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# FreelineUSA 800™ Series USERS MANUAL

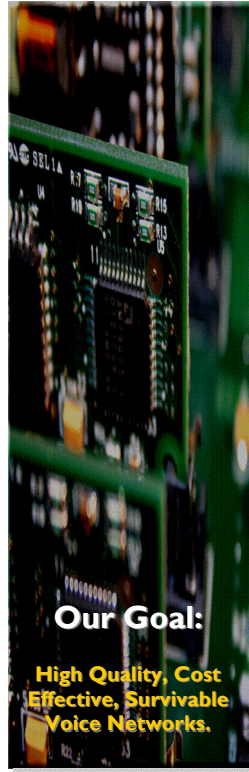
FreelineUSA FL-USA 800™

## Operations and Configuration Guide

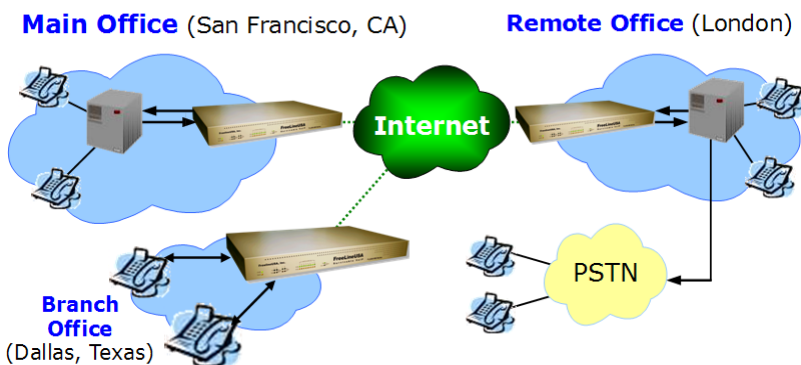
**T**hank You for selecting the FL-USA 800™ Series VoIP System to address your organizations communications needs! The 800™ Series integrated software will allow you to set your own user dialing plan and connect as many as 200 IP networked FL-USA 800™ systems together – all without a centralized server, avoiding any single point of failure in your critical voice network !

FreelineUSA, Inc., a Highlands Ranch, Colorado based corporation, offers the FL-USA 800™ for corporate and government use worldwide. Our software is architecturally designed to be fault tolerant of IP network availability. Through proper configuration and deployment of your new FL-USA 800™ VoIP System, your organization can enjoy the benefits of this uniquely robust VoIP communications system; while saving your company money.

This User's Manual is intended to be used in conjunction with trained engineering support from your Dealer to ensure the highest quality network implementation.



APPLICATIONS



## Table of Contents

Section	Page No.
Sec. 1 Safety FL-USA 800™ Safety Precautions FCC regulatory	2-5
Sec. 2 Features Overview Description FL-USA Features of FL-USA	6-9
Sec. 3 Services Overview H.323 Services PBX-PBX Services Off Prem. Extension	10-11
Sec. 4 Functions Network Settings Basic Functions H.323 Interworking Additional Functions Management Access	12-23
Sec. 5 Installation Power Up System Setting the WAN IP Default Login IDs	24-25
Sec. 6 Configuration H.323 Dialing Peer to Peer Dialing PSTN Dial Back-up Group Calling Option PP versus Group Call Hot-Line Services Stacking two Systems NAT WAN to 800™ NAT LAN from 800™ QOS Traffic Mgt LAN SW Upgrade Process Gain Control DTMF Output Gain	26-51
Sec. 7 LED Status	52
Sec. 8 Cables	53

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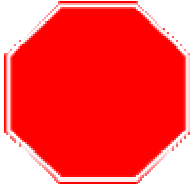
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## Safety Precautions



For your protection, observe the following safety precautions when setting up your FL-USA equipment. ***Your personal safety and protection are our first priority.***



**Caution** - Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.



**Caution** - There is risk of personal injury and equipment damage. Follow the instructions to minimize risk.



**Caution-** If using in an office environment place the equipment on a solid smooth surface. If mounting in rack mount equipment bay or cabinet, first attach rack mount brackets using the included lock-nut screws.



**Caution-** When installing and operating the equipment, follow the safety guidelines provided to prevent serious personal injury and damage.



**Caution-** Do not disassemble, or modify the equipment, unless authorized to do so by trained FL-USA service personnel. Disassembling without removal of the high voltage power supply may cause personal harm and potential electric shock. Disassembly without proper grounding of personnel to eliminate static charges may result in premature product failure. System disassembly and reconfiguration by other than trained FL-USA service personnel is not covered under the standard product warranty.



**Caution-** Connect the chassis ground screw, on the front of FL-USA 800™ series chassis, to solid earth ground when installed for final use. **GROUND EQUIPMENT.**



**Caution-** Place the equipment in a secure place, either on a solid surface or securely mounted with 19" rack mount adapters in equipment bay frame, or cabinet. Otherwise, it could cause personal injury and potentially damage the equipment.



**Caution-** Do not install or use this equipment in wet locations. In the event the unit becomes wet, turn it off, disconnect it from the power source, and contact the FL-USA service personnel for your site. Do not use communications system if wet.



**Caution-** Keep this communication system away from direct sunlight, heat, gas or other flammable substances. While no active fans or filters or used in the FL-USA system, try to limit exposure to fine dust particles. Do not block chassis ventilation ports as the FL-USA system is convection cooled.



### Caution with High Voltage Power supply



For your protection and safety before performing any maintenance on the equipment **be certain the AC power supply cord is disconnected.** While cleaning equipment, be careful not to get the equipment wet and disconnect the power supply from the wall.



**Caution- Do not** work on this system, or connect or disconnect equipment cables, during periods of **lightning activity.**



**Caution-** Always use a standard UL approved AC power cable; otherwise, it may cause a fire. The Universal power supply will accept any AC voltage between 90 Volts and 220 Volts AC, 50/60 Hertz and supply the proper operating current to the FL-USA system. Please use appropriate cable for 220 volt AC.



**Caution-** Do not touch the equipment with wet hands. It might lead to severe electric shock. Do not disassemble the primary switching power supply as this part transmits high current and could cause severe electronic shock.



**Caution-** Do not place objects on top of the FreeLineUSA 800™ System when in use. It might cause the system to overheat or damage the chassis case.

**Please follow all cautions and instructions above, mishandling and improper use of this equipment is not covered under standard warranty and could cause personal harm.**

# Regulatory Approvals



## FCC REQUIREMENT: PART 15 CLASS A DIGITAL DEVICE OR PERIPHERAL

**This device complies with part 15 of the FCC Rules.**

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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 user's receiving antenna.
- Increase the physical separation between the user's equipment and the receiver.
- Connect the equipment into an outlet on a power supply circuit different from that to which user's receiver is attached.
- Consult an experienced radio or TV technician for assistance.

**This device complies with part 15 of the FCC Rules.  
Operation 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 undesired operation.**

**Testing Laboratory:** BWS Tech, Inc. (FCC Registration No. 553281)  
Test Report Part 15: BWS-04-EF-0010 February 18, 2005

## FCC REQUIREMENT: PART 68 This device complies with part 68 of the FCC Rules.

**Testing Laboratory:** EMCC DR. RASEK (FCC No. NGDIS08FL800R)  
Test Report Part 68: 030462B/fc March 1, 2005 AC-REN .08dB RJ11 C

FreelineUSA, Inc.  
 FL-USA 800™  
 Series  
 Complies with FCC  
 Part 15 & 68 Rules

FCC Reg. No. :  
 NGDIS08BFL800R

AC-REN: 0.8dB  
 DC-REN: N/A  
 Connectors:RJ11 C

Final Assembly and  
 Test in U.S.A.



## FreelineUSA FL-USA 800™

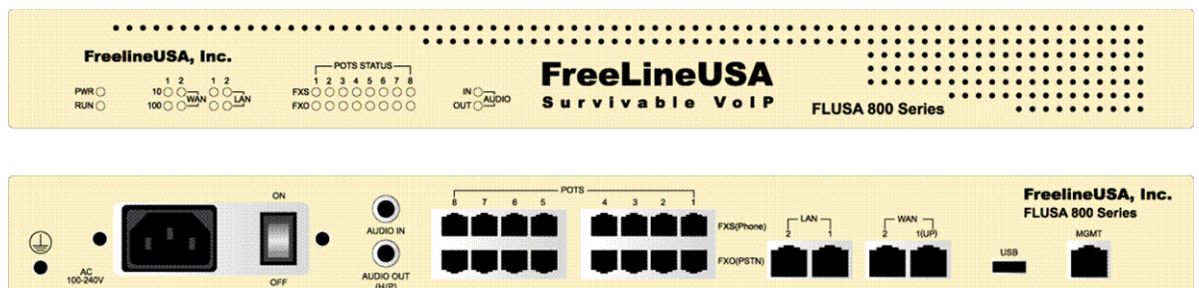
# Description of the FreelineUSA System

The FreelineUSA™ FL-USA 800™ Voice over Internet (VoIP) Communications System.

The FreelineUSA 800™ series of VoIP Gateways provides a fault tolerant environment for IP communications using public or private IP Networks. Operating in a stand-alone mode the system does not require a centralized calling database or centralized Gatekeeper. Each system contains the entire dialing database permitting the user to build a highly resilient and survivable VoIP network without a single point of failure.

The FreelineUSA system also interoperates with many existing H.323 Gatekeepers such as the Cisco Call manager. It allows analog voice and fax communication over an IP network and offers a range of VoIP services when directly connected with traditional analog telephones, fax machines, key telephone systems, PBX and Public Central Office telephone lines. When the Stacking function is enabled the system can provide up to sixteen channels while using only a single IP Address.

Each system permits eight simultaneous phone or fax calls, to or from anywhere, worldwide.





Notes:

## FreelineUSA 800™ Series Features

- ☑ High Quality Voice and Fax service via the Internet
- ☑ ITU Standards Based and H.323v3 compliant
- ☑ Various calling modes are supported
- ☑ Stacking function permits sixteen ports with only one IP Address
- ☑ DHCP server function permits easy IP Sharing with Internal Router
- ☑ Supporting DHCP and PPPoE, as well as, Static IP addressing
- ☑ FXS (foreign exchange station) and FXO (foreign exchange office) Ports
- ☑ Guarantees user's Voice priority with built in Traffic Shaping
- ☑ Automatic 1:1 PSTN fail-over (network congestion, power failure)
- ☑ Straight forward and easy installation
- ☑ FL-USA 800™ is optionally 19" rack mountable

### High quality Voice and Fax service via the Internet

FreeLine offers both analog voice and fax service with its fax auto-detection feature. Each port may be configured to support fax transmission at the optimal rate for your IP Network. The following are the voice compression methods supported.

- ☑ G.711 A-law / u-law— 64 Kbps
- ☑ G.729— 8 Kbps
- ☑ G.723.1 6.3 Kbps\* or 5.3 Kbps (\* default FL-USA 800™ setting)
- ☑ T.38 Fax Relay— note: Auto 64 Kbps on Line that is active with a T.38 Fax Call.

### Standard H.323v3 protocol

FreeLineUSA supports the standard H.323 Version 3 protocol which is the most widely used today. FreeLineUSA 800™ provides high interoperability with many commercial gatekeepers and gateways from leading vendors. The FreelineUSA 800™ simultaneously provides standards based interoperability through H.323 while maintaining its own fault tolerant network dialing plans.

### Various Calling Modes are supported

Various configurations available with the FreelineUSA 800™ series; not only supporting private VoIP telephone service, the system can augment a pre-existing telephone network by interfacing with your organization's PBX and the public switch network. FreelineUSA 800™ series products permit a user to completely bypass existing telephony networks, both public and private, permitting the building of a highly resilient, self contained, worldwide dial voice network; with no additional common equipment, service providers, or centralized call servers required.

Notes:

## Stacking Function

By stacking two of the FL-USA 800™ systems, it is possible to extend support for sixteen voice ports while using only a single IP Address and a single H.323 network ID.

## DHCP Server Function

The FL-USA 800™ Series supports an IP sharing function through its embedded router. As a DHCP Server, it can automatically distribute IP addresses to PCs and other IP devices connected to the FL-USA 800™ via the LAN ports. Therefore, without external hub or router, the user can build a private network using NAT (network address translation) by using the FL-USA 800™ as the GW Router performing the NAT function.

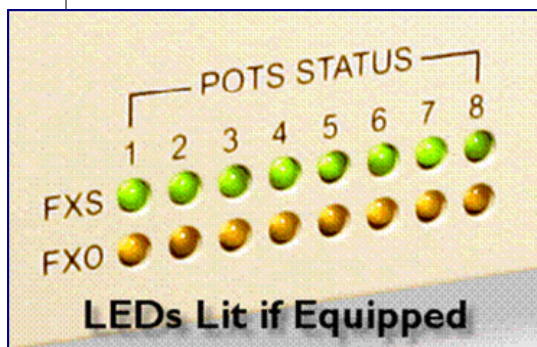
## Supporting DHCP, PPPoE, Static IP

The FL-USA 800™ supports DHCP and PPPoE, as well as, typical static IP configuration. This permits ease of use on a variety of dedicated high speed IP access facilities, ADSL, VDSL, and Cable Modems, or many other options; as the user's IP network access may provide.

## FXS/FXO ports

The FL-USA 800™ supports standard analog interface FXS (Foreign eXchange Station) or FXO (Foreign eXchange Office) ports allowing interface to both phones and PBX or CO telephone lines at the same time. Each port is hardware configurable to support either FXS or FXO or BOTH Port Types at the same time, according to the user's network requirements.

### THE FL-USA 800™ SERIES HAS THREE BASIC PORT CONFIGURATIONS:



1. ALL FXS 8 Port Model: **FL-USA-80RM**  
(Top Row of **Green** LEDs Lit)
2. ALL FXO 8 Port Model: **FL-USA-08RM**  
(Bottom Row of **Yellow** LEDs Lit)
3. Eight FXO and Eight FXS Model: **FL-USA-88RM**  
(If Fully Equipped Both Rows of LEDs are normally Lit)

## PSTN fail-over

In case of IP network failure, or AC power failure, the PSTN fail-over function of the FL-USA 800™ can automatically route user calls over the traditional PSTN network. To support this function the system must be equipped with FXO ports, as well as, FXS ports for the stations.





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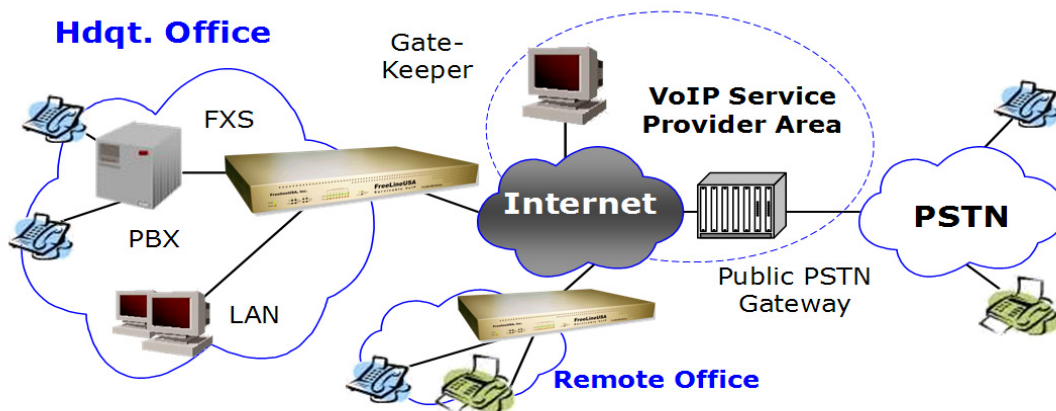
## FreelineUSA 800™ Series Services

- ☑ Service Configuration using Public H.323 call servers. (Public PSTN to VoIP Service)
- ☑ Proprietary Inter-Office Communications. (commonly known as Tandem Tie Trunks)
- ☑ Extension of PBX Services. (commonly known as OPX or Off Premise Extension)

### SERVICE CONFIGURATION USING H.323

The FL-USA 800™ interworks with **H.323 commercial Gatekeepers** of internet telephony suppliers, permitting full replacement of organization's PSTN network using VoIP. Use of this option will require a public internet telephony supplier service subscription.

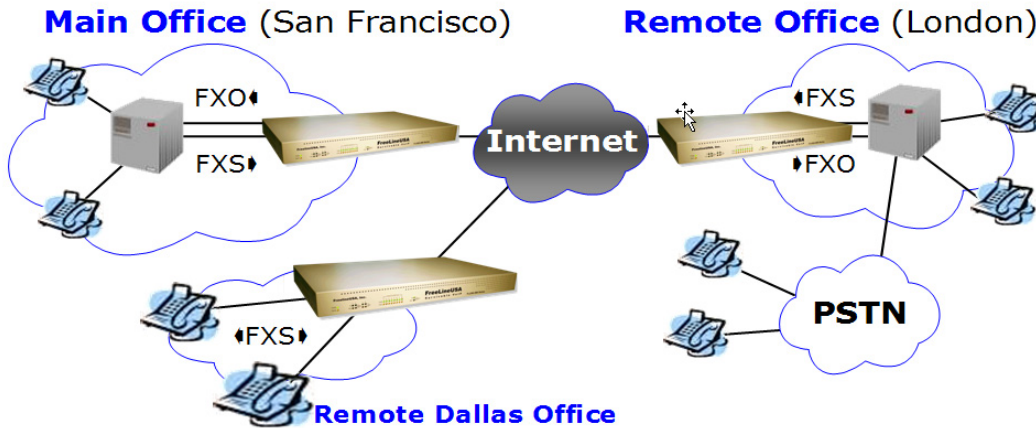
Users accessing the FL-USA 800™ in this scenario are receiving dialing and dial tone from the public VoIP Service providers PSTN Gate-Keeper. User calls originate as IP based VoIP and terminate in the traditional PSTN TDM Network.



Notes:

**PROPRIETARY INTER-OFFICE COMMUNICATIONS**

Without the use of a GateKeeper, users can build inter-office dialing communication networks via the Internet with the FL-USA 800™ VoIP system as shown here. **No service provider is required** other than broadband internet access. Note: the outgoing and receiving trunk lines are split by FXO and FXS to ensure smooth operation in both directions.



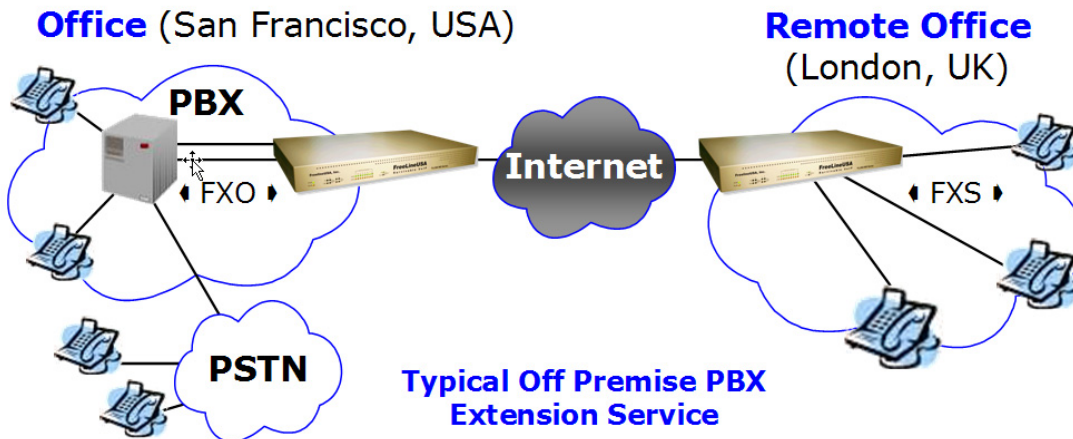
London and San Francisco dial via PBX Trunk Access codes and receive secondary Dial-tone from the PBX in the distant city.

When callers in the Dallas office go off hook, they receive dial tone from the FL-USA 800™ and they then can dial to access the PBX in London or San Francisco.

**EXTENSION OF PBX SERVICES**

At branch offices without a separate PBX or Key System, the FreelineUSA 800™ can be connected to the PBX at your headquarters office, **extending a remote connection** of the PBX extensions to the distant branch office users. This permits services such as voice mail and call accounting to be offered from the main PBX to the remote branch offices, and eliminate intra-company toll charges for Fax and voice traffic.

Local telephone access can be provided in the branch office via traditional PSTN CO lines.



When the remote phone in London goes off-hook if pulls dial tone directly from the PBX in San Francisco.

When the a PBX extension in SFO dials the extension number associated with the London OPX station the phone in London starts to ring.



Notes:

# FreelineUSA 800™ Series Functions

## ☑ NETWORK SETTINGS

Setting the IP Address for FL-USA 800™

Sharing the IP Address via LAN Port

Use via NAT on a Private Network

Voice Priority QOS

## ☑ BASIC FL-USA 800™ FUNCTIONS

Voice Compression Method

Silence Detection

Echo Cancellation

Jitter Control

Audio Gain Control

DTMF Digit Entry Timers

Rotary Dial Pulse Support

Line Hunting

Line Release Mode

Polarity Reversal Signaling Option

## ☑ H.323 INTERWORKING

Interworking Options

H.323 Service Registration

Additional H.323 Interworking Parameters

## ☑ ADDITIONAL FUNCTIONS

PSTN Dial Backup

Subscriber Call Progress Tone Control

Ring Relay Control for OPX Applications

International Progress Tone Control

Prefix or Postfix Dialed Number Modification

Phonebook

Survivable VoIP

## ☑ MANAGEMENT ACCESS

Per Port Calling Service Configuration

Integrated Software Update Capability

Configuration backup Capability



Notes:

Remote System Status Checking

WEB Management Access

## NETWORK SETTINGS

### Setting the IP Address for FL-USA 800™

#### **FREELINE'S IP ADDRESS CAN BE SET THREE WAYS:**

- Manual IP Setting:** The user can manually assign the desired IP address and Gateway Router IP address to the FL-USA 800™.
- DHCP:** When connected to an external DHCP Server via the WAN port, the FL-USA 800™ IP address can be assigned automatically with DHCP. This mode is often used when connecting to Cable Modem services.
- PPPoE:** With PPPoE Server the IP address for the FL-USA 800™ on the WAN port can be assigned automatically with PPPoE. This mode is typically used when accessing the Internet over ADSL using PPPoE.

### Sharing the IP Address via LAN Port

#### **FL-USA 800™ IP SHARING FUNCTION CAN BE USED:**

- FL-USA as NAT ROUTER:** The FL-USA 800™ may be configured as the public edge NAT Router and distribute private IPs (via DHCP) to the user PCs connected to the LAN port. The FL-USA can also direct LAN to WAN traffic based on port tunneling rules as required by network.

**FL-USA 800™ as DHCP Server:** When using the FL-USA 800™ to establish a private network, the FL-USA 800™ can distribute IP addresses via DHCP to user personal computers connected via the LAN port.

- FL-USA behind an External NAT GW ROUTER:** A designated DMZ Zone, virtual server, or Port tunneling may be used in the Gateway Router (out side the FL-USA 800™) to direct traffic to and from the FL-USA 800™ system for voice and data traffic. NOTE: The **Public IP** address of the GW Router must be entered into the FL-USA (NAT Router Entry) to ensure the proper "routable" return IP address is



Notes:

placed on transmitted voice packets.

## Use via NAT on a Private Network

If a NAT gateway router device supports DMZ, Virtual Server, or Port Tunneling, the FL-USA 800™ can be configured to operate within the private IP network. In GateKeeper interworking modes (H.323), availability of this service depends on the capability of your VoIP service provider.

## Voice Priority QOS

Through setting traffic limitations to ensure voice priority, the FL-USA 800™ can guarantee toll quality voice communication.

The FreelineUSA 800™ allows the user to specify the maximum IP data rate that is accepted without traffic shaping from IP network devices attached to the 800's LAN port. If this limit were set for 1,000,000kbps for example, and the WAN side facility were 1,500,000kbps in bandwidth, 500,000kbps will be reserved for IP voice traffic originating from the FL-USA 800™. Simple to set up, and ensures the very highest quality voice in your network even during peak data traffic.



Notes:

## BASIC FL-USA 800™ FUNCTIONS

### Voice Compression Method

The user can choose their preferred voice compression methods. In case that the selected compression methods of calling and called FL-USA 800™ are different, they are subject to change by automatic negotiation between each gateway.

The Default compression method is: G.723.1, 6.3 Kbps per active voice channel

### Silence Detection

**When Silence Detection is Enabled** and there is no voice conversation during a call, the FL-USA 800™ detects this silence, and activates the Silence Suppression function, to reduce the amount of data traffic transferred toward the Internet. Silence Detection is disabled by default, normally used when bandwidth is at a high premium.

**Comfort Noise Generation is automatically activated** according to the option configured for the Silence Suppression function. This ensures the telephone user the communications line is still connected.

### Echo Cancellation

Echo Cancellation is automatic unless Disabled.

### Jitter Control

The user can chose to either activate or deactivate Jitter Control, used to prevent voice quality degradation due to variable voice packet transmission delays.



Notes:

These audio FXS adjustments are ideal for increasing clarity of phone conversations when the user is on a loading dock or guard shack—system flexibility that supports your key applications.

Audio adjustment of the FXO ports permits easy level adjustment of trunk interfaces fine tuning your voice network.

In special circumstances, such as an outside phone in cold weather, dialing intervals may be extended.

#### Rotary Dial Pulse Support:

The FreelineUSA 800 has been successfully interfaced to World war II field phones in Hot-Line, ring down applications. Any telephone set typically works properly with the FL-USA 800- Flexibility to save your organizations budget dollars.

## Audio Gain Control

According to analog interface type, either FXS or FXO, the voice gain for the transmission can be varied as follows:

**FXS Input Gain:** Voice from FL-USA 800™ (FXS Port) → Internet

**FXS Output Gain:** Voice from Internet → FL-USA 800™ (FXS Port)

**FXO Input Gain:** Voice from FL-USA 800™ (FXO Port) → Internet

**FXO Output Gain:** Voice from Internet → FL-USA 800™ (FXO Port)

**Additionally, the actual DTMF Output Gain can be adjusted:** The DTMF signal from Internet is regenerated and emerges from the analog interface of the FL-USA 800™. (**Note:** This applies when the DTMF signal is transmitted out-of-band using the Alphanumeric H.245 message option {normally enabled}, it does NOT apply when DTMF is transmitted in-band as Analog Voice tones.)

## DTMF Digit Entry Timers

This is the same function used with normal PSTN telephones. The user can program the time limits for initial digit entry and the inter-digit interval in seconds.

- First Digit Timeout:** Setting the time in seconds from user Off-Hook to the first digit input. If there is no first digit input during the specified time, the FL-USA 800™ will generate a busy tone.
- Inter Digit Timer:** Setting the time in seconds between each digit input. If there is no digits input within the specified time, it is then considered that all the digits are entered, and your call is initiated.

## Rotary Dial Pulse Support

The FreelineUSA 800™ is designed to support next generation, as well as, legacy networks. As a result, this unique system was engineered to fully support rotary dial pulse phones.





## Notes:

This option when used in conjunction with selection of Group Calling features, distributes the incoming calls so calls are fairly shared within a work group.

Ideal for situations with many incoming sales calls and telephone based customer service applications.

Old telephone equipment, often the case overseas, can cause a call to drop due to poor line supervision, this feature overcomes this problem and ensures your calls will be as reliable as possible for your users.

Older PBX and many coin phones use this unique signaling technique to monitor supervision, The FL-USA 800™ supports this need directly when required by your important applications.. A coin phone provided for the employees in the lunch room may be a good example.

## Line Hunting

The user can decide the sequence of ports to answer when an incoming call has not been directed to a specific port by the remote user dialing a group code. Specific ports must have “Rx Group Call” option Enabled to receive any group calls.

- Sequential:** The port with lowest port number will pick up the call. Each time a new call is received, it will always ring the lowest numbered port first.
- Circular:** The next unused port will pick up the call. For example if port four received the last call, then port five would receive the next call. After this port six would receive the next call.
- Random:** A random port in the group will pick up the call. (UCD)

## Line Release Mode

The user can set the priority order in releasing incoming and outgoing calls. (Used when interfacing to older telephone equipment that may cause accidental drop of calls)

- Normal:** Release the line in case of “On-Hook” by either side.
- Called:** Release the line in case of “On-Hook” by called side.
- Calling:** Release the line in case of “On-Hook” by calling side.

## Polarity Reversal Signaling Option

The user can decide to either activate or deactivate the polarity reversal function that is used to detect call initiation and termination, when FL-USA 800™ is connected to a PBX or Key Telephone System, this signaling is also used with some coin operated telephones.

- Only the FXS interface offers polarity reversal generation.** It reverses the polarity when the call between the calling and called party is established, and when the call is terminated.
- Only the FXO interface can detect polarity reversal.** Call termination according to the polarity reversal signal is also possible when this signaling mode is enabled.



Notes:

## H.323 INTERWORKING

### Interworking Options

When the FL-USA 800™ interworks with commercial H.323 GateKeepers, the following parameters are configured to interoperate with the H.323. Gatekeeper deployed by the Internet Telephone Service Providers (ITSP).

- GateKeeper IP:** The IP address of Gatekeeper and up to two alternate communication ports are configurable.
- Endpoint Type:** According to ITSP's request, the FL-USA 800™ can be registered as a "Terminal" or a "Gateway" as required.
- GateKeeper Discovery:** According to the ITSP's request, the GRQ function of H.323 standard protocol can be activated.
- GRQ Interval:** The sending interval of GRQ message can be configured in the FL-USA 800™.
- RAS Timeout:** The maximum standby time for a correct RAS response from the ITSP's GateKeeper can be configured.
- RAS Retry:** The resending interval time when there is no answer from GateKeeper can be configured.

### H.323 Service Registration

To register the FL-USA 800™ system for commercial H.323 VoIP PSTN Access service, the following parameters should be configured.

- H323 ID:** The unique system ID of the FL-USA 800™.
- E164 Number:** One VoIP identification number (VoIP phone number) can be assigned to the FL-USA 800™ or a separate number for each port can be assigned.



- ☑ **EI64 End Digit:** The End of Digit can be configured. (*\* or # is typical*)
- ☑ **RRQ Interval:** The registration time interval between the Gatekeeper and FL-USA 800™ can be configured.

Notes:

## Additional H.323 Interworking Parameters

- ☑ **RAS Port:** The communication port between FL-USA 800™ and GateKeeper can be assigned.
- ☑ **Q931 Port:** The communication port range used between FL-USA 800s, and between the FL-USA 800™ and other VoIP devices and Gatekeepers can be configured.
- ☑ **RTP Port:** The communication port to send voice signal over Internet can be configured.
- ☑ **Calling Timeout:** The standby time of normal response from the called party when making calls from FreeLine to FreeLine or other VoIP device can be configured.
- ☑ **Answer Timeout:** The standby time of Hook-off on the called side can be configured.
- ☑ **Signaling Mode:** According to the ITSP's needs the FL-USA 800's call processing type can be configured via Signaling Mode Option.
- ☑ **DTMF Relay Mode:** How to send the telephone numbers while making an H.323 GateKeeper call can be configured.

**Calling Time Out:** If normal call supervision is blocked or defective; this feature limits the amount of time the phone will ring unanswered in the remote location.

**H.245 DTMF Relay Mode:** This is usually set to H.245, this mode permits the Touch Tone signals to be passed digitally from the user to the remote end, greatly improving the quality of applications that require use of secondary TT Digits, such as Tandem PBX Trunks and Telephone Banking Applications,

*H.245 is enabled in the FL-USA 800™ by default.*



Notes:

## PER PORT NETWORK ACCESS CONFIGURATION

Every FL-USA 800™ port can be individually configured for various calling services by port. This function permits management of ports on an individual basis, controlling what types of calls the port can make (the TX function) and what type of calls they are permitted to receive (the RX function). This permits incoming call groups to be established, and limits access to outgoing call services to those that are approved for use.

### TX functions.

GateKeeper, Peer-to-Peer (PP), Group, Hotline mode TX

### RX functions.

GateKeeper, Peer-to-Peer (PP), Group, Hotline mode, PSTN backup RX (Incoming WEB calls is a future service selection on this menu)

## INTEGRATED SOFTWARE UPDATE CAPABILITY

The FL-USA supports software upgrades using a TFTP program on connected PC and also has a built in WEB based function to permit easy user updates to the FL-USA software.

## CONFIGURATION BACKUP CAPABILITY

FreelineUSA 800 system configuration information can be downloaded, and uploaded, using the WEB access screens to your personal computer. This allows a number of FL-USA 800™ systems to be configured at the same time, by simply downloading a configuration file.

## REMOTE SYSTEM STATUS CHECKING

FL-USA 800™ to GateKeeper interworking status can be checked remotely via the WEB browser. Operation of each FXS and FXO Port (on Hook/ Off Hook/ Dial Tone/ Call in Progress) may be monitored remotely as well. In addition, the last dialed number, by the port accessed on the FL-USA 800, is displayed to assist in resolving any user dialing issues.

## WEB MANAGEMENT ACCESS

The FL-USA 800™ offers web browser, telnet and serial console user access for ease of configuration and system status check. WEB and Telnet access are password protected and can be disabled for further security if required.

**Calling Time Out:** If normal call supervision is blocked or defective; this feature limits the amount of time the phone will ring unanswered in the remote location.

**H.245 DTMF Relay Mode:** This is usually set to H.245, this mode permits the Touch Tone signals to be passed digitally from the user to the remote end, greatly improving the quality of applications that require use of secondary TT Digits, such as Tandem PBX Trunks and Telephone Banking Applications,

*H.245 is enabled in the FL-USA 800™ by default.*



Notes:

**☑ ADDITIONAL FUNCTIONS****PSTN Dial Backup**

The telephone line connected to an FXO jack on the FL-USA 800™ series can be optionally designated to be recognized as a PSTN backup line or lines. The FL-USA 800™ regularly checks the network condition, and if the IP network is unstable for VoIP voice service, the system can automatically connect outgoing user calls (users connected to the FL-USA 800™ via the FXS jacks) to the integrated PSTN backup ports. This feature requires both FXO and FXS interface cards to be provisioned in the FL-USA 800™ chassis and ensures maximum availability of critical voice services.

For network health monitoring purposes, a router, gatekeeper or a specific IP address can be assigned by the user, the systems ping this address to test IP network.

**Subscriber Call Progress Tone Control**

The FL-USA 800™ can activate or deactivate the dial tone, as well as, the ring back tone heard by the user on each port during a normal call. This function allows support of “HOT LINE” services that automatically dial a remote port, by simply going “Off Hook” on the originating telephone.

**Ring Relay Control for OPX Applications**

The FL-USA can be set to automatically relay the received 20 cycle ring signal, incoming to an FXO port, to a remote FXS port. This function supports Off Premise Extension applications perfectly.

**International Progress Tone Control**

The FL-USA 800™ can configure Dial Tone, Ring back Tone, Busy Tone and RING interval according to requirements of each country. This permits the FL-USA 800™ to mimic telephone systems that the international end user is familiar with when placing calls. Each user can hear the call progress tones they expect and are familiar with.



## Prefix or Postfix Dialed Number Modification

A designated number can be automatically attached as a prefix or a postfix to a specific calling number. Substitution of digits is also supported; applications include the elimination of the need to dial the local area code, long distance access code, or country code, when making an H.323 Gatekeeper call. *(This unique feature may be used to automatically dial 9 for an outside line when attached to a PBX, or include the local area code so your user will only need to dial the seven digit number, may also dial the billing codes and special access numbers for your VoIP service provider, use in the H.323 mode only)*

## Phonebook

With its internal phonebooks stored in Flash Memory in every FL-USA System, the FL-USA 800™ can communicate with other FL-USA systems in a VoIP network formed with a maximum 200 distributed FreelineUSA 800™ Systems.

Phone books for your OWN system are labels “OWN”. Remote FL-USA 800™ locations are identified by user number entries in user configured software phonebooks numbered 1 through 199.

## Survivable VoIP

The FL-USA 800™ Architecture leaves no central point of failure as user VoIP calls are set up on a *peer-to-peer* basis between FL-USA 800™ systems when using the internal user defined phone books. The system administrator can create a highly resilient, fully distributed and survivable VoIP network, for mission critical voice and fax communications. No centralized database is used to translate the users dialed numbers to a valid IP Address and Port. IP facilities can be optic, copper, microwave based.

This fully distributed, survivable VoIP capability is unique to the FreelineUSA 800™.

See side bar for details

Notes:

**What Makes the FL-USA 800™ survivable- compared to other voice communications systems?**

- (1) No Centralized database for translation of the called number to a valid IP Address is required. The FL-USA 800™ is 100% self contained.
- (2) (No Moving parts in the system; no hard-drive, no fans, integrated automatic voltage adjustable universal AC power supply.
- (3) Worldwide voice connectivity with no service provider to pay.
- (4) All calling parameters and dialing database is stored in non-volatile Flash ROM.
- (5) Only the transmitting and receiving FL-USA need to be active to make voice calls- no third parties are required.



Notes:

## MANAGEMENT ACCESS

### Per Port Calling Service Configuration

Every FL-USA 800™ port can be individually **configured for various calling services by port**. This function permits management of ports on an individual basis, controlling what types of calls the port can make (the TX function) and what type of calls they are permitted to receive (the RX function). This permits incoming call groups to be established, and limits outgoing access to those ports that are pre-approved to use these voice services.

#### **TX functions. (transmit services)**

GateKeeper, Peer-to-Peer (PP), Group, Hotline mode TX

#### **RX functions. (receive services)**

GateKeeper, Peer-to-Peer (PP), Group, Hotline mode, PSTN backup RX  
(Incoming WEB calls is a future service selection on this menu)

### Integrated Software Update Capability

The FL-USA supports software upgrades using a TFTP program on connected PC and also has a built in WEB based function to permit easy user updates to the FL-USA software. Simple software upgrades to ensure the latest features for your use in your FreelineUSA VoIP network.

### Configuration backup Capability

FreelineUSA 800 system configuration information can be downloaded, and uploaded, using the WEB access screens to your personal computer. This allows a number of FL-USA 800™ systems to be configured at the same time, by simply downloading a configuration file.

Phone books may also be downloaded, modified, and uploaded into the system, making administration of multiple phonebooks easier for the user.



Notes:

## Remote System Status Checking

FL-USA 800™ to GateKeeper interworking status can be checked remotely via the WEB browser. Operation of each FXS and FXO Port (on Hook/ Off Hook/ Dial Tone/ Call in Progress) may be monitored remotely as well. In addition, the last dialed number, by the port accessed on the FL-USA 800, is displayed to assist in resolving any user dialing issues. With full remote WEB access your ability to troubleshoot user issues is greatly simplified.

By remotely logging onto the system you can monitor call progress and ensure the users of maximum uptime.

## WEB Management Access

The FL-USA 800™ offers web browser, telnet and serial console user access for ease of configuration and system status check. WEB and Telnet access are password protected and can be disabled for further security if required.

WEB, Telnet and RS-232 Management interface is supported to easily configure and deploy the system.





Notes:

**CONNECT THE AC POWER CABLE**

Using the supplied 110 or 220 Volt AC power cable, connect cord to a properly grounded AC power outlet and turn on the power switch.

**CHECK THE CONDITION OF FREELINE**

Check condition of the FL-USA 800™ using the LEDs on the front panel.

- PWR:** ON Green LED is LIT (Power is on)
- RUN:** ON Yellow LED is LIT (system is fully booted)
- Loaded FXS/FXO cards and the LED status indications for the FXO and FXS ports will match. (If not check, I/O Boards)

**CONNECT LAN CABLE TO WAN (UP) 10/100) PORT****NETWORK CONFIGURATION**

To configure the IP address of FL-USA 800, choose one of these options.

- Web browser:** Connect FreeLine to PC via the **WAN (up)** Port using a 10/100 Hub and change the IP address of your PC to "192.168.0.1". Access the FL-USA 800™ and configure the IP address. This option is only available when user knows the current IP address of the FL-USA 800. Typical default IP address is 192.168.0.110.
- Login as *User* :**manager** Default *Password*: **FL-USA**
- Console:** Connect FL-USA 800™ to your PC using the RJ-45 to DB9 cable provided with the unit. Open HyperTerminal on your PC, set to 38.4 kbps, no parity and no flow control. The FL-USA 800™ will present a **freeline>** prompt, enter **wan stat** to obtain the current IP Address for the WAN port. Then configure the IP address. This option is always available regardless of knowing IP address of the FL-USA 800. Enter **manager**, then **FL-USA** to enter manager mode.

**CONNECTING SUBSCRIBER LINES**

Connect subscriber lines according to the installed FXS and FXO cards.

**NOTE: Misplaced subscriber lines may damage the FXO/FXS I/O modules.**

Devices can be connected to FL-USA as follows:



Notes:

**Note:** Don't lose your password if you chose to change it. The only way to access the system without it is to reboot the system from **default** settings, this will cause the loss of all user entered information other than the IP Address. The user set password cannot be accessed by the manufacturer.

## DEFAULT FL-USA 800™ IP ADDRESS AND ACCESS

The default configuration of FL-USA 800

### WAN/LAN Address configuration

WAN default address is **192.168.0.110**

### LAN address configuration

IP Address : **192.168.6.100**

Subnet Mask : **255.255.0.0**

#### [user settings]

Manager Logging in: ID = **manager** [\_\_\_\_\_]

Password = **FL-USA** [\_\_\_\_\_]

User Logging in: ID = **user** [\_\_\_\_\_]

Password: = **FL-USA** [\_\_\_\_\_]

### VOICE SERVICE CONFIGURATION

**Decide what voice services you will need to support**

The WAN port IP Address may be set for DHCP (such as when you use a cable modem), Static or PPPoE (typical with ADSL) as your needs require. By default the FL-USA 800™ is configured with a static IP Address set to **192.168.0.110**. By default it expects the gateway router to be at **192.168.0.1**.

**Decide on an adequate FreelineUSA 800 service type** according to your businesses needs. You may require public VoIP Gatekeeper service, Port to Port calling, Group Calling or some combination of these potential services. You may chose to use the Public Telephone network as backup for your VoIP Services, these are options you can chose based on your needs.



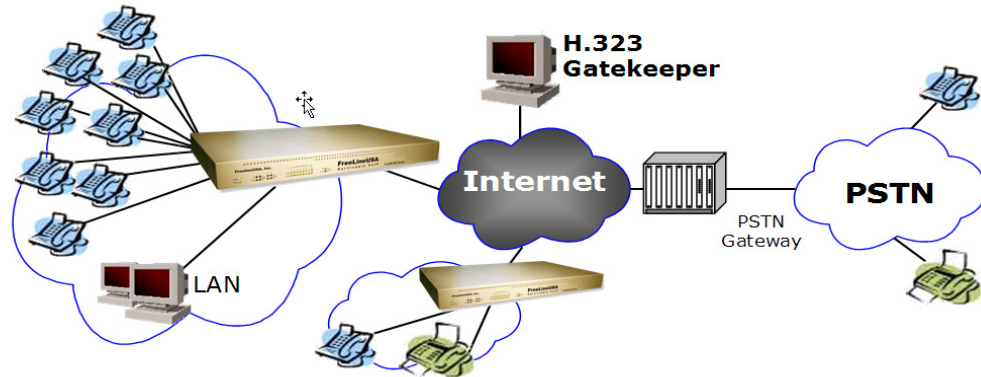
**LOGGING ON  
TO SET-UP  
YOUR FL-USA  
800™ SYSTEM.**



Notes:

**H.323 GATEKEEPER INTERWORKING SERVICE CONFIGURATION**

To place calls using H.323 to the PSTN using the FL-USA 800, an internet telephony service provider using an H.323 Gatekeeper is required; as shown in diagram below.



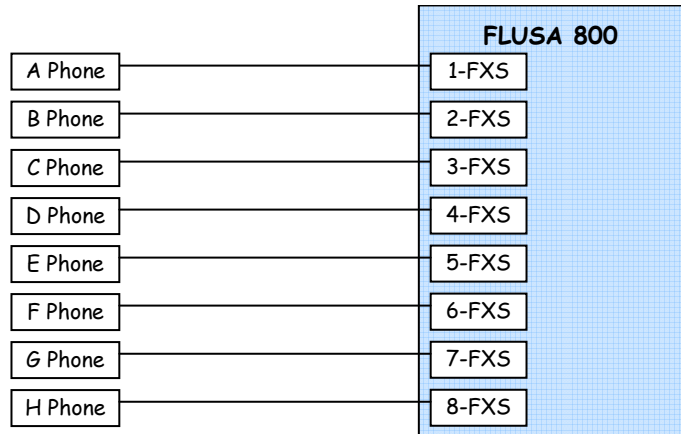
An example of FL-USA 800™ configuration for H.323 interworking:

**NETWORK CONFIGURATION**

This figure shows the Gatekeeper interworking service using the FL-USA 800™ with 8 FXS ports.

**HW CONFIGURATION**

For this configuration an FL-USA 800™ with 8 FXS ports is required.



**CHECK LISTS FOR GATEKEEPER INTERWORKING SERVICE**

To deploy GateKeeper interworking service, subscribe to the VoIP service from a public Internet Telephone Service Provider (ITSP).

**GATEKEEPER IP ADDRESS**

**H323 ID:** FreeLine’s unique ID registered at a GateKeeper



**Endpoint Type:** FL-USA 800™ registration type. Select “Terminal” or “Gateway” when applying for the VoIP subscription

Notes:

**E164 Number:** Subscriber telephone numbers. For “Terminal” type, only 1 E164 number is released. For “Gateway” type, each FL-USA FXS port has different E.164 number. An E164 End Digit, Either “\*” or “#” is assigned for the E164 End Digit. Refer to the service provider for the relevant information.

**PORT CONFIGURATION**

Setting POTS and Port Mode as the figure below, at [Configuration] – [Voice Port] in WEB MANAGER mode.

This indicates the system will permit calls via a public Gatekeeper (GK)

**POTS:** Setting the type [FXS, FXS+PSTN] for each port.

**Note:** The new settings for POTS selections will be applied when the FL-USA 800™ system re-starts.

**Port Mode:** Used for Setting the purpose of each port.

TX and RX for GK should be checked both WAYS (Transmit and receive calls can be made via the Gate-keeper)

The screenshot shows the 'Voice Port' configuration page in 'Manager Mode'. It is divided into two main sections: 'POTS' and 'Port Mode'.

**POTS Configuration:** A vertical list of 8 ports, each with a dropdown menu set to 'FXS'. A yellow highlight covers this list. Below it is an 'Update' button and a note: 'This configuration will be applied after restarting the system.'

**Port Mode Configuration:** A table with 8 rows (ports 1-8) and columns for TX and RX. Each row has a 'Hot-Line' checkbox and a 'Port Mode' section with checkboxes for 'GK', 'Group', and 'PP'. The 'GK' checkbox is checked for all TX and RX entries. A yellow highlight covers the 'GK' column.

Port	TX	RX	Hot-Line	Port Mode
1	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
2	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
3	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
4	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
5	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
6	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
7	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
8	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP
	<input type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/> GK <input checked="" type="checkbox"/> Group <input checked="" type="checkbox"/> PP

**Note:** New settings for Port mode will be applied immediately without restart.



Notes:

**H.323 INFORMATION CONFIGURATION**

At [Configuration]-[Signaling] setting VoIP Signaling (H.323) as the figure below.

▶ VOIP Signaling (H.323)

Endpoint Type  -- default : Terminal

Service Provider  -- default : Default

1st Gatekeeper IP  port  -- default : 1719

2nd Gatekeeper IP  port  -- default : 1719

H323 ID  -- string

Common E164 Number  -- digits:

E164 Line Number

Line 1	<input type="text" value="5550001"/>	-- digits
Line 2	<input type="text" value="5550002"/>	-- digits
Line 3	<input type="text" value="5550003"/>	-- digits
Line 4	<input type="text" value="5550004"/>	-- digits
Line 5	<input type="text" value="5550005"/>	-- digits
Line 6	<input type="text" value="5550006"/>	-- digits
Line 7	<input type="text" value="5550007"/>	-- digits
Line 8	<input type="text" value="5550008"/>	-- digits

E164 Send Digit  -- default : Blocked Number

Signaling Mode  -- default : Fast

Signaling Mode Option  -- default : Tunn

RAS Port(UDP)  -- default : 1024 [1024-60000]

Q931 Port(TCP)  -- default : 1720 [1025-60000]

RTP Port(UDP)  -- default : 30000 [10000-60000]

RAS Timeout  sec -- default : 5 [2-60]

RAS Retry  -- default : 1 [1-5]

Retry Interval RAS Fail  sec -- default : 4 [4-20]

RAS RRQ Interval  sec -- default : 300 [60-3600]

Calling Timeout(T303)  sec -- default : 10 [3-60]

Answer Timeout(T301)  sec -- default : 180 [30-180]

Gatekeeper Discovery  -- default : Enable

DTMF Relay  -- default : Alphanumeric

**H.323 INFORMATION CONFIGURATION****If Only One E164 Number:** Enter the number at “Common E164 Number”**OR****If More than One E164 Number:** Enter the numbers at “E164 Line Number” Line 1 to 8



Notes:

### To Confirm FL-USA 800™ registration at the GateKeeper:

From [Control] – [GateKeeper], click [Register] button.

From [State], confirm the H.323 registration. **“Registration Success”** message is displayed when the registration is successful. Please confirm FL-USA 800™ system registration at the SERVICE PROVIDER’S GateKeeper.



In case of failure, check the setting of VoIP Signaling (H.323) and try again. When the FL-USA 800™ is successfully registered to Gatekeeper, save the configuration at [Control] – [Configuration], click [Save Configuration] button.

After the system restarts, check the service registration status again. Reboot the system selecting [Reboot] at [Control], (system rebooting will take around 30 seconds). Most of the FL-USA 800™ configuration changes are applied immediately. The configuration settings that require a system restart to be applied are identified.

This describes how to place a call using the VoIP service of ITSP. Making calls through the GateKeeper interworking configuration varies based on the service provider and actual Gatekeeper equipment used in their VoIP network. Please refer to your service provider for more detailed dialing information.

### Placing an H.323 call

Lift the receiver and check for dial tone

After dialing the number press \* button. On the telephone set.

Check the ring-back tone and start call when the remote side answers the line.

### Receiving an H.323 call

Dial the assigned e-164 number from the PSTN or Cellular telephone network.

Answer the phone when ringing.



Notes:

Three offices, direct communications through the FreelineUSA Systems.

May be anywhere in the world with IP connectivity.

- ✓ Prepare a dial plan that will work well for your users.

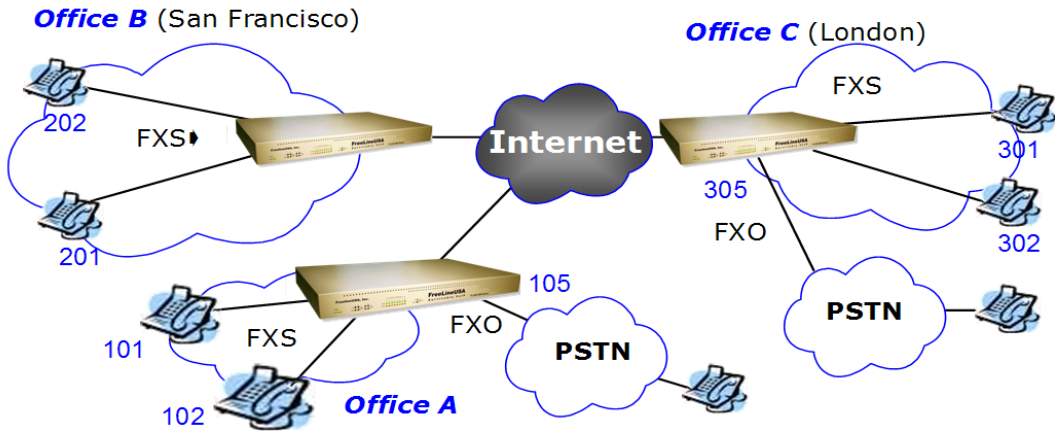
This diagram maps the internal phone book entries to the actual ports connected to the telephones.

This is an example of the phone books that have been entered in each remote system, permitting calling to take place.

Dialing sequence for end users to remote parties.

**PEER TO PEER CALLING SERVICE CONFIGURATION**

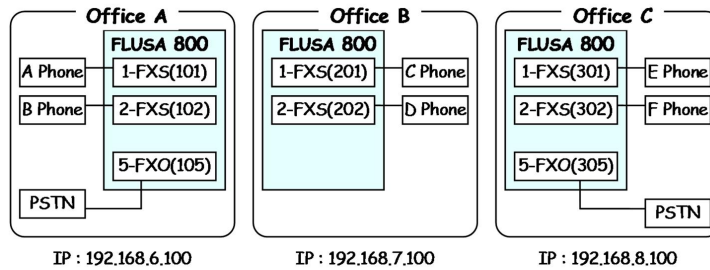
PP (Peer to Peer) service offers voice service among FL-USA 800s without additional network support and devices such as a Gatekeeper. A unique number is assigned to each FL-USA 800™ port. So the calling party, directs a call to a specific port of the called party by entry of a USER assigned telephone number.



**CONFIGURATION AND PRE-PREPARED PORT CONFIGURATION**

- ✓ Before configuring FL-USA 800, set the number plan first.
- ✓ Diagrams below show configuration of network above.

**MAKE SURE THAT NUMBERS ARE NOT REPEATED.**



Office A	Office B	Office C
A : 101	C : 201	E : 301
B : 102	D : 202	F : 302
PSTN : 105	-	PSTN : 305

**Dialing from port to port based on phone book in above FL-USA systems.**

- ✓ A Phone to B Phone : 102 (from Ext # 101 to Ext # 102)
- ✓ A Phone to C Phone : 201 (from Ext # 101 to Ext # 201)
- ✓ A Phone to E Phone : 301 (from Ext # 101 to Ext # 301)
- ✓ A Phone to PSTN of Office C : 305 + PSTN Number



**H/W CONFIGURATION**

Make sure that each system is configured with adequate number of FXO and FXS ports.

**OFFICE A PORT CONFIGURATION**

**Office A:** To configure office A FreeLine, at [Configuration] select [Voice Port] and set POTS and Port as shown in the figures below. Access these configuration logging screens in each system by using the web interface, entering the IP address for each system, and logging in as “manager”

**► POTS**

1	FXS
2	FXS
3	FXS
4	FXS
5	FXO
6	FXO
7	FXO
8	FXO

This configuration will be applied after restarting the system.

Update

**► Port Mode**

Port	Port Mode					
1	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web
2	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web
3	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web
4	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web
5	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web
6	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web
7	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web
8	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input checked="" type="checkbox"/> PP	<input type="checkbox"/> Web

Update

**FL-USA 800s IN OFFICE B AND C CAN BE CONFIGURED AS BELOW:**

**Office B:** POTS : Ports 1 and 2 set FXS Port Mode : Check PP on Ports 1 and 2

**Office C:** POTS : Ports 1 and 2 set FXS, FXO for Port 5; Port Mode : Check PP for 1, 2, and 5

Notes:

**You must select either FXO or FXS for service** on a particular telephone port. The selection is only available if the appropriate FXO and FXS cards are installed.

✓ Installed hardware ports can be determined by looking at the LED lamps on the FL-USA 800™ chassis, the LIT LED lamps indicate what ports are installed in hardware, FXS, FXO or Both.

**Peer to Peer or PP calls must be enabled** on the appropriate ports so user may place phone calls using the FL-USA internal phone books.





Notes:

**PHONE BOOK ENTRIES FOR OFFICE A (OWN, INDEX 1, INDEX 2)**

**Office A** FL-USA 800, at [Configuration]-[Phone Book] select Index OWN, 1 and 2 and configure as in the screen below.

Note: Your "own" phonebook entry does not need an IP Address.

► Phone Book : Index own

FRS ID	<input type="text"/>	-- string	
Group Number	<input type="text"/>	-- digits	
Phone Number	Line 1	<input type="text" value="101"/>	-- digits
	Line 2	<input type="text" value="102"/>	-- digits
	Line 3	<input type="text" value="103"/>	-- digits
	Line 4	<input type="text" value="104"/>	-- digits
	Line 5	<input type="text" value="105"/>	-- digits
	Line 6	<input type="text" value="106"/>	-- digits
	Line 7	<input type="text" value="107"/>	-- digits
	Line 8	<input type="text" value="108"/>	-- digits

► Phone Book : Index 1

Note: Each active phone book must be "Enabled"

► This PhoneBook:  -- d

FRS ID	<input type="text"/>	-- string	
IP Address	<input type="text" value="192.168.7.100"/>		
Q931 Port(TCP)	<input type="text" value="1720"/>	-- default: 1720 [1025-60000]	
Group Number	<input type="text"/>	-- digits	
Phone Number	Line 1	<input type="text" value="201"/>	-- digits
	Line 2	<input type="text" value="202"/>	-- digits
	Line 3	<input type="text" value="203"/>	-- digits
	Line 4	<input type="text" value="204"/>	-- digits
	Line 5	<input type="text" value="205"/>	-- digits
	Line 6	<input type="text" value="206"/>	-- digits
	Line 7	<input type="text" value="207"/>	-- digits
	Line 8	<input type="text" value="208"/>	-- digits

► Phone Book : Index 2

Note: Enter IP Address of remote FL-USA 800™

► This PhoneBook:  -- default: D

FRS ID	<input type="text"/>		
IP Address	<input type="text" value="192.168.8.100"/>		
Q931 Port(TCP)	<input type="text" value="1720"/>	-- default: 1720 [1025-60000]	
Group Number	<input type="text"/>	-- digits	
Phone Number	Line 1	<input type="text" value="301"/>	-- digits
	Line 2	<input type="text" value="302"/>	-- digits
	Line 3	<input type="text" value="303"/>	-- digits
	Line 4	<input type="text" value="304"/>	-- digits
	Line 5	<input type="text" value="305"/>	-- digits
	Line 6	<input type="text" value="306"/>	-- digits
	Line 7	<input type="text" value="307"/>	-- digits
	Line 8	<input type="text" value="308"/>	-- digits

Each of the FL-USAs' has three unique phone book entries.

✓ The first entry is for its own numbering plan "own".

✓ The 2nd entry is for Index 1 for (Office B's) numbering plan.

✓ The 3rd entry is for Index 2 for (Office C's) numbering plan.

Dialed Numbers are set only by entries in your own FL-USA system, multiple numbers in different FL-USA systems can point to the same remote port. This prevents errors in a single system, from impacting other user locations.



**FREELINES IN OFFICE B AND C CAN BE CONFIGURES AS FOLLOWS:**

**Office B—Phone Book Entries**

Index **own**

Line 1 : 201

Line 2 : 202

Index **I**

IP Address : 192.168.6.100

Line 1 : 101

Line 2 : 102

Line 5 : 105

Index **2**

IP Address : 192.168.8.100

Line 1 : 301

Line 2 : 302

Line 5 : 305

**Office C—Phone Book Entries**

Index **own**

Line 1 : 301

Line 2 : 302

Line 5 : 305

Index **I**

IP Address : 192.168.6.100

Line 1 : 101

Line 2 : 102

Line 5 : 105

Index **2**

IP Address : 192.168.7.100

Line 1 : 201

Line 2 : 202

**This phone book entry means:**

A phone connected to the FL-USA 800™ in **Office C** will reach the remote telephone connected to **Port 2** at the FL-USA 800™ located at IP Address **192.168.7.100**; after the user dials the correct remote phone number of "202"



**How to make calls in this network:**

A Phone (Office A) to C Phone (Office B) : 201

C Phone (Office B) to A Phone (Office A) : 101

A Phone (Office A) to E Phone (Office C) : 301

E Phone (Office C) to A Phone (Office A) : 101

E Phone - Use PSTN line of Office A : 105 + PSTN Dial

Notes:

✓ Each FL-USA points to the other systems through it's own phone book entries.

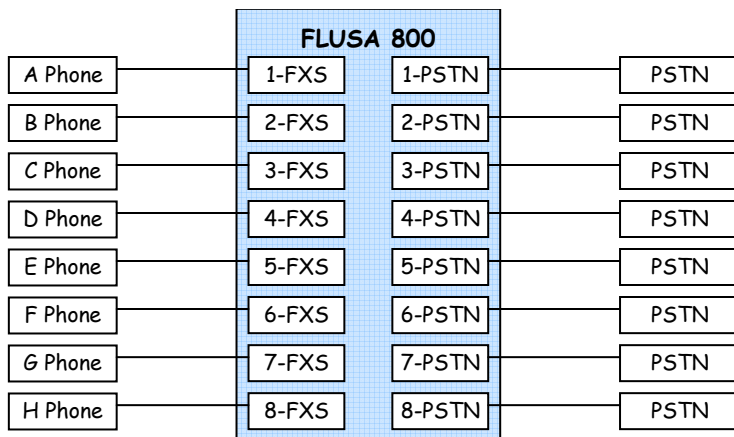


Notes:

## PSTN Dial backup Configuration

### NETWORK CONFIGURATION

FXO cards can be assigned as dynamic PSTN backup ports. The following description shows how to set port 7, equipped with an FXO card as a PSTN backup port. Any number of ports may be designated with a PSTN backup capability if the proper hardware (one FXS and one FXO IO Card) per port is installed.



### H/W CONFIGURATION

For this sample configuration the FL-USA 800™ is equipped with 8 FXS and 8 FXO cards.

### POTS CONFIGURATION

Set the POTS Mode as the figure below, at [Configuration] – [Voice Port] in Web man-

▶ POTS

1	FXS+PSTN ▼
2	FXS+PSTN ▼
3	FXS+PSTN ▼
4	FXS+PSTN ▼
5	FXS+PSTN ▼
6	FXS+PSTN ▼
7	FXS+PSTN ▼
8	FXS+PSTN ▼

This configuration will be applied after restarting the system.



ager mode. The software setting for POT for PSTN Back-up should be: FXS+PSTN.

**PSTN Backup**

<p>1 ▶</p> <p>2 ▶</p> <p>3 ▶</p>	<p>Network Monitor Router -- default : Router</p> <p>When Network is Down Switch over to PSTN Backup Port -- default : PSTN Backup</p> <p>PSTN Switchover Number 88 -- digits</p>	
----------------------------------	---	--

Notes:

- ✓ Before configuring FL-USA 800s, set the number plan first. Be sure that phone numbers and group numbers are not overlapped.

### PSTN BACKUP CONFIGURATION

At [Configuration], select [Voice Port] and configure as figure below.

1. Configure to select a reliable IP address target for Ping command to monitor for IP network congestion or failure. This configuration allows the FL-USA 800™ system to run the Ping test regularly and decide dynamically if the IP network is congested or has failed.
2. Set the FL-USA 800™ Systems response to excessive IP Network congestion.
3. The number “88” in this example routes a call directly to the PSTN backup port, when the user dials this pre-configured number, the caller is routed to the PSTN back up port automatically. This number is also useful for periodically testing the PSTN backup facility.

In case of network congestion, failure, or Gatekeeper registration failure (when operating in H.323 interworking mode), the FL-USA 800™ automatically routes the FXS port connected telephones to the pre-configured PSTN Back-up port. Therefore your voice service subscribers can place calls via the PSTN, instead of the VoIP network.

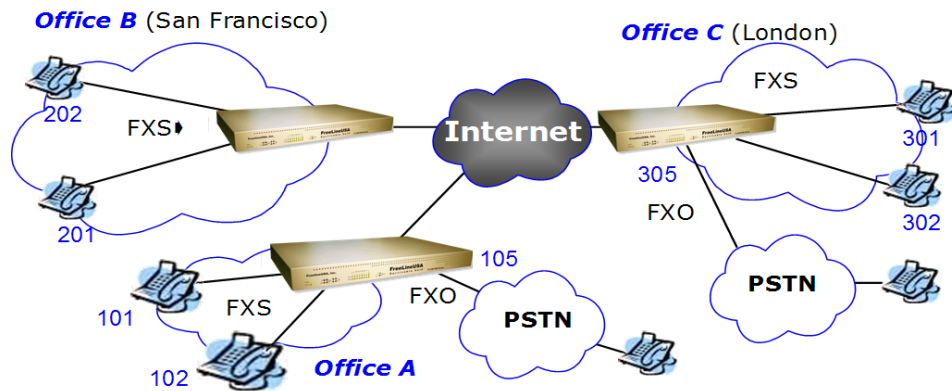
When the system is in fallback to PSTN mode and receives a call from the PSTN it routes these incoming PSTN calls to the designated FXS port. This unique FL-USA 800™ functionality allows subscribers to use the FL-USA 800™ attached telephones just like PSTN users during a power failure, congestion or loss of the IP Network.



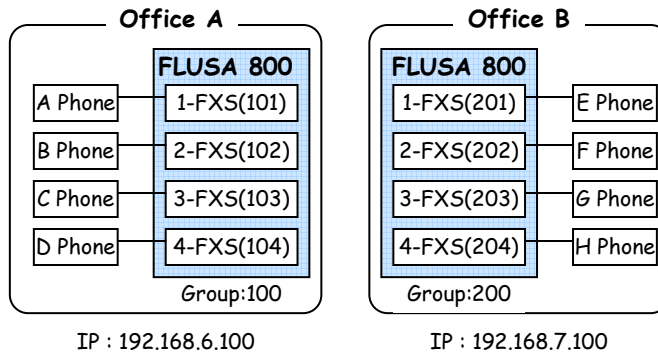
Notes:

## Group Call service

Group service offers voice service among FL-USA 800s without assigning a specific port number for the called party as configured below.



## Service Configuration



### AN EXAMPLE OF GROUP CALLING SERVICE CONFIGURATION

A good example of a group calling application may be when the caller wishes to reach to anyone in the accounting department, the caller dials the accounting department's **group code**, whoever is available in accounting will then receive the incoming call.



Notes:

### HARDWARE CONFIGURATION

Make sure that the FL-USA 800™ is loaded with minimum of four FXS ports.

► POTS

1	FXS
2	FXS
3	FXS
4	FXS
5	FXO
6	FXO
7	FXO
8	FXO

This configuration will be applied after restarting the system.

Update

► Port Mode

Port	Port Mode					
1	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
2	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
3	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
4	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input checked="" type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
5	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
6	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
7	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
8	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web

Update



Notes:

**PORT CONFIGURATION**

Configure FL-USA 800s of Office A and B as below.

Phone Book Configuration for Group Calling

▶ Phone Book : Index own

FRS ID  -- string

▶ Group Number  -- digits

Phone Number

Line 1	<input type="text" value="101"/>	-- digits
Line 2	<input type="text" value="102"/>	-- digits
Line 3	<input type="text" value="103"/>	-- digits
Line 4	<input type="text" value="104"/>	-- digits
Line 5	<input type="text" value="105"/>	-- digits
Line 6	<input type="text" value="106"/>	-- digits
Line 7	<input type="text" value="107"/>	-- digits
Line 8	<input type="text" value="108"/>	-- digits

▶ Phone Book : Index 1

▶ This PhoneBook  -- default : Disable

FRS ID

▶ IP Address

Q931 Port(TCP)  -- default : 1720 [1025-60000]

▶ Group Number  -- digits

Phone Number

Line 1	<input type="text" value="201"/>	-- digits
Line 2	<input type="text" value="202"/>	-- digits
Line 3	<input type="text" value="203"/>	-- digits
Line 4	<input type="text" value="204"/>	-- digits
Line 5	<input type="text" value="205"/>	-- digits
Line 6	<input type="text" value="206"/>	-- digits
Line 7	<input type="text" value="207"/>	-- digits
Line 8	<input type="text" value="208"/>	-- digits

Configure FL-USA 800™ of Office A as shown below at [Configuration]-[Phone Book] Menu.

**Add a new phone book to the FL-USA 800™ in Office B.**

**OFFICE B**

Index **own**  
Group Number : 200

Index **I**  
IP Address : 192.168.6.100  
Group Number : 100

**How to make calls:** Office A to Office B : Dial Ext. 200 (Receiving calls via available port)  
Office B to Office A : Dial Ext. 100 (Receiving calls via available port)



Notes:

## Differences between Group and Peer-to-Peer

(or also referred to as port to port dialing)

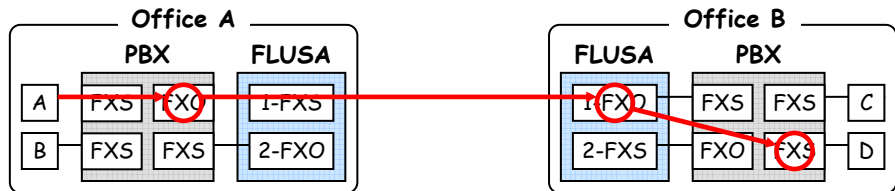
There are several key differences between PP service and Group Call service.

**Dialing in PP service**, each FL-USA port is assigned with a specific number using the phone book in the calling parties FL-USA 800. When a user makes a call, he uses the assigned number of a port. This is the port-directed dialing method know as PP.



✓ When do you chose PP or Group Dialing as an option for your network?

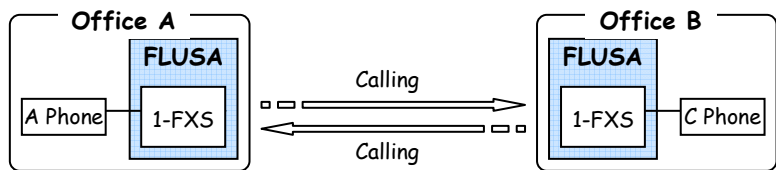
**Group Call service**, even though each port has an assigned number, a user makes a call by selecting a FL-USA 800™ by dialing the **GROUP** number. So the called port is randomly selected. This applies to only those ports that are set to receive Group Calls. The actual sequence of received Group calls can be set for sequential, circular or random but to receive a Group call this permission must be enabled.



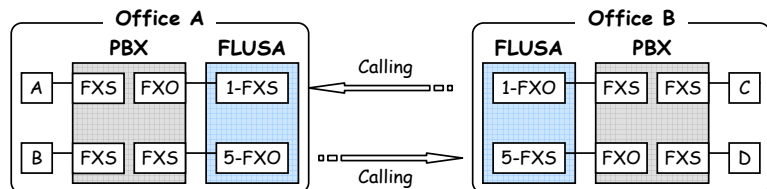
### TYPICAL USES FOR THESE TWO UNIQUE TYPES OF SERVICE:

**PP service** is usually adapted to connect telephones directly to FL-USA 800™ when a PBX is not available in the network. On the other hand, **Group Call** service is implemented when there is an existing PBX.

**Line assignment in PP service**, a single port is used for both calling and called. So each port both originates and answers calls.



**In Group Call service**, The FL-USA 800™ interfaces with PBX. So for easier dialing, calling ports and called ports are separated. Outgoing calls may originate on the FL-USA 800™ FXO ports connected to a PBX hunt group of "station lines", connected into the near side PBX. Remote calls come into the near PBX from the FXS ports on the FL-USA 800, these ports are terminated in the outside trunk lines on the PBX, to accept incoming calls from the distant end. In this way calling and called paths are separated in the PBX so the trunks will operate smoothly for the end users.



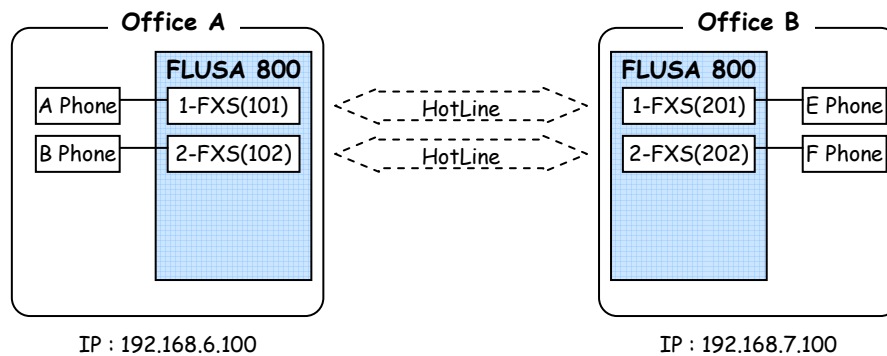
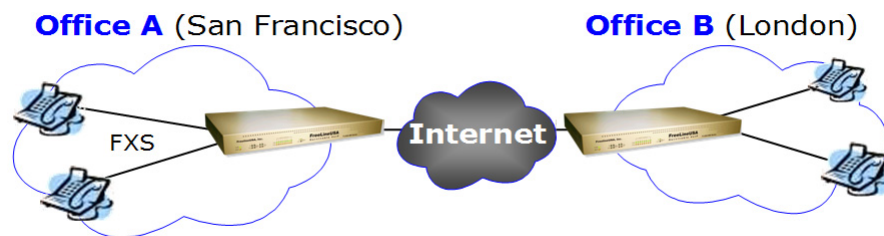




Notes:

## Hot-line service

Hotline mode service offers voice service among FL-USA 800s without any additional devices such as a Gatekeeper. Each port logically connects to a specific port of a counterpart FL-USA 800™ without requiring any dialing process by the user, simply pick up the phone and the remote port starts to ring.





► POTS

1	FXS
2	FXS
3	FXS
4	FXS
5	FXO
6	FXO
7	FXO
8	FXO

This configuration will be applied after restarting the system.

Update

► Port Mode

Port	Port Mode					
1	TX	<input checked="" type="checkbox"/> Hot-Line 201	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
2	TX	<input checked="" type="checkbox"/> Hot-Line 202	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
3	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
4	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
5	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input checked="" type="checkbox"/> Web
6	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
7	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web
8	TX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	
	RX	<input type="checkbox"/> Hot-Line	<input type="checkbox"/> GK	<input type="checkbox"/> Group	<input type="checkbox"/> PP	<input type="checkbox"/> Web

Update

Notes:



Notes:

▶ Phone Book : Index own

FRS ID	<input type="text"/>	-- string
Group Number	<input type="text" value="100"/>	-- digits
Phone Number	Line 1 <input type="text" value="101"/>	-- digits
	Line 2 <input type="text" value="102"/>	-- digits
	Line 3 <input type="text" value="103"/>	-- digits
	Line 4 <input type="text" value="104"/>	-- digits
	Line 5 <input type="text" value="105"/>	-- digits
	Line 6 <input type="text" value="106"/>	-- digits
	Line 7 <input type="text" value="107"/>	-- digits
	Line 8 <input type="text" value="108"/>	-- digits

▶ Phone Book : Index 1

▶ This PhoneBook	<input type="text" value="Enable"/>	-- default : Disable
FRS ID	<input type="text"/>	-- string
▶ IP Address	<input type="text" value="192.168.7.100"/>	
Q931 Port(TCP)	<input type="text" value="1720"/>	-- default : 1720 [1025-60000]
Group Number	<input type="text" value="200"/>	-- digits
Phone Number	Line 1 <input type="text" value="201"/>	-- digits
	Line 2 <input type="text" value="202"/>	-- digits
	Line 3 <input type="text" value="203"/>	-- digits
	Line 4 <input type="text" value="204"/>	-- digits
	Line 5 <input type="text" value="205"/>	-- digits
	Line 6 <input type="text" value="206"/>	-- digits
	Line 7 <input type="text" value="207"/>	-- digits
	Line 8 <input type="text" value="208"/>	-- digits

**SERVICE CONFIGURATION**

**An example of Hot-line configuration**

**H/W CONFIGURATION**

Make sure that the system is loaded with more than 2 FXS cards.

**PORT CONFIGURATION**

Configure FL-USA 800s of Office A, select [Configure] – [Voice Port] and set POTS and Port Mode as below.



Notes:

Like office A's, office B's FL-USA 800™ can be configured as below.

**OFFICE B**

POTS : Set as FXS for 1, 2 port

Port Mode : Check Hot-Line for port 1, enter '101'

Check Hot-Line for port 2, enter '201'

**PHONE BOOK CONFIGURATION**

Configure FL-USA 800™ of **Office A**, at [Configuration] – [Phone Book] set Index own and I as below.

Add new phone book for FL-USA 800™ in Office B as follows:

**OFFICE B**

Index **own** Line 1 : 201 Line 2 : 202

Index **I**

IP Address : 192.168.6.100

Line 1 : 101, Line 2 : 102

**HOW TO INITIATE HOT-LINE CALLS**

*A Phone to E Phone* : Automatically connected when user A picks up the handset.

*B Phone to F Phone* : Automatically connected when user B picks up the handset.

Notes:



Notes:

## Stacking two FL-USA 800™ Systems

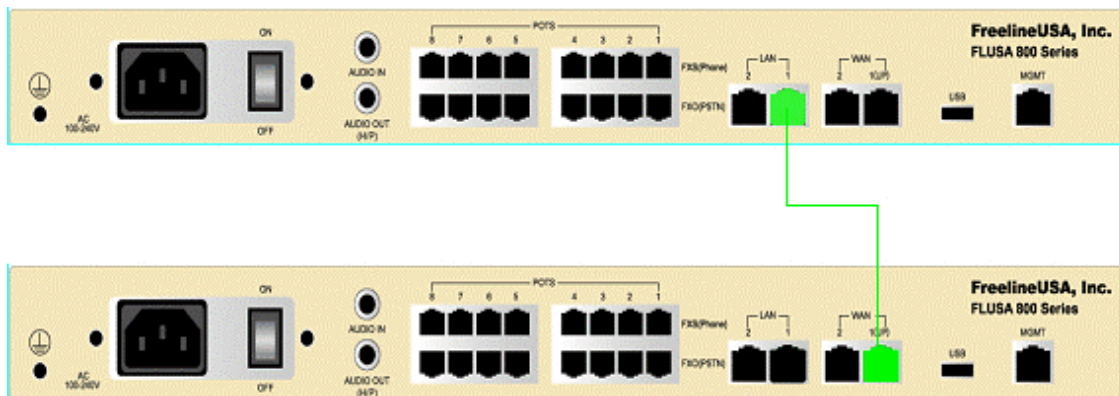
The FL-USA 800™ supports two systems to be cascaded to operate as one system, using the IP address for the primary system to control both FL-USA 800™ systems. This has the benefit of allowing one IP address to serve as many as 16 voice ports.

The configuration has three basic requirements; **First** the primary/master system must be connected with a 100BT cable to the secondary/slave system; this cable runs from the LAN 1 port on the Primary/master to the WAN1 (up) port on the secondary/slave system. **Second**, the IP Settings in the Primary System on the STACKING menu should be as pictured below; set for Master and entering the WAN IP address for the secondary/slave system; the Stacking menu on the secondary/slave system must be set to SLAVE and no IP needs to be entered. **Third**, the IP setting must be configured as shown below; with the IP WAN address of the secondary/slave system set to the LAN settings in the primary/master system.

Top system is Primary/Master; Bottom System is Secondary/Slave FL-USA 800™ system.

Note: Connection from Master WAN 1 (up) goes to the Public IP Network. As shown the connection from LAN1 goes to WAN 1 (up) on secondary/slave system.

### 1.0 Panel view Primary System



### 1.1 Primary/Master System **Configuration>Stacking Menu**

### 1.2 Primary/Master System **Configuration>Network Menu**

### 2.0 Panel view Secondary System

### 2.1 Secondary/Slave System **Configuration>Stacking Menu**



Notes:

### 2.2 Secondary/Slave System **Configuration>Network Menu**

#### **PRIMARY/MASTER SYSTEM**

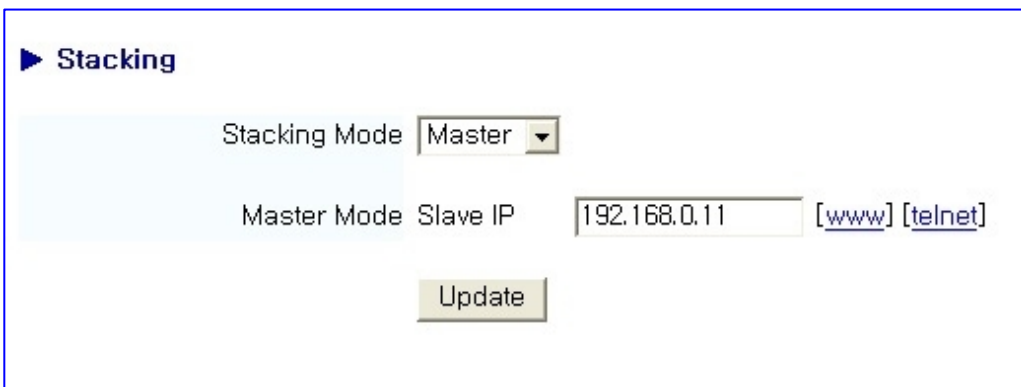
This unit links to the public IP network through the WAN1 (UP) Port.

This Primary system links to the Secondary/Slave System via the LAN 1 Port, this 100BT cable (straight through cable) connects to the WAN1 (UP) Port on the Secondary/Slave System.

NOTE on FIGURE 1: Connection to WAN1 (up) goes to Public IP Network. Connection from LAN1 goes to WAN1 (up) on secondary/slave system.



**Primary/Master System Face Panel – Figure 1.**



Primary/Master System **Configuration>Stacking Menu** –Figure 1.1

The above configuration screen (for the Master System) is set to **Master** and contains the IP entry for WAN IP address of secondary/slave system.



Notes:

**▶ WAN IP Address**IP Setup 

Manual IP Address	<input type="text" value="218.55.236.135"/>
Netmask	<input type="text" value="255.255.255.192"/>
Gateway	<input type="text" value="218.55.236.129"/>
DNS	<input type="text" value="127.0.0.1"/>

PPPoE Username	<input type="text"/>
Password	<input type="text"/>

**▶ LAN IP Address**

Manual IP Address	<input type="text" value="192.168.0.10"/>
Netmask	<input type="text" value="255.255.0.0"/>

Primary/Master System **Configuration>Network** menu –Figure 1.2

**Setting the LAN IP Address for the attached secondary system:** This screen has the entry for the starting LAN IP Address range, this is the IP Address the secondary/slave FL-USA 800™ system looks toward when connected to the primary/master's LAN port.

This IP address setting allows the secondary/slave system to communicate with the primary/master system.



Notes:

This Slave/Secondary FL-USA 800™ links to the Primary/Master System network through the WANI (UP) Port.

This Secondary system links to the Primary/Master System via the WANI (UP) Port, this 100BT cable (straight through cable) connects to the LAN1 Port on the Primary/Master System.

NOTE on FIGURE 2: Connection to WANI (up) goes to LAN1 port on primary/master system.



Secondary/Slave System Face Panel – Figure 2



Secondary/Slave System **Configuration>Stacking Menu** –Figure 2.1

Note: This screen is set for Slave and [no IP address needs to be entered.](#)





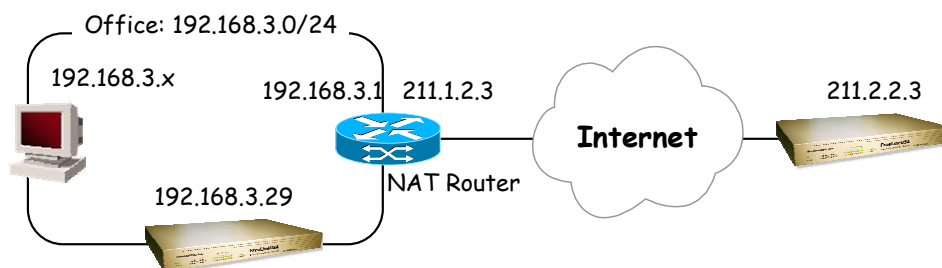
Notes:

## NAT configuration

FL-USA 800™ can be used on a private network utilizing NAT for proper Internet connection. The NAT Server / Gateway Router should be assigned with a public IP address.

The NAT Server should support either port tunneling or a DMZ function to direct incoming packets to the FL-USA 800.

**Private network :** On a private network, the following configuration is available with FL-USA 800™ without a public IP address.



To operate FL-USA 800™ in the above system, input the public IP address of the NAT Router (in this case IP 211.1.2.3) to the FL-USA 800™ “NAT Router” parameter. The NAT Router must be configured to send the data it received from the public side GateKeeper or other FL-USA 800s to the appropriate local FL-USA 800™ ports and local LAN assigned IP Address.

### FRS CONFIGURATION

From [Configuration] – [FRS] menu, enter the IP address to “NAT Router” field.

**▶ NAT Server and FRS**

NAT Router	<input type="text"/>	-- IP
Primary FRS Server	<input type="text"/>	-- IP
Secondary FRS Server	<input type="text"/>	-- IP
FRS Refresh Interval	<input type="text" value="60"/> sec	-- default : 60 [30-240]

**NOTE: The new NAT configuration is applied after restarting the FL-USA 800.**

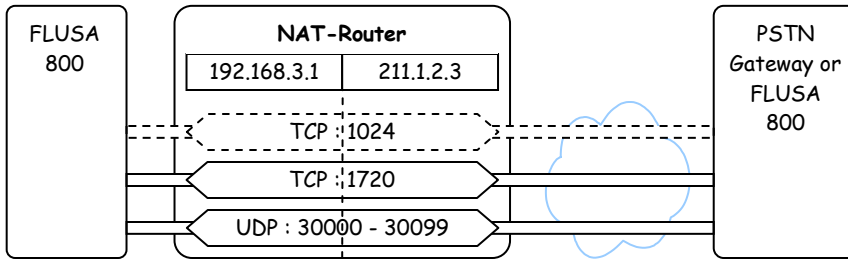


Notes:

**SETTING UP YOUR NAT ROUTER**

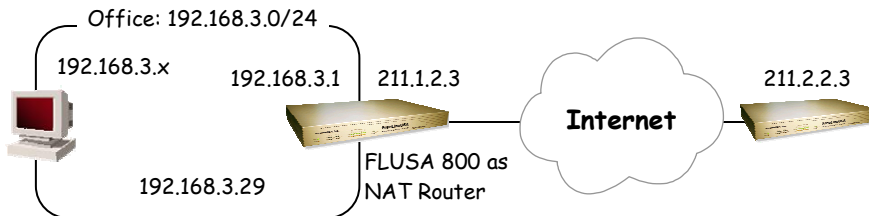
Configuration Configure NAT Router so that it can redirect the data received from the followings ports to FL-USA 800.

- TCP : 1024 \* [H323 Config] – [RAS Port] (this port determined by GK )
- TCP : 1720 \* [H323 Config] – [Q931 Port] (port determined by user)
- UDP : 30000 ~30099 \* [H323 Config] – [RTP Port] (this is the default range )
- The port numbers can be changed** from the [H323 Config] menu.
- TCP port 1024 is only used for GateKeeper (H.323) interworking service, so it is not needed with other voice service modes.
- NAT Router configuration is configured uniquely according to each vendors router. So check the NAT router manual to set the port forwarding as shown below.



**BUILDING PRIVATE NETWORKS WITH THE FL-USA IP SHARING**

FL-USA 800™ allows users to build private IP network and to install PC or FL-USA 800™ in private network. **Private network environment:** Setting FL-USA 800™ as NAT Router allows users to build a private IP network with the FL-USA 800™ as the edge router for the DHCP served local LAN.



**FL-USA 800™ as NAT Router Configuration**

To configure NAT Router set to resend data to ports on LAN.

[Configuration] – [Network] – [NAT] “Enable”

According to type of service [Port Tunneling] “Enable”



Notes:

## Gain Control

FL-USA 800™ is connected to ordinary telephones and PBXs via FXS/ FXO interface. According to the line condition and connected devices, the transmitting or receiving voice may be too soft or too loud, easy level adjustment is possible via the web interface.

### The followings can be configured to adjust the sound.

FXS input/Output Gain (Range: +31dB ~ -31dB, Default: 0dB)

FXO Input/Output Gain(Range: +31dB ~ -31dB, Default 0dB)

DTMF Output Gain (Range: 0dB ~-31dB, Default -12dB)

### To adjust receiving volume level,

Adjust FXS Output Gain or FXO Output Gain.

To increase the volume: Increase Output Gain by +3dB and check the volume.

To decrease the volume: Decrease Output Gain by -3dB and check the volume.

During a call, the adjusted Gain is not applied but it is applied to a new call.

### To adjust transmitting volume level,

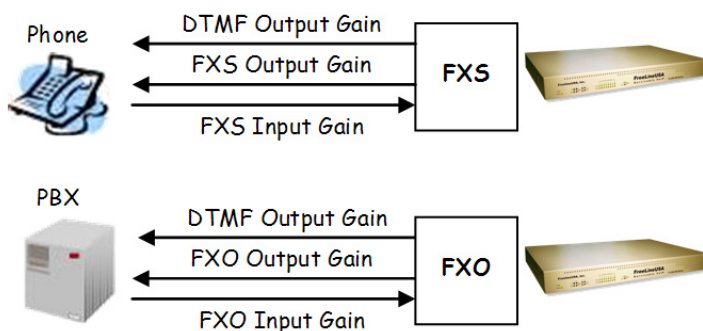
When the transmitting volume is too soft on the called party, refer to the followings.

### Adjust FXS Input Gain or FXO Input Gain.

To increase the volume: Increase Input Gain by +3dB and check the loudness.

To decrease the volume: Decrease Input Gain by -3dB and check the loudness.

NOTE: During a call, the adjusted Gain is not applied, it is applied to the next new call.





Notes:

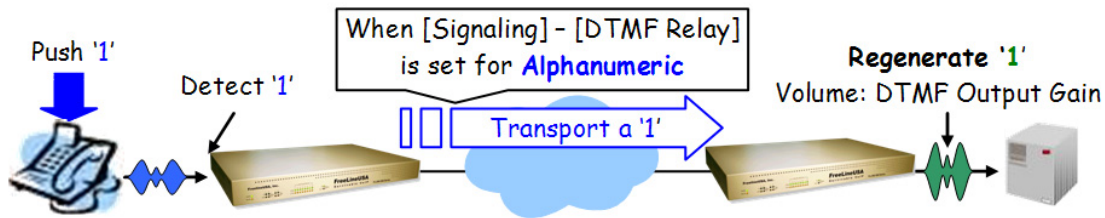
### ADJUSTING DTMF OUTPUT GAIN

DTMF Output Gain adjusts only the DTMF signal loudness and does not impact the volume of the voice signal. In VoIP, the DTMF signal is sent to the called party as a digital message, not analog tones in channel, by configuring [H323 Config] – [DTMF Relay]. The H.323 protocol that supports this feature is known as H.245.

[DTMF Output Gain] adjusts the loudness of restored DTMF signal on the called side.

### DTMF Output Gain

Control when connecting to the PSTN or PBX via FL-USA 800, the restored DTMF tone is too soft so that PSTN or PBX cannot detect the tone. Increase or decrease [DTMF Output Gain] by 3dB to enhance the DTMF tone detection rate. This is usually only adjusted if users complain of reaching wrong numbers when dialing a remote PBX.





Notes:

**SYSTEM STATUS LEDs**

PWR : Indicating the power supply status.

- ON      the power supply is on
- OFF      the power supply is off

RUN : Indicates the Operating Condition of FL-USA 800

- ON      under normal operation
- OFF      system errors

**LED LAN/WAN 10** : Connected LAN/WAN port to 10BT

- ON      LAN/WAN port connection is at 100BT
- Blinking      Data being transmitted via LAN Port

**LED LAN/WAN 100** : Connected LAN/WAN port to 100BT

- ON      LAN/WAN port connection is at 100BT
- Blinking      Data being transmitted via LAN Port

**LED FXO**: Indicating the status of each FXO port.

- ON      An FXO card is installed.
- Blinking      An FXO port is in use
- OFF      An FXO card is not installed.

**LED FXS**: Indicating the status of each FXS port.

- ON      An FXS card is installed.
- Blinking      An FXS port is in use
- OFF      An FXS card is not installed.

**LED Audio IN/OUT**

- Reserved for future use with MP3 Stereo Broadcast Capability

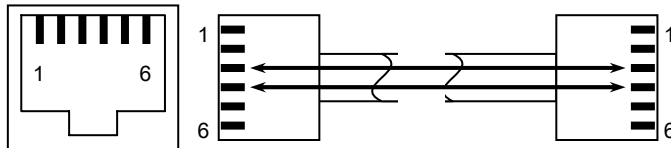


Notes:

# Cables

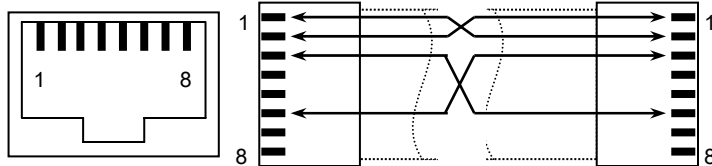
## FXS/FXO LINE

This cable is used to connect telephones or PBX lines with the FL-USA 800. This is a typical two wire telephone cable with RJ-11 connectors.



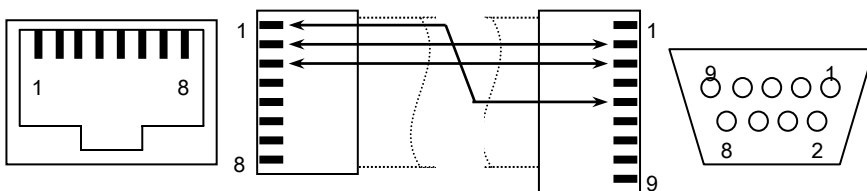
## LAN/WAN

This is a typical 10Base-T or 100Base-TX LAN Cable



## RS-232 CONSOLE PORT

Connector on FL-USA 800™ management port is RJ45., connector on PC side is DB-9 female connector, cable is UTP category 5 type.





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FREELINEUSA, INC. VOIP TECHNOLOGY**

***Your Direct Feedback to improve this  
manual is appreciated!***

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Please send us your contact information if you wish us to email you a soft copy of revised manuals as they become available.

**THANK YOU!**