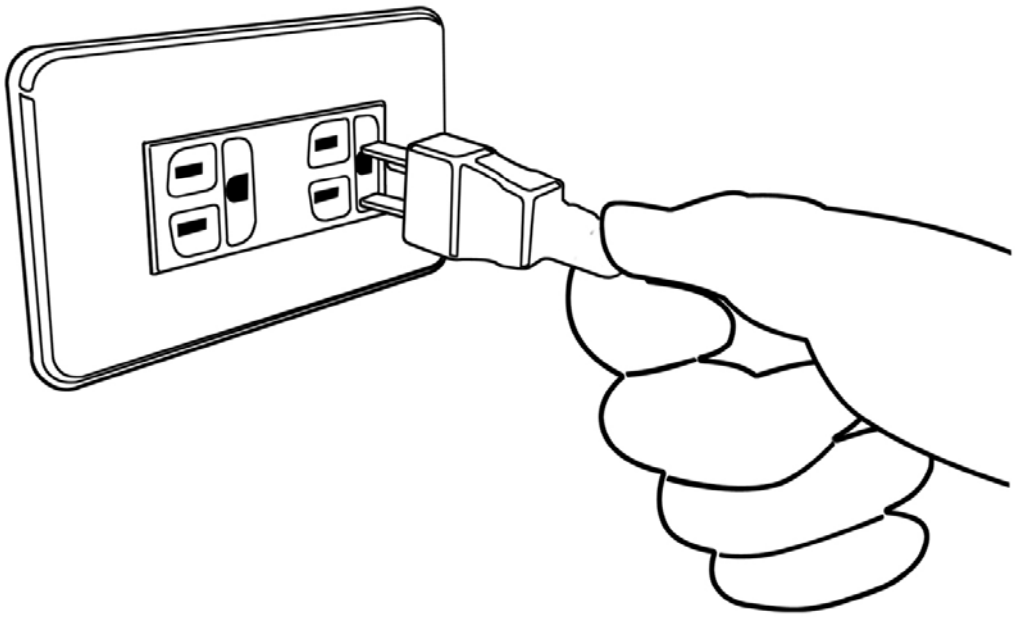
Plug the power cord into the PBmaX.



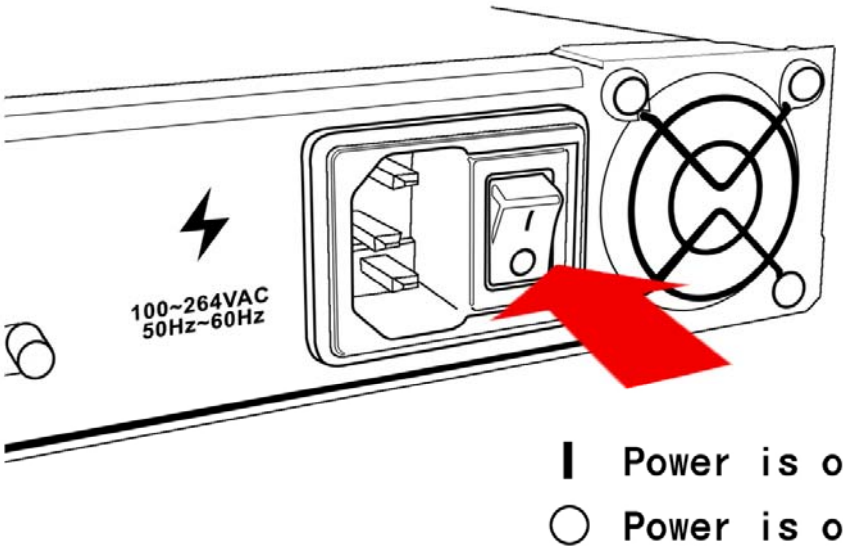


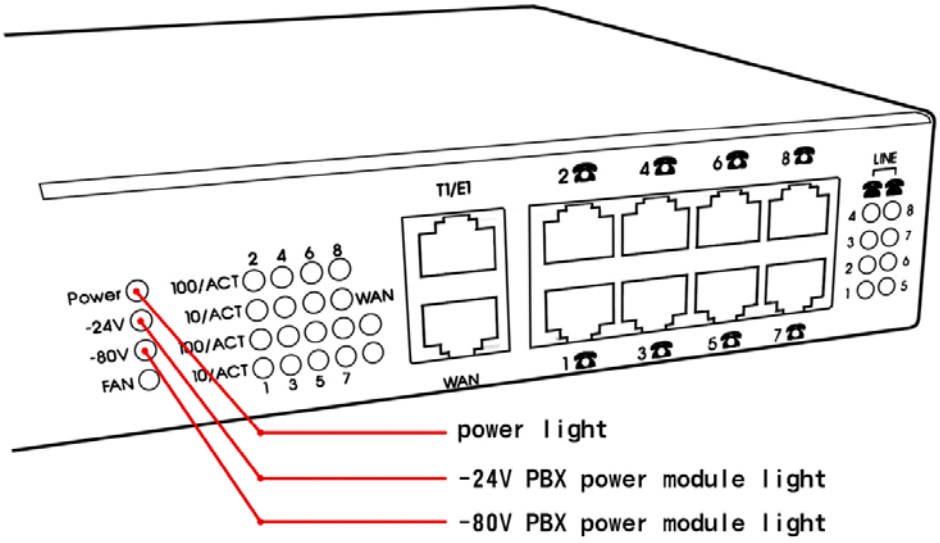
Plug the power cord into a power outlet.





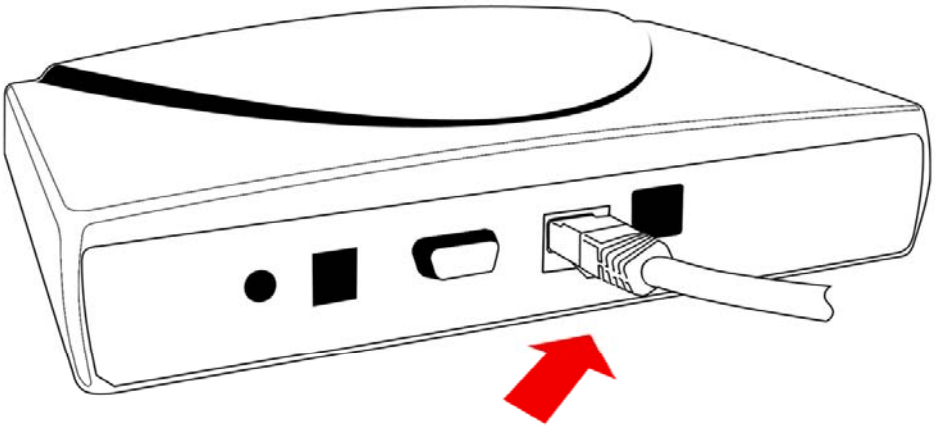
Turn on the power. Three lights (“Power”, “24V”, and “80V”) on the front panel will turn on, indicating that the system is up and running.

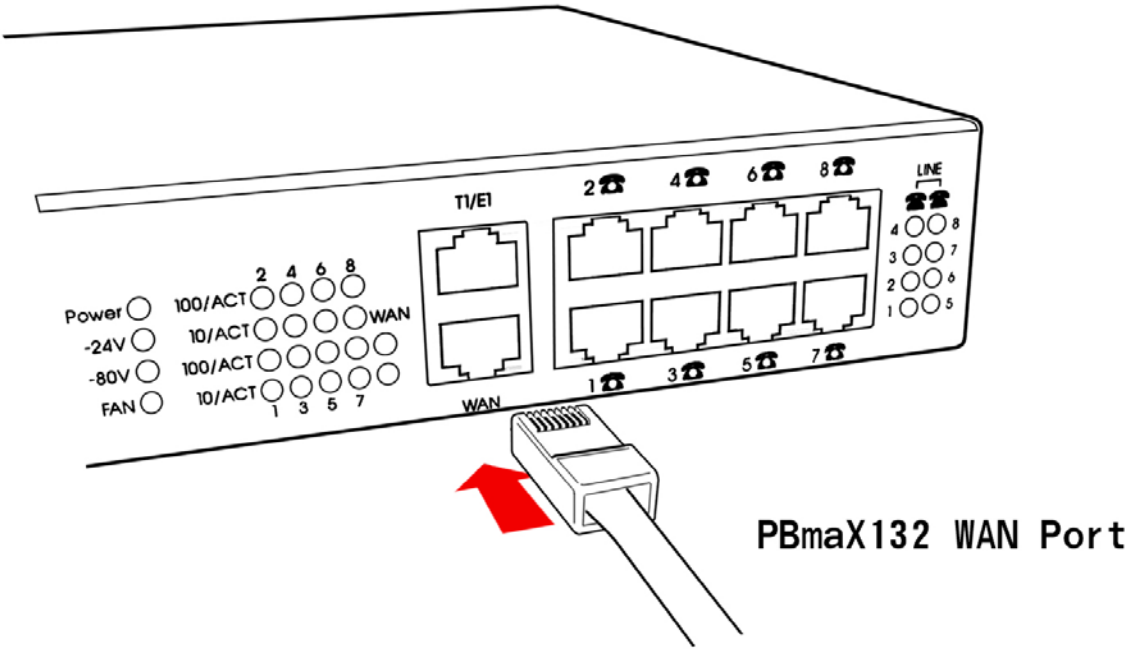




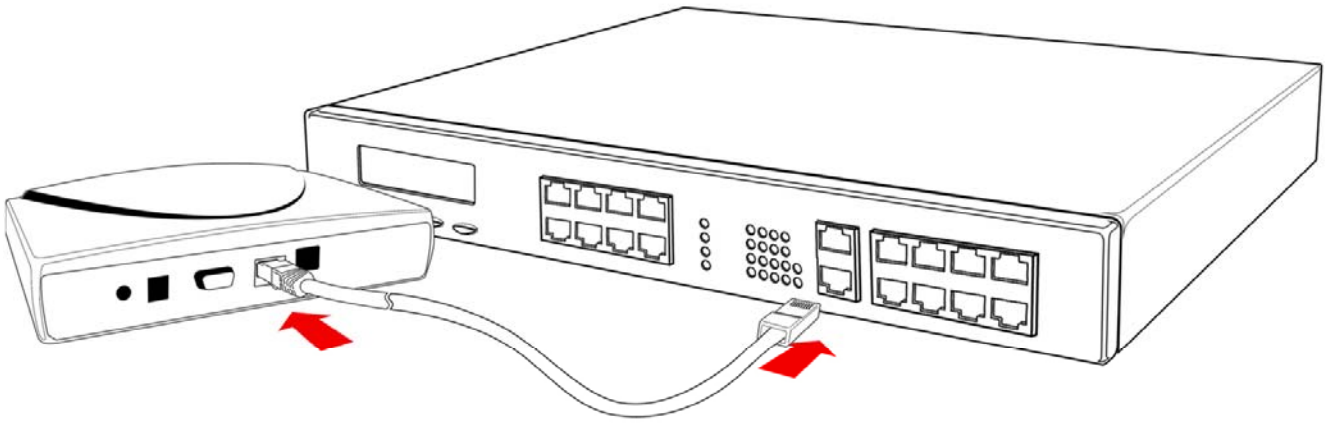
Step 3: Connecting to DSL or cable modem

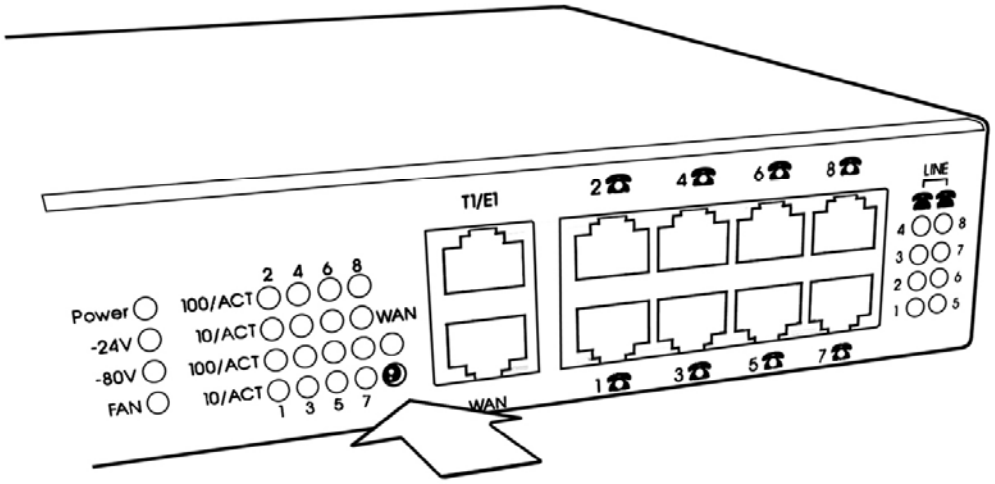
Using a UTP cable, connect the LAN port on the ADSL/cable modem to the WAN port on the PBmaX. Turn on the ADSL/cable modem and make sure its *READY* light is on steadily. If the *READY* light keeps blinking, contact your Internet service provider (ISP) and fix the problem before going to the next step.





If the connection is made properly, the “WAN” light on the front panel will turn on.

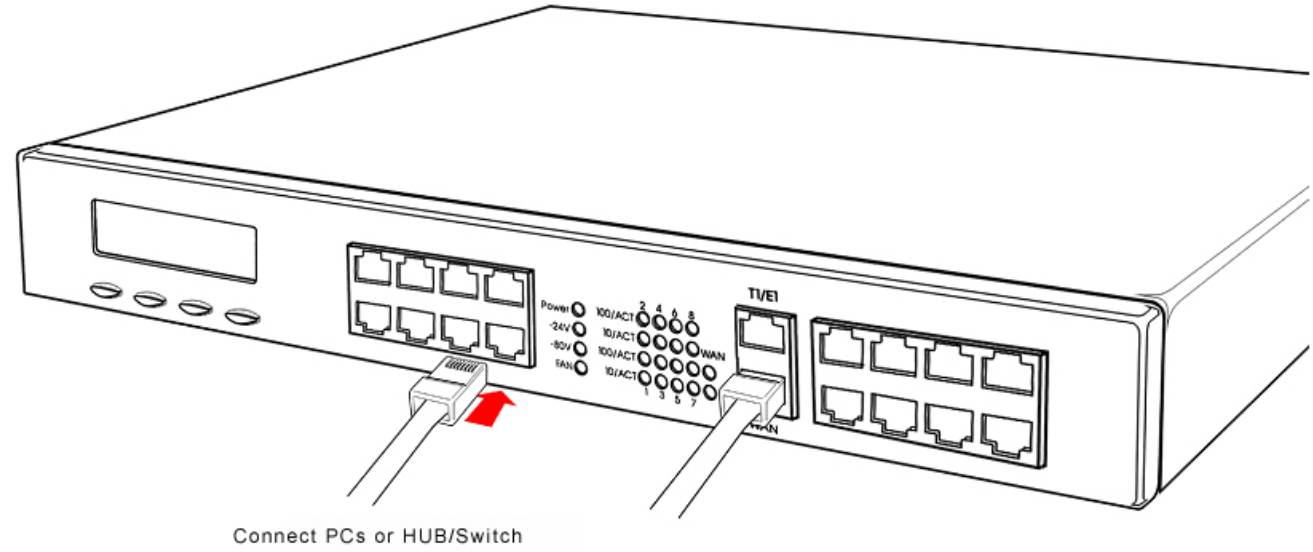


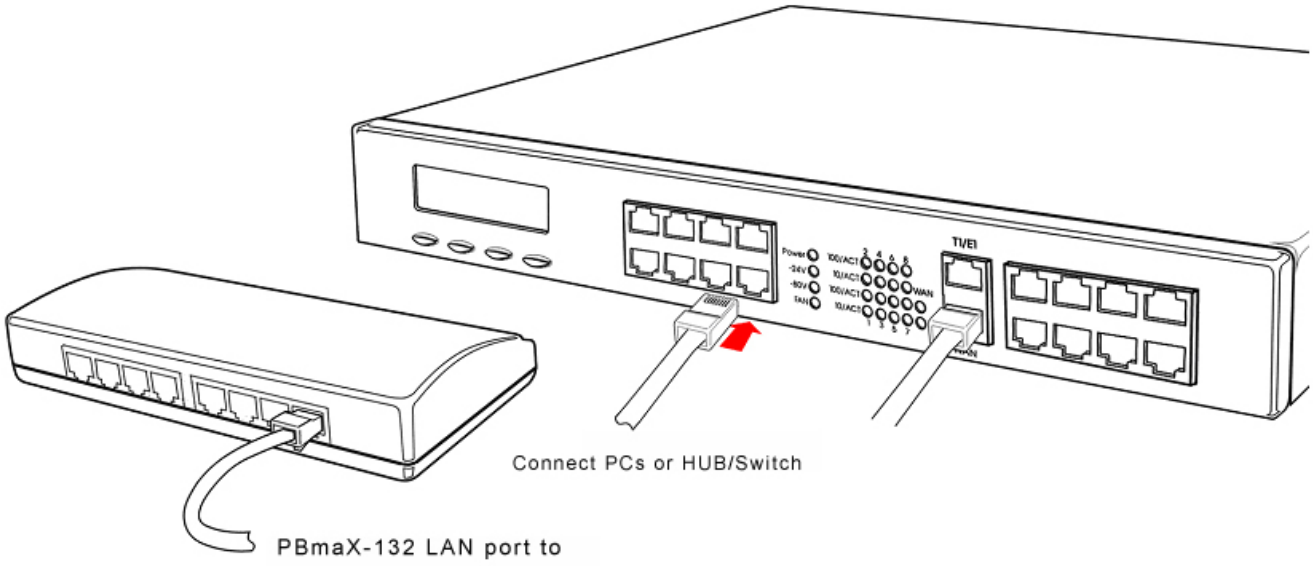


After connecting ADSL or Cable modem to WAN port, the LED of WAN will be light up.

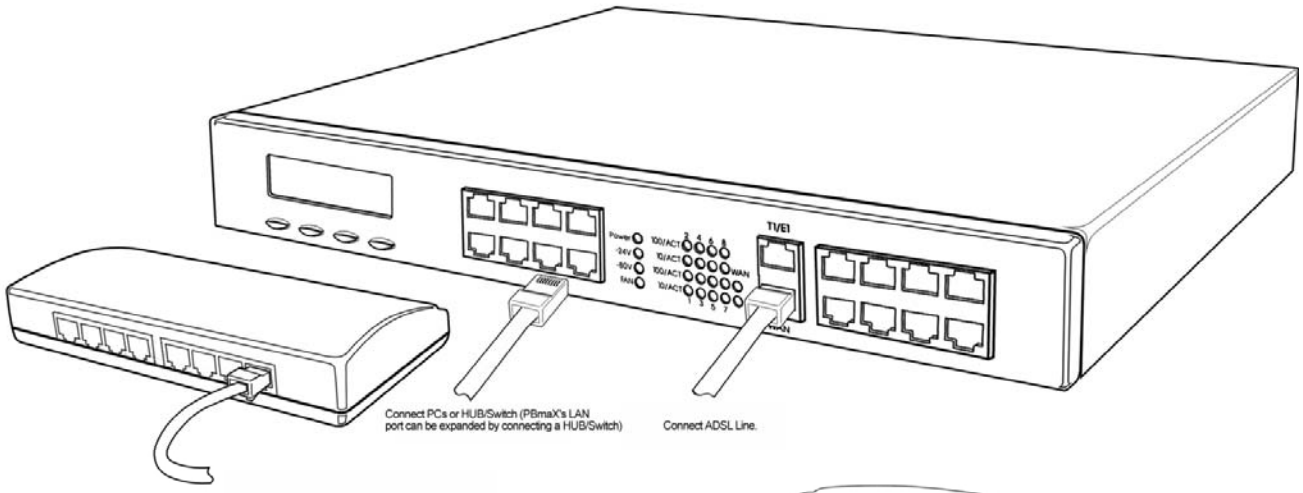
Step 4: Connecting to LAN

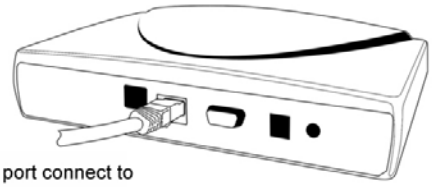
Using UTP cables, connect all your LAN devices (PC, NB, HUB, switch…) to the LAN ports on the PBmaX.



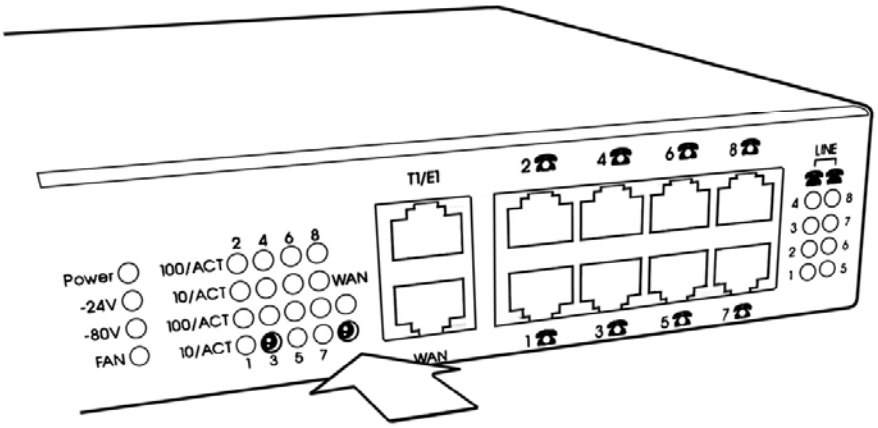


Wait a minute or two for all LAN devices to establish links with the PBmaX. The network related installation is now complete and you should be able to access the Internet.





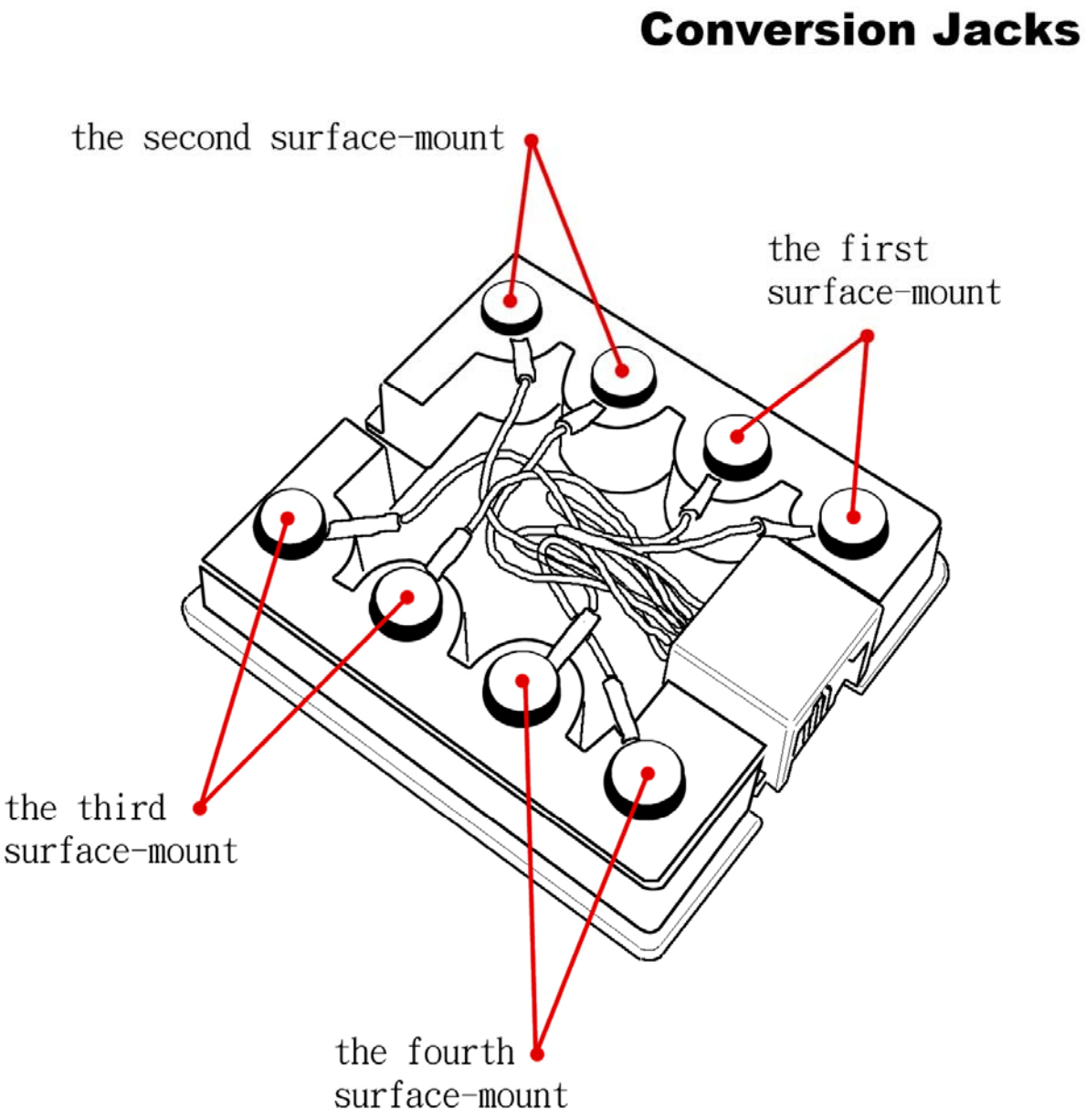
ADSL LAN port connect to PBmaX's WAN port.



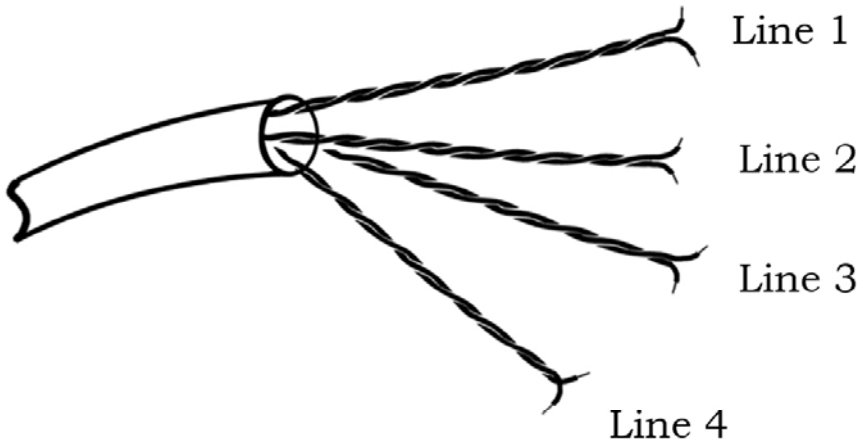
After connecting ADSL or Cable modem, the LED of WAN will be light up.

Step 5: Connecting CO lines

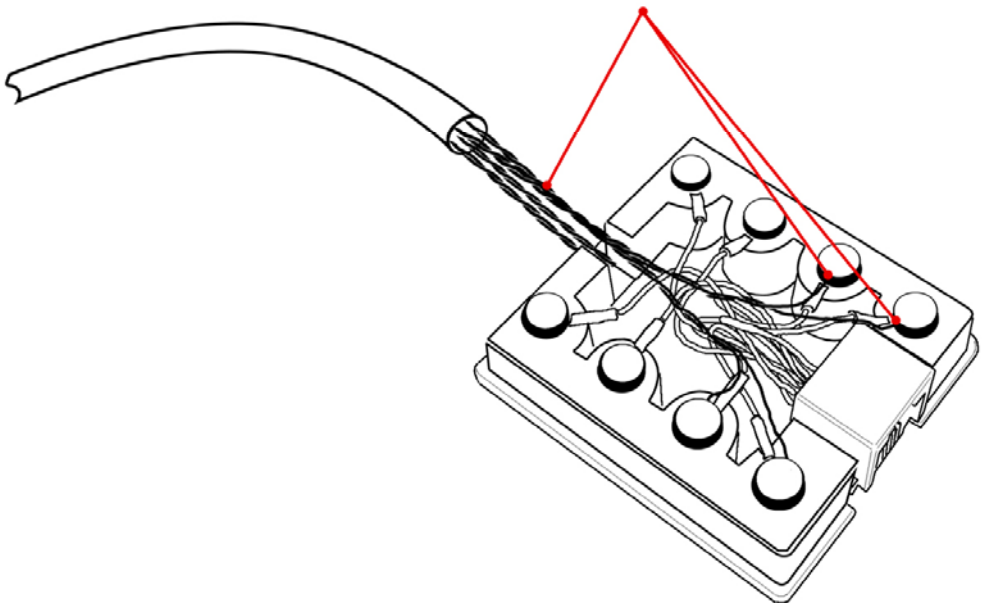
CO lines are also called trunk lines or outside lines. They are the lines that come from the phone company into your facility. Using conversion jacks and RJ-45 cables provided, CO lines can be easily connected to the PBmaX in groups of four.



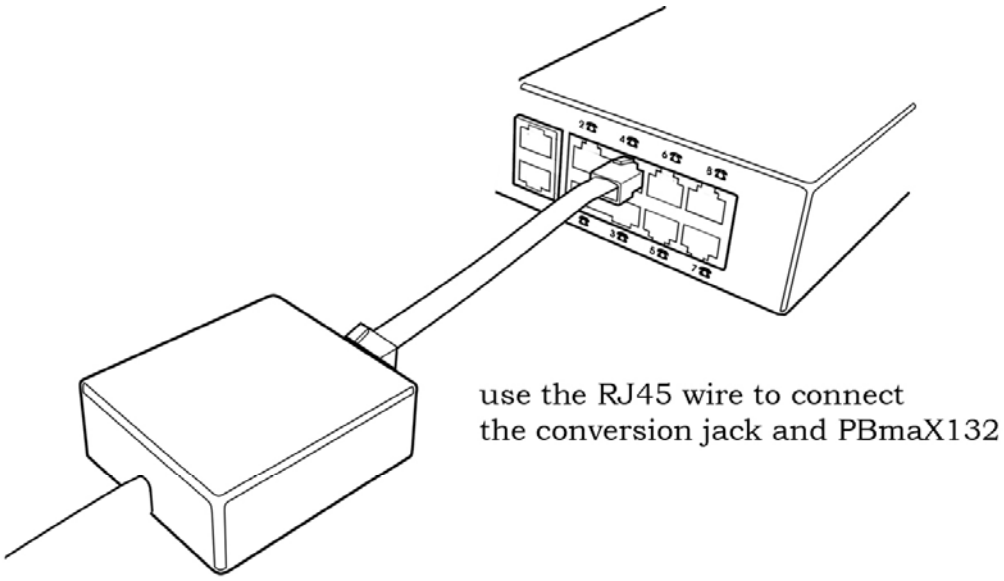
Connect up to four CO lines in each conversion jack, as illustrated below.



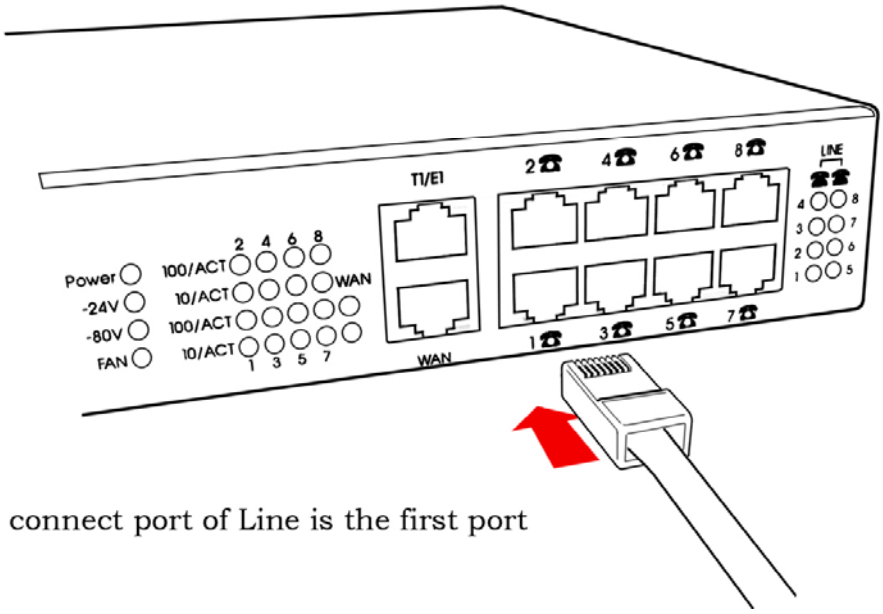
Line1 connect to the first surface-mount
Line2 connect to the second surface-mount
Line3 connect to the third surface-mount
Line4 connect to the fourth surface-mount



Using RJ-45 cables, connect each conversion jack to a CO port on the PBmaX. CO ports usually start from port 1. For example, if your PBmaX is equipped with 12 CO lines, then connect the CO lines to port 1, 2, and 3. Line 1 in port 1 is the first physical CO line, line 1 in port 2 is the fifth physical CO line, and etc.



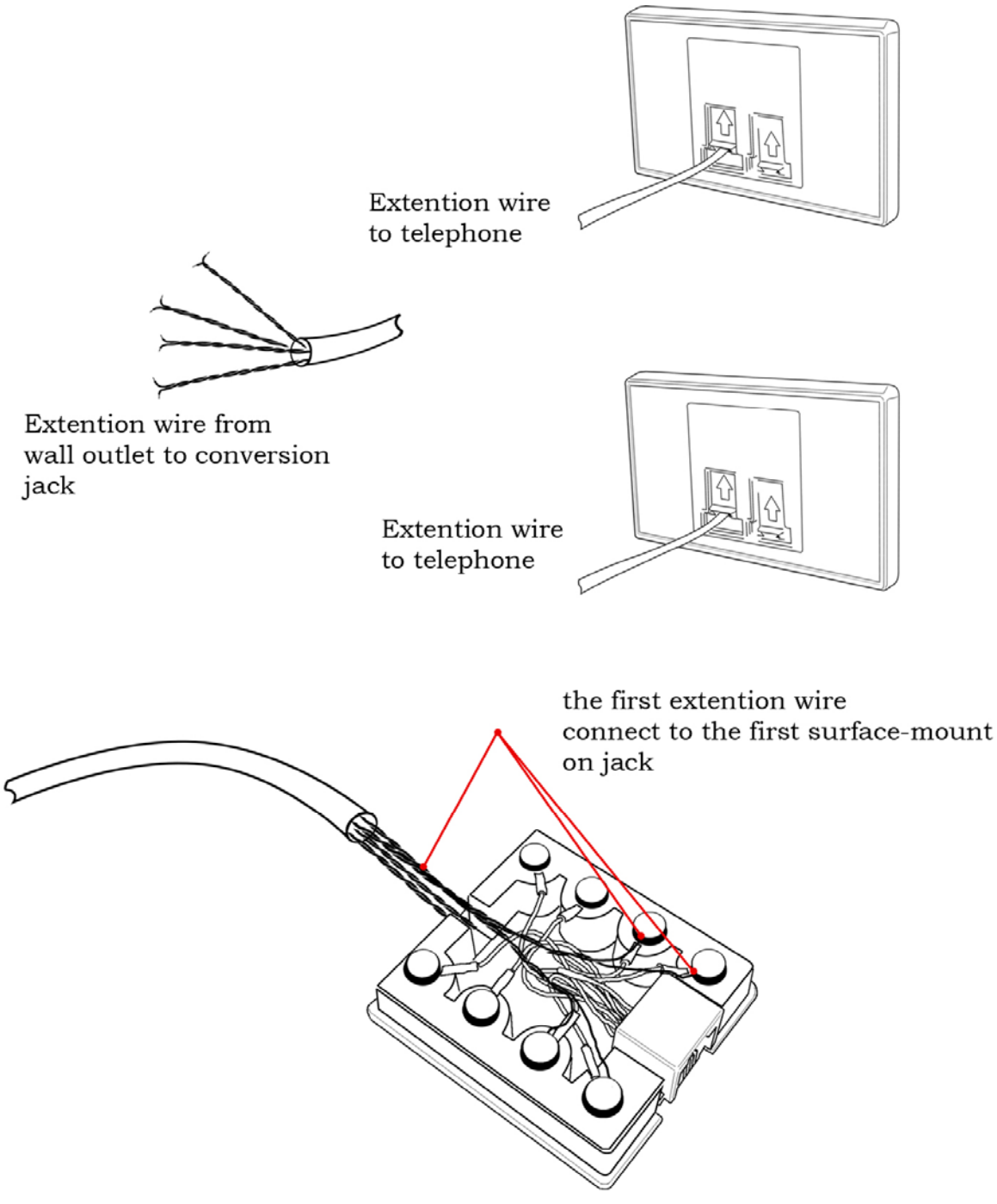
use the RJ45 wire to connect
the conversion jack and PBmaX132



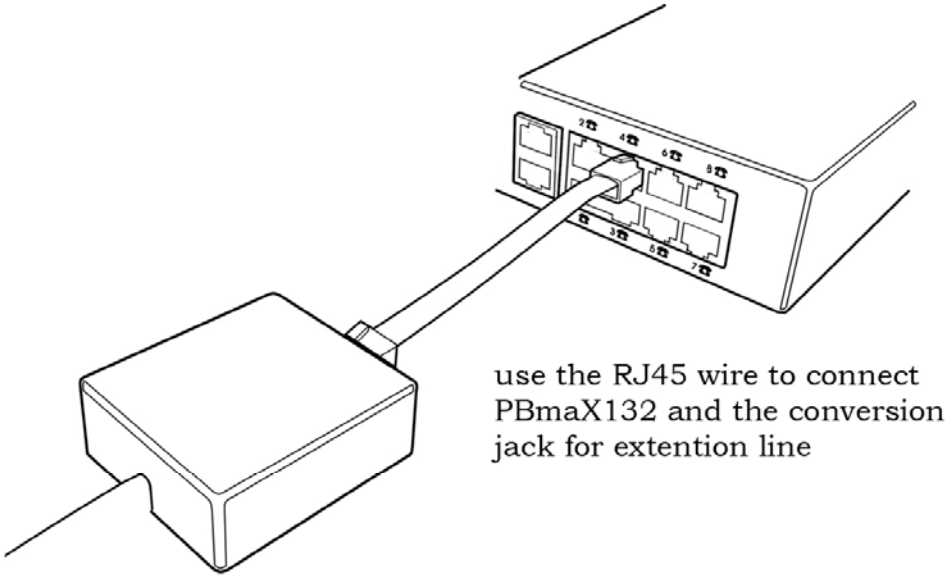
the default connect port of Line is the first port

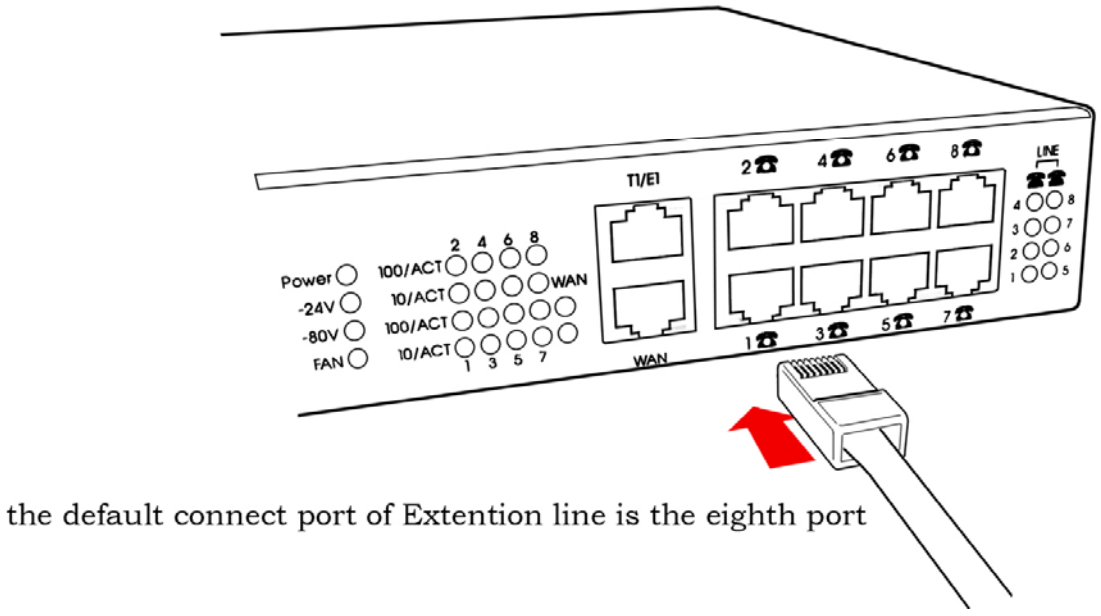
Step 6: Connecting extension lines

Extension lines are also called station lines or inside lines. They are the lines that connect desktop phones to the phone system. Using conversion jacks and RJ-45 cables provided, extension lines can be easily connected to the PBmaX in groups of four.



Using RJ-45 cables, connect each conversion jack to a EXT port on the PBmaX. EXT ports usually start from port 8. For example, if your PBmaX is equipped with 16 extension lines, then connect the extension lines to port 8, 7, 6, and 5. Line 1 in port 8 is the first physical extension, line 1 in port 7 is the fifth extension, and etc.





the default connect port of Extention line is the eighth port

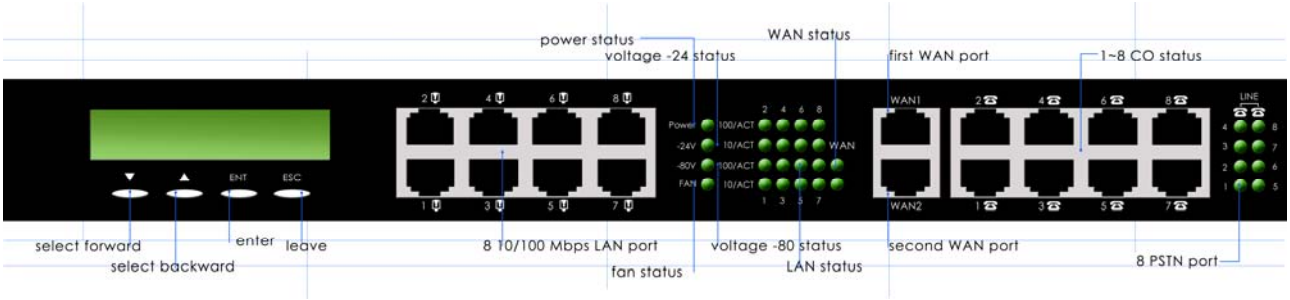
You can now test the following telephone functions.

please dial “#19” to get your extention number

please dial “#xxx” to ring the other extentions

try to get co line by dialing “9 or 0”

PBmaX Front Panel Descriptions



CD Display : For system startup procedure. Use △, △, ENT, and ESC keys to operate

▽: Select next function or digit value

△: Select previous function or digit value

ENT: Enter

ESC: Escape (Quit)

LAN Port
8-port 10/100Mbps Ethernet switch，RJ-45 interface

First WAN Port
10/100Mbps Ethernet NIC，RJ-45 interface

E1/T1 Port
Not Available

PSTN Port
Each port (RJ-45 interface) supports 4 lines of the same type (CO or extension).

Power Status
This light is on when the power is on.

-24V Status
This light is on when the system's loop current circuitry is operational.

-80V Status
This light is on when the system's ring voltage circuitry is operational.

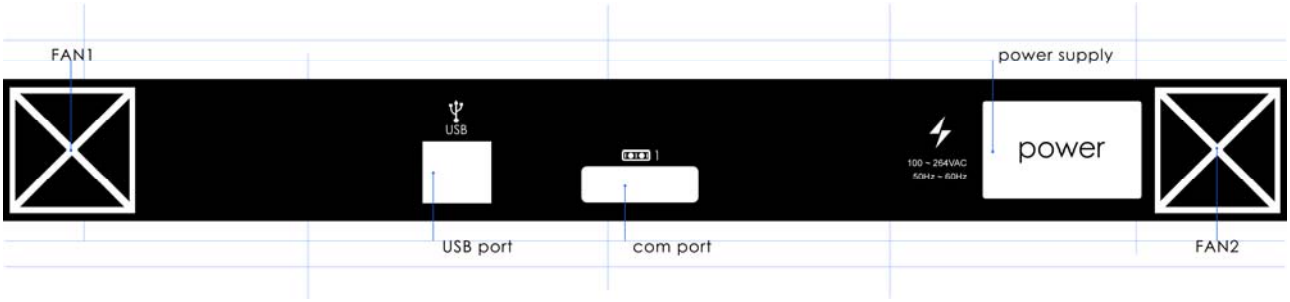
FAN Status
This light turns on if at least one of the cooling fans is not working.

LAN Status
There are two status lights for each LAN port: 10Base-T and 100Base-T. The status light turns on when the link is established, and flashes when data is being transferred.

WAN Status
This light turns on when the system has successfully established a link with the DSL or cable modem.

CO Status
When a CO line is in use, the corresponding status light turns on.

PBmaX Rear Panel Descriptions



FAN1 & FAN2
Two built-in fans.

Power
Power cord connector; 100～264VAC 50～60Hz; power switch legend: ▯ is on, ○ is off.

COM Port
One RS-232 DTE port; DB-9 connector.

USB port:
Two USB 1.1 ports; A type connector.

Startup Procedures

The system goes through the following startup procedures after power on.

Step1

System is ready to start up.

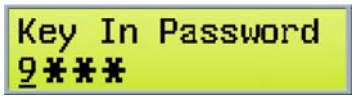
Step2

System is starting up…

Step3

There are 8 slots in the unit. If a slot has a CO module installed, it's represented by a "+". If a slot has an Extension module installed, it's represented by a "*". If a slot has nothing installed, it's represented by a "=". The example shows one CO module and three Extension modules. Since each module consists of 4 Ports, there are a total of 4 CO Ports and 12 extensions Ports in this unit. That's what the first four digits in [04124] represent. The last digit represents the number of VoIP Ports.

Step4



Key in the password to enter the Main Menu. The default password is "9999".

Step4

Use ▽ (select next) and △ (select previous) to move to the desired function, then press Enter to select it.

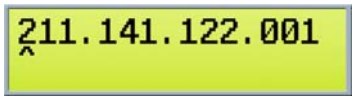
Set WAN IP

Set the first static IP address, which is provided by your ISP.

Step1：

Scroll to this function and press Enter.

Step2：



Enter the static IP address provided by your ISP. For DHCP client or PPPoE, you may enter 192.168.X.X (where X = any) as long as it's not the same as the LAN IP address. Use the arrow keys to change number and move the cursor by pressing enter.

Step3：

This screen appears after entering the IP address.

Step4：

Enter the netmask value provided by your ISP. Use the arrow keys to change number and move the cursor by pressing enter.

Step5：

The system asks for your confirmation.

Step6：

Use the arrow keys to select "Yes" or "No".

Step7：

This screen appears if "Yes" is selected. The Main Menu appears if "No" is selected.

Set LAN IP

Set the LAN IP address.

Step1：

Scroll to this function and press Enter.

Step2：

Enter the LAN IP address. Use the arrow keys to change number and move the cursor by pressing enter.

Step3：

This screen appears after entering the IP address.

Step4：

Enter the netmask value. Use the arrow keys to change number and move the cursor by pressing enter.

Step5：

The system asks for your confirmation.

Step6：

Use the arrow keys to select “Yes” or “No”.

Step7：

This screen appears if “Yes” is selected. The Main Menu appears if “No” is selected.

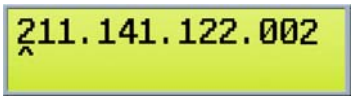
Set Gateway

Set the Gateway IP address, which is provided by your ISP.

Step1：

Scroll to this function and press Enter.

Step2：

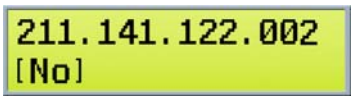


Enter the gateway IP address. Use the arrow keys to change number and move the cursor by pressing enter.

Step3：

The system asks for your confirmation.

Step4：



Use the arrow keys to select “Yes” or “No”.

Step5：

This screen appears if “Yes” is selected. The Main Menu appears if “No” is selected.

Set DNS IP

Set the DNS IP address, which is provided by your ISP.

Step1：

Scroll to this function and press Enter.

Step2：

Enter the DNS IP address. Use the arrow keys to change number and move the cursor by pressing enter.

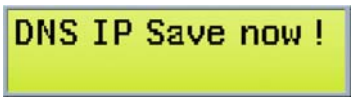
Step3：

The system asks for your confirmation.

Step4：

Use the arrow keys to select “Yes” or “No”.

Step5：



This screen appears if “Yes” is selected. The Main Menu appears if “No” is selected.

ChangePsw

Change the password. The default password is “9999”.

Step1：

Scroll to this function and press Enter.

Step2：

Enter the new password. Use the arrow keys to change number you want and move the cursor by pressing enter.

Step3：

The system asks for your confirmation. Use the arrow keys to select “Yes” or “No”.

Step4：

This screen appears if “No” is selected. If “Yes” is selected, the password will be changed.

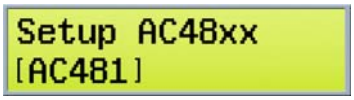
Setup AC48xx

Use this function to configure what type of VoIP module (AC481, AC482 or AC483) is installed inside the unit.If you are changing the VoIP module to a different type for some reason, you must re-configure the unit accordingly.

Step1：

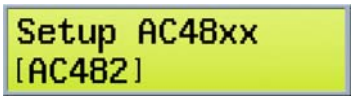
Scroll to this function and press Enter. Then use the arrow keys (▽ and △) to select one of the following VoIP modules.

Step2：



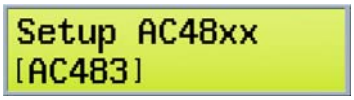
When you see this screen, press Enter if your VoIP module is AC481.

Step3：



When you see this screen, press Enter if your VoIP module is AC482.

Step4：



When you see this screen, press Enter if your VoIP module is AC483.

System Upgrade

Use this function to download and upgrade the firmware.

Step1：

Scroll to this function and press Enter.

Step2：

This message indicates that the unit could not find any upgrade instructions in the remote server.

Step3：

This message indicates that no new firmware update is available at this time.

SerNo

The serial number is for factory use only. The end user may ignore this function.

Step1：

Scroll to this function and press Enter.

Step2：

The serial number is displayed.

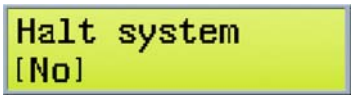
HaltSys

Please halt the system before turning off power.

Step1：

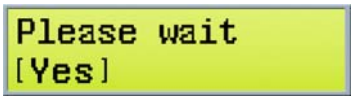
Scroll to this function and press Enter.

Step2：



The system asks for your confirmation. Use the arrow keys to select “Yes” or “No”.

Step3：



Please wait while the system is shutting down.

Step4：

It is now safe to turn off power.

Change LAN IP Address

PBmaX's LAN IP address is factory set at "192.168.168.1". Usually this LAN IP address needs not be changed. If you do need to change it, you may do so via PBmaX's control panel. You will first enter the system's four-digit password in order to gain access to the control panel. Then use the up/down keys to scroll the display until *Set LAN IP* is selected. Now enter the new address and it's done. You may also want to write it down in the spaces below for future reference.

LAN IP Address: _____

After the new LAN IP address is set, you will need to use it in your web browser in order to access PBmaX's setup menu. Don't forget to add ":8000" to the end of the address. For example, if you changed the address to "192.168.0.1", then you need to enter "http://192.168.0.1:8000" in the web brower.

Please note that if, after changing the LAN IP address, PBmaX and your PC are in different domains, then you must re-configure your PC's LAN IP address to the same domain as PBmaX's. Otherwise you will not be able to access PBmaX's setup menu.

System Login

You need to login the system in order to set up configurations. First launch your web browser (e.g. Internet Explorer) then open the login menu by entering the following address:

http://192.168.168.1:8000

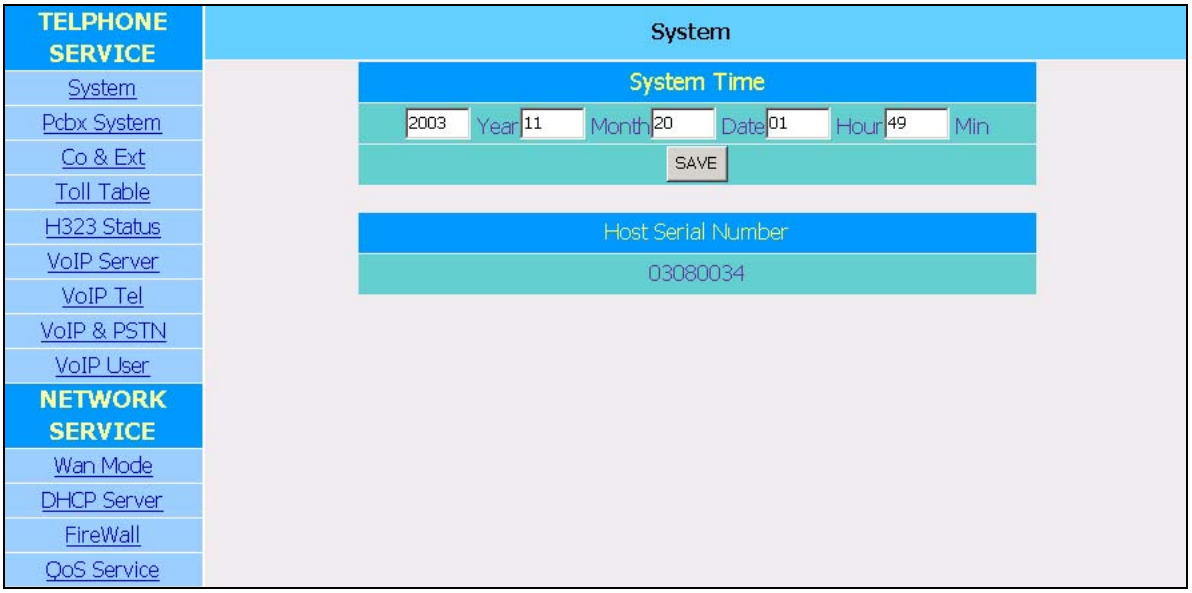
Note that the above address is PBmaX's default (factory set) LAN IP address. You can change it if you want. If you have already changed it, then you need to enter the new address with ":8000" added to the end. For example, if you changed the address to "192.168.0.1", then you need to enter "http://192.168.0.1:8000" to open the login menu. The login menu looks like the following:

Now, enter the username and the password, then click on the *LOGIN* button. The default username is "*PBMAX132"* and the default password is "*1234*". You can change them later if you want. If you do so, please write them down in the spaces below for future reference.

Username: _____ Password: _____

System Menu

After logging in successfully, you will see a window similar to the following:



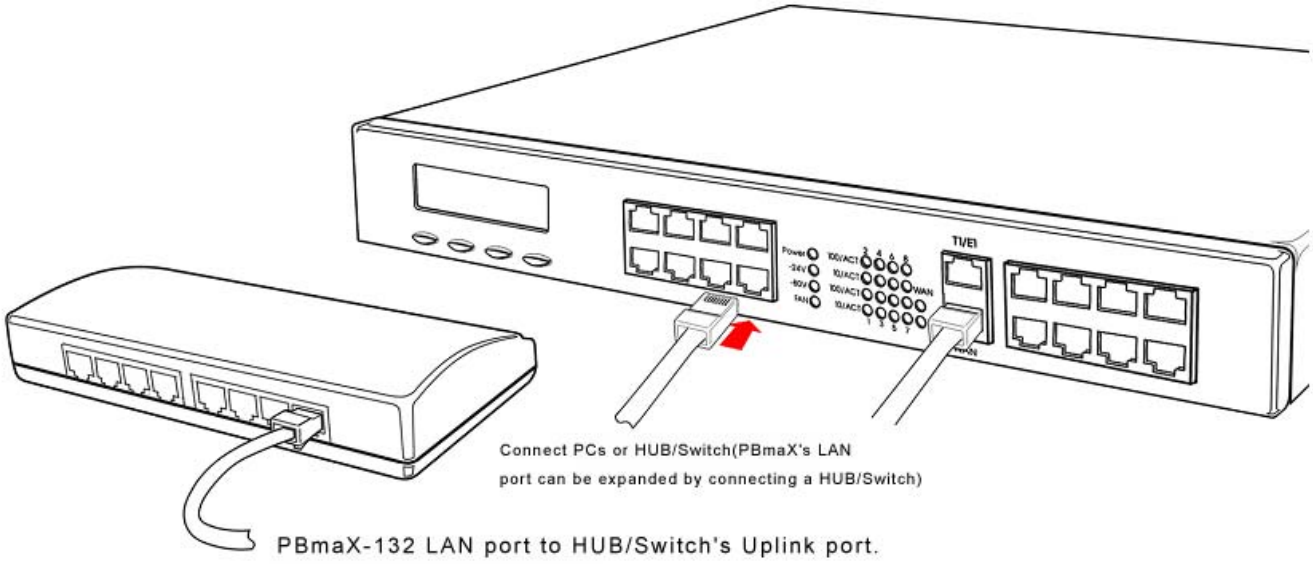
System Time
You may update the system date and time here. Click on the *SAVE* button when you are finished.

Serial Number
This is the hardware serial number for this particular PBmaX unit. This information cannot be changed.

To enter a service's setup menu, click on its name in the left vertical bar. After you finish configuring the system, simply close the browser to exit.

Network Service

PBmaX has one WAN port and eight LAN ports. The WAN port is used to connect PBmaX's internal router to the Internet (or, in general terms, a Wide Area Network), usually via a DSL or a cable modem. The LAN ports are used to connect local computers to PBmaX's internal hub. If eight LAN ports are not enough, one or more of these LAN ports can be connected to external hubs to expand the Local Area Network.



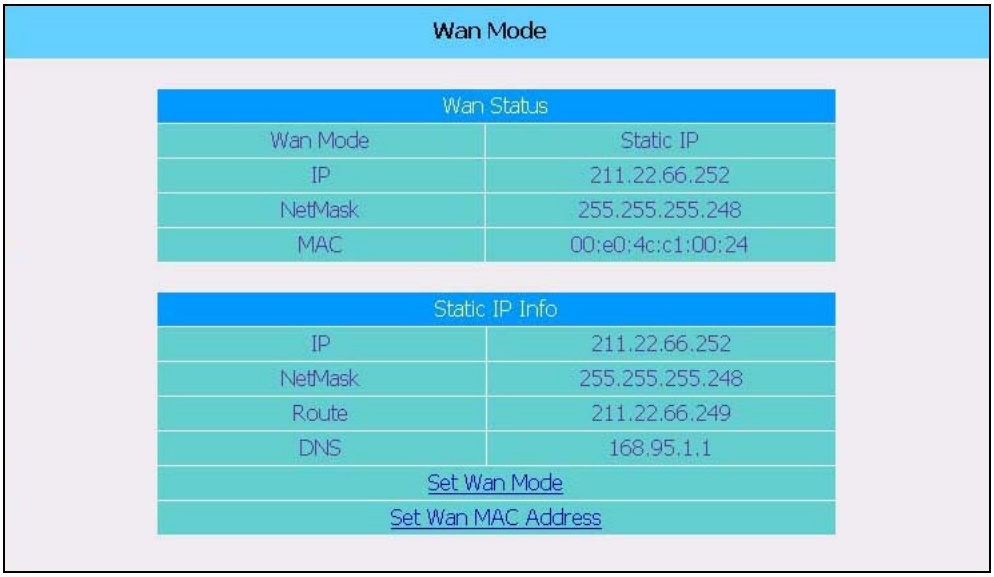
The following network services are provided:

- ***WAN Router***
- ***DHCP Server***
- ***Firewall***
- ***QoS Service***

Detailed technical descriptions on these services are beyond the scope of this manual. If you are not familiar with these services, we suggest that you consult with a network expert or a textbook.

Click on a link in the left vertical bar on the screen to enter the setup menu of that particular service.

WAN Mode



The initial setup menu shows the current settings. Click on a link at the bottom to enter the corresponding setup menu.

Set WAN Mode

There are three possible settings for the WAN mode. If you are not sure which one to choose, ask your ISP (Internet Service Provider) which one of these WAN modes they provide you with.

Static IP
This is usually the mode for connecting to the Internet when you have web servers in your facility. Please use PBmaX's control panel and enter WAN IP, Netmask, and Gateway IP addresses first (these addresses should have been provided to you by your ISP). Then select *Static IP* and click on *SAVE*.

PPPoE
If the PPPoE mode is used, you must enter the Username and the Password (provided to you by your ISP) here. You don't need to set anything via PBmaX's control panel. Just select *PPPoE*, click on *SAVE*, and wait about one minute to allow PBmaX to make the connection. To verify that the settings are correct, click on *WAN Router* (in the left vertical bar) and see if the PPPoE connection has been made successfully.

DHCP Client
Also called Dynamic IP mode, this is the most common mode for connecting to the Internet when you don't have any web server in your facility. You don't need to set anything via PBmaX's control panel. Just select *DHCP Client*, click on *SAVE*, and wait about one minute to allow PBmaX to make the connection. To verify that the settings are correct, click on *WAN Router* (in the left vertical bar) and see if the (dynamic) IP address has been assigned successfully.

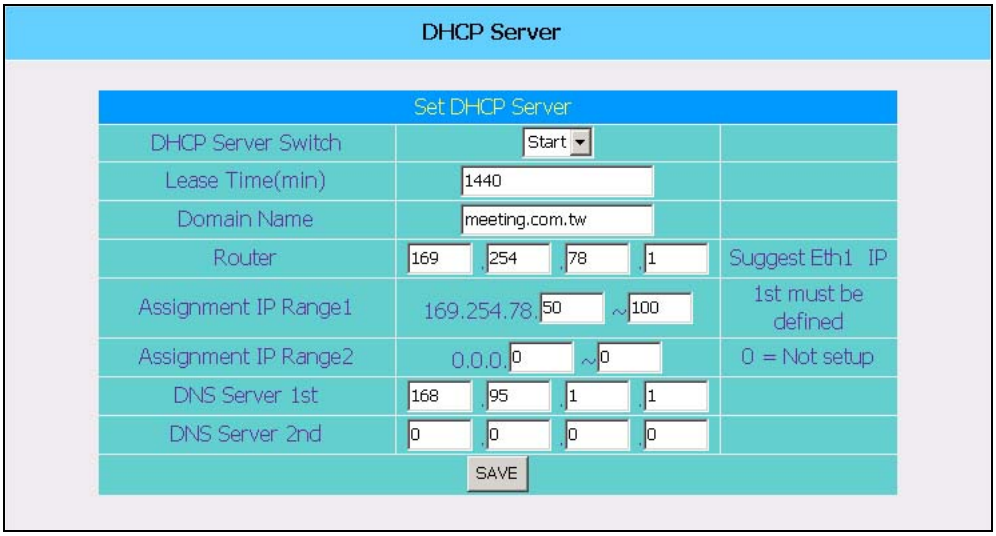
SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

Set WAN MAC Address

In most cases the MAC address does not need to be set manually. However, it may be necessary for some cable modem users to set the MAC address manually. In that case, simply enter the new MAC address and click on the *SAVE* button. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

DHCP Server

PBmaX has a built-in DHCP server that can automatically assign dynamic IP addresses to client PCs connected to its LAN ports, simplifying the task of IP address management. You can set up two IP address ranges for the DHCP server to use – the second range will be used only after the first range is all used up. Being able to set up two IP address ranges makes the system more flexible in terms of IP address usage.



DHCP Server Switch
You may enable the DHCP server by selecting *Start*, or disable it by selecting *Stop*. Make sure all the following parameters are set properly before enabling the DHCP server.

Lease Time
The lease time is measured in minutes. We recommend that you leave the default setting unchanged.

Domain Name
Enter PBmaX's domain name here.

Router IP
Enter the router's IP address here. If you want to use PBmaX's internal router, enter PBmaX's LAN IP address here. If you want to use another router on the LAN then enter its IP address here instead.

IP Address Range 1
Enter the first IP address range here. The values must be within 1 ~ 254, and the end value must be greater than the start value. Note that the first three numbers (unchangeable) should be the same as the first three numbers of PBmaX's LAN IP address. If not, then you must correct PBmaX's LAN IP address setting first.

IP Address Range 2
Enter the second IP address range here. The DHCP server will start to use the second range only after the first range is all used up. If you don't need to use the second range, then enter zero for both the start value and the end value.

DNS Server 1st
Enter the first (or the only) DNS server's IP address here. If this IP address is set incorrectly, your PC will not be able to access web sites via domain names (such as www.yahoo.com).

DNS Server 2nd
Enter the second DNS server's IP address here. This IP address is optional. Enter zero in all four fields if there is no 2nd DNS server.

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

If, after clicking on the *SAVE* button, the system refuses to save the changes (reverting back to the old settings), then you need to request a new IP address for your PC from the DHCP server. To request a new IP address from the DHCP server, follow these steps:

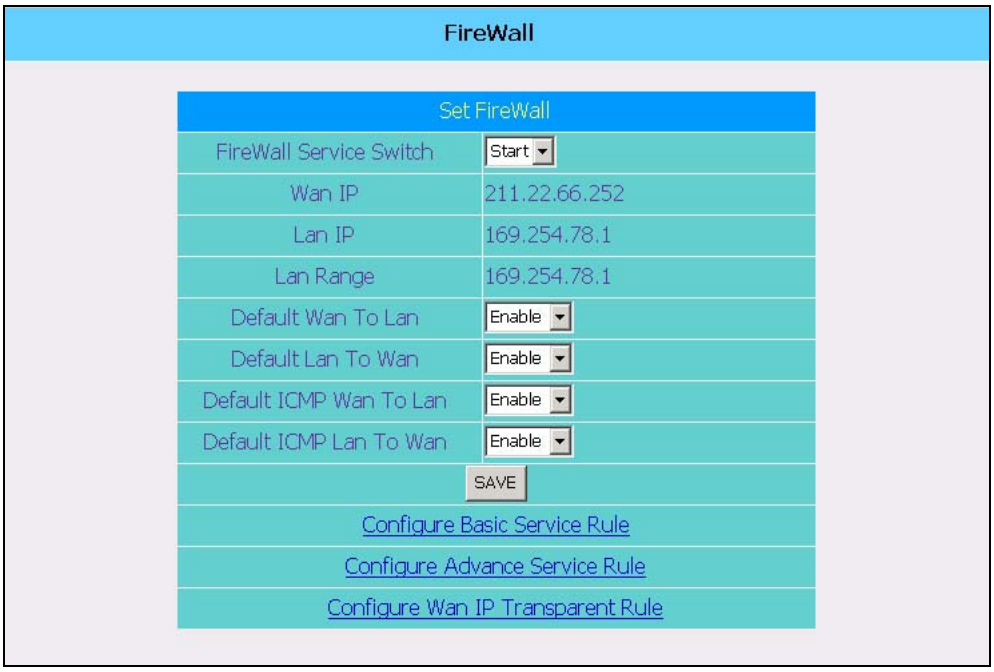
1. Open the Command Prompt window (sometimes called DOS window) from Windows.
2. If you are using Windows 95/98, enter "ipconfig /release_all". After the command is completed, enter "ipconfig /renew_all".
3. If you are using Windows 2000/XP, enter "ipconfig /release". After the command is completed, enter "ipconfig /renew".
4. If you want to know your PC's new IP address, enter "ipconfig".

Firewall

A firewall is designed to prevent unauthorized access to and/or from a private network. It can stop inappropriate communications into and out of the LAN, preventing hacker attacks. PBmaX's built-in firewall provides hardware based network security via the following two mechanisms:

Packet Filtering
Looks at each packet entering or leaving the network and accepts or rejects it based on user-defined rules. PBmaX supports packet filtering on the following packet types: IP, ICMP, TCP, UDP, Port.

Network Address Translation (NAT)
NAT enables a LAN to use one set of IP addresses for internal traffic and another set of addresses for external traffic. It hides internal IP addresses and therefore prevents hackers from probing your LAN. Using NAT also allows you to use an inexpensive, single-user ISP account to provide Internet access for as many computers as you want - a feature often called Internet sharing.



Firewall Service Switch
You may enable the firewall by selecting *Start*, or disable it by selecting *Stop*. Make sure all the following parameters are set properly before enabling the firewall.

WAN IP
If you use static IP mode, make sure PBmaX's WAN IP address shown here is correct. If you use PPPoE or DHCP client mode, PBmaX's assigned WAN IP address will be shown here.

LAN IP
Make sure PBmaX's LAN IP address shown here is correct. If not, you must correct it first.

Default WAN To LAN
Enable or disable all incoming packets except for the ones governed by other filtering rules.

Default LAN to WAN
Enable or disable all outgoing packets except for the ones governed by other filtering rules.

Default ICMP WAN to LAN
Enable or disable all incoming ICMP packets.

Default ICMP LAN to WAN
Enable or disable all outgoing ICMP packets.

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

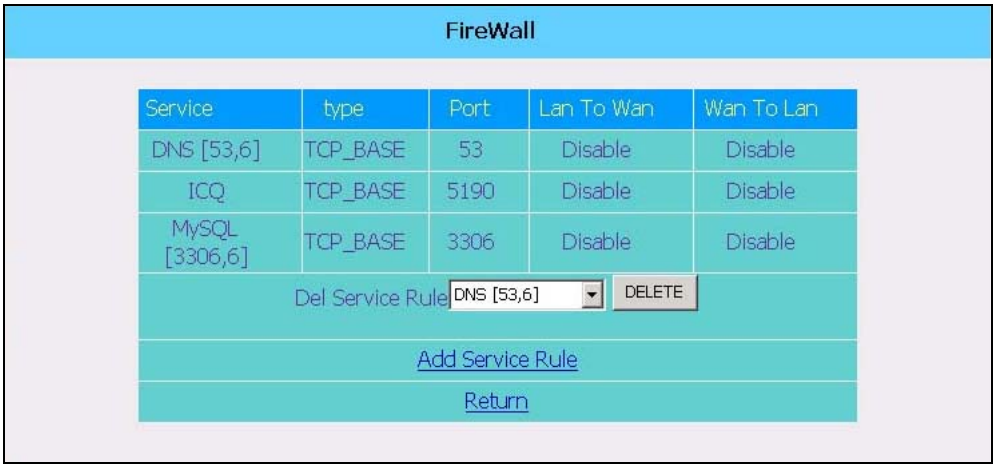
Configure Basic Service Rules
Click here to enter the basic service rules menu.

Configure Advance Service Rules
Click here to enter the advanced service rules menu.

Configure Bypass Rules
Click here to enter the bypass rules menu.

Firewall Basic Service Rules

PBmaX offers a number of known service rules for your convenience. You can also define your own rules easily from scratch. Note that no rules are installed by default, which means security level is at the lowest initially. A good practice for maximum security is to close all the ports and open only the ones that you need. The problem is knowing which ports need to be open in order to allow unhindered network operation.



Service
Displays the name of each installed service rule.

Type
Displays the packet type of the service. Possible packet types are TCP_BASE, TCP_ADD, UDP_BASE and UDP_ADD.

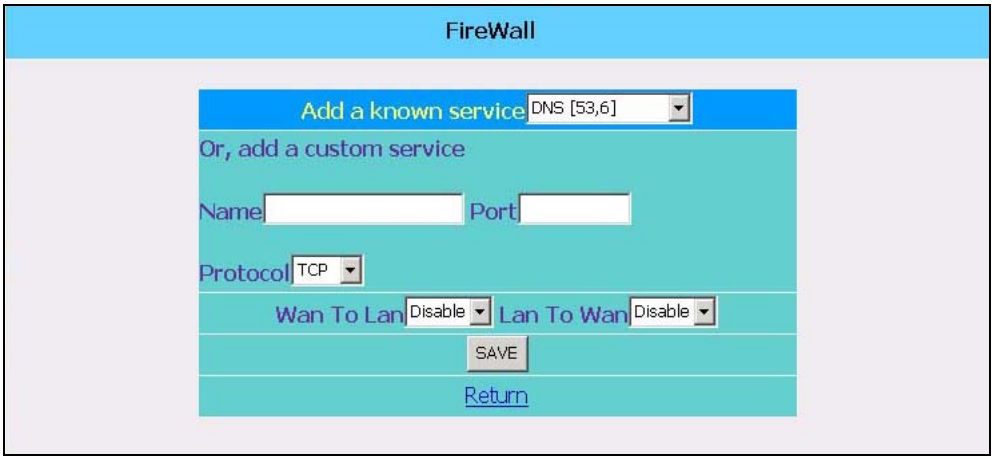
Port
Displays the service port.

LAN to WAN
Displays the setting for outgoing packets – enable or disable.

WAN to LAN
Displays the setting for incoming packets – enable or disable.

Delete Service Rule
To delete a service rule, select it from the drop down list and click on the *DELETE* button.

Add Service Rule
Click here to add service rules. The following window will appear.



Add A Known Service
To add a known service rule, simply select it from the drop down list and click on the *SAVE* button. In the drop down list, the first number after the service name indicates the service number, and the second number indicates the protocol. For example, protocol 6 is TCP, and protocol 17 is UDP.

Add A Custom Service
Enter the following parameters to add a custom service rule.

Name: Enter 8 characters or less and do not start with "_".
Port: Enter the port number.
Protocol: Select the protocol from the drop down list.
LAN to WAN: Enable or disable outgoing packets.
WAN to LAN: Enable or disable incoming packets.

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

CANCEL
Click on the *CANCEL* button to cancel the changes.

Firewall Advanced Service Rules

SN
The service number automatically assigned to the service by the system.

Source IP
Displays the IP address and subnet mask of the source. For example, “192.168.168.1/24” means IP = 192.168.168.1, subnet mask = 255.255.255.0.

Destination IP
Displays the IP address and subnet mask of the destination. For example, “192.168.168.1/24” means IP = 192.168.168.1, subnet mask = 255.255.255.0.

Protocol
Displays the protocol.

Source Service
Displays source service port number.

Destination Service
Displays destination service port number.

Upload/Download
Displays whether the service is upload or download.

Rule
Displays whether the service is denied or not.

Delete Advanced Rule
To delete an advanced rule, select its service number from the drop down list and click on the *DELETE* button.

Add Advanced Rule
Click here to add an advanced rule.

Return
Click here to go back to the previous menu.

WAN IP Transparent (Firewall Bypass) Rules

You can allow certain IP addresses to bypass the firewall, so that the communication is not regulated by the firewall. This is like giving these IP addresses a VIP pass and they can go through the firewall freely.

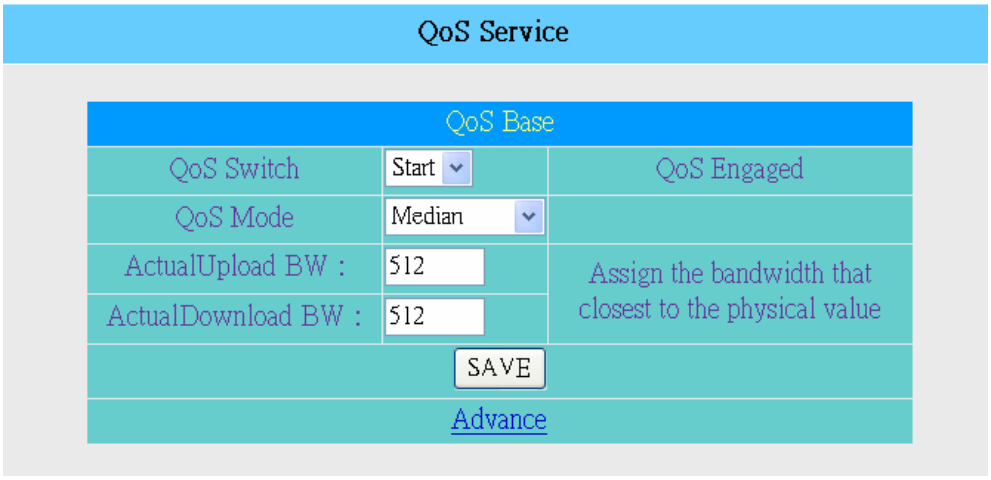
Delete Transparent IP (Delete Bypassing IP)
To delete a bypass IP, select its number from the drop down list and click on the *DELETE* button.

Add Transparent IP (Add Bypassing IP)
Click here to add a bypass IP. Simply enter the IP address in the next window and click on the *SAVE* button.

Return
Click here to go back to the previous menu.

QoS Service

QoS (Quality of Service) regulates the bandwidth used by each network services. Without QoS, it is possible for a single user to take up almost the whole bandwidth for a long time (e.g. downloading a large file), leaving little room for other users. QoS can prevent this from happening and make more efficient use of the available bandwidth. QoS is also needed for certain network services (such as IP phone) where it is essential to guarantee a minimum level of bandwidth in order for the service to be usable.



Note: All bandwidth (BW) numbers shown above are in units of kbit/second.

QoS Switch
Starts or stops QoS.

QoS Mode
Voice Good: voice communication has higher priority
Medium: no priority between voice and data
Data Good: data communication has higher priority

Actual Upload BW
From the drop down list, select the actual upload bandwidth (upload speed). In some cases the actual bandwidth may be smaller than what your ISP claims. Select the closest value based on your real life experience instead of what your ISP claims.

Actual Download BW
From the drop down list, select the actual download bandwidth (download speed). In some cases this bandwidth may be smaller than what your ISP claims. Select the closest value based on your real life experience instead of what your ISP claims.

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

Advanced QoS Standard Rules

PBmaX provides two standard rules: one for H323 (IP phone) and the other for FTP. Usually you want to guarantee a minimum bandwidth for H323 in order to have an acceptable IP phone quality. And you may want to limit the bandwidth for FTP so the network will not perform poorly when someone is uploading or downloading a large file. Note that if "-1" is entered into any BW (bandwidth) field, it means that no QoS is applied to that particular bandwidth. For example, if all four BW fields are entered "-1" for FTP, it means that FTP is not regulated by QoS at all (this is generally not a good idea).

Max Up BW: Maximum upload bandwidth – the service will not be allowed to use more than this bandwidth even if more bandwidth is available. Note that this bandwidth cannot be larger than the Actual Upload BW.

Guaranteed Up BW: Guaranteed upload bandwidth – the service is guaranteed to have this bandwidth available to it no matter how busy the network is. Note that guaranteeing an upload bandwidth for a service may degrade the performance of others since a portion of the upload bandwidth is set aside and not available to other services.

Max Down BW: Maximum download bandwidth – the service will not be allowed to use more than this bandwidth even if more bandwidth is available. Note that this bandwidth cannot be larger than the Actual Download BW.

Guaranteed Down BW: Guaranteed download bandwidth – the service is guaranteed to have this bandwidth available to it no matter how busy the network is. Note that guaranteeing an download bandwidth for a service may degrade the performance of others since a portion of the download bandwidth is set aside and not available to other services.

SAVE

Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

QoS User Rules

Up to ten user rules can be defined. Note that if "-1" is entered into any BW (bandwidth) field, it means that no QoS is applied to that particular bandwidth. For example, if all four BW fields are entered "-1" for a certain rule, it means this rule is not regulated by QoS at all and you might as well delete it.

No.: The rule number automatically assigned to the rule by the system.

Type: TCP, UDP or BOTH (TCP plus UDP).

Use Port: Up to 5 ports can be defined in each rule.

Guaranteed Up BW, Max Up BW, Guaranteed Down BW, Max Down BW: See QoS Standard Rules for definitions on these bandwidths.

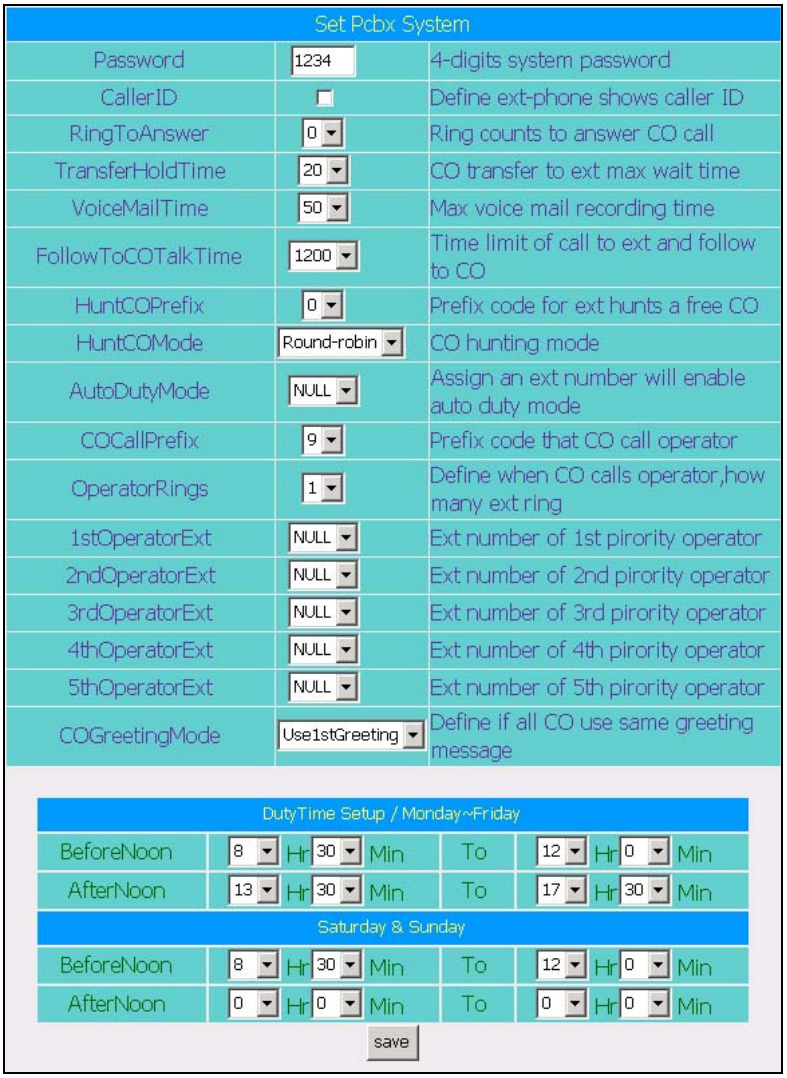
Delete User Rule: To delete a user rule, simply select its number from the drop down list and click on the *DELETE* button.

Add QoS User Rule: Click here to add a user rule.

PBmaX Telephony Functions

PBmaX comes standard with 4 CO ports and 8 extension ports. It is expandable to a total of 32 ports with any CO/extension combination. Basically any analog telephones can be used, but it is better to use telephones with a “Flash” key which generates hook flashes within the range of 100 ~ 700 milliseconds. The Flash key is used in many operations such as transferring a call. Although you can flash the hook manually without using the Flash key, it will be quite inconvenient and subject to timing errors.

PBX System Setup



Password
This is the password used to login the system.

Call ID (Caller ID Pass Through)
Click on the box to enable *Caller ID Pass Through* - a check mark will appear in the box. If *Caller ID Pass Through* is enabled, the system will pass caller ID information through to the extensions. Otherwise, it will not. Click on the box again to disable *Caller ID Pass Through* – the check mark will disappear from the box.

Ring To Answer
Number of rings the system will wait before answering incoming calls.

Transfer Hold Time (Transfer Recall Time)
After being transferred to an extension, if a call is not answered within *Transfer Recall Time* (measured in seconds), the system will cancel the transfer and try to re-transfer the call to either the voicemail box of that extension or the operator, based on the caller's choice.

Voicemail Time (Max. Voicemail Length)
This is the maximum recording time (in seconds) that the caller is allowed to leave a voicemail message. Maximum setting is 50 seconds.

Follow To CO Talk Time (Max. OPF Duration)
This is the maximum duration (in seconds) allowed for an OPF (*Off-Premises Forwarding*). If an extension has OPF enabled, an incoming call to that extension will be automatically forwarded to an off-premises location via a CO line. If the call comes in from a CO line originally, then a total of two CO lines will be involved in establishing this communication link. This is why you may want to put a limit on the duration of an OPF so that it does not tie up two CO lines for an extended period of time.

Hunt CO Prefix (CO Access Code)
This is the code you must dial first to request a CO (outside) line in order to dial out. Your choices are "0" and "9" (recommended). A CO access request may be rejected by the system if no CO lines are available at the moment. In that case, you will hear a busy tone instead of a dial tone. The *CO Access Code* must be different from the *Operator Access Code* (see below).

Hunt CO Mode (CO Access Mode)
When the system receives a CO access request, it selects an available CO line based on *CO Access Mode*. If the mode is set to "Lowest First", then the system will select the idle line with the lowest physical port number. If the mode is set to "Highest First", then the system will select the idle line with the highest physical port number. If you have several CO lines but don't have the "Automatic Rollover" capability, you can set up the system so that the main line will be the last one to be selected for a CO access request. This way the main line will more likely be open for incoming calls.

Auto Duty Mode (Off-Duty Extension)
If the *Off-Duty Extension* is set to "NULL", then the system will always work in the regular mode (also called *On-Duty Mode*). If the *Off-Duty Extension* is set otherwise, then the system will switch to the *Off-Duty Mode* during the off-duty time. In the *Off-Duty Mode*, all incoming (CO and VoIP) calls will be forwarded to the *Off-Duty Extension* automatically. For example, the *Off-Duty Extension* can be assigned to a security guard at night when nobody else is working in the office.

CO Call Prefix (Operator Access Code)
This is the code that a caller dials to get to the operator. Your choices are "0" (recommended) and "9. This code must be different from the *CO Access Code* (see above).

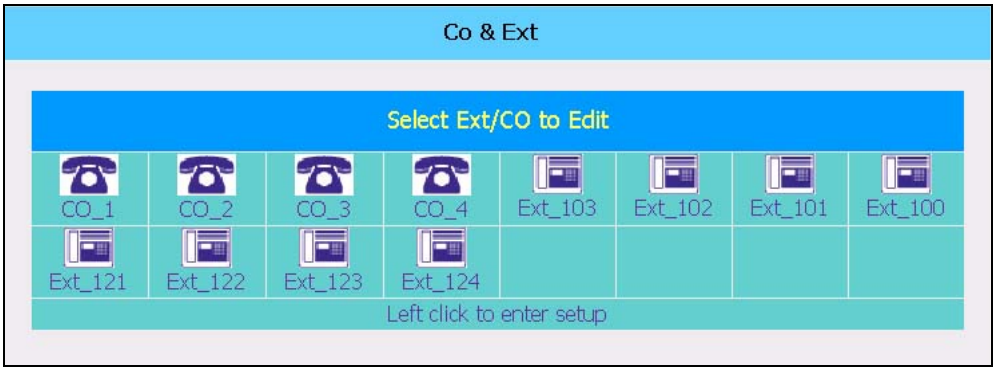
Operator Rings
Define when CO calls operator, how many extension ring.

1st Operator Extension … 5th Operator Extension
Enter up to five operator extensions here. Operators are prioritized. The first operator has the highest priority, which means he/she will be the first operator that the system will try to access. If the first operator is busy, then the system will try the second operator, and etc.

Duty Time Setup
The system works in the regular mode (*On-Duty Mode*) during the duty time, and in the *Off-Duty Mode* outside the duty time. The day is partitioned into two time sections (*Section 1* and *Section 2*), accommodating lunch break and such. Weekdays (Monday thru Friday) and weekends (Saturday and Sunday) are also separated for greater flexibility. Enter the time in the 24-hour format; for example, 17:30 means 5:30 PM.

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

CO & Ext Setup



This menu lists all CO lines and extensions. However, it does not mean that all these lines have physical connections. For an unconnected or unused CO line, you should enter its setup menu and set its operation mode to “Disabled”. This way the system knows which CO line(s) should never be accessed.

The lines are listed in the physical port order, from the lowest to the highest. For example, CO_1 is port 21 and CO_2 is port 22. The first extension listed, although called Ext_103 in the screen shot above, is port 25. Note that “103” is the extension number (assigned by the system manager) for the line connected to physical port 25.

To set up a CO line or an extension, click on its icon.

CO Setup

CO Group
Each CO line can be assigned to one of twenty possible groups. The reason for grouping is so that an extension can be set up to use only certain groups of CO lines for making and/or receiving calls. For example, calls coming in from a certain group can be directed to the service department, while calls coming in from another group can be directed to the sales department. Another example, the sales department can be set up to dial out only through a certain, dedicated group, making call accounting possible.

We suggest that you write down, on a piece of paper, each group number with a reference name of your own creation. For example, 1 = sales, 2 = service, 3 = accounting and etc. You will need this information later when you configure the *Pickup Group* and the *Dial Out Group* for the extensions.

If you are not interested in the benefits of CO grouping, you should assign all CO lines to a single group (e.g. group 1). Note that all CO lines are assigned to group 1 by default.

Answer Mode (Operation Mode)
Each CO line can operate in one of the following modes.

Shutdown: This line is totally disabled – usually used for unconnected CO ports.
Dial In Only: This line can only be used to receive calls.
Dial Out Only: This line can only be used to make calls.
Two-Way: This line can be used to both receive and make calls.
Direct Ring (Ring Through): This line is two-way, but incoming calls on this line will be transferred to the *Ring Through Extension* (see below) directly, bypassing the system's auto attendant.
Voicemail (Ring Through Voicemail): This line is two-way, but incoming calls on this line will be transferred to the voicemail box for the *Ring Through Extension* directly, bypassing the system's auto attendant.

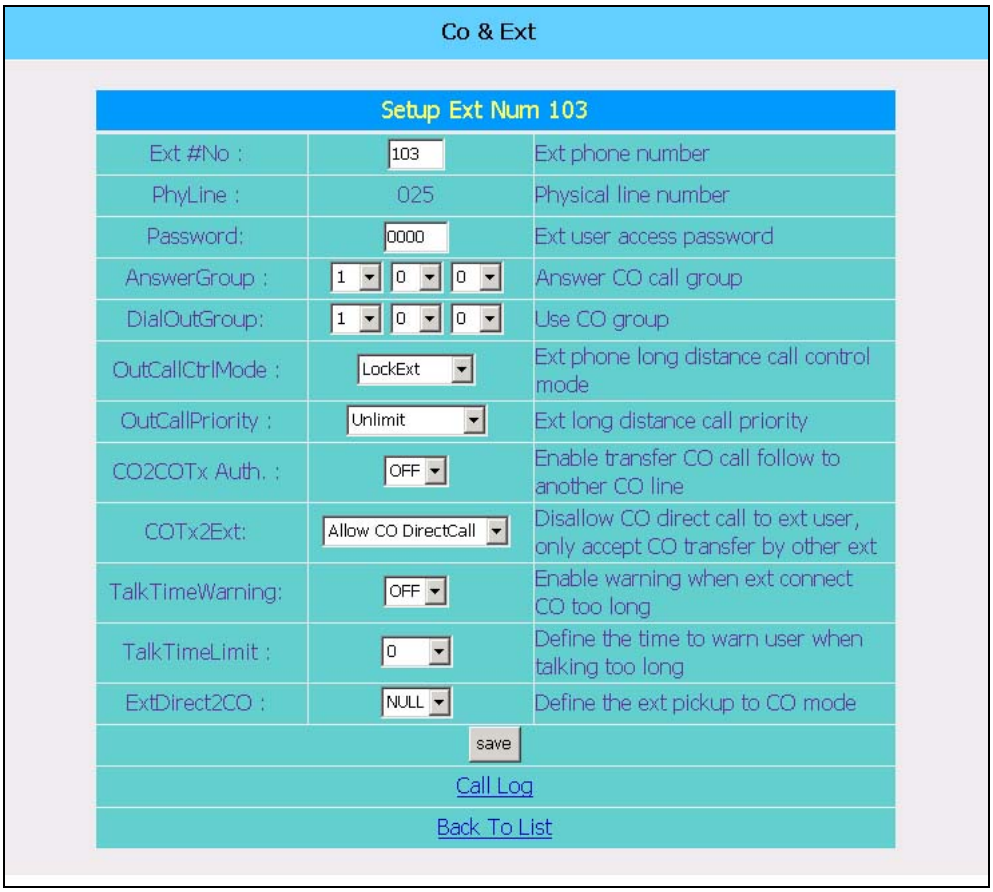
Caller ID
PBmaX supports the following three caller ID types: FSK, DTMF before ring, DTMF after ring. Check with your local phone company to find out which type is used in your area. The caller ID information will be passed through to the extension if *Caller ID Pass Through* function is enabled (see "PBX System Setup").

Ring2Ext/VMail (Ring Through Extension)
Specify which extension the ring through functions will use for this particular CO line.

Disconnect
Click on this button to disconnect the line forcefully, for whatever reasons.

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

Extension Setup



Extension No.
The range is 100~899 and you are free to assign any number in this range to an extension. If two or more extensions are assigned the same number, the system will try to transfer the call to the one with the lowest physical port number first. If that extension busy, the system will then try the one with the second lowest port number, and so on.

Physical Port No.
Displays the physical port number of this extension.

Password
Enter a four-digit number. This password is used in the *Usage Control* function described below.

Answer Group (Pickup Group)
You can configure up to three CO groups from which this extension can pick up calls. Note that “picking up” a call is different from “answering” a call. You answer a call when it is specifically transferred to you. When a call is transferred to someone else and that person is not available, you may “pick up” the call from your own extension by entering a pickup code provided that you both are in the same pickup group. You cannot pick up the call if you both are not in the same pickup group. Enter “0” as the group number means no group is specified. For example, if you enter 3-0-1, it means that this extension can pick up calls for CO group 1 and 3.

Dial Out Group
You can configure up to three CO groups from which this extension can dial out. If all CO lines in these three groups are busy at the moment, then you will not be able to dial out from this extension. Enter "0" as the group number means no group is specified. For example, if you enter 2-5-0, it means that this extension can use only CO groups 2 and 5 to dial out. This feature is often used for call accounting purpose.

Out Call Control Mode (Usage Control)
You can protect the phone with a password so that other people cannot make calls from this extension without your permission. However, there is no control on answering calls – anyone nearby can pick up your phone and answer the call for you.

LockExt: No control at all, anyone can use this extension to make calls.
Password: A person must enter this extension's password in order to make calls.
Virtual User :

Out Call Priority (Toll Restriction)
You can restrict the outward dialing capability with this function if you also set up the *Toll Table*. The *Toll Table* tells the system whether the dialed number is local, domestic long distance or international.

Unlimited: No restriction at all.
No City Call: Only internal dialing is allowed. No outward dialing is allowed.
No Domestic: Only internal dialing and domestic local dialing are allowed.
No International: All are allowed except international dialing.

CO2COTX Auth. (Off-Premises Call Forwarding)
If this function is enabled, all incoming calls to this extension will be automatically forwarded to a preset outside number via a CO line – a second CO line if the call originates from a (first) CO line.

OFF (Disabled): *Off-premises Call Forwarding* is totally disabled.
ON (Enabled): Both internal and external calls will be forwarded.

COTX2EXT (Incoming CO Transfer)
If this feature is enabled, incoming CO calls can be transferred to this extension by the system (via the auto-attendant or the *Ring Through* function). If this feature is disabled, incoming calls cannot be transferred to this extension directly. Therefore, the only way for an outside caller to talk to this extension is to call another extension (which allows *Direct Inward Transfer*) first, and ask to be transferred manually to this extension.

Talk Time Warning (Usage Abuse Reminder)
In order to prevent people from talking on the phone for too long, the system can be set up to play a reminder tone when the *Usage Abuse Time* is reached. The call will then be disconnected forcefully in 30 seconds. This function, however, does not apply to internal communications (extension to extension).

Talk Time Limit (Usage Abuse Time)
Measured in seconds, this is the time the system will wait before playing the reminder tone as described above.

EXT. Direct To CO (Direct CO Access)
If this function is enabled, you can pick up the phone and make an outside call directly without pressing the *CO Access Code* first. In this case, you will need to press the "#" key first in order to access other system features or calling other extensions.

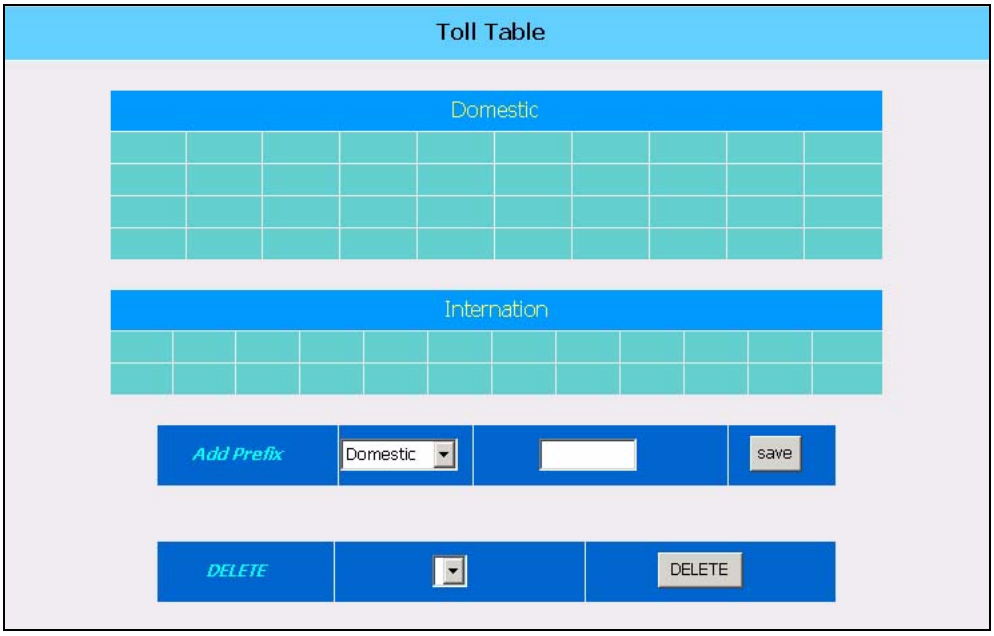
SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

Call Details Log
Click here to access the *Call Details Log*. The *Call Details Log* keeps a record of all outside related calling details (both inbound and outbound) for this extension in the past 7 days. The below is an example.

Back To List
Click here to return to the previous menu listing all CO and extension lines.

Toll Table

If you enable *Local* or *Domestic* toll restriction, you must set up the *Toll Table* so that the system knows whether a outward dialing is local, domestic long distance or international. When entering the prefix digits, do not include the *CO Access Code* - the code that must be dialed before making an outbound call.



Add Prefix
Select either *Domestic* or *International* from the drop down list, enter the prefix in the blank box, and click on the *SAVE* button. Here *Domestic* means domestic long distance.

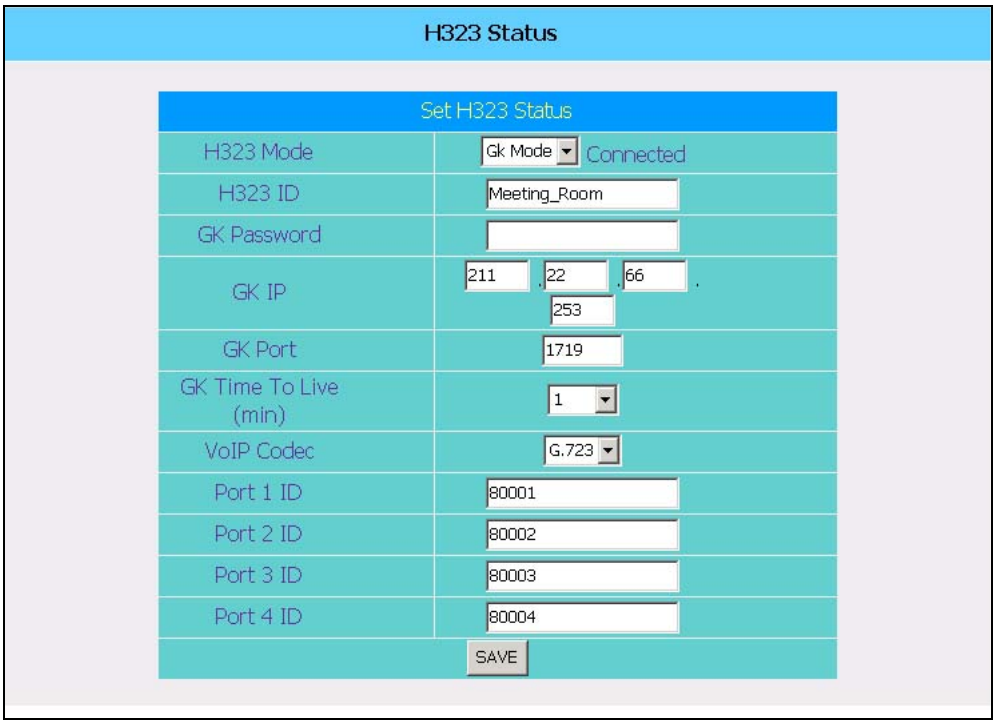
Delete Prefix
Select the prefix from the drop down list and click on the *DELETE* button.

VoIP Status

PBmaX supports the “H.323” VoIP phone standard, but not the “SIP” standard. There are two modes of operation: IP mode and GK (Gatekeeper) mode. The IP mode allows for direct communication and is used when both parties have static IP address. The GK mode is used when at lease one party has dynamic IP address.

To understand how IP phone works, you may think of the IP address as the “phone number” for the IP phone. If your IP address is static then your “phone number” is fixed, and anyone can call you if he/she knows your IP address. But if your IP address is dynamic, then your “phone number” will likely change each time you connect to the Internet, making it difficult for people to call you. In this case, you need the Gatekeeper service.

The Gatekeeper acts like an address translating middleman. Every time you connect to the Internet, your PC will automatically register with the Gatekeeper to let it know about your current IP address. You can then communicate with other members of the same Gatekeeper service.



H322 Mode
Your choices are IP mode and GK mode, as described above. If you select the IP mode, you don’t need to set up any Gatekeeper related items described below.

H323 ID
Enter a name for your own reference.

GK Password
Enter the password that you need to register with (login) the Gatekeeper service. Consult with your Gatekeeper service provider if you don’t know.

GK IP
Enter the IP address of your Gatekeeper service provider. Consult with your Gatekeeper service provider if you don't know.

GK Port
Enter the port used by the Gatekeeper service. Consult with your Gatekeeper service provider if you don't know.

Port 1 ID, Port 2 ID, Port 3 ID, Port 4 ID
Enter the ID for port 1, 2, 3 and 4. Consult with your Gatekeeper service provider if you don't know. Note that, in general, each port ID must be unique.

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

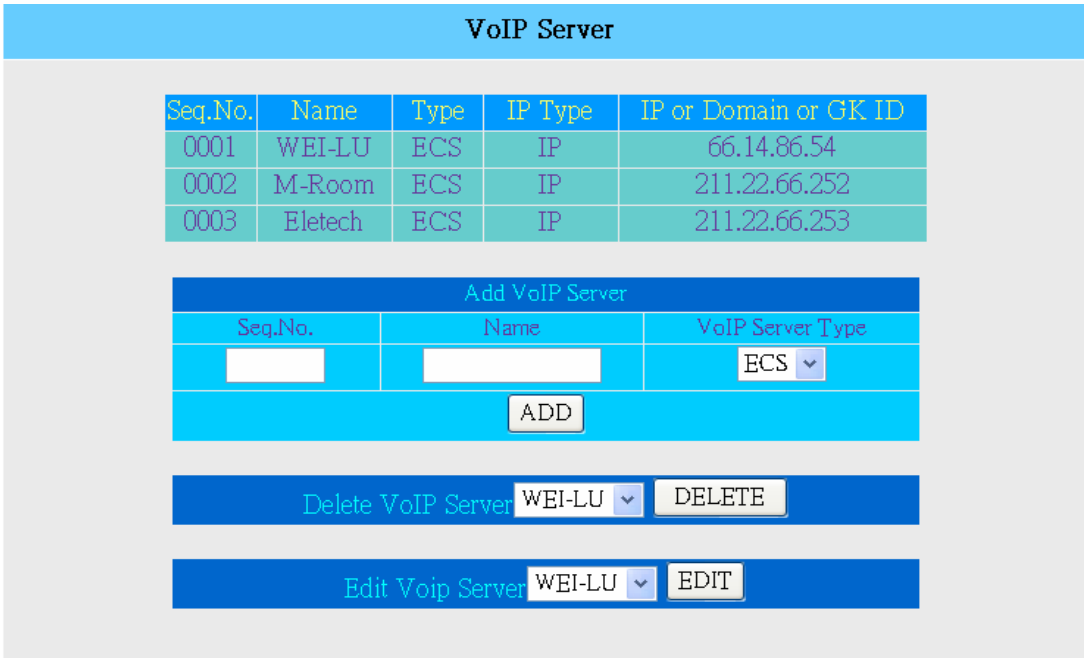
VoIP Server

This is where you enter the details of all the VoIP servers that you want to communicate with. An IP phone call involves two VoIP servers: your PBmaX and the VoIP server at the other end. Both VoIP servers must be in the same mode when communicating with each other. Therefore, in addition to setting up your own system properly, you must also advise the other party to set up their system with the same mode. Here is a description on the three available modes.

ECS (Economic Communication Server) Mode
This mode is unique to PBmaX and requires both parties to have static IP address. If the other party also uses PBmaX, using this mode is highly recommended but not mandatory. When two parties communicate in the ECS mode, their systems know more about each other's capabilities. This mode offers better Off-Net controls.

G/W (Gateway) Mode
This mode requires both parties to have static IP address. This mode is usually used when the other party uses an H.323 system other than PBmaX.

GK (Gatekeeper) Mode
You must use this mode if at least one party does not have static IP address. The call is made through a Gatekeeper service with which both parties are registered.



Add VoIP Server

Entry No.
Assign a unique number to each server.

Server Name
Enter a name for your own reference.

Type
From the drop down list, select a mode to use when communicating with this server. Your choices are ECS, G/W (Gateway) and GK (Gatekeeper).

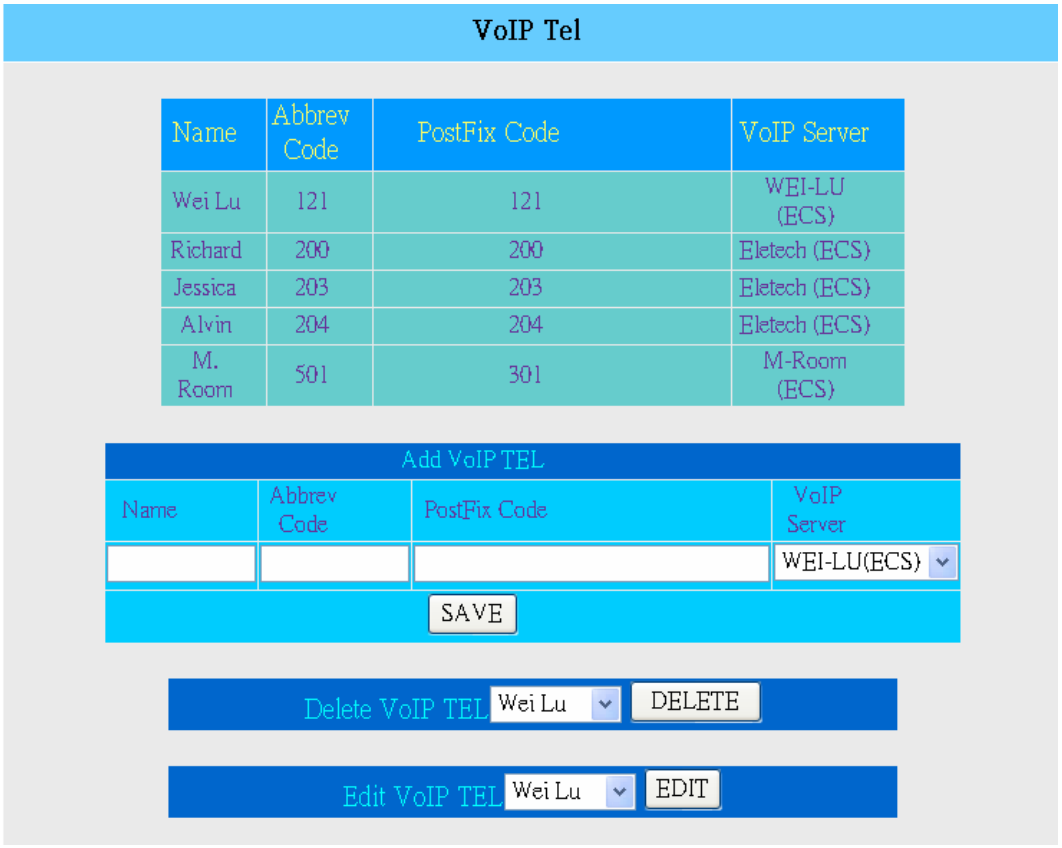
SAVE
Click on the *SAVE* button to add an entry. A new menu will appear for you to enter the other server's IP address or domain name.

Delete VoIP Entry
Select an entry from the drop down list and click on the *DELETE* button.

VoIP Tel. (VoIP Ext.)

Based on the distributed architecture concept, VoIP extensions are off-premises extensions reachable through VoIP servers. You can call a VoIP extension by dialing a simple extension number as if you are dialing a local extension, although the VoIP extension may be physically located in a remote office thousands of miles away. Since the call is established via the Internet, voice quality may be subject to network conditions.

In addition to calling remote offices, you can also use VoIP extension to go Off-Net – a way to make outbound calls from the remote office. The main reason for making Off-Net calls is to save long distance charges.



Name
Enter a name for this VoIP extension.

VoIP Abbreviation Code (VoIP Speed Dial No.)
Assign 3 digits number for this VoIP extension. If this number is the same as a local extension, a call made to this number will ring the local extension first. The VoIP extension will ring only if the local extension is busy at the moment.

Post Fix Code (Post Dialing Code)
The *Post Dialing Code* tells VoIP server in the remote office what to do after the call is established.

If the VoIP server is in ECS mode:

To reach a VoIP extension, enter the extension number here.

If you are calling from a local extension and want to go Off-Net, enter the remote office's *Off-Net Code*. You will be able to make Off-Net calls based on the *Off-Net Privilege Level* of your local extension.
If you want to go Off-Net but you are calling from outside via a CO line, you must enter a proper code based on the *Off-Net Privilege Level* setting of the remote office.

If the VoIP server is a PBmaX in G/W mode:

To reach a VoIP extension, enter the extension number here.

If you want to go Off-Net, enter "9" followed by the required information based on the *Off-Net Privilege Level* setting of the remote office.

If the VoIP server is in G/W mode but not a PBmaX, or if the VoIP server is in GK mode:

Enter the code/information required by the remote office.

VoIP Server
From the drop down list, select a VoIP server to use for this VoIP extension. You should have already set up one or more VoIP servers, otherwise no choices will be available.

SAVE
Click on the *SAVE* button to add the entry. If you want to quit without saving the entry, just click on another link in the left vertical bar or simply close the web browser.

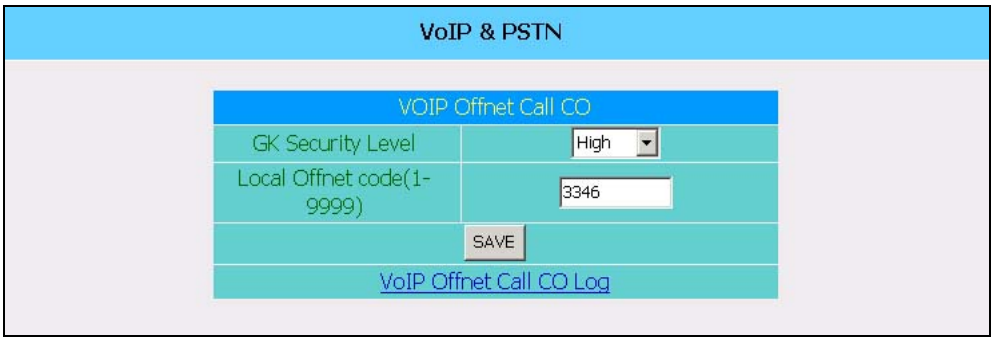
Delete VoIP Extension
Select the extension from the drop down list and click on the *DELETE* button to delete it.

Off-Net Control

In order to save long distance charges, you may want to make a VoIP call to a remote office and then make an outbound call from there. This is called an Off-Net call and you only pay for the call from the remote office to the final destination. An Off-Net call involves two communication links: one from the local office to the remote office via the Internet, and one from the remote office to the final destination via PSTN (a technical term for the conventional telephone network). Although the name says "off", the call is partially on the net.

In other cases, you may want to call the local office from an outside location (such as your home) and then make a VoIP call to a remote office. This is called an On-Net call and you only pay for the call from the outside location to the local office. An On-Net call also involves two communication links: one from the outside location to the local office via PSTN, and one from the local office to the remote office via the Internet. Although the name says "on", the call is partially off the net.

An even more complicated call can be made by going On-Net and then Off-Net. This is called a Via-Net call and you pay for the call from the outside location to the local office, as well as the call from the remote office to the final destination. A Via-Net call involves three communication links and the voice quality may suffer as a result.



GK Security Level (Off-Net Security Level)
Off-Net Security Level controls all incoming Off-Net calls with unknown privilege. An incoming Off-Net call's privilege is known if and only if the call is in ECS mode and originated from a remote extension. All other types of incoming Off-Net calls have unknown privilege, therefore are regulated by this setting.

High
This level requires the *Post-Dialing Code* to be consisted of a "9" followed by a valid *Virtual User ID* and *Virtual User Password*. The Off-Net call will be restricted by the user's toll restriction setting. For example, if the toll restriction of the virtual user is set to "Local", then the Off-Net call can only be made to local numbers. If the toll restriction is set to "Internal", then Off-Net calls are not allowed. Also, people who are not a virtual user of the remote office cannot make Off-Net calls via this office.

Medium
This level requires the *Post-Dialing Code* to be consisted of a "9" followed by the *Local Off-Net Password* (described later). There is no toll restriction for this level. People who don't know the *Local Off-Net Password* cannot make Off-Net calls via this office.

Low
This level requires just a "9" as the *Post-Dialing Code* to make Off-Net calls, and there is no toll restriction for this level. Use this level with caution because it allows virtually everyone to make Off-Net calls.

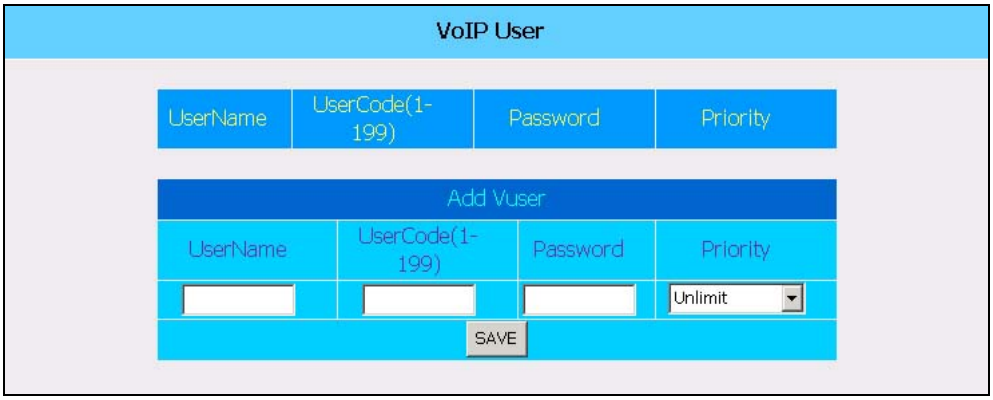
Lacal Off-Net Code (Local Off-Net Password)
Select a four-digit number as the *Local Off-Net Password* which is required to make Off-Net calls when the *Off-Net Privilege Level* is set to “medium” (as described above).

SAVE
Click on the *SAVE* button to apply the changes. If you want to quit without saving the changes, just click on another link in the left vertical bar or simply close the web browser.

Off-Net Call Log
Click here to view a log for all Off-Net calls. The information includes source IP, date, time, duration, and called number.

Virtual Users

Virtual Users are users who want to make Off-Net calls through this office. If the *Off-Net Security* Level is set to high, a non-ECS Off-Net call will be allowed only if the caller is a *Virtual User* of this office. Up to 50 *Virtual Users* can be set up here.



User Name
Enter a name for your own reference.

Virtual User ID
Enter a unique three-digit number, ranging from 000 to 049.

Virtual User Password
Enter a four-digit number, ranging from 0000 to 9999.

Priority (Privilege)
From the drop down list, select a privilege level you want to assign to this *Virtual User*.

SAVE
Click on the *SAVE* button to add the entry. If you want to quit without saving the entry, just click on another link in the left vertical bar or simply close the web browser.

PBmaX Telephone Commands

When an inbound call is received, the system will play the *System Greeting Message* first and then wait 3 seconds. If the caller does not press any key during this entire period (both message playing and waiting time), the call will be transferred to an operator automatically. Otherwise, the system will respond according to the key(s) pressed.

"0" or "9" (whichever the *Operator Access Code* is set to be)
The call will be transferred to an operator.

"*2"
The call will be transferred to the voicemail system.

"100~899"
The call will be transferred to the corresponding extension.

The following commands are available to internal extensions only.

CO Access

"9" or "0" (whichever the *CO Access Code* is set to be)

In order to make an outside call, you must dial the *CO Access Code* to request a CO line first. If the request is granted, you will hear the CO dial tone and you can start making the call. If the request is denied because all lines are busy or the extension is not allowed to make outside calls, you will hear a message to that effect.

Occasionally, you will find the granted CO line actually has an inbound call waiting to be answered – and you just answered it by accident. It is because the inbound call came in at the same moment when the line was granted to you – the system had not the chance to detect the ring yet.

Voicemail Access

"*2" + Mailbox Number +
"1" = leave a message
"2" + Mailbox Password (default value is "0000") +
"1" = hear new messages
"2" = hear old messages
"3" = change password
"4" = change Follow-Me setting
"5" = set Follow-Me number
"6" = hear old conversation recordings
"7" = hear new conversation recordings

When listening to the playback of a message or conversation, you may interrupt it by pressing the Flash key or the Recall key on the phone.

Call Pickup

"8" = pick up within the same pickup group
"0" = pick up calls for other pickup groups
"9" + Extension Number = pick up calls for that particular extension

Call Transfer

Flash + Extension Number = transfer the call to that extension

To transfer a call, first you should press the Flash key to the call on hold. Next, dial the extension number. When the extension answers, you may talk to it before hanging up. The call will not be transferred until you hang up. If the extension is busy without voicemail or does not want to answer this call, you may cancel the transfer by pressing the Flash key again (after your conversation with the extension). The call will then come back to you instead of being transferred to the extension.

If the extension is busy with voicemail, the call will be transferred to its voicemail box automatically. In this case you should hang up the phone immediately and let the caller hear the personal greeting message.

Conference Call

Flash + make a call + two Flashes (within 2 seconds)

First you press the Flash key to place the first party on hold, then you make a call (internal or external) to the second party. After the second party answers, press the Flash key twice quickly to establish the conference call. If the second Flash key is not pressed quickly (within 2 seconds), the conference call will not be established. In this case, no party is lost and you can simply try again.

If, after making the call to the second party, you find out the second party is not available, you can simply press the Flash key once to get back to the first party.

During the conference call, if you press the Flash key once then the first party will be put on hold so that you can talk to the second party alone. You can then press the Flash key again to put the second party on hold and talk to the first party alone. You can keep on alternating between the two parties until you want to re-establish the conference call. At that time you will simply press the Flash key twice quickly.

Personal Speed Dialing

"*4" + Personal Speed Dialing Number (900 ~ 999)

You can configure up to 100 personal speed dialing numbers using *Personal Command Setup* described below.

Public Speed Dialing

"*4" + Public Speed Dialing Number (001 ~ 899)

You can configure up to 900 public speed dialing numbers using *System Command Setup* described below.

Personal Command Setup

Set up or use a personal command by entering the appropriate command code ("#01" ~ "#30") when you hear the system dial tone, and you must do it from your own extension. If your extension has *Direct CO Access* enabled, you must dial "#" first to get the system dial tone.

All command codes not described below are reserved.

#01 = Record Personal Greeting Message

This is the message the caller will hear when a call is transferred to your voicemail box. After the message is recorded, you may press the "#" key (to stay in the system) or simply hang up the phone. If you don't record a personal greeting message, a default greeting message will be used instead.

#02 = Change Follow-Me Setting
0 = cancel, 1 = voicemail, 2 = transfer to internal, 3 = transfer to external

When you are going to be away from your office for an extended period of time, you can use the Follow-Me function to automatically transfer incoming calls to your voicemail box, another extension, or an outside number (such as your cell phone).

When you come back to your office, you may want to cancel Follow-Me.

#03 = Set Follow-Me Number

Enter up to 39 digits, ending with the "#" key. This number is used when Follow-Me function is set to "transfer to internal" or "transfer to external". Be sure to include the *CO Access Code* if it's "transfer to external", unless your extension is *Direct CO Access* enabled.

#07 = Set Message Alarm

Enter two digits each for month, day, hour, and minute in this particular order. When the time comes, the system will ring your extension and play a pre-recorded message. If you don't answer the call in 30 seconds, the system will save the pre-recorded message to your voicemail box.

#09 = Record Phone Conversation

To start recording a phone conversation, first you need to press the Flash key and put the other party on hold. When you hear the system dial tone, press "#09" to start recording. The other party will be put back on the line automatically. To stop recording, simply hang up the phone or press the Flash key again. Maximum recording length is 20 minutes, and the system will only save the last two recordings for each extension. To listen to the recordings, use the *Voicemail Access* commands.

#10 = Answer Call Waiting

If you subscribe to the call waiting service with your phone company, you can answer a call waiting by pressing the Flash key first – this will put the first party on hold. Then, when you hear the system dial tone, press "#10" and you will be connected with the second party. If you want to switch back to the first party, press the Flash key and "#10" again. You can keep doing this to alternate between two parties.

Note that answering call waiting is different at home where no phone system is installed. The line is connected with the CO (central office) directly and you only need to press the Flash key once to answer the call waiting.

#11 = Set Call-Me-Back

If the extension you want to reach is busy, you can use the Call-Me-Back function to automatically notify the extension that you want to talk to it. Simply enter "#11" and the extension number when you hear the system dial tone. When that extension is no longer busy, the system will call and ask it to call you back.

#14 = Verify Speed Dialing Number

After entering the command code ("#14"), you will need to enter the speed dialing number (either public or personal). The system will then tell you the actual dialing string for that speed dialing number.

#15 = Set Personal Speed Dialing Number

Up to 100 personal speed dialing numbers can be set up for each extension. You will need to enter a three-digit speed dialing number ranging from 900 to 999, as well as the actual dialing string ended with a "#". The actual dialing string must be 39 digits or less, and may contain one or more "*" keys. Each "*" in the dialing string creates a two-second delay when dialing.

Note that speed dialing is not password controlled, therefore anyone can call your personal speed dialing number from your phone.

#17 = Date and Time Announcement

Use this command to hear the system announcement of current date and time.

#19 = Who-Am-I Announcement

Usually used by system installers to verify system configurations, this command allows you to find out what extension number this line is set to.

System Command Setup

Set up or use a system command by entering the appropriate command code ("#31xxxx" ~ "#60xxxx", where "xxxx" represents the system password). You can do it from any extension. If the extension has *Direct CO Access* enabled, you must dial "#" first to get the system dial tone.

System commands are usually used by system administrators and that's why the system password is required. All command codes not described below are reserved.

#30xxxx = Change the system password.

#33xxxx = Reset the extension password.

#36xxxx = Set maximum voice mail length, ranging from 20 to 200 seconds.

#37xxxx = Set maximum duration for CO call forwarding, ranging from 100 to 999 seconds.

#41xxxx = Set Public Speed Dialing Number

Up to 899 public speed dialing numbers can be set up for use by anyone in the office. You will need to enter a three-digit speed dialing number ranging from 001 to 899, as well as the actual dialing string ended with a "#". The actual dialing string must be 39 digits or less, and may contain one or more "*" keys. Each "*" in the dialing string creates a two-second delay when dialing.

#43xxxx = Record/Review Off-Duty System Greeting Message

Maximum recording time is 60 seconds. When you are finished, carefully hang up the phone in order to minimize the noise at the end. To review the off-duty system greeting message, enter "#43" alone without the system password. The message will be played after about 2 seconds.

#46xxxx = Set the toll restriction for extension.

#49xxxx = Record/Review On-Duty System Greeting Message

Maximum recording time is 120 seconds. When you are finished, carefully hang up the phone in order to minimize the noise at the end. To review the on-duty system greeting message, enter "#49" alone without the system password. The message will be played after about 2 seconds.

#53xxxx = Change the extension number.