TVP-221H

VoIP Gateway
4 Port (2FXS +2FXO)

User's Guide

TRENDnet®
TRENDware, USA
What's Next in Networking

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 in accordance with the instruction manual, may cause harmful interference to radio communication. 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 the user's own expense.

CE Declaration of conformity

This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 class A for ITE and EN 50082-1. This meets the essential protection requirements of the European Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

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How to Use This Manual

This manual was designed for the non-technical users of the VoIP Gateway (TVP-221H). It contains information about the functions of the TVP-221H and instructions for its installation, basic configuration and operation. Read this section carefully for important information about the manual's organization.

Important Safety Instructions

Before you plug the TVP-221H into an electrical outlet, carefully read all the installation instructions in Chapter 2.

For your own safety and the safety of your equipment, always take the following precautions:

- Follow instructions and warnings in the documentation.
- Never push any object through the fan vent or other openings in the equipment. Such action may produce a short circuit, causing fire, electric shock, or equipment damage.
- Keep the TVP-221H away from all chemicals and sources of liquids.

Warning

- Connection of the RJ45 connector from a TVP-221H to TNV circuits can cause permanent damage to the TVP-221H.
- Incorrectly connecting telephony devices to the RJ11 port on the Telephony Interface Module can cause permanent damage to the module.

Documentation Abbreviations

Throughout this guide, the user will come across a number of abbreviations that are common throughout the industry. The user should be familiar with the following abbreviations:

ATPM	Address Translation and Parsing Manager
CLI	Command Line Interface
DSP	Digital Signal Processor
DTMF	Dual Tone Multi-Frequency
FXO	Foreign Exchange Office
FXS	Foreign Exchange Station
H.323	ITU specification for multimedia transmission over IP networks
ICMP	Internet Control Message Protocol
IMTC	International Multimedia Telecommunications Consortium
IP	Internet Protocol
TVP-221H	4-port VoIP Gateway
TVP-224HR	4-port VoIP Gateway Router
KTS	Key Telephone System
LAN	Local Area Network
NVS	Non-Volatile Storage
LED	Light Emitting Diode
PBX	Private Branch Exchange
PSTN	Public Switched Telephone Network
RTP	Real-Time Transport
TCID	Telephony Channel Identifier
TFTP	Trivial File Transfer Protocol
TIM	Telephony Interface Modules
TNV	Telephone Network Voltage
UDP	User Datagram Protocol
UTP	Unshielded Twisted Pair
VAD	Voice Activity Detection
WAN	Wide Area Network

Notation Conventions

Throughout this guide, different type styles and characters are used. These serve a variety of purposes as described below:

Convention	Description
boldface	Commands and keywords are in **boldface.**
italic	Arguments for which you supply values are in italics.
courier	Messages that the TVP-221H CLI displays are in plain courier font.
[ ]	Elements in square brackets are optional.
{ x | y | z }	Alternative but required elements are grouped in braces ({ }) and separated by vertical bars (|).
[x | y | z]	Optional alternative keywords are grouped in brackets ([ ]) and separated by vertical bars (|).
string	A non-quoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
key	A key on the VT-100 terminal of terminal emulator. For example <Enter> denotes the Enter key

Table of Contents

Chapter 1

Overview

This chapter gives an overview of the 4 ports desktop version VoIP Gateway (TVP-221H) and a detailed description of its front panel and rear panel.

1.1 Features

The TVP-221H is a cost-effective and highly reliable analog Voice over IP (VoIP) Gateway that offers toll quality voice and real-time fax data over IP networks. With its embedded architecture, the gateway is ideal for VoIP applications associated with Remote Office and Branch Office (ROBO) environments. With its built-in user-friendly interface, the gateway may be installed easily and conveniently to yield immediate cost savings. One VoIP Gateway supports up to four voice or Fax communications simultaneously.

Implemented with an efficient Real-Time Operating System (RTOS) and flash memory, the TVP-221H provides upgradeable capabilities, so it may be programmed with updated firmware locally or via the network at any time. It comes equipped with remote management capabilities, configurable signaling to work with PBX, KTS, and/or telephone. The TVP-221H utilizes advanced VoIP related technology. It includes various voice codecs and fax algorithms, echo cancellation, Voice Activity Detection (VAD) , Comfort Noise Generation (CNG) , and lost packet recovery algorithms.

1.2 Networking Protocols

The TVP-221H supports several industry-standard networking protocols required for voice communication. The following table describes these protocols.

Networking Protocol	Description
Internet Protocol (IP)	IP is a messaging protocol that addresses and sends packets across the network. To enable IP protocol, the TVP-221H must have a Real IP address, subnet, and gateway assigned to it.
Voice over IP Protocol (VoIP)	VoIP enables the TVP-221H to transfer voice communications over an IP network. The TVP-221H employs ITU-T H.323 protocol for setting up calls with one another.
Trivial File Transfer Protocol (TFTP)	TFTP allows you to transfer files over the network. The TVP-221H implements a TFTP client allowing you to download new revision firmware from a TFTP server. The TFTP client requires a TFTP server in your network.
Real-Time Transport (RTP)	RTP is a standard for transporting real-time data over IP network. The TVP-221H uses RTP protocol to send digitized and compressed voice packets.

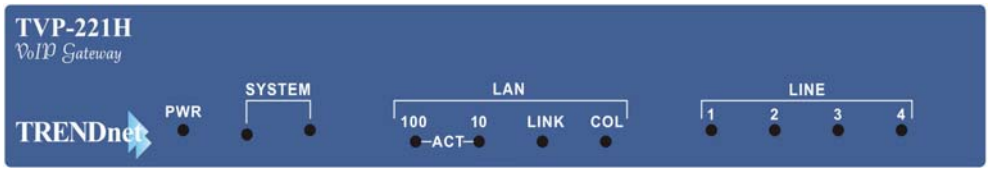
1.3 Package Contents

The contents of your product should contain the following items:

- TVP-221H VoIP Gateway 4 port desk top version
- 100-240V Power Adapter
- 9-pin straight through RS-232 cable
- Printed Quick Installation Guide
- User's guide (CD)
- RJ45 Cable

1.4 Front Panel

The front panel of the TVP-221H contains a push button and LED indicators. The following figure illustrates the front panel of the TVP-221H.



4-port TVP-221H Front Panel

LED Indicators

When the TVP-221H powers on, it switches the state of COL, LNK, 100 and ACT LED indicators in red color per 200 ms in a manner shown in the following table

ACT	100	LNK	COL	Boot loader State
solid on	solid on	solid on	solid on	Execution start
blink	off	off	solid on	Memory test
blink	blink	off	solid on	Loading application code
blink	blink	blink	solid on	Loading TFTP loader code
blink	blink	blink	blink	Failed loading application code and TFTP loader
off	off	blink	off	Memory test fail

The LED indicators on the front panel display the current status of the TVP-221H as described in the following table:

Indicator	Color	Activity	Indication
PWR	Green	On	Power is supplied to the gateway.
SYSTEM	Green	Blinking	The system is running. (Heartbeat LED)
LAN • ACT • 100M • LNK • COL	 Green Green Green Green	 On On Off On On	 Data is being transferred on the LAN. The gateway is connected to LAN at 100Mb/s. The gateway is connected to LAN at 10Mb/s. The gateway is connected to LAN. Data collision is occurring on the network connection.
LINE Channels 1-4	Green	Off On Blinking	The line is idle. The line is being used. The line is ringing.

Reset Button

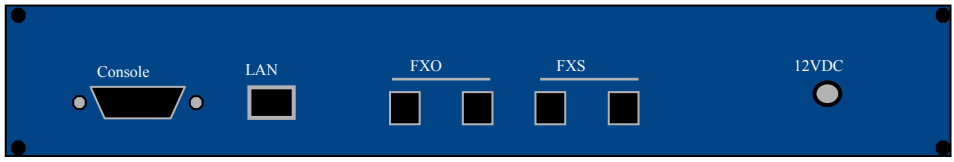
There is a recessed push button located next to the SYSTEM LED. This button allows you to reset the TVP-221H or force the TVP-221H to enter firmware upgrade mode.

To reset the gateway, push a small, stiff object into the hole until the SYSTEM LED stops blinking, then release the button.

Powering on the gateway while pressing down the button for 5 seconds forces the TVP-221H to enter download mode

1.5 Rear Panel

The rear panel of the TVP-221H has four analog telephony ports, two FXO and two FXS ports offering flexible telephony interface usage. The FXS telephony interface ports may be connected to Subscriber Equipment, such as Telephones, Fax Machines, Cordless Phones, and Modems. FXO ports can be connected to PBX and local phone company Central Office (CO) lines. In addition to analog telephony interface ports, there is a power jack for power adapter connection on the rear panel.



4-port TVP-221H Rear Panel

LAN / Console Ports

The TVP-221H is equipped with an Ethernet interface with 10/100 Mbps auto-negotiation, auto MDIX capability. The Ethernet interface port is located on the rear panel. In addition to the Ethernet interface port, there is a 9-pin RS-232 interface port on the rear panel. Their functions are described below:

Port	Label	Function
RJ45	LAN	Connecting the TVP-221H to 10/100 Mbps Ethernet network
9-pin RS-232	User Console	Connecting the TVP-221H to a VT-100 terminal or terminal emulator for configuring the TVP-221H

Chapter 2

Installing the TVP-221H

This chapter gives information on how to install the TVP-221H.

2.1 Network Requirements

For the TVP-221H to successfully operate in your network, your network must meet the following requirements:

1. A working 10/100 Base-T Ethernet. The TVP-221H connects to the Internet via an Ethernet LAN.
2. IP network that supports gateway, and subnet mask. You'll need a static IP address to assign the TVP-221H or a DDNS account for your Dynamic IP.

2.2 Installing the TVP-221H

Due to the TVP-221H being used in a desktop configuration, ensure that the TVP-221H is placed in a clean, well-ventilated, and vibration-free environment.

When the TVP-221H is used, be certain that the unit is placed on a sturdy, flat surface, near a grounded power outlet. At least three inches of clearance must be provided on both sides of the TVP-221H for good ventilation.

2.3 Connecting to the telephony devices

The 4 port TVP-221H supports 2 FXO and 2 FXS. Each RJ11 port is for connecting to telephony devices.

The FXO port is designed for connecting to PBXs or local telephone company central office switches (CO).

The FXS port is designed for connecting to analog telephone sets, G3 fax machines.

Warning: *connection of incorrect telephony devices to the ports on the TIM can cause permanent damage to the TIM and/or the TVP-221H.*

2.4 Connecting to the Network

The RJ45 network port on the rear panel supports 10/100 Mbps half-duplex connections to Ethernet. You can use either Category 3 or 5 straight-through UTP cable for 10 Mbps connections, but use Category 5 for 100 Mbps connections. TVP-224 supports PPPoE and DDNS so it can be connected directly to your Cable / ADSL modem, or under a Router. The first time you connect the TVP-221H for configuration, you will need to connect to it under the same LAN segment to set the Fixed IP or DHCP, PPPoE clients. To configure the TVP-221H, insert one end of the Ethernet cable into the RJ45 port on the rear panel of the TVP-221H and other end directly to your PC Terminal. The TVP-221H supports auto MDIX so

you do not have to worry about the cable. Any Cat 3 or 5 cable will be sufficient. Once Internet Access has been set up, disconnect the TVP-221H from configuring PC and connect it directly to your ADSL Cable Modem or place it under a router as configured.

2.5 Providing Power to the TVP-221H

To provide power to the TVP-221H complete the following steps:

1. Connect one end of the power cord that came with the TVP-221H to the power jack on the rear panel.
2. Connect the other end of the power cord to an AC power outlet.
3. The TVP-221H will execute memory and application code testing automatically.

2.6 Assigning an IP address to the TVP-221H

The IP address is the unique logical address identifying each IP node, such as the TVP-221H, on an IP network. An IP address is a 32-bit number expressed as four decimal numbers from 0 to 255 separated by periods. The TVP-221H can be configured with a fixed IP address, subnet mask and default gateway (typically a router). The TVP-221H can also be setup as a DHCP Client if your network has a DHCP Server (typically a router). Additionally, the TVP-221H can also be configured to use PPPoE. With PPPoE, you will have a Dynamic IP but combined with Dynamic DNS, the TVP-221H will automatically notify DynDNS of your changing IP Address and DynDNS will in turn, map it to your registered Domain Name. Consult your network manager to obtain a unique and static IP address for the TVP-221H, the IP subnet mask and default gateway of your network, and fill out the work sheet in Appendix D before configuring the gateway. Procedures for assigning IP address, default gateway and subnet mask is available in Chapter 4.

The first time you connect the TVP-221H for configuration, you will need to connect to it under the same LAN segment to set the Fixed IP or DHCP, PPPoE clients. To configure the TVP-221H, insert one end of the Ethernet cable into the RJ45 port on the rear panel of the TVP-221H and other end directly to your PC Terminal. The TVP-221H supports auto MDIX so you do not have to worry about the cable. Any Cat 3 or 5 cable will be sufficient. Once Internet Access has been set up, disconnect the TVP-221H from the configuring PC and connect it directly to your ADSL Cable Modem or place it under a router as configured.

Chapter 3

TVP-221H Telephony Concepts

The TVP-221H enables the transmission of voice and fax traffic over any IP network by digitizing voice and fax signals, encapsulating the information within IP packets, and then sending the packets across the IP network

3.1 How the TVP-221H Operates

1. The TIM inside the TVP-221H digitizes analog voice signals at 8 Kbps.
2. TVP-221H system software handles the:
   - Capture of telephone number presented as DTMF tones.
   - Mapping the telephone number to the IP address of remote VoIP Gateway.
   - Setting up calls with remote TVP-221Hs utilizing H.323 call control protocol.
   - Digitizing, compressing and encapsulating the voice into IP packets and transmission of the IP packets onto the Ethernet LAN.
3. A router attached to the LAN forwards the IP packets across the WAN, where they will be received by another VoIP Gateway at the remote.
4. The process is reversed at the remote VoIP Gateway.

3.2 ATPM

To allow you to easily dial a telephone or fax on the network, the TVP-221H maps a series of dialed digits to the IP address of the remote TVP-221H whose phone or fax you are calling. This mapping information is contained in a database inside each TVP-221H called the dial plan.

Based on the dial plan, the Address Translation and Parsing Manager (ATPM) inside the TVP-221H maps telephony numbers to IP addresses of remote VoIP Gateways. The ATPM collects telephone number dialed by users, decides whether the dial string is part of the dial plan and, if it is, maps it to a remote TVP-221H / TVP-224HR. When the call is set up to the destination, a sub-string of the original dial string will be sent along to the remote VoIP Gateway.

3.3 Destination

The destination is where a call is terminated. Typically, for inbound calls from the IP network, the TVP-221H terminals the call at one of the telephony ports. The

destination for the call is the telephony port where the call terminated. For calls initiated from telephony ports, the TVP-221H forwards the call to a remote TVP-221H/TVP-221H via IP network, and the remote TVP-221H/TVP-221H terminates the call. The destination of the call is the remote TVP-221H/TVP-224HR.

3.4 Hunt Group

Instead of directly mapping a phone number to a destination, the ATPM first maps the phone number to a group of destinations known as a Hunt Group. A hunt group is a group of destinations that are equivalent. For example, the customer support group of a company might have 20 people who can handle support calls. Access to customer support is through a single phone number but the next available support person is actually connected upon each incoming call. These 20 phones would be configured as a hunt group. A hunt group consists of a phone number and a list of destinations (members of the group). When an incoming phone number matches the phone number of the hunt group, the TVP-221H attempts to terminate the call at each of the destinations in the hunt group, one at a time until a call is successfully completed.

Every destination that can be reached by dialing a phone number is a member of at least one hunt group. When an address is presented to ATPM for lookup, the output is a hunt group ID number. As a second step, the hunt group ID is presented to ATPM to get the list of members. To effectively bypass the hunt group feature, simply assign a unique hunt group number to a single destination. In effect, the Hunt Group will just have this one member.

3.5 Dial Plan

The dial plan is a database inside the TVP-221H that allows the ATPM to map telephone numbers dialed to IP addresses of remote VoIP Gateways. The dial plan consists of three tables; destination table, hunt group table and the address table. Users need to setup these tables in order for the TVP-221H to process calls to remote VoIP Gateways.

3.51 Address Table

The address table maps a phone number to a hunt group. The table contains entries that specify the following information:

- Telephone number
- The hunt group the phone number maps to.
- The minimum number of digits to collect before the ATPM starts address lookup.
- The maximum number of digits the ATPM collects before it considers the dial string is complete.
- Number of digits forwarded to the destination.

- Address table sample:

Address Entry	Hunt Grp_Id	Min. Digits	Max. Digits	Prefix strip	Prefix Address
201	3	3	3	3	None
301	4	3	3	3	None
8	1	3	3	0	None
0	1	1	1	0	None
20	11	5	5	2	None

3.52 Hunt Group Table

The hunt group table maps a hunt group to a list of destinations. Hunt group sample

Hunt Group ID	Hunt Type	# of Dest ID(s)	Dest. ID(s)
1	2	1	1
3	2	1	3
4	2	1	4
11	2	1	11

3.53 Destination Table

The destination table maps a destination to a telephony port or the IP address of a remote TVP-221H.

Destination table sample

Dest ID	Mode	Destination
1	Local	Port = 0
3	Local	Port = 2
4	Local	Port = 3
11	H.323	Dest = 192.168.0.55/1720 TCP

3.6 DTMF Relay

Voice from PSTN is compressed by the TVP-221H before it is sent across the IP network and then decompressed by the destination VoIP gateway. The voice codecs supported by the TVP-221H are designed for ideally compressing and decompressing human voice. If the compression / decompression process is performed on DTMF tone which needs to be conveyed across IP network, distortion might be too significant to be cognizable on the receiving end. To overcome the shortcoming that the voice codecs may have encoding DTMF tone, the TVP-221H encodes DTMF tone into special packets. The packets are then sent to the destination VoIP Gateway via a separate IP connection. The destination VoIP Gateway decodes the packets, generates the DTMF tone, and then sends the

tone to the PSTN. This method in which the TVP-221H handles DTMF tone is so called DTMF relay.

The TVP-221H handles DTMF relay per H.323 specifications. Certain third party VoIP devices may handle DTMF relay per IMTC standard. For the TVP-221H to interoperate with those VoIP devices, users need to specify which remote VoIP devices uses IMTC conforming DTMF relay technique. Refer to CLI command Error! Reference source not found. on Chapter 8 for detailed information on how to select DTMF relay mode.

3.7 Voice Codecs

Voice codecs supported by the TVP-221H include G.711, G.723.1 5.3kbps, G.723.1 6.3kbps and G.729 AB. When setting up a call, two VoIP Gateways automatically negotiate with each other until an agreement on codec is determined.

Chapter 4

Configuring TVP-221H from a Web Browser

This chapter explains procedures for configuring the TVP-221H from a web browser.

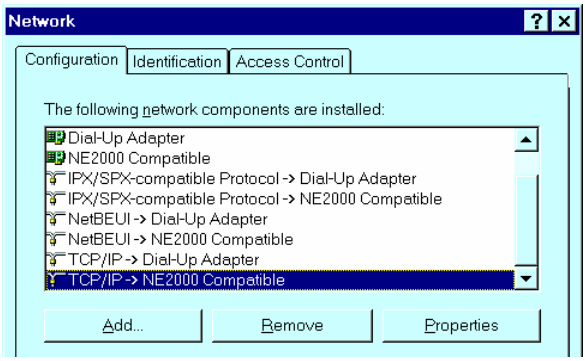
4.1 HTTP setting mode

This section describes the processes for setting up the VoIP Gateway once it has been installed. Java enabled browsers including Microsoft Explorer version 4 or higher, or Navigator version 4.5 or higher can be used in this section to view and change parameters.

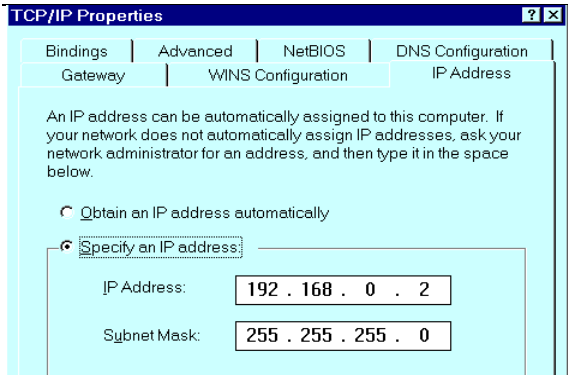
PC Setup

In order to configure the TVP-221H, the Terminal PC needs to have TCP/IP protocol and a compatible IP Address.

1. Connect the TVP-221H to the network with a RJ-45 UTP cable. Power it on.
2. To configure a PC under Windows 95/98, select the *Network Neighborhood* icon on the desktop, then select *Properties*. You will see a screen like below:



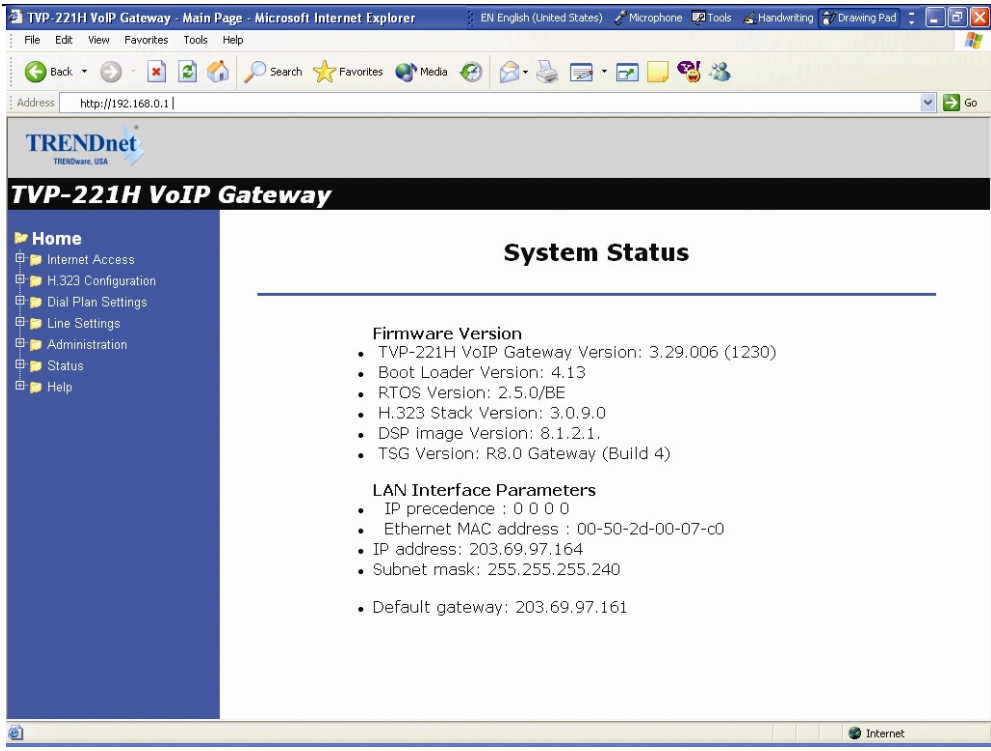
3. If a line like the one highlighted ("TCP/IP -> Network Card") is not listed , select *Add-Protocol-Microsoft-TCP/IP-OK* to add it.
4. Select *Properties* for the "TCP / IP -> Network card" entry. You will see a screen like the following:



5. On the *IP Address* table, enter values as follows:
   - *Specify an IP address* set ON.
   - *IP Address*: 192.168.0.2
   - *Subnet Mask*: 255.255.255.0

   Restart your PC and Start your WEB browser.
6. In the *Address* box, enter the following:
   HTTP://192.168.0.1 (This is the default IP in the gateway from factory)
7. Press enter to confirm and you should find the screen below.

8. The User name is **admin** (all lower case). Password is **123**. Both **admin** and **123** are default strings from factory. For security reasons, please change and memorize the new password after this first setup.
9. Click "OK". The main screen will appear as below.



Main Menu Function Briefings

Home	View System Status
H.323 Configuration	Set H.323 Parameters
Dial Plan Settings	Links to dial plan setting / entry / store / clear / restore pages. You should complete the dial Plan work sheets before working in this menu.
Line Settings	Set Line Settings including Channel Status, Codec Selection, Common Parameters, Channel Parameters and Telephony Ports
Administration	Set Password, Telnet Access, Interface Speed
Status	View current System Status
Help	Definitions of Graphical User Interface Terms and Parameters for Dial Plan Setup, H.323 Configurations, DDNS
Manual	Link to Trendware FTP Website, online user manual and support materials.

System Status

Select *Home*
In order to view the System Status page, please **navigate** to *Home.*
The System Status page will display the following parameters:

Firmware Version

- TVP-221H VoIP Gateway Version:
- Boot Loader Version:
- RTOS Version:
- H.323 Stack Version:
- DSP image Version:
- TSG Version:

LAN Interface Parameters

- IP precedence:
- Ethernet MAC address:
- IP address:
- Subnet mask:
- Default gateway:

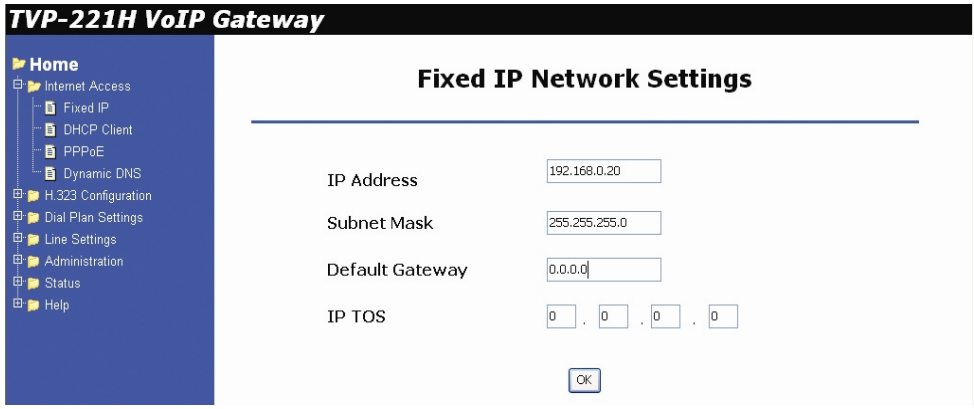
4.2 Internet Access

The TVP-221H can be configured with a fixed IP address, subnet mask and default gateway (typically a router). The TVP-221H can also be setup as a DHCP Client if your network has a DHCP Server (typically a router). Additionally, the TVP-221H can also be configured to use PPPoE. With PPPoE, you will have a Dynamic IP but combined with Dynamic DNS, the TVP-221H will automatically notify DynDNS of your changing IP Address and DynDNS will in turn, map it to your registered Domain Name. Consult your network manager to obtain a unique and static IP address for the TVP-221H, the IP subnet mask and default gateway of your network, and fill out the work sheet in Appendix D before configuring the gateway..

The first time you connect the TVP-221H for configuration, you will need to connect to it under the same LAN segment to set the Fixed IP or DHCP, PPPoE clients. The default TVP-221H IP address is 192.168.0.1. To configure the TVP-221H, insert one end of the Ethernet cable into the RJ45 port on the rear panel of the TVP-221H and other end directly to your PC Terminal. The TVP-221H supports auto MDIX so you do not have to worry about the cable. Any Cat 3 or 5 cable will be sufficient. Once Internet Access has been set up, disconnect the TVP-221H from the configuring PC and connect it directly to your ADSL Cable Modem or place it under a router as configured.

Fixed IP – Connection Details

If you are using a Fixed IP, you are either using a fixed IP as assigned by your ISP or your Systems Administrator. Please enter your Fixed IP as designated by your ISP along with Subnet Mask and Default Gateway. If you have a locally assigned Fixed IP, please talk with your Systems Administrator.



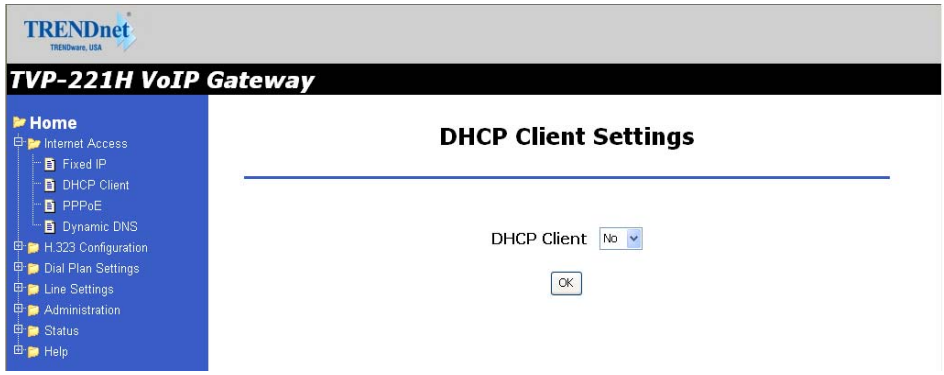
Data - Fixed IP address Screen

Internet	
Physical Address	The hardware address of this device, as seen by remote devices on the Internet. (This is different to the hardware address seen by devices on the local LAN.)
IP Address	This address is allocated by your ISP (Internet Service Provider) or System Administrator (if it is a local IP, the IP must be in the same segment as your Gateway & Router)
Network Mask	The Network Mask associated with the IP Address above.
Default Gateway	The IP Address of the remote Gateway or Router associated with the IP Address above.
IP TOS	Fill in and "**IP TOS**" parameter for 'Precedence', 'Delay', 'Throughput' and 'Reliability' if your ISP provides these features.
DNS IP Address	The IP Address of the Domain Name Server which is currently used.
DHCP Client	This will show "Enabled" or "Disabled", depending on whether or not this device is functioning as a DHCP client. If "Enabled" the "Remaining lease time" field indicates when the IP Address allocated by the DHCP Server will expire. The lease is automatically renewed on expiry; use the "Renew" button if you wish to manually renew the lease immediately.

DHCP Client

If you will be using the DHCP with a DHCP server on your local LAN

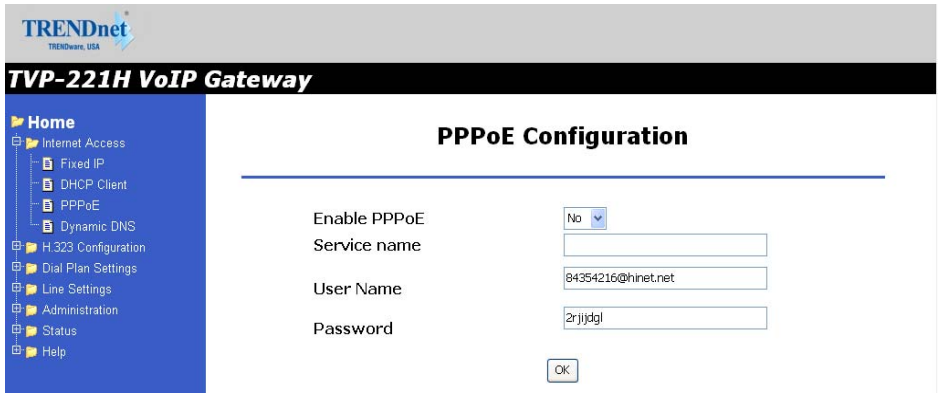
1. **Select** *Yes*
2. **Click** on *OK*
3. **Click on** *Reboot* for changes to take effect



PPPoE

If you will be using the PPPoE as assigned my your ISP

1. **Select** *Yes*
2. **Enter** *Service name, User Name* and *Password* as provided by your ISP
3. **Click** on *OK*
4. **Click on** *Reboot* for changes to take effect



Note: If you are assigned a Dynamic IP, you will have to register for a DDNS (Dynamic Domain Name Server). See 4.23 for details

Dynamic DNS

It allows Internet users to connect to your gateway using a static URL, rather than an IP Address. This is particularly useful because a dynamic IP address, by definition, is constantly changing making it difficult for internet users to find you.

The Service works as follows:

1. Obtain a free account for the service by registering at http://www.dyndns.org.
2. www.dyndns.org will automatically notify you confirming your account information.
3. Return to http://www.dyndns.org and use the "Create New Host" option to register your preferred Domain name. It is recommended that you register a name within the xxxx.dyndns.org hostname.
4. Details of your http://www.dyndns.org account (Name, password, Domain name) must then be entered and saved in the DDNS page of the TVP-221H. The TVP-221H will then automatically notify DynDNS of your changing IP Address and DynDNS will in turn, map it to your registered Domain Name. Internet users will now be able to easily connect to your Virtual Servers (or DMZ PC) using your easy to remember Domain name.

Dynamic DNS Screen

Select *Internet* on the main menu, then *Dynamic DNS*, to see a screen like the following:

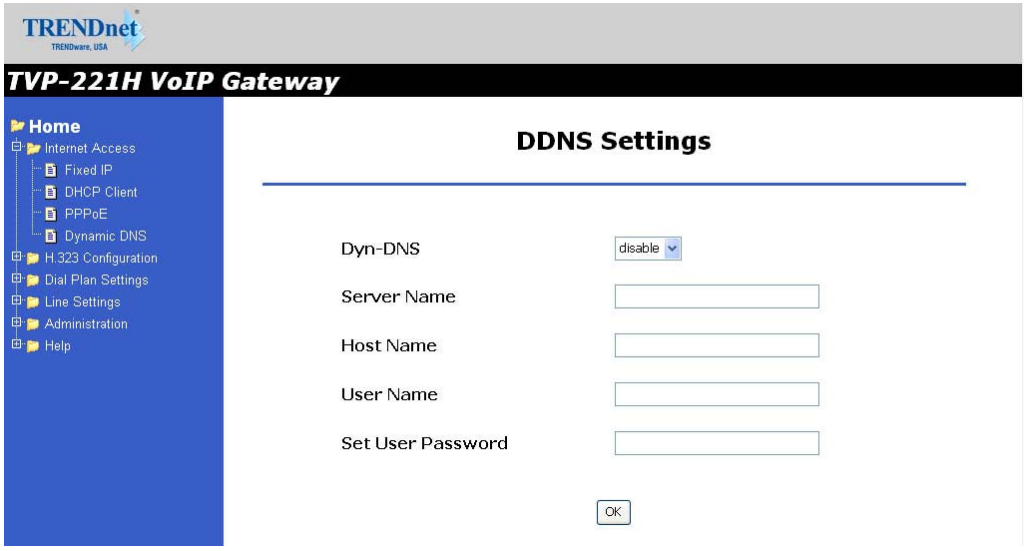


Figure 1: DDNS Screen

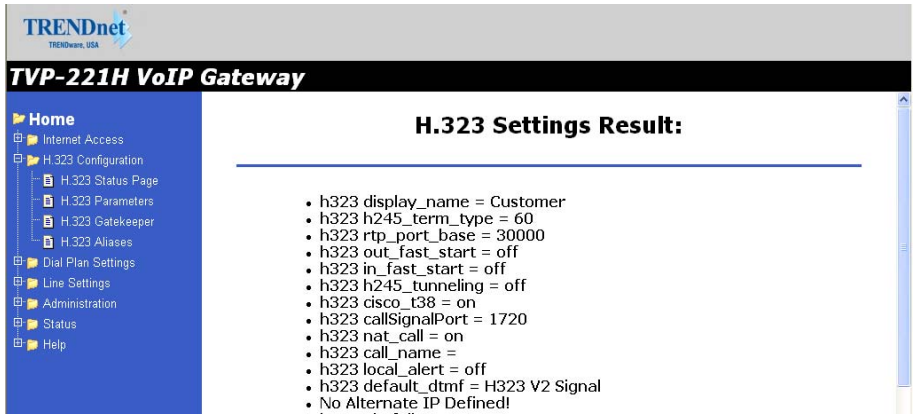
Data - Dynamic DNS Screen

DDNS Service	
DDNS Service	You must register for the service at dyndns.org. Apply for a Domain Name, and ensure it is allocated to you. Details of your DDNS account (Name, password, Domain name) must then be entered and saved on this screen. This device will then automatically ensure that your current IP Address is recorded by the DDNS Service Provider. (You do NOT need to use the "Client" program provided by some DDNS Service providers.) From the Internet, users will now be able to connect to your Virtual Servers (or DMZ PC) using your Domain name.
DDNS Data	
Dyn DNS	On/Off
User Name	Enter your Username for the DDNS Service.
Password/Key	Enter your current password for the DDNS Service.
Domain Name (Hostname)	Enter the domain (hostname) name registered at www.dyndns.org. For instance, if you registered johnsmith.dyndns.org, please enter **johnsmith**
DDNS Status	This message is returned by the DDNS Server Normally, this message should be something like "Update successful" or "IP address updated". If the message indicates some problem, you need to connect to the DDNS Service provider and correct this problem.

4.3 H.323 Configuration

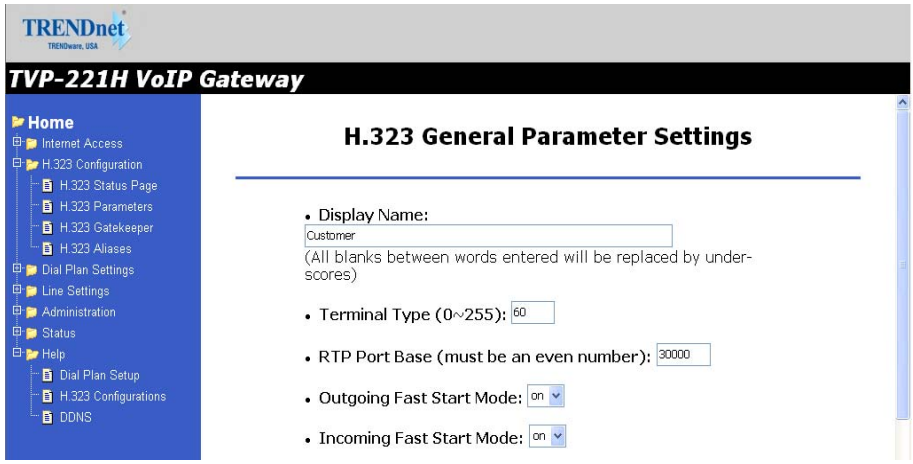
H.323 Status Page

This page lists all current settings for H.323 Parameters.



H.323 Parameters

For the most part end users will not be using these functions / features and / or should use the default settings. For more information please see the Advanced User Manuals or consult with your Systems Integrator



1. **Display Name:** The default string is "Customer".
   This field is to set the display name information that is carried in the H.323 setup messages. Up to 48 characters can be entered.

2. **Terminal Type**: The default value is 60.
   This field is to set the H.245 terminal type, which is used as part of the master/slave determination process of H.245. Typically, setting a value of less than 50 will force slave operation, and a value of greater than 200 will force the master operation. For more details, please refer to H.323-related standard documents.

3. **RTP Port Base**: The default value is 30000.
   This field is to select the starting port number for assignment of RTP and RTCP ports. According to the H.323 specification, RTP port number should be even in value, and the RTCP port number should be one greater than the RTP port. Typically, numbers from 0 to 1023 are reserved on most systems.

4. **Outgoing Fast Start**: The default setting is off.
   This field is to enable or disable the Fast start mode on the outgoing side of the link.

5. **Incoming Fast Start**: The default setting is off.
   This field is to enable or disable the Fast start mode on the incoming side of the link. You'll have to reboot the system to make your changes active!
   Frame Rate = 2 frames/packet

6. **Auto-Answer**: Enables quick H.225 to H.245 transition without waiting for receiver picking up the phone, default is on

7. **NAT Call Mode**: Enables calls from remote sites which use NAT routers with private IP networks behind, default is on

8. **Default DTMF Mode**: H323 V2 Signal or IMTC. The default is H323 V2 Signal

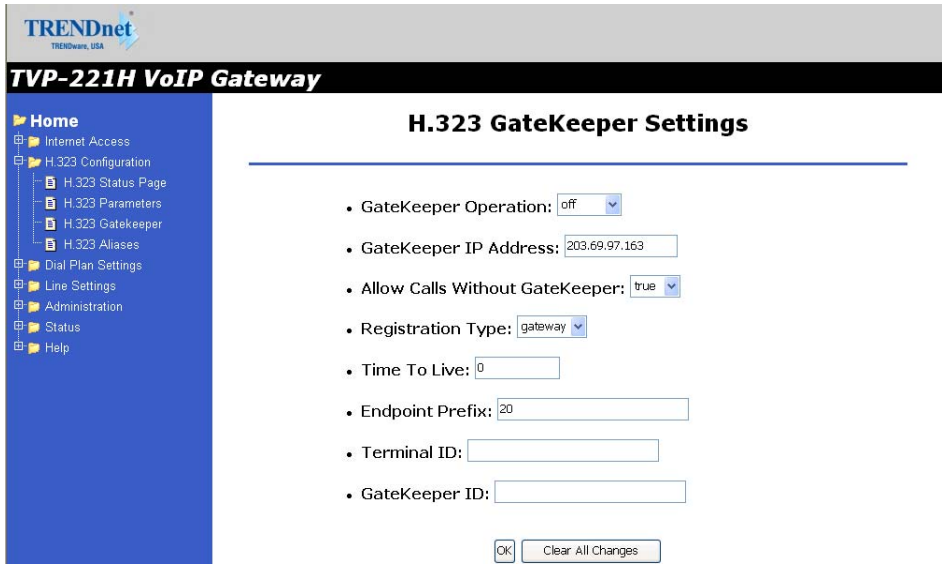
9. **DNS IP Address**

10. **Alternate DTMF IP Address**

11. **DTMF Duration**: default is 300

Gatekeeper

This page is home to many specific H.323 Gateway / Gatekeeper functions / features. For the most part end users will not be using these functions / features and / or should use the default settings. For more information please see the Advanced User Manuals or consult with your Systems Integrator
The primary function of the gatekeeper component is to provide address translation services. This function converts external (telephone number) addresses and alias (name) addresses to network addresses, allowing users to maintain the same telephone numbers or alias addresses regardless of changes to their network addresses.



1. Gate Keeper Mode: The default setting is off. This field is to select the co-operation mode with some other gatekeeper(s). Three options are available:
    i. Off: Disables gatekeeper co-operation,
    ii. Auto: Enables auto-discovery of the gatekeeper

iii. Manual: Enables gatekeeper co-operation in manual operation (the gatekeeper address must be properly assigned).

The following fields must be filled in when Gate Keeper Mode is set to manual.

2. **Gate Keeper Address**: Specify the gatekeeper address when configured to manual mode. When auto mode is desired, this field should be set to auto

3. **Allow Calls Without Gate Keeper**: This field is to inform the H.323 stack to allow calls when the endpoint is not registered with a gatekeeper.

4. **Registration Type**: This field is to set the endpoint registration type. This specifies how the endpoint will register itself with the gatekeeper.

5. **Max Registration Retries**: This field is to control how many registration attempts will be made before the endpoint considers itself to have failed registration.

6. **Time To Live**: Do not have to set this because GK to perform this function. Every x seconds will check to see if it is alive

7. **Endpoint Prefix**: This command is used to set the H.323 prefix that the TVP-221H uses when registering to an H.323 gatekeeper.

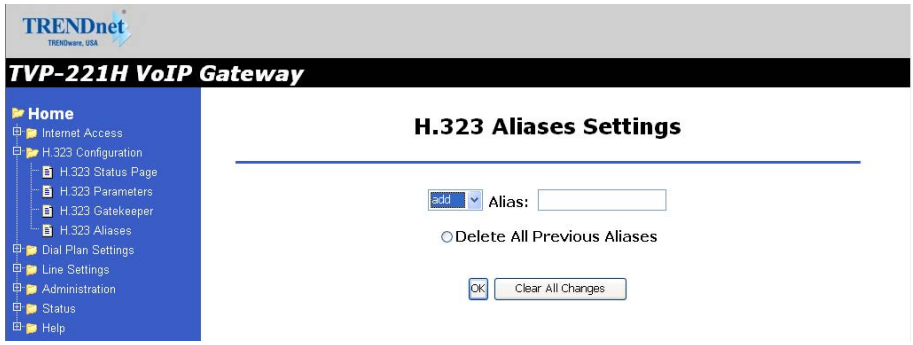
8. **Terminal ID**: To specify GW's ID.

9. **GateKeeper ID**: To specify Gate Keeper's ID.

You'll have to **reboot** the system to make your changes take effect!

Aliases

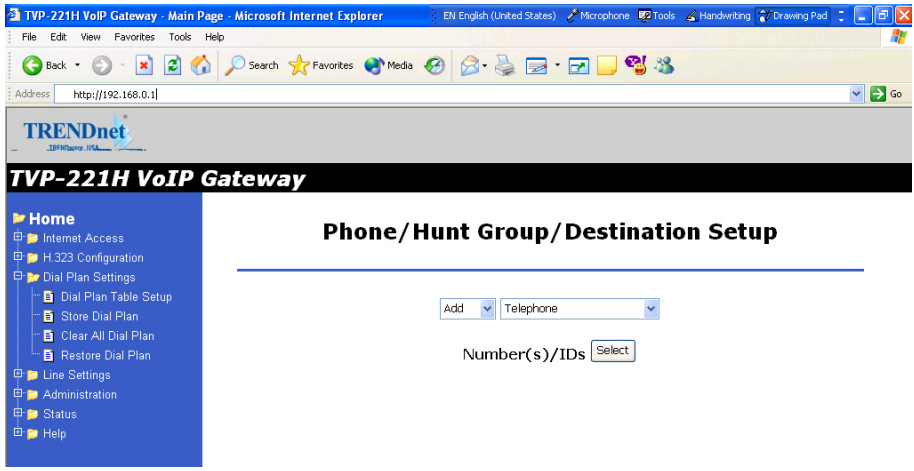
For the most part end users will not be using these functions / features and / or should use the default settings. For more information please see the Advanced User Manuals or consult with your Systems Integrator



Alias: This field is to create or delete aliases that are registered with the gatekeeper.
The primary function of the gatekeeper component is to provide address translation services. This function converts external (telephone number) addresses and alias (name) addresses to network addresses, allowing users to maintain the same telephone numbers or alias addresses regardless of changes to their network addresses.

4.4 Dial Plan Settings

Dial Plan Setup



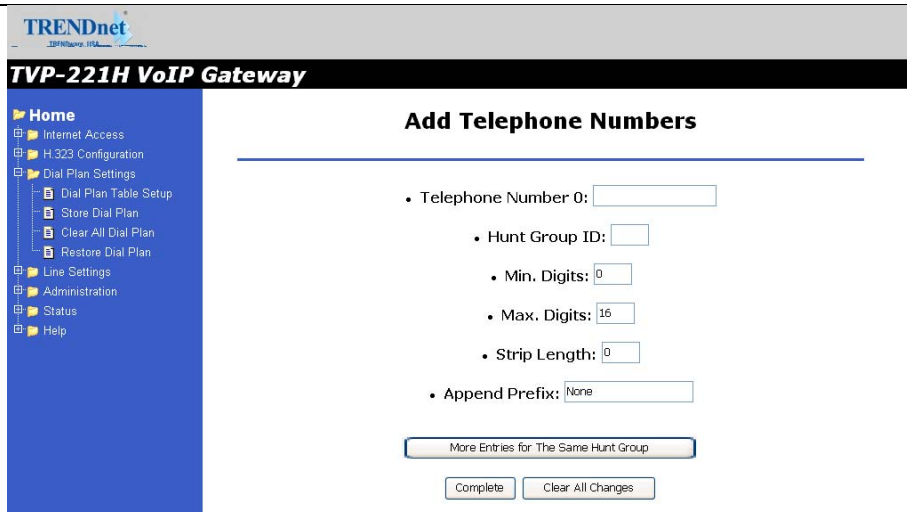
Using the function scroll bar on the right, you are able to Add, Delete, Find or List data to/from one of 3 tables (While it may appear that there are 5 tables, Remote Destination IP, Remote_Host_Name, and Local_Destination Channel are all part of the Destination Table).

The following are the three tables:

1. **Telephone Table**
2. **Hunt Group Table**
3. **Destination Table**
   a. Remote Destination
      (IP takes precedence over Hostname)
   b. Destination - Remote_Host_Name
      (IP takes precedence over Hostname)
   c. Destination - Local_Destination_Channel

Telephone Number Table

1. From Navigation Bar, **Select** Dial Plan Settings / Dial Plan Table Setup.
2. The default values are **Add** and **Telephone**. Click on **Select.** The following window will appear.

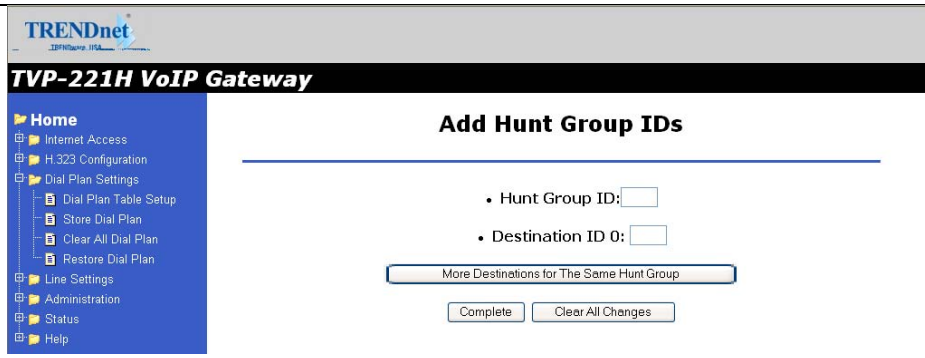


From this window, we can Add / Delete / Find or List desired telephone numbers and map them to a hunt group.

Parameter	Description
Telephone Number	Telephone number to match. This is only part of the total dialed string.
Hunt Group ID	For each hunt group ID, you need to assign it a unique identifier between 0 and 99.
Min. Digits	Minimum number of digits to be collected before the ATPM starts matching the dialed string with entries in the address table.
Max. Digits	Maximum number of digits to be collected before the ATPM starts matching the dialed string with entries in the address table.
Strip Length	The number of digits to be stripped at the beginning of the collected dial string before forwarding the string to the destination.
Append Prefix	(Optional) Digit(s) to be added to the beginning of the collected dialed string before forwarding it to the destination.

Hunt Group Table

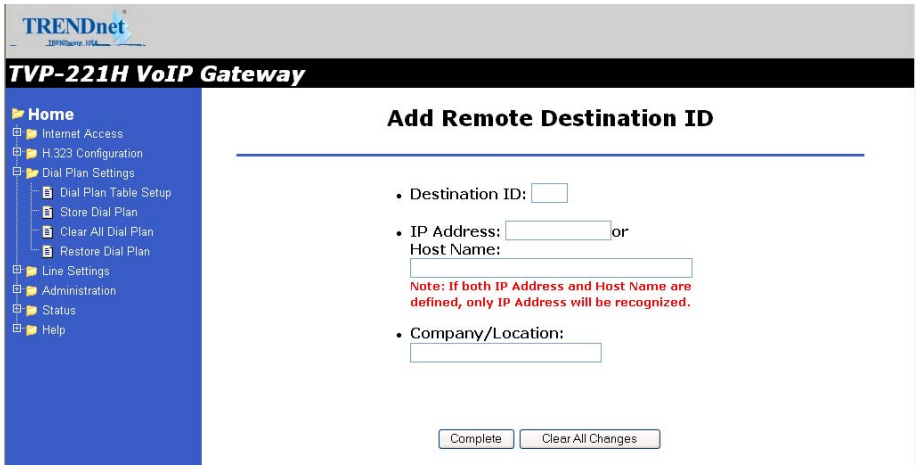
1. From Navigation Bar, **Select** Dial Plan Settings / Dial Plan Table Setup.
2. The default values are **Add** and **Telephone**. Change Telephone to Hunt Group and Click on **Select**
3. A screen will appear showing the following page:



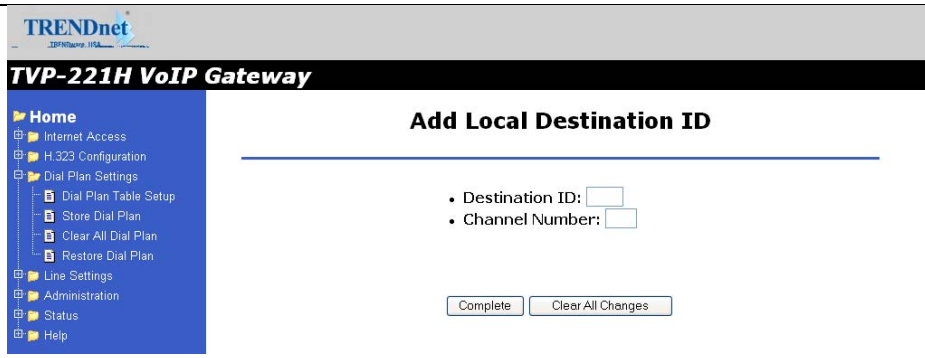
From this window, we can Add / Delete / Find or List the desired hunt group ID and map it to a destination ID.

Destination ID Table

1. From Navigation Bar, **Select** Dial Plan Settings / Dial Plan Table Setup.
2. The default values are **Add** and **Telephone**. Change Telephone to Hunt Group and Click on **Select**
3. A screen will appear showing the following page:



The Destination ID is either a Remote Destination IP (or Hostname but not both) or a Local Destination Channel. Please note that if a Remote Destination IP and a Hostname is specified, the Remote Destination IP takes precedence.

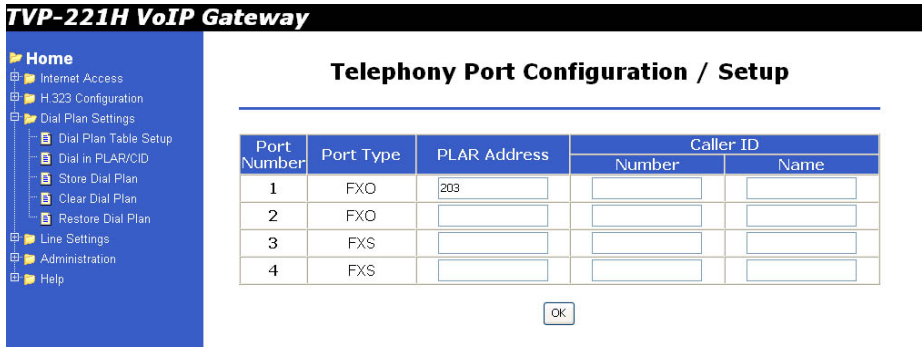


Each telephony port of the TVP-221H must be assigned a unique destination ID. Fill out the worksheet for local destinations by designating each port a unique destination ID,

4.42 Dial in PLAR / CID

Data – Dial in PLAR / CID Screen

DDNS Service	
PLAR Address	Enter PLAR Address which could be any destination telephone number already entered into the dial plan. This programs the gateway to automatically connect you to that number. This port will not be able to dial any other numbers when PLAR is used.
CID – Number and Name	This is a separate feature to PLAR. If you would like to have the Caller's Identification including Number and Name forwarded to the recipient, please provide the information in the provided fields..
Buttons	
OK	On/Off



Private-line automatic ringdown (PLAR) circuits have statically configured endpoints and do not require the user dialing to connect calls. The PLAR feature provides an easy method to create a switched Voice over IP (VoIP) call without digit dialing. PLAR connections are often referred to as a "bat-phone" or "hotline" type of application. This is when a phone goes off-hook

and a remote phone rings without digits being dialed. This is a useful tool for customer requirements such as:

- The provision of an Off-Premises eXtension (OPX) from a private branch exchange (PBX). Connection PLAR allows remote users on Foreign Exchange Station (FXS) ports to look to a central PBX like physical extensions.

- The provision of dial-tone from a remote PBX. Many customers want to offer toll-bypass VoIP services without having the routers provide dial-tone or change their existing dialplan. This allows stations at remote sites to look like they are physically connected stations to a PBX.

Dial in PLAR Considerations and Limitations

- Dial in PLAR is a switched VoIP call. The call is setup on an as-needed basis. With connection PLAR, no bandwidth is consumed while the phone is on hook. When a phone connected to a POTS dial peer is taken off-hook, the call is automatically connected and the remote phone begins to ring.

- Dial in PLAR can work between any type or combination of Foreign Exchange Office (FXO), and/or FXS) telephony port / device.

- Dial in PLAR does not collect digits from the connected Telephony device. Once a dial plan has been entered into the ATPM, PLAR can be enabled without need to alter the dial plan. Note: All other Dial plans set for this starting port will become ineffective.

4.43 Store Dial Plan

Store Dial Plan - will store the Dial Plan from DRAM / Working Memory to Flash / Non-Volatile Storage

Always be sure to **Store,** the Dial Plan from working memory / DRAM to Flash Memory / Non-Volatile Storage. Storing to Non-Volatile Storage ensures that you have saved the dial plan which can then be restored on request.

Note: The Dial Plan in the Non-Volatile Storage is not the working Dial Plan. If the Gateway is turned off for what ever reason, the Dial Plan from Non-Volatile Storage is copied into the Flash / Working memory and processes phone calls accordingly

4.44 Clear Dial Plan

Clear Dial Plan - Will clear the Dial Plan from DRAM / Working memory. DRAM – Everytime you make an entry into the Address Table, Hunt Group Table or Destination ID table, you have to **Click** on *Complete.* This only saves the plan to the working memory / DRAM. If there was a power outage or the TVP-221H was unplugged or a system crash for what ever reason, the Dial Plan in working memory / DRAM will be lost.

4.45 Restore Dial Plan

Restore Dial Plan - Will retrieve the Dial Plan from Flash Memory / Non-Volatile Storage but erase the dial plan currently in DRAM / Working memory.

Note: To ensure your new settings are actually accepted, please check the configuration page carefully after you submit the new settings. If the new settings are not present, it probably conflicts with the old settings. or there is not enough space to store your settings.

4.5 Line Settings

Channel Status

View all settings made to each Channel (port). Simply **Select** the Channel (0-3) and **Click** on *View*

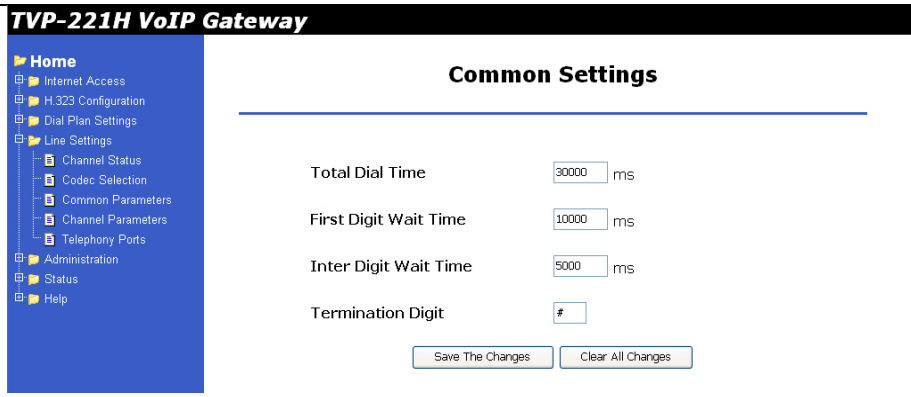
Codec Selection

Select the codec of your preference.

- G.711 PCM 64kbps (A-law and μ-law)
- G.723.1A ACELP/M-MLQ (5.3, 6.3kbps)
- G.729AB CS-ACELP (8kbps)

Common Parameters

Common Parameters is found under Common Settings and allots the amount of time given to each step of the dial process.



Total Time

The total amount of time you have to enter a telephone number (Default 30000ms)

First Digit Wait Time

The amount of time you have to enter your first digit (Default 10000ms)

Inter Digit Wait Time

The amount of time you have between each digit entered (Default 5000ms)

Termination Digit

A special number which tells the gateway that you have finished entering your telephone number and that the number should be processed. (Default - none)

4.6 Channel Parameters

Allows you to set parameters associated with each port, such as transmission / receive gains and comfort noise level

4.7 Administration

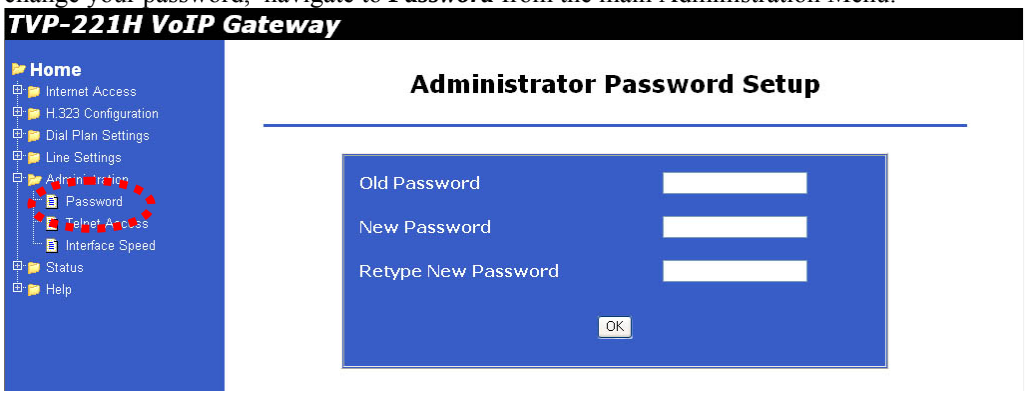
The administrative menus include the following screens.

Administrative Password	This administrative screen allows you to change your password . It is recommended that you change the default password immediately.
Remote Admin	This feature allows you to manage the TVP-221H via the Internet using your web browser or Telnet.
Upgrade	The firmware (software) in the TVP-221H can be upgraded using your

Firmware	Web Browser.

Administration Password Setup / Login

The Administration Password Page allows you to change your password on the TVP-221H. To change your password, navigate to ***Password*** from the main Administration Menu.



Data – Administration Password Setup

Admin Login	
Old Password	Enter the old password
New password	Enter the new password here. If no password is required, leave this blank. If a password is set, the password will be required in order to change the configuration.
Retype New password	Enter the new password here again. This entry must match the value above.
Buttons	
OK	Click on OK to confirm new password

Note	Changes to the password from the Web UI and Telnet are immediately effective unless trying to use the new password set in Web UI and Telnet from Console port. In this case, you would have to reboot the GW before the password would take effect.

Enter the default "User Name" and the "Password" you set on the *Administration Password Setup* screen above.

Remote Administration

Remote Administration allows you to connect to this interface via the Internet, using your Web browser or Telnet. By default, both services are activated.

Data – Telnet Access Screen

Information	
Information	To establish a connection from the Internet using Telnet: 1. Enable the Telnet Server. 2. From Windows command prompt 3. Enter "telnet 192.168.0.1" 4. Enter Username "admin" 5. Enter "123"
Settings	
Telnet	Check this to allow Telnet administration/management via the Internet. (To connect, see above). If Disabled, this device will ignore management connection attempts

	from the Internet.
IP Address	To manage this device via the Internet, you need to know the IP Address of this device, as seen from the Internet. This IP Address is allocated by your ISP. However, if you are using a Dynamic IP Address, this value can change each time you connect to your ISP. There are 2 solutions to this problem: Have your ISP allocate you a Fixed IP address. Use the DDNS feature (Internet menu) so you can connect using a Domain Name, rather than an IP address.

To connect from a remote PC via the Internet using a web browser.

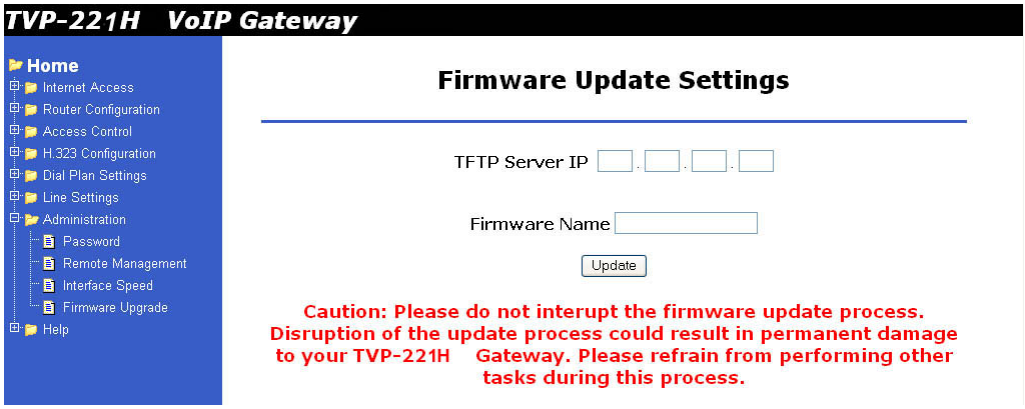
1. Ensure your Internet connection is established, and start your Web Browser.
2. In the "Address" bar, enter "HTTPS://" followed by the Internet IP Address of the TVP-221H. If the port number is not 80, the port number is also required. (After the IP Address, enter ":" followed by the port number.)
   e.g.
   `HTTPS://123.123.123.123:8080`

This example assumes the WAN IP Address is 123.123.123.123, and the port number is 8080.

Upgrading Firmware Using the Web Browser

Use this screen to upgrade your TVP-221H's firmware.

- You must download the required firmware file, and store it on a TFTP Server.
- During the upgrade process, all existing Internet connections will be terminated.
- The upgrade process must NOT be interrupted!.



Data – Upgrade Firmware Screen

Upgrade Firmware	
Upgrade File	Click the "Browse" button and browse to the location on your TFTP Server where you stored the firmware upgrade file. Select this file.
TFTP Server IP	Enter the IP address of the TFTP Server.

Update	Click this button to start the Firmware upgrade. Note than any users accessing the Internet via the TVP-221H will lose their connection. When the upgrade is finished, the TVP-221H will restart, and this management connection will be unavailable during the restart.
Cancel	Cancel does NOT stop the Upgrade process if it has started. It only clears the input for the "Upgrade File" field.

To perform the Firmware Upgrade:

1. Click the "Browse" button and navigate to the location of the upgrade file.
2. Select the upgrade file. It's name will appear in the *Upgrade File* field.
3. Click the "Update" button to commence the firmware upgrade.

The TVP-221H is unavailable during the upgrade process, and must restart when the upgrade is completed. Any connections to or through the TVP-221H will be lost.

Interface Speed

1. **Select** AUTO, 10 MB Full-Duplex or 100 MB Full-Duplex
2. **Click** on *OK*
3. **Reboot**

4.8 Channel Status

View all settings made to each Channel (port). Simply **Select** the Channel (0-3) and **Click** on *View*

4.9 Help

Here you will find helpful definitions to common parameters in the TVP-221H User Interface. In addition, from the main page in the help menu, you can link to the Trendware **FTP** website and download the most current User Guide and support materials ftp.trendware.com/TVP-221H/

Chapter 5

Making Calls with TVP-221H

This chapters shows how to make phone calls from telephony devices connected to the TVP-221H directly through or indirectly.

5.1 Configuration Examples

Default Dial Plan

Before any configuration set up, your TVP should have the following basic information.

Network

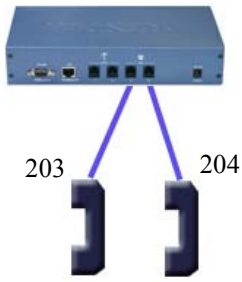
IP : 192.168.0.1

Mask: : 255.255.255.0

Gateway : 0.0.0.0

Dial Plan

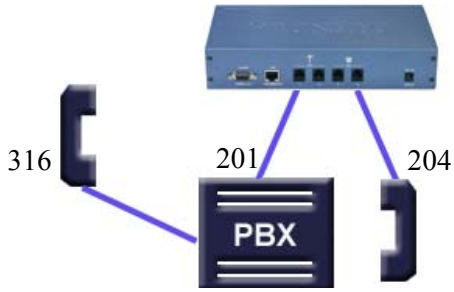
No.	Hunt Group	Dest. ID	Dest.
201	1	1	0 (local port #1)
202	2	2	1 (local port #2)
203	3	3	2
204	4	4	3



1. If your TVP's two FXS ports are connected to two telephones, say port 2 and port 3 respectively, just pick up phone 203 and dial '204', phone 204 should ring.
2. ☎ ☝203 ⇨ TVP ⇨ local port #3⇨ ☎)))

Hint	You may also check the LED indicators on the TVP-221H. When it rings, the related LED should flash. After you pick up the handset, it should remain on and off when the phone is on hook.

Now let's test your TVP-221H that is equipped with 2 FXO interfaces. Assume you have one extension line with your PBX system, say, 201 as the extension number, we connect this line to the gateway's port 0 (FXO port), then connect a telephone phone set to port 3 (for example) of the gateway.



Pick up your extension handset, for example, 316 and dial '201'. After one ring, you should hear a dial tone. Now dial '204'. The telephone connected to the TVP's FXS port should ring.

Hint	If you do not hear the dial tone, please check the line impedance of your PBX. For a TVP-221H with FXO port, you should find consult with your PBX supplier or your System integrator for correct FXO configuration.

1. Now let's make a call to your PBX extension. Pick up the handset connected to the FXS port and dial '**201**', you should hear a dial tone (This means that TVP-221H picks up the line connected to your PBX). Then dial **'316**', your extension handset should ring right away.

Hint	This guide only uses the default values. Once you are familiar with the dial plan set up, you may design your own dial plan.

5.2 Making a call with TVP-221H FXS Port

TVP-221H has two FXS ports. An FXS port can connect to an analogue phone directly, and a FXO port can connect to a PBX system or CO line.

Connection: Analogue telephone set connects to FXS port

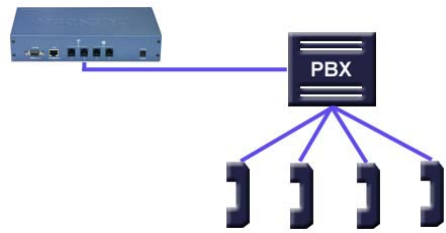
Operation:

1. Pick up this analogue telephone set. You should be able to hear the dial tone provided by the TVP-221H.
2. The corresponding green LED will light up when the telephone set is picked up. For Example: If the telephone set is connected to the second port of FXS. When you pick up the telephone set, the second green LED will light up.
3. We can dial the desired destination phone number at the telephone set. If the desired destination phone number is legal, the TVP-221H will play two quick address ack tones, Du Du, to destination. If the desired destination phone number is illegal, the TVP-221H will play three out of service tones, please check the dial plan and your desired destination phone number.

5.3 Making a call with TVP-221H FXO Port

Connection: Analogue PBX connects to FXO port

Operation:



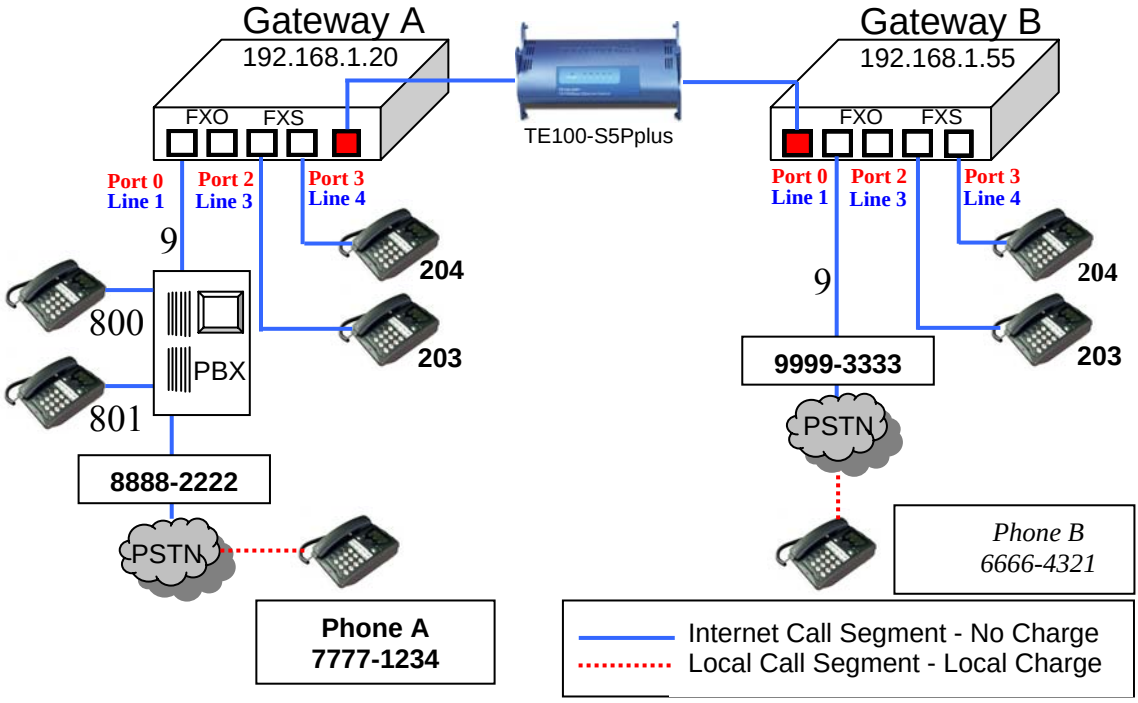
1. Pick up this analogue telephone set, you can hear the PBX dial tone provided by the PBX system. In some cases, you have to dial a specific number to get the connection between telephone set and PBX.
2. Dial the extension number for the gateway as provided by the PBX for the TVP-221H FXO port.
3. When the TVP-221H is connected, the corresponding green LED will be illuminated. For Example: If the telephone set is connected to the second FXO port, the second LED will be green.
4. We can dial the desired destination phone number on the telephone set. If the desired destination phone number is legal, the TVP-221H will play two quick sounds, "Du Du", to destination. If the desired destination phone number is illegal, the TVP-221H will play three out of service tones, please check the dial plan and your desired destination phone number.

5.4 Web Browser Sample Dial Plan

This section describes how to use a web browser to build a dial plan in the VoIP Gateway. We suggest the following when developing your dial plan:

Draw an application diagram to illustrate / clarify application including:
1. Local gateway: IP setup
2. Local gateway: local telephone number setup
3. Local gateway: remote gateway IP & remote telephone number setup

Note: The Diagram below of Gateway A & B could be any combination of either the TVP-224HR (connected to switch by WAN port) or the TVP-221H (Connected by LAN port). The switch that joins these two gateways serves the purpose of initial lab configuration. Under this configuration, both GW must be in the same IP segment. Once the dial plans have been entered and tested, the switch would be replaced by the public internet and the gateways would then have to be updated with the field application Internet Access Settings (eg. Public IP Address, Subnet Mask and Gateway IP Address). In addition, all remote destinations in the dial plan must be updated with the actual application / field IP Addresses.



This diagram serves the purpose of illustrating the possible analog phone / PBX / PSTN integration / applications of the Gateway. However, disconnect cadence provided by your phone company for your PSTN line and disconnect cadence provided by your PBX may require additional matching with the gateway. This will require the assistance of your PBX supplier and /or Systems Integrator. Please also see User's Guide for additional information.

Scenario description: Two gateways connected by a switch.

There are two gateways connected by a switch. They are generically labeled "Gateway" but could be any combination of either the TVP-224HR (connected to switch by WAN port) or TVP-221H (Connected by LAN port). Theoretically, GW A is

in Taiwan (Local Area Code have 2 digits) and GW B is in the US (Local Area Codes have 3 digits).

Gateway A, 4 ports, is configured as follows:

1. Gateway A IP: 192.168.1.20, mask IP: 255.255.255.0, gateway IP 0.0.0.0 (virtual IP)
2. FXS Port 2 has a telephone set connected, its phone number is "203"
3. FXS Port 3 has a telephone set connected, its phone number is "204"
4. FXO Port 0 is connected to PBX. There are two telephone sets connected to the PBX. Their extension numbers are "800" and "801".
5. FXO Port 0 is registered as number "9" and it is connected to PBX
6. PBX has an external line to PSTN. Dialing "9" connects you PBX, where "9" is dialed to connect to PSTN.
7. The PSTN number to reach the PBX is "8888-2222".
8. Telephone A's number is "7777-1234" and belongs to the local PSTN

Gateway B, 4 ports, is configured as follows:

1. Gateway B IP: 192.168.1.55, mask IP: 255.255.255.0, gateway IP 0.0.0.0 (virtual IP)
2. FXS Port 2 has an analog telephone set connected, its phone number is "203"
3. FXS Port 3 has an analog telephone set connected, its phone number is "204"
4. FXO Port 0 is registered as number "9". Dialing "9" connects you to the outside line.
5. FXO Port 0 is connected to PSTN line "9999-3333".
6. Telephone B's number is "6666-4321" and belongs to the local PSTN.

Gateway A - IP setup:

1. Navigate to Internet Access / Fixed IP Menu
2. Type in IP Address: 192.168.1.20, Subnet Mask: 255.255.255.0 and Default IP Gateway Address: 0.0.0.0 in the related fields.
3. Click on "Save"
4. Click on "Reboot"

Gateway B – IP Setup:

5. Navigate to Internet Access / Fixed IP Menu.
6. Type in IP Address: 192.168.1.55, Subnet Mask: 255.255.255.0 and Default IP Gateway Address: 0.0.0.0 in the related fields.
7. Click on "Save"
8. Click on "Reboot"

Gateway A: Dial Plan Setup

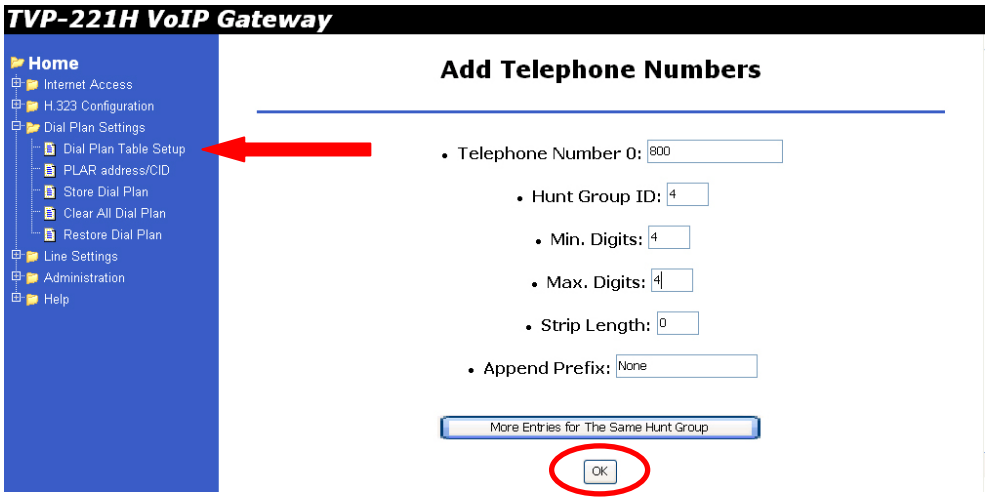
FXS Ports to Analog Phones - Gateway A has two phones on the FXS ports. Telephone number 203 on Port 2 and 204 on Port 3. These numbers are part of the default dial plan and do not have to be entered. We can skip the local Dial Plan setup including Telephone Address, hunt group and destination for phones 203 and 204.

How to Enter the Dial Plan

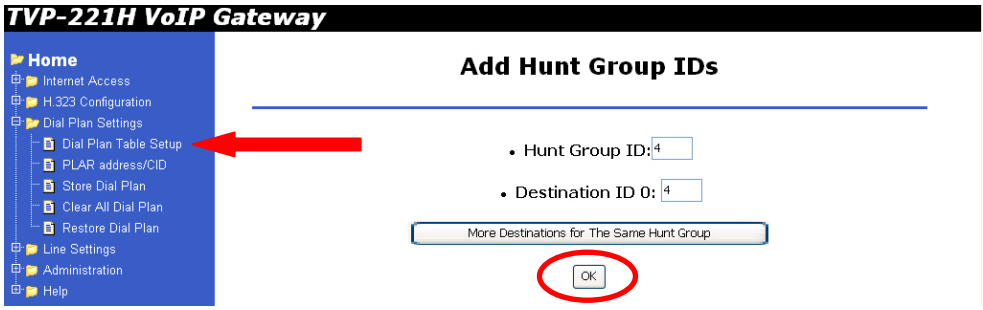
The Dial plan consists of three tables that include the Telephone Table, Hunt Group (eg. Customer Service may have multiple phones that the GW must search through for an open line), and Destination Table (Both Local and Remote). The dial plan has to be entered into all Gateways so that the local gateway knows how to process calls, sending them to its local ports or to remote gateways for further processing.

The following screen shots show an example for entering a dial plan for a single number. This example should give you the necessary insight as to how to enter the rest of the Dial Plan. If you still have difficulty understanding the dial plan and entering data, please reference the User Manual for more examples.

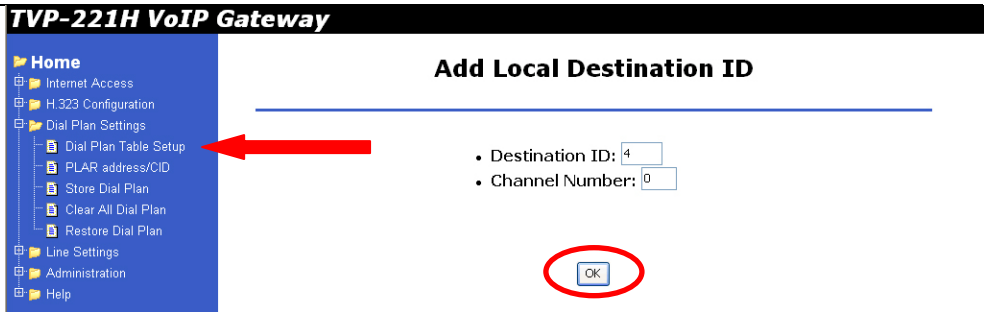
1. From the Navigation Menu on the left side, **Select** *Dial Plan Table Setup*
2. From the window, please **Select** <Add> <Telephone>
3. The following window will appear. Please **Enter** Data as shown
4. **Click** on *Ok*



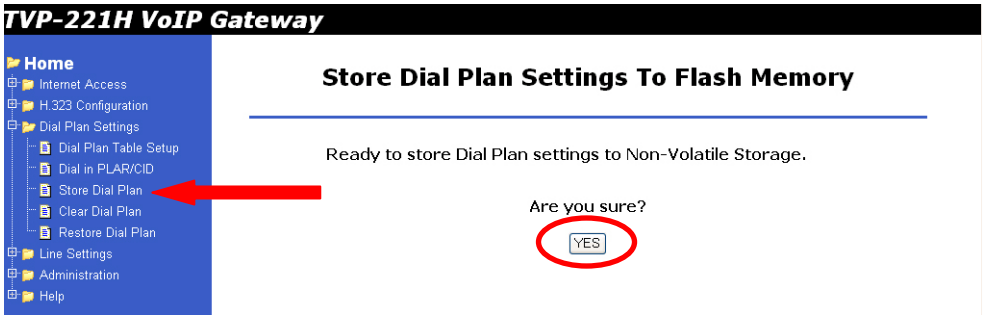
1. From the Navigation Menu on the left side, **Select** *Dial Plan Table Setup*
2. From the window, please **Select** <Add> <HuntGroup>
3. The following window will appear. Please **Enter** Data as shown
4. **Click** on *Ok*



5. From the Navigation Menu on the left side, **Select** *Dial Plan Table Setup*
6. From the window, please **Select** <Add> <Local_Destination_Channel>
7. The following window will appear. Please **Enter** Data as shown
8. **Click** on *Ok*



1. Continue entering the Gateway A Dial Plan as laid out in the tables below (Telephone Table, Hunt Group Table and Destination Table) following the above procedures.
2. After you have entered the Dial Plan, make sure you **Store Dial Plan** to flash memory. From the Navigation Bar on the left side, **Click** on *Store Dial Plan*
3. The following screen will appear on the right side. **Click** on *YES*



Gateway B: Dial Plan Setup

1. Enter Gateway B Dial Plan into Gateway B as shown in the tables below (Telephone Table, Hunt Group Table and Destination Table) following the above procedures.
2. After entering all the information listed in the tables below, **DO NOT** navigate away from Dial Plan Settings. Click **Store Dial Plan**, and click **YES** to save your dial plan to Flash Memory.

Gateway A and Gateway B Dial Plan Tables

Gateway A - Telephone Number Table

Phone #	Hunt Group ID	Min. Digits	Max. Digits	Prefix strip	Prefix Address	Function	Comment
203	2	3	3	3	None	Dialing "203" calls phone on FXS Port 2	
204	3	3	3	3	None	Dialing "204" calls phone on FXS Port 3	
800	4	3	3	0	None	Dialing "800" calls PBX on FXO Port 0, which then	This is an example only. Please substitute your ext# on PBX if

						dials "800".	applicable
801	5	3	3	0	None	Dialing "801" calls PBX on FXO Port 0, which then dials "801".	This is an example only. Please substitute your ext# on PBX if applicable
9	6	1	1	0	None	Dialing "9" from local phone on FXS Port connects you FXO Port 0 PBX, where "9" is dialed for outside line.	For PBX on FXO use only
01	7	10	12	2	"9"	After receiving "01" + 8 to 10 digits (2 Digit Taiwan Area Code) from GW B, "01" is stripped, prefix address "9" is dialed to PBX on FXO Port 0 for outside line and then, remaining 8 to 10 digits are dialed.	For PBX on FXO use only
22	22	5	5	2	None	"22" is stripped and remaining 3 digits are sent to GW B.	Remote Zone # used to make calls to remote GW B FXS (Internal Ext)
02	22	10	13	0	None	"02" + 8 to 11 digits (3 Digit US Area Code) are sent to GW B.	Remote Zone # used to make calls to remote GW B FXO (External – PBX to PSTN)

Gateway A - Hunt Group Table

Hunt Group ID	Hunt Type	# of Dest ID(s)	Dest. ID(s)
2	2	1	2
3	2	1	3
4	2	1	4
5	2	1	4
6	2	1	4
7	2	1	4
22	2	1	22

Gateway A - Destination Table

Dest ID	Mode	Destination
2	Local	Port = 2

3	Local	Port = 3
4	Local	Port = 0
22	Remote	Dest = 192.168.0.55/1720 TCP

The above destination table has both local destinations and remote destinations. When the gateways are taken out of this initial testing environment, and implemented in the field, the internet access settings will have to be updated. In addition, the above remote destination IP will have to be updated to the field IP address.

Gateway B - Telephone Number Table

Phone #	Hunt Group ID	Min. Digits	Max. Digits	Prefix strip	Prefix Address	Function	Comment
203	2	3	3	3	None	Dialing "203" calls phone on Port 2	
204	3	3	3	3	None	Dialing "204" calls phone on Port 2	
9	4	1	1	1	None	Dialing "9" from local phone on FXS Port gets you a dial tone on FXO Port 0 for outside line.	Assumes that Telephone line is attached to Port 0 / Line 1
02	5	10	13	2	None	"02" is stripped, and the remaining 8 to 11 digits (3 Digit US Area Code) are dialed out on Port 0 to PSTN.	Assumes that Telephone line is attached to Port 0 / Line 1
11	11	5	5	2	None	"11" is stripped and remaining 3 digits are sent to GW A.	Remote Zone # used to make calls to remote GW A FXS (Internal Ext)
01	11	10	12	0	None	"01" + 8 to 10 digits (2 Digit Taiwan Area Code) are sent to GW B.	Remote Zone # used to make calls to remote GW A FXO (External - to PSTN)

Gateway B - Hunt Group Table

Hunt Group ID	Hunt Type	# of Dest ID(s)	Dest. ID(s)
2	2	1	2
3	2	1	3
4	2	1	4
5	2	1	4

11	2	1	11

Gateway B - Destination table

Dest ID	Mode	Destination
2	Local	Port = 2
3	Local	Port = 3
4	Local	Port = 0
11	H.323	Dest = 192.168.0.20/1720 TCP

The above destination table has both local destinations and remote destinations. When the gateways are taken out of this initial testing environment, and implemented in the field, the internet access settings will have to be updated. Likewise, the above remote destination IP will have to be updated to the field Destination IP address.

5.5 Making a call between Gateway A and Gateway B

Case 1: Gateway Phone to Gateway Phone

Gateway B phone 203 calls Gateway A phone 203		
Caller Operation at GW B	**Equipment Operation**	**Receiver Operation at GW A**
Pick up phone 203 (204)	1. GW dial tone is heard. 2. GW B Line 3 LED "ON"	
Dial 11203 (11204, 11800, 11801)	1. Du Du is heard 2. VoIP call processing	
Ring back tone is heard	1. GW A Line 3 LED "ON"	Phone 203 rings
		Pick up phone 203
VoIP Conversation		VoIP Conversation

The above process is the same for Gateway B phone 203 and 204 calls to Gateway A phone 201, 800 and 801.

Case 2: Gateway Phone to PSTN Phone

Gateway B phone 203 calls to PSTN phone A number 7777-1234		
Caller Operation at GW B	**Equipment Operation**	**Receiver Operation at GW A**
Pick up phone 203 (204) on GW B	1. GW dial tone is heard. 2. GW B Line 3 LED "ON"	
Dial 01-7777-1234	1. Du Du is heard 2. VoIP call processing	
Ring back tone is heard	1. GW A Line 1 LED "ON" 2. GW A is connected to PSTN	
Ring back tone is heard	1. PSTN call processing	Phone 7777-1234 is ringing
		Receiver on 7777-1234 picks up
VoIP Conversation		VoIP Conversation

The above dialing process is the same for phones 203, 204 to any GW A local PSTN phone number.

Case 3: PSTN Phone to Gateway Phone

Phone A, number 7777-1234 calling Gateway B phone 203		
Caller Operation at Phone A	**Equipment Operation**	**Receiver Operation at GW B phone 203**
Pick up phone A	1. PSTN dial tone is heard.	
Dial 8888-2222	1. Call being processed 2. PBX plays voice greeting	

Dial 22203 (22204)	1. Du Du tone is heard 2. VoIP call processing	
Ring back tone is heard		
	1. GW A Line 1 LED "ON"	Phone 203 is ringing
	1. GW B Line 3 LED "ON"	Receiver Picks up phone 203
VoIP Conversation		VoIP Conversation

The above dialing process is the same for any calls made from GW A local PSTN to remote phone numbers 203 & 204.

ⓘ Case 1-3 Dial Plan samples show the possible analog phone / PBX / PSTN integration / applications of the Gateway. Disconnect cadence provided by your phone company for your PSTN line and disconnect cadence provided by your PBX may require additional matching with the gateway. This will require the assistance of your PBX supplier and / or Systems Integrator. Please also see User's Guide for additional information.

5.6 VoIP in a Dynamic IP environment

The previous section dealt with the TVP-222H in and its configuration in a static IP environment. The following section will address the issue of Dynamic IP and the TVP-221H deployment in such an environment. This section we will shows you how to connect two TVP-221H in a dynamic IP address environment and configure PPPoE, DHCP, and DDNS clients.

5.7 PPPoE, DHCP, and DDNS clients:

Case 4: Gateway Prefix–Simplified Gateway Phone to Gateway Phone

In addition to fixed IP, the TVP-221H can be configured to use PPPoE or DHCP clients. With PPPoE and DHCP, you will under most circumstances be assigned a Dynamic IP. In order for other people and devices to locate you, they will need to be pointed to your dynamic IP. Therefore, it is necessary that you register with a DDNS (**Note**: www.dyndns.org is currently the only service supported). Once you have registered an account, and have configured the DDNS client in the TVP-221H, the TVP-221H will automatically notify DynDNS when your Dynamic IP Address changes. DynDNS will in turn, map your Dynamic IP to your registered Domain Name. See Chapter 6, DDNS section for more information.

The first time you connect to the TVP-221H for configuration, you will need to connect to it under the same LAN segment to set the DHCP or PPPoE client. To configure the TVP-221H, insert one end of an Ethernet cable into the RJ45 WAN port on the rear panel of the TVP-221H and the other end directly to your PC Terminal. Open your browser and enter the TVP-221H's default IP Address: **192.160.0.1**. Make sure your computer's Fixed IP is in the same segment. (See Chapter 4, PC Configuration). The TVP-221H supports auto MDIX so you do not have to worry about the cable. Any Cat 3 or 5 cable will be sufficient.

Dial Plan

After these dial plans are added, users on Site A are able to dial "22 + extension number" to connect to users on site B for free VoIP telephony. Users on Site B are able to call phones on Site A for free VoIP telephony by dialing "11 + extension number". (Note: There is a Max digit (5) limitation on dial plan which allows the TVP-221H to differentiate with potential PSTN numbers that may start with 11 or 22 but because they exceed 5 digits, they would be handled differently)

The benefits of this dial plan are:

1. Simplified setup
2. VoIP (Free calls to remote site extension)
3. Simplified dialing ensures easy, direct access to remote extensions.
4. Simplified dialing makes remote offices and branches feel like local extensions.

Two TVP-221H Gateways (Both Gateways are set up with default settings)

1. TVP-221H A, located site A
2. TVP-221H B, located on site B.

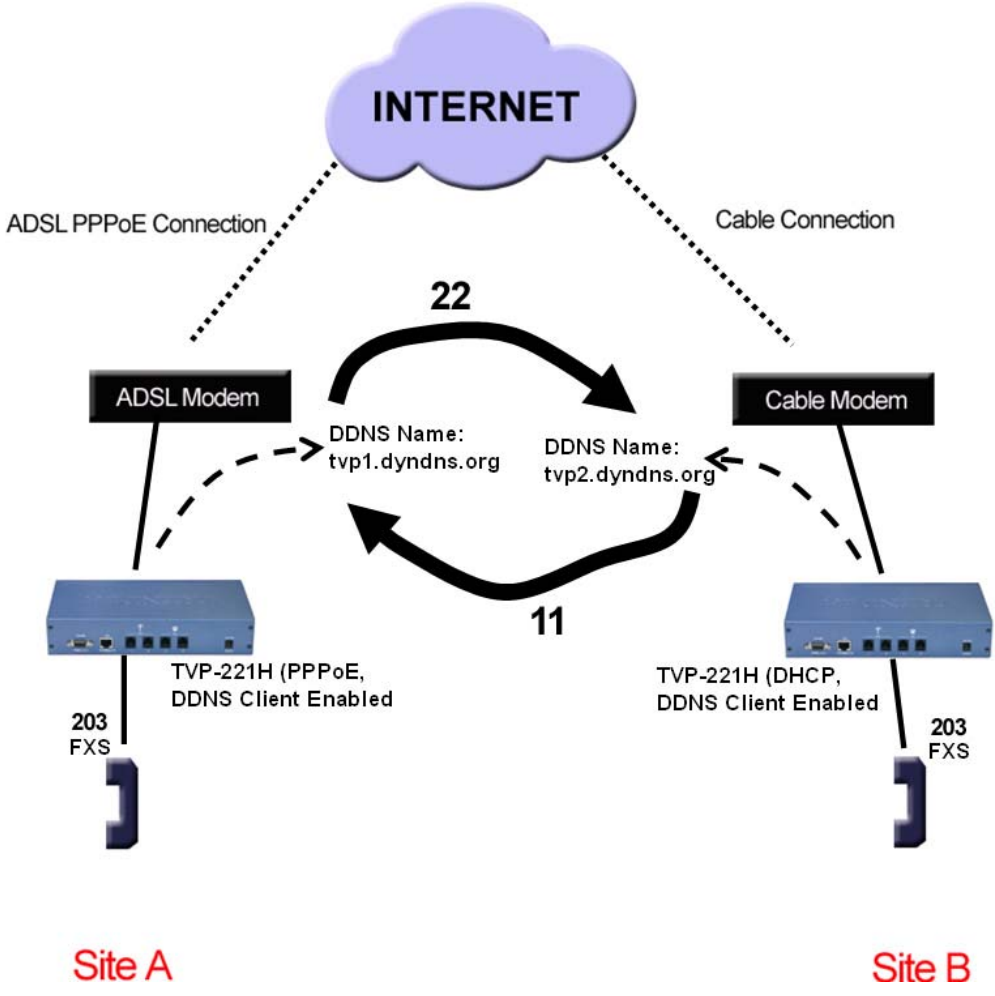
Registered DDNS name for both Dynamic IPs

- **tvp1.dyndns.org** is applied for TVP-221H on site A
- **tvp2.dyndns.org** is applied for TVP-221H on site B

Clients used on this topology :

- TVP-221H on site A has **PPPoE**, and **DDNS** clients enabled
- TVP-221H on site B has **DHCP**, and **DDNS** clients enabled.

Network topology is illustrated as follows:



TVP-221H configuration (ADSL PPPoE connection) on site A	
Web Configuration	**Telnet / Console**
Local (from PC in same Segment) Open your browser 1. Enter 192.168.0.1 2. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.	**Console** **Connect RS-232 to TVP-221H and PC** **Open Hyper Terminal** **Input parameters:** Baud rate 19,200 Number of data bit 8 Parity check None Number of stop bit 1 Flow control None **Enter "123"** **Local Telnet (from PC in same segment)** **From Windows command prompt**

Enter "telnet 192.168.0.1"
Enter Username "admin"
Enter "123"

Web Configuration of Internet Access

Internet Access / PPPoE

1. Select "Yes" to enable PPPoE function
2. Enter username and password provided by your ISP
3. Click on "Save"

Internet Access / Dynamic DNS

4. Select Enable
5. Enter Server Name, Host Name, User Name, Password (eg. dyndns.org tvp1 username1 password1)
6. Click on "Save"
7. Click on "Store"

net set pppoe on
net set pppoe user_name *[user_name]*
net set pppoe pw *[my_password]*

net set dyndns on
set dyndns add [serv_name] [host_name] [user_name] [password] (eg. dyndns.org tvp1 username1 password1)
config activate
config store

Once Internet Access is setup, you could choose to reboot and then reconnect using an PC with internet access:

1. Click on "Reboot"

On your PC, close all browser windows, before reopening.

2. Enter tvp1.dyndns.org
3. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.

You would then continue as below:

From the local connection, you could continue setting up the dial plan. However you could choose to reboot.

Enter "net reset"

Using a RJ45 Cat 5 cable, connect your TVP-221H directly to your ADSL / Cable Modem and initiate new Telnet session from a PC with internet Access:

Enter "telnet tvp1.dyndns.org"
Enter Username "admin"
Enter "123"

You would then continue as below:

Web Configuration of Dial Plan

Dial Plan Settings / Dial plan Table Setup

8. Select "Add" and "Telephone"
9. Enter following fields
   a. Telephone Number :22
   b. Hunt Group ID: 22
   c. Min. Digits: 2
   d. Max. Digits: 5
   e. Strip Length: 2
   f. Append Prefix: none
10. Click on "OK"

atpm req
atpm aadd 22 2 5 22 2

atpm hadd 22 2 22

Dial Plan Settings / Dial plan Table Setup 11. Select "Add" and "HuntGroup" 12. Enter following fields a. Hunt Group ID: 22 b. Destination ID: 22 13. Click on "OK"	
Dial Plan Settings / Dial plan Table Setup 14. Select "Add" and "Remote_Host_Name" 15. Enter the following fields a. Destination ID: 22 b. Hostname or IP address (eg. tvp2.dyndns.org) c. Click on "OK"	**atpm dadd <dest_id> dns <hostname/port> (**eg**.** 22 dns tvp2.dyndns.org) **atpm done** **atpm store**
Dial Plan Settings / Store Dial Plan 16. Click on "Store" 17. Click on "Yes"	

Changes to network settings require rebooting to take effect. Changes to the Dial Plan do not and will take effect as soon as they are stored.

Caution: If you do not store the dial plan, it will be lost when you reboot.

Note: After changing the default IP address, you will be required to use the new IP Address (hostname), in this example tvp1.dyndns.org, to gain access to the TVP-221H via web browser user interface or Telnet.

TVP-221H configuration (cable connection) on site B	
Web Configuration	**Telnet / Console**
Local (from PC in same Segment) Open your browser 3. Enter 192.168.0.1 4. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.	**Console** **Connect RS-232 to TVP-221H & PC** **Open Hyper Terminal** **Input parameters:** Baud rate 19,200 Number of data bit 8 Parity check None Number of stop bit 1 Flow control None **Enter "123"** **Local Telnet (from PC in same Segment)**

From Windows command prompt
Enter "telnet 192.168.0.1"
Enter Username "admin"
Enter "123"

Web Configuration of Internet Access

Internet Access / DHCP Client

24. Select "Yes"
25. Click on "Save"

net set dhcp on.
net set dyndns on

Internet Access / Dynamic DNS

26. Select Enable
27. Enter Server Name, Host Name, User Name, Password (eg. dyndns.org tvp2 username2 password2)
28. Click on "Save"
29. Click on "Store"

set dyndns add [serv_name] [host_name] [user_name] [password] (eg. dyndns.org tvp2 username2 password2)
config activate
config store

Once Internet Access is setup, you could choose to reboot,

1. Click on "Reboot"

Connect your TVP-221H directly to your ADSL / Cable Modem. Using a PC with Internet Access, close all browser windows, and then reopen your browser.

2. Enter tvp2.dyndns.org
3. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.

You would then continue as below:

From the local connection, you could continue on setting up the dial plan. However you could choose to reboot,

Enter "net reset"

connect your TVP-221H directly to your ADSL / Cable Modem and reconnect from a PC with Internet Access

Enter "telnet tvp2.dyndns.org"
Enter Username "admin"
Enter "123"

You would then continue as below:

Web Configuration of Dial Plan

Dial Plan Settings / Dial plan Table Setup

30. Select "Add" and "Telephone"
31. Enter following fields
    a. Telephone Number:11
    b. Hunt Group ID: 11
    c. Min. Digits: 2
    d. Max. Digits: 5
    e. Strip Length: 2
    f. Append Prefix: none
32. Click on "OK"

atpm req
atpm aadd 11 2 5 11 2

Dial Plan Settings / Dialplan Table

Setup 33. Select "Add" and "HuntGroup" 34. Enter following fields a. Hunt Group ID: 11 b. Destination ID: 11 35. Click on "OK"	**atpm hadd** 11 2 11
Dial Plan Settings / Dialplan Table Setup 36. Select "Add" and "Remote_Host_Name" (eg. 11 dns tvp1.dyndns.org) 37. Enter the following fields c. Destination ID: 11 d. Hostname (or IP address) tvp1.dyndns.org e. Click on "OK"	**atpm dadd <dest_id> dns <hostname/port> (eg.** 11 dns tvp1.dyndns.org)
Dial Plan Settings / Store Dial Plan 38. Click on "Store" 39. Click on "Yes"	**atpm done** **atpm store**

Changes to network settings require rebooting to take effect. Changes to the Dial Plan do not and will take effect as soon as they are stored.

Caution: If you do not store the dial plan, it will be lost when you reboot.

Note: After changing the default IP address, you will be required to use the new IP Address (hostname), in this example tvp2.dyndns.org, to gain access to the TVP-221H via web browser user interface or Telnet.

5.8 (NAT) router with built-in DDNS client

Case 5: Gateway Prefix-Simplified Gateway Phone to Gateway Phone

A major consideration in NAT to NAT VoIP communication is that the DMZ function and DDNS Client of the NAT routers have to function correctly. If they do not, it will result in one-way communication. The following Case example explains how the

TVP-221H can be configured with a Router. In this example, Trendwares TEW-431BRP is used.

Internet Access

In addition to fixed IP, the TEW-431BRP can be configured to use PPPoE or DHCP clients. With PPPoE and DHCP, you will have a Dynamic IP but combined with Dynamic DNS, the TEW-431BRP will automatically notify DynDNS of your changing IP Address and DynDNS will in turn, map it to your registered Domain Name. Assuming the above has been done, we can configure the TVP-221H

Note: The following installation method takes into consideration that both the TEW-431BRP and the TVP-221H have the same default IP address: 192.168.0.1. Please note that the TEW-431BRP DHCP Server start IP Address and finish IP Address fields set the values used by the DHCP server when allocating IP Addresses to DHCP clients. Please set the DHCP Server values to avoid conflict with the Fixed IP addresses assigned to the TVP-221H A (192.168.0.20) and TVP-221H B (192.168.0.55)

The first time you connect to the TVP-221H for web configuration, you will need to connect to it under the same LAN segment. To configure the TVP-221H, insert one end of an Ethernet cable into the RJ45 LAN port of the TVP-221H and the other end directly to your configuring PC.

Once Internet Access has been configured (See below), you can disconnect the cable from the PC and reconnect it to one of the LAN ports of the TEW-431BRP. Connect your PC to one of the remaining 3 Hub ports. By default, the TEW-431BRP's DHCP server is enabled. Make sure your computer is DHCP client enabled or has a Fixed IP not used by any other devices on the LAN. If using a Fixed IP, make sure it is also in the same LAN segment.. See Chapter 4 for more information. The TEW-431BRP and the TVP-221H both support auto-MDIX so a Standard Cat 5 cable will be sufficient.

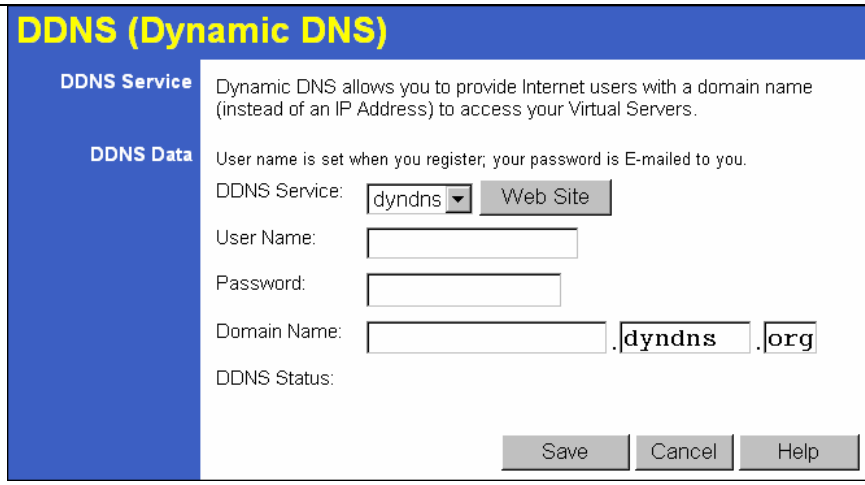
Network Configuration

In this case application, the Trendware TEW-431BRP can be set up to use Virtual Servers or DMZ, and DDNS Client Support

1. The TEW-431BRP supports Virtual Servers and DMZ allowing you to connect a device / server you wish to make available to the public. Using a standard RJ45 cable, connect your TVP-221H LAN port to a TEW-431BRP LAN port.

   Please note the following regarding DMZ configuration.
   - Devices connected to a LAN port are in the same LAN segment as PCs connected to the other LAN ports. They must use the same IP address range.

2. **Select** *Internet* on the main menu, then *Dynamic DNS*, to see a screen like the following



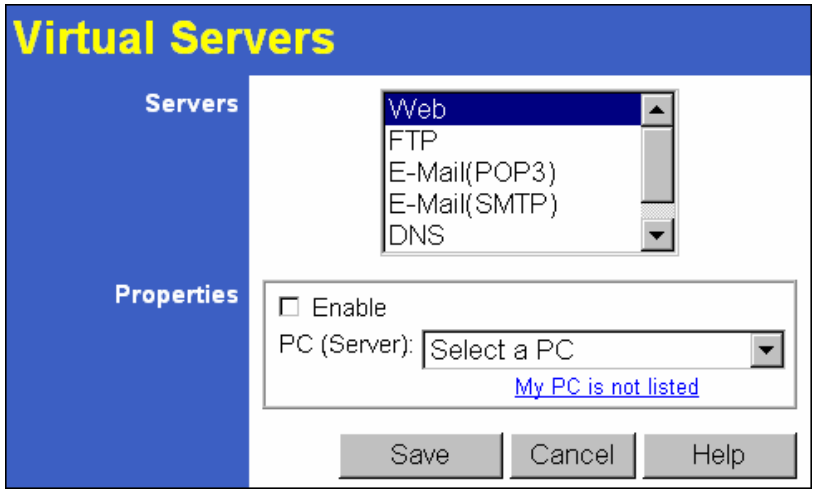
3. **Enter** *username / password* and *domain name (hostname)* as registered with www.dyndns.org
4. **Click** on *Save*, and wait a few seconds to verify if DDNS service has taken effect. DDNS Status should appear. You can also verify by checking the Status page.

   Note: When setting up the DDNS Client, it is advised that you register a hostname with only dyndns.org domain.

   Note: DDNS feature implementation may be different for different routers from different vendors. Please refer to respective vendor's user's manual for DDNS feature explanation and configuration

   Note: Please note that DDNS client in TVP-221H is not suggested in NAT environments.

5. From the *Internet* menu, **navigate** to the *Virtual Servers* submenu. The following menu will appear.



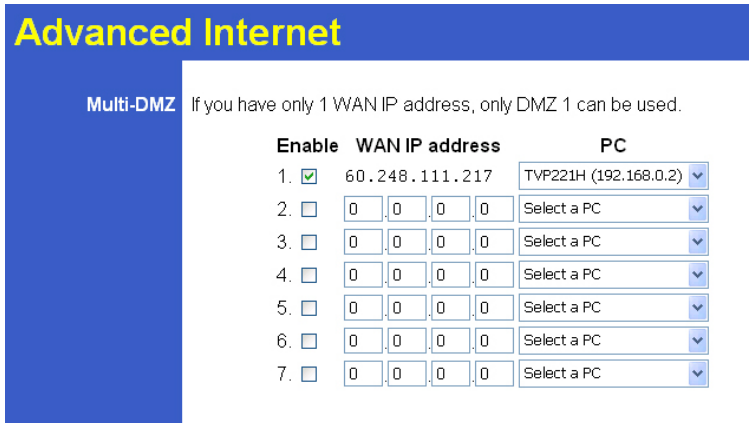
6. **Select** the device and **check** *enable*
7. **Click** on *Save*

Note: Defining your own Virtual Servers
If the type of Server you wish to use is not listed on the Virtual Servers screen, you can use the Firewall Rules to allow particular incoming traffic and forward it to a specified PC (Server).

Virtual Servers Menu

Servers	
Servers	This lists a number of pre-defined Servers, plus any Servers you have defined. Details of the selected Server are shown in the "Properties" area.
Properties	
Enable	Use this to Enable or Disable support for this Server, as required. If Enabled, any incoming connections will be forwarded to the selected PC. If Disabled, any incoming connection attempts will be blocked.
PC (Server)	Select the PC for this Server. The PC must be running the appropriate Server software.

8. Alternately, instead of using Virtual Servers, you could set up the TVP-221H as a DMZ. From the *Internet* menu, **navigate** to the *Advanced Internet* submenu. The following menu will appear.

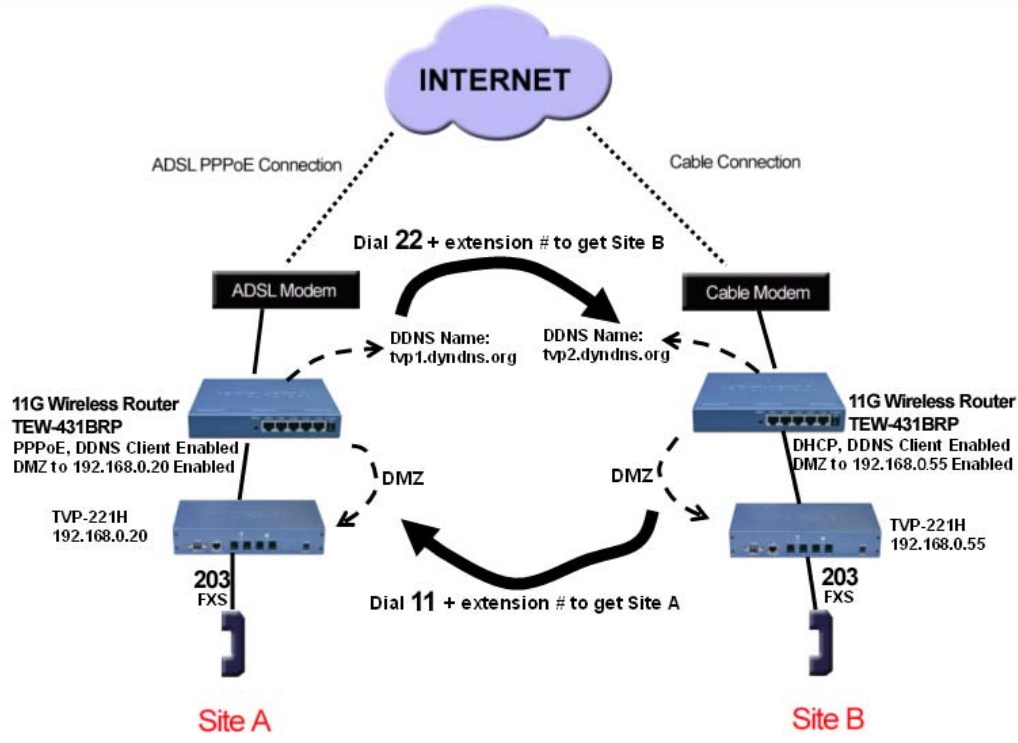


9. **Select** the device and **check** *enable*
10. **Click** on *Save*

DMZ	
PC	This lists a number of pre-defined PC, plus any PC you have defined from "PC Database"

Properties	
Enable	Use this to Enable or Disable support for DMZ, as required. If Enabled, any incoming connections will be forwarded to the selected PC. If Disabled, any incoming connection attempts will be blocked.
PC	Select the PC for to be the DMZ

Network topology is illustrated as follows:



Web Menu Configuration / Console Telnet Commands used on this topology:

Web Configuration	Console / Telnet
Internet Access / Fixed IP Menu: =>Enter	
IP	**net set ip**: to setup IP
Subnet Mask	**net set mask**: to setup IP mask
Default Gateway	**net set gateway** : assign gateway IP address
Home	**net show**: display status

Dial Plan Function

After these dial plans are added, users on Site A are able to dial "22 + extension number" to connect to users on site B for free VoIP telephony. Users on Site B are able to call phones on Site A for free VoIP telephony by dialing "11 + extension number". (Note: There is a Max digit (5) limitation on dial plan which allows the TVP-221H to differentiate with potential PSTN numbers that may start with 11 or 22 but because they exceed 5 digits, they would be handled differently)

The benefits of this dial plan are:

1. Simplified setup
2. VoIP (Free calls to remote site extension)
3. Simplified dialing ensures easy, direct access to remote extensions.
4. Simplified dialing makes remote offices and branches feel like local extensions.

Network Deployment

Two TVP-221H Gateways (Both Gateways are set up with default settings)

1. TVP-221H A, located site A
2. TVP-221H B, located on site B.

Register DDNS name for both Dynamic IPs (See Chapter 4)

- **tvp1.dyndns.org (xxx.xxx.xxx)** is applied for TEW-431BRP on site A
- **tvp2.dyndns.org (xxx.xxx.xxx)** is applied for TEW-431BRP on site B

Clients used in this topology:

- TEW-431BRP on site A has **PPPoE**, and **DDNS** clients enabled
- TEW-431BRP on site B has **DHCP**, and **DDNS** clients enabled.

Other considerations for this configuration:

- TVP-221H on site A is connected to a **LAN port**, Virtual Server is enabled.
- TVP-221H on site B is connected to a **LAN port,** Virtual Server is enabled.

TVP-221H configuration (ADSL PPPoE connection) on site A

Web Configuration

Local (from PC in same Segment)

Open your browser

1. Enter 192.168.0.1
2. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.

Web Configuration of Internet Access

Internet Access / Fixed IP

Enter Fixed IP (192.168.0.20, Subnet Mask(255.255.255.0), Default Gateway 192.168.0.254.

3. Click on 'Save"

Once Internet Access is setup, you could choose to reboot the TVP-221H, and then use a PC in the same segment and with a web browser, access theTVP-221H:

If using the Router's DHCP Server, make sure the routers DHCP Server is on and that the configuring PC and TVP-221H are DHCP Client enabled.

If you would like your PC and / or TVP-221H to have a Fixed IP, Make sure that the their IP's do not conflict with the range of IP's allocated with the Routers DHCP Server.

If you are trying to access the TVP-221H from a PC in the same segment as the TVP-221H (LAN), Open your browser and enter

1. Enter 192.168.0.20

If you would like to access the TVP-221H from the WAN side, from a remote PC with Internet Access:

2. Enter tvp1.dyndns.org

You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.

You could then continue as below:

Telnet / Console

Console

Connect RS-232 to TVP-221H & PC
Open Hyper Terminal
Input parameters:

Baud rate	19,200
Number of data bit	8
Parity check	None
Number of stop bit	1
Flow control	None

Enter "123"

Telnet (from PC in same Segment)

From Windows command prompt
Enter "telnet 192.168.0.1"
Enter Username "admin"
Enter "123"

net set ip 192.168.0.20
net set mask 255.255.255.0
net set gateway 192.168.0.254

From the local connection, you could continue on setting up the dial plan. However you could choose to reboot,

Enter "net reset"

Connect your TVP-221H and a PC directly to your router making sure they are in the same LAN segment. From the windows command prompt:

Enter "telnet 192.168.0.20"

Or from a remote computer

Enter "telnet tvp1.dyndns.org"
Enter Username "admin"
Enter "123"

You would then continue as below:

Web Configuration of Dial Plan

Dial Plan Settings / Dialplan Table Setup

4. Select "Add" and "Telephone
5. Enter following fields
   g. Telephone Number: 22
   h. Hunt Group ID: 22
   i. Min. Digits: 2
   j. Max. Digits: 5
   k. Strip Length: 2
   l. Append Prefix: none
6. Click on "OK"

Dial Plan Settings / Dialplan Table Setup

7. Select "Add" and "HuntGroup"
8. Enter following fields
   m. Hunt Group ID: 22
   n. Destination ID 0: 22
9. Click on "OK"

Dial Plan Settings / Dialplan Table Setup

10. Select "Add" and "DestinationID"
11. Enter the following fields
    o. Destination ID: 22
    p. Hostname (or IP address) tvp2.dyndns.org
    q. Click on "OK"

Dial Plan Settings / Store Dial Plan

12. Click on "Yes"

atpm req
atpm aadd 22 2 5 22 2

atpm hadd 22 2 22

atpm dadd 22 dns tvp2.dyndns.org

atpm done
atpm store

Changes to network settings require rebooting to take effect. Changes to the Dial Plan do not and will take effect as soon as they are stored.

Caution: If you do not store the dial plan, it will be lost when you reboot.

Note: After changing the default IP address, you will be required to use the new IP Address (hostname), in this example, 192.168.0.20 to gain access from the local LAN segment or tvp1.dyndns.org, to gain remote access via the Internet.

TVP-221H configuration (cable connection) on site B	
Web Configuration	**Telnet / Console**
Local (from PC in same Segment)	**Console**

Open your browser
Enter 192.168.01

1. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.

Web Configuration of Internet Access

Internet Access / Fixed IP
Enter Fixed IP (192.168.0.55, Subnet Mask(255.255.255.0), Default Gateway 192.168.0.254

2. Click on "Save"

Once Internet Access is setup, you could choose to reboot the TVP-221H, and then use a PC in the same segment with a web browser, to access theTVP-221H:

If using the Router's DHCP Server, make sure the routers DHCP Server is on and that the configuring PC and TVP-221H are DHCP Client enabled.

If you would like your PC and / or TVP-221H to have a Fixed IP, Make sure that the their IP's do not conflict with the range of IP's allocated with the Routers DHCP Server.

If you are trying to access the TVP-221H from a PC in the same segment as the TVP-221H (LAN), Open your browser and enter

3. Enter 192.168.0.55

If you would like to access the TVP-221H from the WAN side, from a remote PC with Internet Access:

4. Enter tvp2.dyndns.org

You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.

You could then continue as below:

Connect RS-232 to TVP-224HR and PC
Open Hyper Terminal
Input parameters:

Baud rate	19,200
Number of data bit	8
Parity check	None
Number of stop bit	1
Flow control	None

Enter "123"

Local Telnet (from PC in same Segment)
From Windows command prompt
Enter "telnet 192.168.0.1"
Enter Username "admin"
Enter "123"

net set ip 192.168.0.55
net set mask 255.255.255.0
net set gateway 192.168.0.254

From the local connection, you could continue on setting up the dial plan. However you could choose to reboot,

Enter "net reset"

connect your TVP-221H and a PC directly to your router making sure they are in the same LAN segment.
From the windows command prompt:

Enter "telnet 192.168.0.55"

Or from a remote computer

Enter "telnet tvp2.dyndns.org"
Enter Username "admin"
Enter "123"

You would then continue as below:

Web Configuration of Dial Plan

Dial Plan Settings / Dial plan Table Setup

3. Select "Add" and "Telephone
4. Enter following fields
   r. Telephone Number:11
   s. Hunt Group ID: 11
   t. Min. Digits: 2
   u. Max. Digits: 5
   v. Strip Length: 2
   w. Append Prefix: none
5. Click on "OK"

atpm req
atpm aadd 11 2 5 11 2

Dial Plan Settings / Dial plan Table Setup

6. Select "Add" and "HuntGroup"
7. Enter following fields
   f. Hunt Group ID: 11
   g. Destination ID 0: 11
8. Click on "OK"

atpm hadd 11 2 11

Dial Plan Settings / Dial plan Table Setup

9. Select "Add" and "DestinationID"
10. Enter the following fields
    h. Destination ID: 11
    i. Hostname (or IP address) tvp1.dyndns.org
    j. Click on "OK"

atpm dadd 11 dns tvp1.dyndns.org

Dial Plan Settings / Store Dial Plan

11. Click on "Yes"

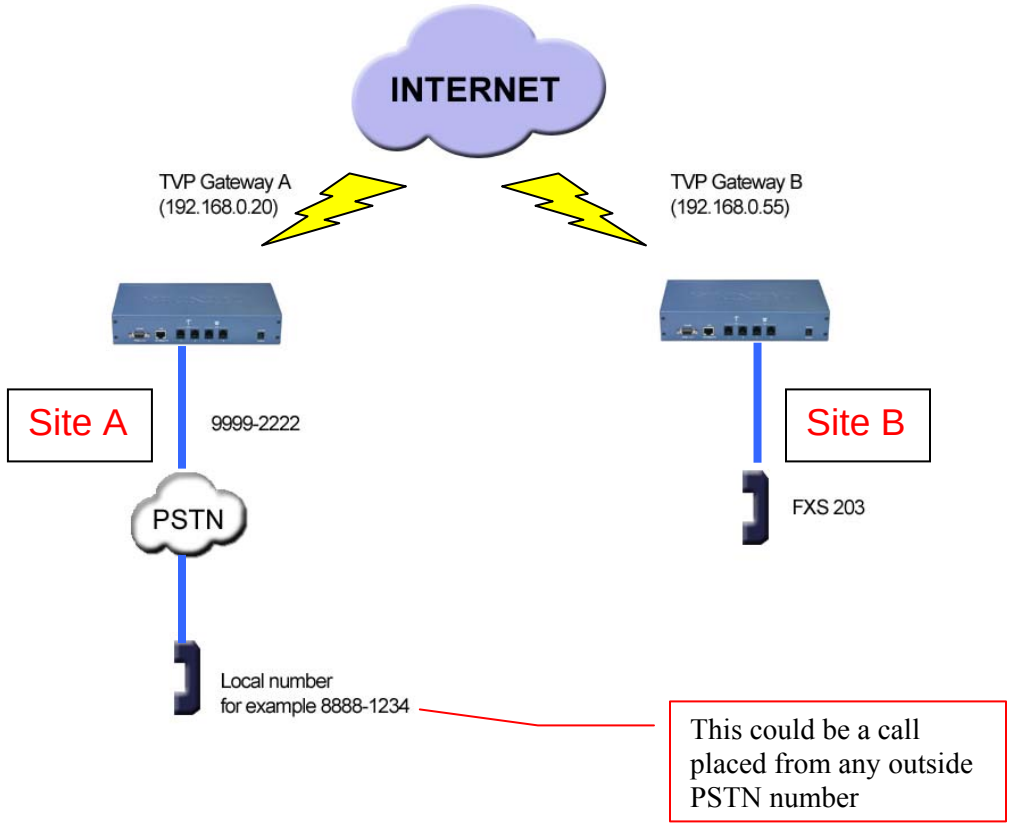
atpm done
atpm store

Changes to network settings require rebooting to take effect. Changes to the Dial Plan do not and will take effect as soon as they are stored.

Caution: If you do not store the dial plan, it will be lost when you reboot.

Note: After changing the default IP address, you will be required to use the new IP Address (hostname), in this example, 192.168.0.55 to gain access from the local LAN segment or tvp2.dyndns.org, to gain remote access via the Internet.

Case 6: PLAR (Hotline) FXO to FXS example



Case Scenario:

Outside PSTN caller near Site A wants calls automatically forwarded to extension 203 on Site B.

Definition - PLAR – Private Line Auto Ring – Bat phone / Hotline which allows you to pick up phone and automatically be connected to pre-determined remote destination.

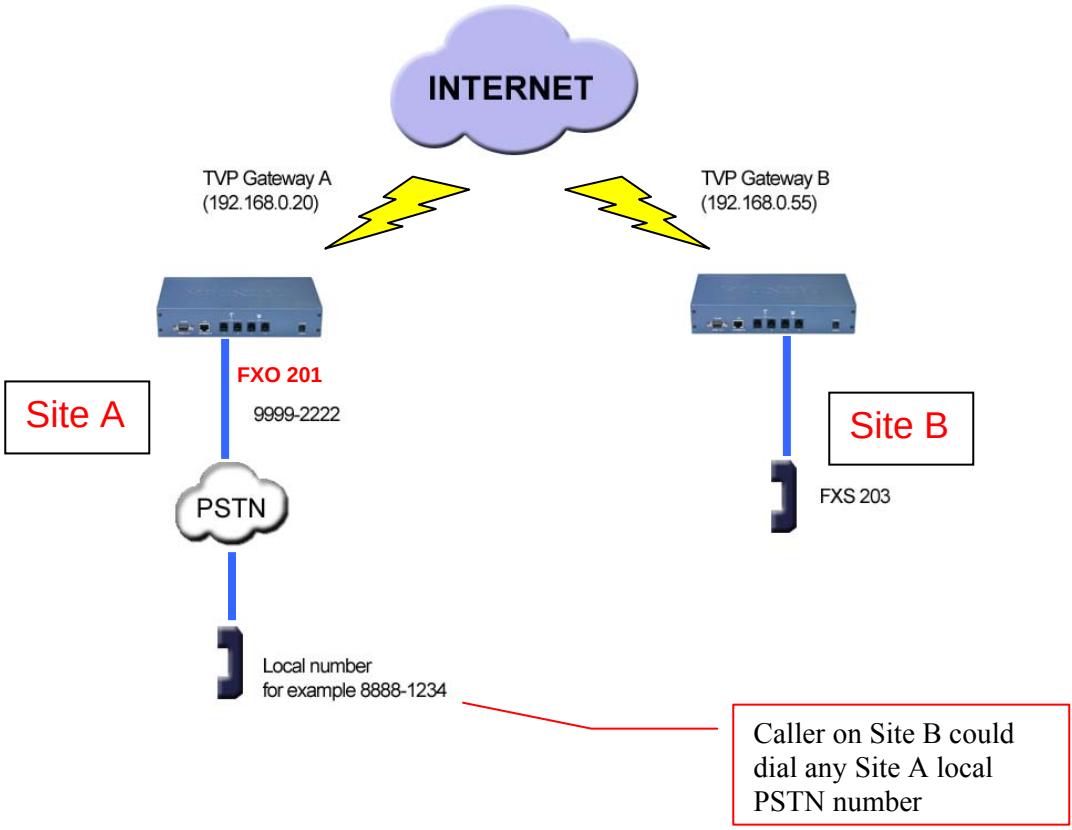
Solution: Set up hotline (PLAR) on TVP Gateway on Site A to TVP Gateway on Site B. This uses existing default local dial plan with the addition of a remote destination zone number.

Usage: PSTN Caller near Site A picks up phone 8888-1234 and dials PSTN number 9999-2222 which is connected to Site A TVP Gateway FXO port 201. TVP Gateway A will automatically forward the call via internet to TVP Gateway B FXS phone 203.

Site A TVP Gateway configuration - FXO to FXS PLAR

Web Configuration	Telnet / Console
Login in to Site A TVP Gateway Logon to the Web Configuration by opening your browser 1. Enter Wan IP xxx.xxx.xxx Or if you are on the LAN, 192.168.0.20 2. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.	**From Console** **Enter Username "admin"** **Enter Password "123"** **or** **Windows command prompt** **Enter "telnet xxx.xxx.xxx.xxx"** **Enter Username "admin"** **Enter Password "123"**
Web Configuration of Dial Plan Dial Plan Settings / Dial Plan Table Setup 3. Select "Add" and "Telephone 4. Enter following fields a. Telephone Number: 22 b. Hunt Group ID: 22 c. Min. Digits: 5 d. Max. Digits: 5 e. Strip Length: 2 f. Append Prefix: none 5. Click on OK	**atpm req** **atpm aadd** 22 5 5 22 2 Lines 3-10 creates a zone number (a number that tells the ATPM to forward to a remote destination) address entry in TVP GW A for TVP GW B
Dial Plan Settings / Dial Plan Table Setup 6. Select "Add" and "HuntGroup" 7. Enter following fields a. Hunt Group ID: 22 b. Destination ID 0: 22 8. Click on OK	**atpm hadd** 22 2 22
Dial Plan Settings / Dial Plan Table Setup 9. Select "Add" and "DestinationID" 10. Enter the following fields a. Destination ID: 22 b. Hostname (or IP address) 192.168.0.55 c. Click on OK	**atpm dadd** 22 h323 192.168.0.55 **atpm done** **atpm store**
Dial Plan Settings / Dial in PLAR/CID 11. Enter 22203 into the PLAR Address Field 12. Click on OK Dial Plan Settings / Store Dial Plan 13. Click on Yes	**set tcid 0 dial_in plar 22203** **config activate** **config store** Lines 11-13 Setup the hotline (PLAR) from TVP Gateway A to TVP Gateway B

Case 7: PLAR (Hotline) FXS to FXO example



Case Scenario:

Caller on Site B FXS 203 wants to be able to pick up phone and immediately have dial tone to Site A local PSTN.

Solution: Set up hotline (PLAR) on TVP Gateway on Site B to TVP Gateway on Site A. This uses existing default local dial plan with the addition of a remote destination zone number.

Definition - PLAR – Private Line Auto Ring – Bat phone / Hotline which allows you to pick up phone and automatically be connected to pre-determined remote destination.

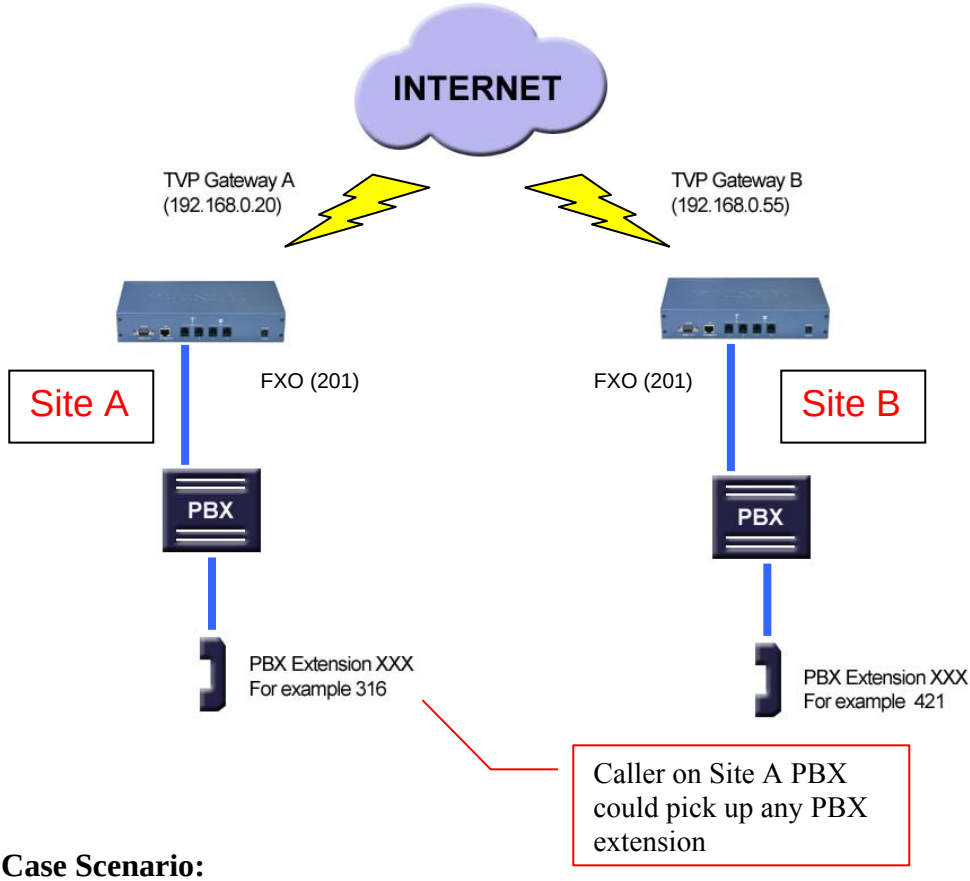
Usage: Caller on Site B picks up FXS 203 phone and TVP Gateway B automatically connects to TVP Gateway A FXO 201 which is connected to PSTN line 9999-2222. Caller will hear PSTN dial tone on Site A and can then call any number on local PSTN.

Site B TVP Gateway Configuration - FXS to FXO PLAR

Web Configuration	Telnet / Console
Login to Site A TVP Gateway 1. Logon to the Web Configuration by opening your browser 2. Enter 192.168.0.55 3. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.	**From Console** **Enter Username "admin"** **Enter Password "123"** **or from** **Windows command prompt** **Enter "telnet 192.168.0.55"** **Enter Username "admin"** **Enter Password "123"**
Web Configuration of Dial Plan Dial Plan Settings / Dial Plan Table Setup 4. Select "Add" and "Telephone 5. Enter following fields a. Telephone Number :11 b. Hunt Group ID: 11 c. Min. Digits: 5 d. Max. Digits: 5 e. Strip Length: 2 f. Append Prefix: none 6. Click on OK	**atpm req** **atpm aadd** 11 5 5 11 2 Lines 4-13 creates a zone number (a number that tells GW B to forward to a remote destination) for TVP GW A.
Dial Plan Settings / Dial Plan Table Setup 7. Select "Add" and "HuntGroup" 8. Enter following fields a. Hunt Group ID: 11 b. Destination ID: 11 9. Click on OK	**atpm hadd** 11 2 11
Dial Plan Settings / Dial Plan Table Setup 10. Select "Add" and "DestinationID" 11. Enter the following fields a. Destination ID: 11 b. Hostname (or IP address) 192.168.0.20 c. Click on OK	**atpm dadd** 11 h323 192.168.0.20 **atpm done** **atpm store**
Dial Plan Settings / Dial in PLAR/CID 12. Enter 11201 in the PLAR Address Field 13. Click on OK Dial Plan Settings / Store Dial Plan 14. Click on Yes	**set tcid 0 dial_in plar 11201** **config activate** **config store**

Lines 12-14 setup the hotline (PLAR) from TVP Gateway B to TVP Gateway A

Case 8: PLAR (Hotline) FXO to FXO example



Case Scenario:

Site A PBX Extension Caller 316 wants to be able to pick up phone, dial a number and immediately have dial tone on Site B PBX, and then be able to call any Site B PBX extension.

Solution: Set up hotline (PLAR) on TVP Gateway on Site A

Usage: Caller on Site A picks up any PBX extension and dials extension 201. TVP Gateway A automatically establishes a connection with TVP Gateway B Port 0, FXO 201 to get the dial tone from PBX on site B. After getting dial tone, the caller can call any Site B PBX extension.

Site A TVP Gateway Configuration - FXO to FXO PLAR

Web Configuration	Telnet / Console
Login to Site A TVP Gateway 1. Logon to the Web Configuration by opening your browser Enter 192.168.0.20 2. You will be prompted for Username and Password. Default Username and Password are "admin" and "123" respectively.	**From Console** **Enter Username "admin"** **Enter Password "123"** **or from** **Windows command prompt** **Enter "telnet 192.168.0.20"** **Enter Username "admin"** **Enter Password "123"**
Web Configuration of Dial Plan Dial Plan Settings / Dial Plan Table Setup 3. Select "Add" and "Telephone 4. Enter following fields a. Telephone Number: 22 b. Hunt Group ID: 22 c. Min. Digits: 5 d. Max. Digits: 5 e. Strip Length: 2 f. Append Prefix: none 5. Click on OK	**atpm req** **atpm aadd** 22 5 5 22 2 Liness 3-12 create an address entry for TVP Gateway B
Dial Plan Settings / Dial Plan Table Setup 6. Select "Add" and "HuntGroup" 7. Enter following fields a. Hunt Group ID: 22 b. Destination ID 0: 22 8. Click on OK	**atpm hadd** 22 2 22
Dial Plan Settings / Dial Plan Table Setup 9. Select "Add" and "DestinationID" 10. Enter the following fields a. Destination ID: 22 b. Hostname (or IP address) 192.168.0.55 c. Click on OK	**atpm dadd** 20 h323 192.168.0.55
Dial Plan Settings / Dial in PLAR/CID 11. Enter 22201 in the PLAR Address Field 12. Click on OK Dial Plan Settings / Store Dial Plan 13. Click on Yes	**atpm done** **atpm store** **set tcid 0 dial_in plar 22201** **config activate** **config store** Lines 11-13 setup the hotline (PLAR) from TVP Gateway A to TVP Gateway B

Chapter 6

Connection Considerations

This section discusses the special connection consideration for various environments and situations where you can use the VoIP Gateway.

6.1 Port Configuration

VoIP Gateway supports FXS and FXO ports.

FXS (Foreign Exchange Station)
FXS provides power and ringing signals to its interfacing equipment. It is ***not*** intended for connection to the Public Switched Telephone Network. It is a station loop start operation that provides a connection to:

1. A standard, single-line analog telephone system
2. The line circuit of a key telephone system
3. A loop start trunk circuit of a Private Branch Exchange (PBX) that normally connects to incoming Central Office circuits

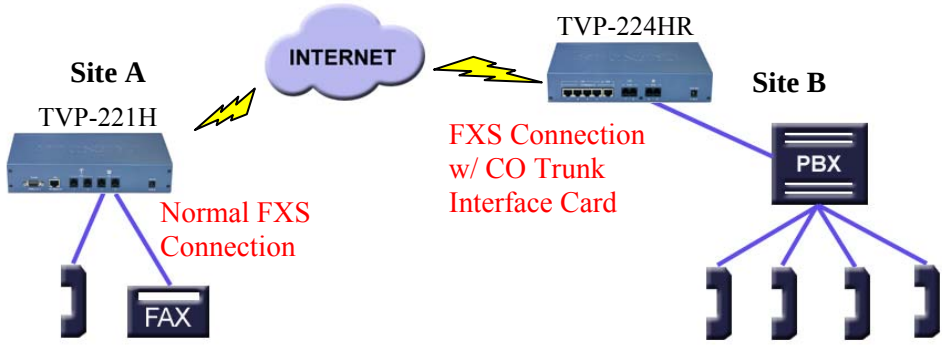
FXO (Foreign Exchange Office)
FXO recognizes signals and draws current to indicate an active state. It is a trunk loop start operation that emulates a single-line telephone to:

1. Central Office lines
2. PBX station

There are two basic environments that the TVP-221H can be applied to. They are described in the following sections.

Application 1: Special FXS Connections

The following diagram illustrates two different types of connections. The SITE A FXS Connection shows the normal connection between a gateway and telephone set (POTS) or FAX machine. The other type of FXS connection is shown on SITE B, on the right hand side. The Connection between the gateway and PBX has a special CO trunk interface card. The telephone sets connected to PBX can be either POTS or digital telephone depending upon the PBX capability.

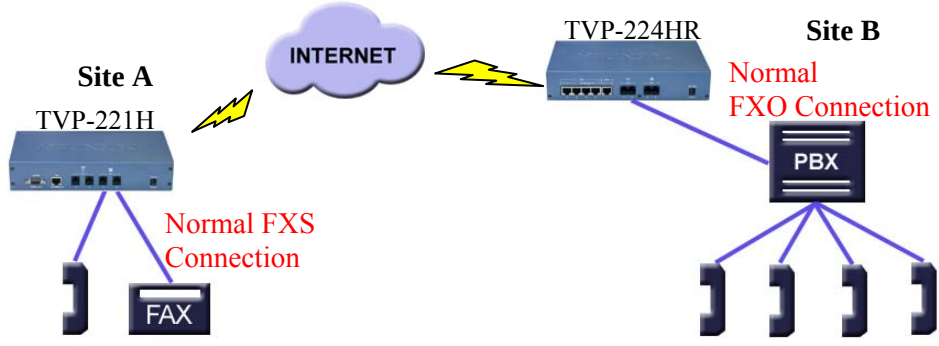


Application 2: FXO Connections

Application 2 has three possible connections. One Site A, the FXS connection to analog devices is normal and is identical to connections mentioned in Application 1. On Site B, the connection between PSTN and PBX is also a normal connection. The last connection is between PBX and the gateway which uses the internal analogue lines of the PBX. In this case, the FXO port has to be used.

Note: If a digital PBX is used, an analog terminal adapter is needed to provide an analog interface to the FXO port. Please consult with your PBX supplier.

In this application, the caller on Site A, can make a call using a device connected to a FXS port on the Site A gateway. The call will be routed to the Site B Gateway, through a FXO port and passed on to the PBX system. The PBX system will then forward the call to the dedicated terminal / extension.



Chapter 7

Troubleshooting Tips

This section provides solutions for problems you may possibly encounter while installing and connecting your VoIP Gateway.

Power (PWR) LED is not illuminate

1. Check the power adapter connection.
2. If the power adapter or power cord is connected to the gateway, check that the cord is securely plugged into the power socket on the rear of the console.
3. Check that the other end of the power adapter or power cord is securely plugged into the power outlet.
4. If both ends of the power cord are properly connected and there is still no power, the gateway might have a faulty power outlet, power adapter, or power cord.
5. Change to another power outlet or obtain another power adapter or power cord.

LNK LED is not illuminate

1. Check the TVP-221H was connected correctly:
    a. Powered on
    b. Correctly connected
2. Check if the cable connects to an end device is a standard straight through network Ethernet cable.
3. Make sure connectors at both ends are securely seated.
4. Check the TVP-221H IP setting is correct

Line port LED is not illuminate when pick up the phone

1. Check the RJ11 telephone line is connected correctly between phone set and line port

There is no dial tone when pick up the phone

2. Check line port LED illuminate
3. Check the RJ11 telephone line is connected correctly between phone set and line port

There is an out-of-service tone when dialing destination phone number

1. Check the dial plan setting (address table, hunt group table and destination table) at the destination phone number

There is no connected tone when dialing destination phone number

2. Check the IP network (Ethernet cable, Ethernet port and GW IP setting) is connected correctly
3. Check the destination TVP-221H and phone is available

Final Steps

If the procedures in this section have not solved the problem, reset the gateway by turning the power on and off. If the problem still exists, contact customer support.

Appendix A - Technical Specifications

TVP-221H Technical Specifications

Telephony Interface	
Physical interface	Desktop with 4 Analog Ports • Loop start 2 x FXO (RJ-11) • Loop start 2 x FXS (RJ-11)
Programmable line interfaces	Complex line impedance
Protocols	H.323v3 (Normal/fast-start mode) Supports gateway-gateway direct routing and gateway-gatekeeper assisted routing mode
Voice coders support	ITU-T G.711 u-law, G.723.1, and G.729A/B, auto-switching (Frame-rate/packet: 1 – 8)
Fax	Supports T.30 G3 fax on PSTN Interface; ITU-T T.30 fax spoofing; ITU-T T.38
Simultaneous connections	4 channels voice/fax
Media processing	Gain control; G.168 echo cancellation (16 ms); Voice activity detection (VAD); Comfort noise generation (CNG); Call progress detection; DTMF detection/filtering/regeneration (H.323v3/IMTCv1)
Data Network Interface	
Physical interface	LAN: 1 (10Base-T/100Base-TX, Auto-Negotiation, Auto MDIX)
Protocols	TCP/IP, DHCP, HTTP, DNS
Advanced functions	IP Precedence, PLAR, DDNS

System	
Call Control	Built-in three-tier dialing plan and destination hunting Supports gatekeeper authorization and accounting Supports gatekeeper call routing control and gateway mapping Call accounting information on gateway (via RS-232) or gatekeeper
Management	RS-232 (DCE mode) Built-in HTTP Web-based remote management Telnet remote management
System upgrade	Flash memory and built-in TFTP allowing firmware and feature upgrade via network
LED Indicators	System: 2 Power, System LAN: 4, Link/ACT, Speed, Collision Voice: 2 per channel (Ringing, Active)
Interoperability	Microsoft NetMeeting*; Cisco AS5300, 3600; RADVISION gatekeeper; Cisco gatekeeper
Dimensions (L X W X H)	241 x 135 x 45 mm (9.5 x 4.3 x 1.8 inches)
Weight	1.9 kg (4.2 lb)
Input Voltage, AC	90-260 VAC, auto ranging, 50-60 Hz
Power Requirement	12V DC, 2.0A
Operating environment	Operating temperature: 0° ~ 50° C (32° ~ 122° F) Humidify: 90% (non-condensing)
Certifications	CE; FCC, UL

Telephony Line Module Specifications

FXO Ports	
Signaling	Loop start/DTMF
Number of channels	2
Interface connectors	2 RJ-11 2-pin modular jacks
Line impedance	600□□900 □□Complex line impedance
Insertion loss	2 dB nominal
Frequency response	300 Hz ~ 3400 Hz +/- 2 dB w.r.t. 1004 Hz
Return loss	18 dB
Input level adjustment	-6 dB to +6 dB
Output attenuation	0 dB to 13 dB
Longitudinal balance	45 dB
Disconnect detection	Loop current; Customizable tone detection
FXS Ports	
Signaling	Loop start/DTMF
Number of channels	2
Interface connectors	2 RJ-11 2-pin modular jacks
Line impedance	600□□900 □□Complex line impedance
Insertion loss	2 dB nominal
Frequency response	300 Hz ~ 3400 Hz +/- 2 dB w.r.t. 1004 Hz
Return loss	18 dB
Input level adjustment	-6 dB to +6 dB
Output attenuation	0 dB to 13 dB
Longitudinal balance	□ 45 dB
Loop current	25 mA nominal
Ring voltage	40 Vrms nominal
Ringing tone	16.67 Hz, 20 Hz (default), 25 Hz or 50 Hz
Disconnect detection	Loop current

Console Port

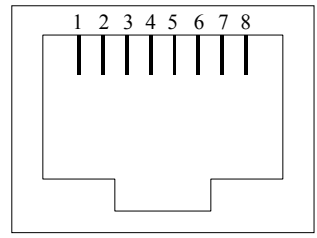
The console port uses a DB-9 RS-232 connector. The supplied straight through RS-232 cable connects the console port of the TVP-221H to a console PC or terminal. Pin assignment for the port is described in the following table.

DB-9 pin	Signal
1	Not connected
2	TxD
3	RxD
4	Not connected
5	Ground
6	Not connected
7	Not connected
8	Not connected
9	Not connected

LAN Port

The 10/100 LAN port use standard RJ-45 connector and Ethernet pin assignment. The following diagram and table show the pin assignment on the port connector. When connecting the LAN port to switches or repeaters, you must use a straight-through cable.

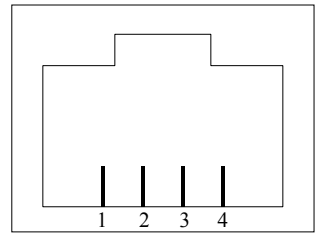
RJ45 pin	Signal
1	RxD+
2	RxD-
3	TxD+
4	Not connected
5	Not connected
6	TxD-
7	Not connected
8	Not connected



FXO Port Pin Assignments

The FXO Telephony Interface Module has 2 RJ11C/W modular jacks. The following diagram and table show the assignments of the pin for the RJ11 port.

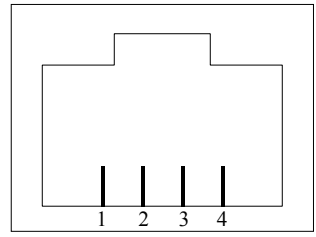
RJ-11 pin	Signal
1	Not connected
2	Tip
3	Ring
4	Not connected



FXS Port Pin Assignments

The FXS Telephony Interface Module has 2 RJ11C/W modular jacks. The following diagram and table show the assignments of the pin for the RJ11 port.

RJ-11 pin	Signal
1	Not connected
2	Tip
3	Ring
4	Not connected



Appendix B – Connecting Through Console

The console port uses a DB-9 RS-232 connector. The supplied straight through RS-232 cable connects the console port of the TVP-221H to a console PC or terminal.

Task	Prompt	Type
Connect RS-323 Cable to TVP-221H RS-232 console port a your computer that you will use as a configuring terminal		
Open HyperTerminal and enter the following Input Parameters when prompted:	Baud rate Number of data bit Parity check Number of stop bit Flow control	19,200 8 None 1 None
When HyperTerminal Screen appears type "123"		123
In the event that you forget your administration password, you can gain console access to the TVP using the super password. The super password is the last six digits of your MAC address located on the bottom of your TVP (00-50-2d-xx-xx-xx). At the Console prompt enter the super password without hyphens. The password is all lower case. After gaining access, at the console prompt type in **`net set user_pw <pw> <pw>`** If entry of new password is successful, the console will list "OK, USER Password Changed". You will now be able to gain Web Access from a PC in the same local segment using the TVP-221H IP Address (Only applicable if GW and a PC are setup under a router in the same LAN Segment). If Web and / or Telnet Access are enabled, you will also be able to remote access the TVP-224HR by entering http:// followed by the WAN IP or domain name.		
When the TVP-221H is directly connected to the ADSL / Cable Modem and remote access to the TVP-221H is not possible because you do not have an second line for Internet Access, it becomes difficult to verify that the TVP-221H has established Internet Access. In order to confirm Internet Access, at the console prompt: `Console>` **`Enter`** *`ping xxx.xxx.xxx.xxx`* The following dialogue indicates that Internet Access is successful. (xxx.xxx.xxx.xxx is a know public IP)	`Console>`	`ping xxx.xxx.xxx`

ping (xxx.xxx.xxx.xxx): 56 data bytes **xxx.xxx.xxx.xxx is alive** If the ping times out, you do not have Internet Access or the Public IP Address you used is incorrect. Please try another Public IP address. If you confirm that you do not have Internet Access, please refer to the trouble shooting section of the User Manual or consult your ISP to make sure your Internet Access Data is correct and accurately entered into the TVP-221H.		
The following commands enable / disable web and telnet access respectively. **Net set http <on/off>** **Net set telnet <on/off>**	Console>	on / off
To reset to Factory Default settings, please perform the following commands to: Erase all 'port', 'codec' & 'h323' configuration **config erase** Then access dial plan edit mode by entering **atpm req** Purge the dial plan from the database **atpm purge all** Store the changes **atpm store** Reset the network configuration to default **net set fac_default** Key in **"yes"** to re-boot.		

Appendix C – Connecting Through Telnet

To use Telnet, Internet Access must have been previously setup so that the gateway is visible on the internet (See User Guide for More Information). Alternatively, you can use Telnet to locally access the TVP-221H, if you are under a router or switch and the TVP-221H and your computer are in the same network segment.

To access the TVP-221H Gateway from a remote location / or from the same LAN Segment using Telnet, perform the following tasks:

Task	Prompt	Type
Open the windows command prompt and enter the **telnet** command followed by the IP address of the TVP-221H Gateway you want to access.	None	**telnet** ***xxx.xxx.xxx***
When the TVP-221H Gateway prompts you to **Login**, enter the user name "admin"	Login:	admin
When the TVP-221H Gateway prompts you for the **Password**, enter the password. The default password is "123" but it is recommended that the password be changed for security considerations. The password can be changed from the Web UI Administration / Password submenu page.	Password :	123
Type in "ping xxx.xxx.xxx", where xxx.xxx.xxx is your ISP provided DNS Server IP or any known Public Internet Address. The following dialogue confirms Internet Access **Console>ping 168.95.1.1** **ping <168.95.1.1>: 56 data bytes** **168.95.1.1 is alive** If the ping times out, you do not have Internet Access or the Public IP Address you pinged is incorrect. Try another IP Address. If you confirm that you do not have Internet Access, please refer to the trouble shooting section of the User Manual or consult your ISP to make sure your Internet Access Data is correct and accurately entered into the TVP-221H.	Console>	ping xxx.xxx.xxx

Appendix D – CLI Commands

Normal Mode Commands

Command	Description
atpm aadd	Add an entry to the address table
atpm adel	Delete an entry from the address table
atpm afind	Find and display an entry in the address table
atpm alist	Display all entries in the address table
atpm dadd	Add an entry to the destination table
atpm ddel	Delete an entry from the destination table
atpm dfind	Find and display an entry in the destination table
atpm dlist	Display all entries in the address table
atpm hadd	Add an entry to the hunt group table
atpm hdel	Delete an entry from the hunt group table
atpm hfind	Find and display an entry in the hunt group table
atpm hlist	Display all entries in the hunt group table
atpm done	End the atpm table update session
atpm erase	Erase all atpm tables from NVS
atpm purge	Purge entries from atpm table(s)
atpm req	Start atpm table update session
atpm restore	Restore atpm tables from NVS
atpm store	Store atpm tables into NVS
atpm slist	Display atpm system parameters
atpm sys	Set atpm system parameters
config activate	Move the configuration from temporary area to active area.
config erase	Erase the configuration from NVS
config store	Store the active configuration data into NVS
clrscr	Clear screen
download	Switch to download mode
help	Display help screen
net reset	Reset the system

net set gateway	Set default gateway's IP address
net set http	Turn on/off HTTP server
net set ip	Set IP address
net set ip_preced	Set IP precedence bits
net set mask	Set IP subnet mask
net set speed	Select Ethernet link speed
net set user_pw	Set password
net show	Display IP parameters
net show hwstat	Display hardware status
ping	Send ICMP echo request to another host
show h323	Display H.323 parameter settings
show version	Show software versions
set h323	Set H.323 parameters
tel show tel_id	Display line impendence setting.
tel show port	Display hook state for a telephony port
tel show ring_freq	Show ringer's frequency
tel set tel_id	Set line impendence for GW line interface
tel set ring_freq	Set ringer's frequency

Download Mode Commands

Command	Description
Help	Display help screen
Quit	Switch to normal operation mode
set gateway	Set default gateway 's IP address
set ip	Set IP address
set mask	Set IP subnet mask
start	Start downloading file

Appendix E - Factory Default Settings

The following table lists the settings of certain parameters before the TVP-221H is shipped.

Parameter	Default Setting
Network	
PPPoE	disabled
DYN DNS	disabled
DHCP client	disabled
Configured IP address	192.168.0.1
Configured IP subnet mask	255.255.255.0
Default gateway IP address	0.0.0.0
Current active IP address	192.168.0.1
Current active subnet mask	255.255.255.0
IP precedence	0 0 0 0
Ethernet MAC address	00-50-2d-xx-xx-xx
Ethernet link speed	10/100 auto-negotiation
User ID for HTTP browser and Telnet client login	admin
Password for HTTP browser and Telnet access login	123
HTTP server	enabled
Telnet server	enabled
Serial port (Fixed)	
Baud rate	19,200
Number of data bit	8
Parity check	None
Number of stop bit	1
Flow control	None
H.323	
h323 display_name	customer
h323 h245_term_type	60
h323 rtp_port_base	30,000

h323 out_fast_start	Off
h323 in_fast_start	Off
h323 h245_tunneling	Off
h323 cisco_t38	On
h323 callSignalPort	1720
h323 call_name	None
h323 local_alert	Off
h323 default_dtmf	H323 V2 Signal
h323 gk_mode	Off
h323 h245_timeout	30000
h323 term_id	None
h323 refresh	120
Voice codec	
Preferred voice codec	G.723 6.3kbps
Telephony	
PCM codec receiver gain for FXO ports	-1 dB

Appendix F - Worksheets

IP Parameters

Consult your network manager to obtain a static IP address for the TVP-221H, and the information about the IP subnet mask and the default gateway for your network. Fill out the following work sheet before configuring the TVP-221H.

IP address _____

IP subnet mask _____

Default gateway _____

ATPM Destination Table

Local Destinations

Each telephony port of the TVP-221H must be assigned a unique destination ID. Fill out the worksheet for local destinations by designating each port a unique destination ID, then use the CLI command **atpm dadd *dest_id* port *port#*** for each entry in the worksheet to add it to the destination table. The *dest_id* in the command corresponds to the Destination ID in the worksheet, while the *port#* corresponds to the Port#. You may alternatively use the web browser to add local destinations to the destination table.

Port#	Mode	Destination ID
0	port	
1	port	
2	port	
3	port	

Remote Destinations

Each remote TVP-221H to be reached must be assigned a unique destination ID. Obtain the IP addresses of the TVP-221H at remote sites and fill out the worksheet for remote destinations by designating each

remote TVP-221H a unique destination ID, then use the CLI command **atpm dadd *dest_id* h323 *ip_addr* [*ip_port*]**for each entry in the worksheet to add it to the destination table. The *dest_id* in the command corresponds to the Destination ID in the worksheet, the *ip_addr* corresponds to the Port#, the optional *ip_port* corresponds to the IP port. You may alternatively use the web browser to add remote destinations to the destination table.

IP address	IP port (optional)	Mode	Destination ID
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	
. . .		H323	

ATPM Hunt Group Table

Several destinations may be grouped together to form a hunt group. When an incoming phone number matches the phone number of the hunt group, the TVP-221H attempts to terminate the call at each of the destinations in the hunt group one at a time until a call is successfully completed. Plan how destinations are to be grouped and fill out the hunt table worksheet, then use the CLI command **atpm hadd *hunt_group_id hunt_type dest_id …*** for each entry in the worksheet to add it to the hunt group table. The *hunt_group_id* in the command corresponds to the Hunt Group ID in the worksheet, the *hunt_type* corresponds to the Hunt Type (1 or 2), the *dest_id* … corresponds to the List of Destination IDs. You may alternatively use the web browser to add hunt groups to the hunt group table.

Hunt Group ID	Hunt Type		List of Destination IDs
	1	2	

ATPM Address Table

Each phone number to be recognized by the TVP-221H must have its first digits match an entry in the address table. Fill out the address table worksheet and use the CLI command

atpm aadd ***tel#*** ***min_digits*** ***max_digits*** *hunt_group_id prefix_strip_len* [*prefix#*] to add each entry in the worksheet to the address table. The *tel#* in the command corresponds to the Digits to Match in the worksheet, the *min_digits* corresponds to the Min. # of Digits to Collect, the *max_digits* corresponds to Max. # of Digits to Collect, the *hunt_group_id* corresponds to the Hunt Group, the *prefix_strip_len* correspond to No. of Digits to Strip and the *prefix#* corresponds to the Prefix String. You may alternatively use the web browser to add telephone numbers to the address table.

Digits to Match	Min. # of Digits to Collect	Max. # of Digits to Collect	Hunt Group	No. of Digits to Strip	Prefix String

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