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IP6000-2  
Rugged, Hands-Free VoIP Phone  
With Built-in DSL Ethernet  
Extender

Installation, Operation  
and Programming

25 February, 2021

RECORD OF CHANGES

Changes to this IP6000-2 Rugged, Hands-Free VoIP Phones I&O and Programming V3 shall be recorded in the accompanying table. Changes will be reviewed and approved prior to incorporating into the document using change order procedure.

Record of Changes Table

Rev #	Date	Brief Description	Change Order #
A	26 Mar 2019	Preliminary Release	
B	29 Mar 2019	Preliminary Release	
C	25 Feb 2021	Updated Mounting & Connection Diagram For IP6000-2 Figure 2.	

## I Product Description

The IP6000-2 is a rugged, hands-free phone typically used in public areas, including areas with harsh environments, to provide connection to emergency assistance resources. The phone utilizes VoIP (Voice over Internet Protocol) and communicates through the Ethernet with other devices using SIP (Session Initiation Protocol). To enable operation beyond the 100 meter limitation of Ethernet connectivity, the unit includes a built-in DSL Ethernet extender. When the DSL Ethernet extender is enabled and mated with a matching near-end DSL unit, and CAT3 or higher class wire is used, the IP6000-2 can be placed as far as 300 meters (984 feet) from a near end Ethernet connection while receiving a data rate of 100 Mbps. The IP6000-2 may be used with or without the DSL Ethernet extender which is transparent to all network traffic. Whether or not the extender is engaged, the phone portion of the IP6000-2 performs exactly as the Emcom IP6000.

The IP6000-2 has its own phonebook which may be programmed so that when its pushbutton is pressed the unit connects to other devices such as VoIP telephones

- Analog telephones (through gateways)
- The Public Switched Telephone Network
- PBXs
- The EmVista Central call management and conferencing system

Programming of the phone is accomplished through a simple web browser interface or through Emcom Systems' EmVista Maintenance Station application which is typically used for large installations.

The IP6000-2 utilizes DSP (Digital Signal Processing) to manage audio levels and can be set for normal, echo prone or noisy environments. The environment settings and volume levels are remotely programmable.

The IP6000-2 may be powered from DC sources of 24 to 48 Volts and when the DSL extender portion is bypassed it may be powered with POE (Power over Ethernet).

## 2 Installation

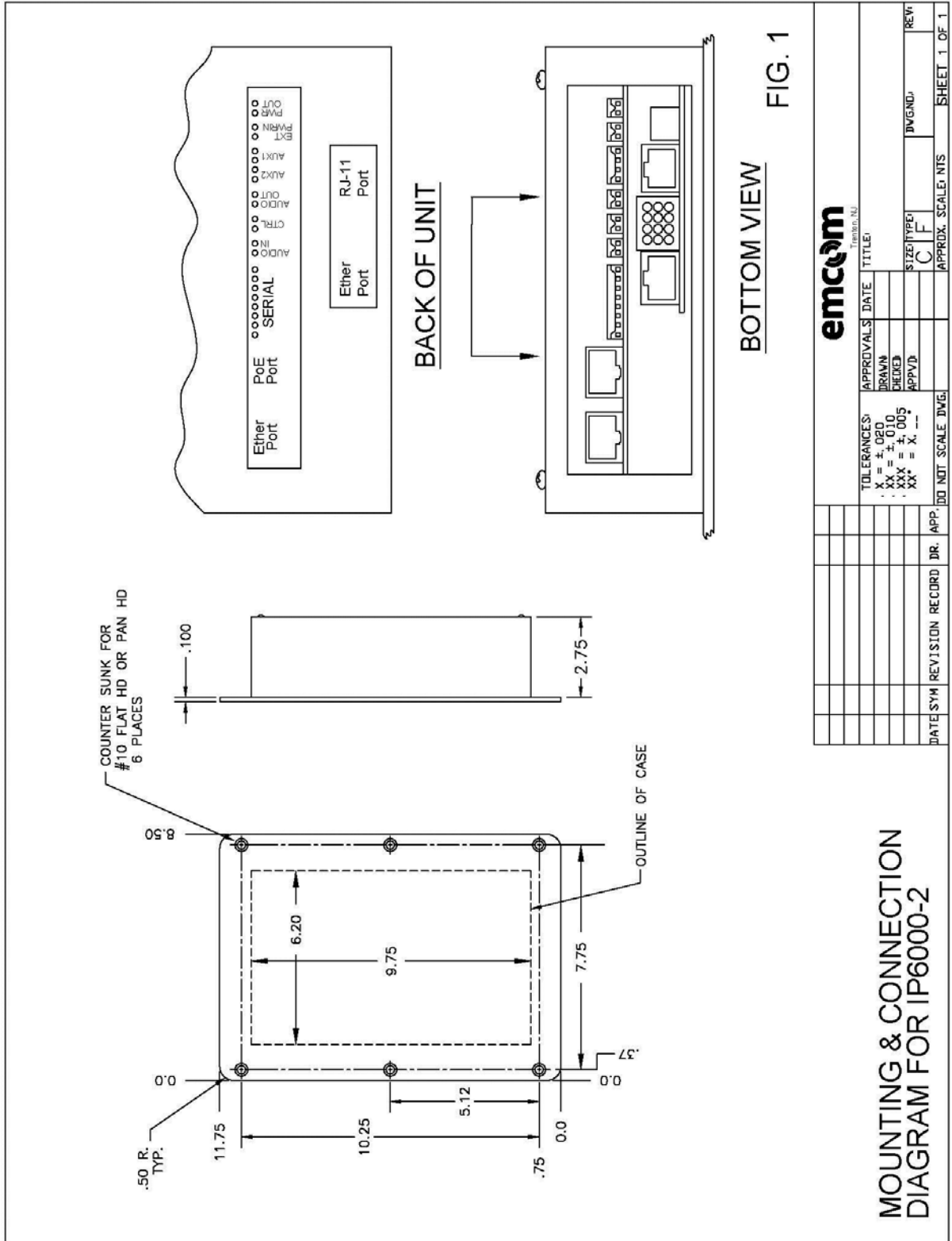
### 2.1 Mechanical

Figure 1 depicts the outline of the IP6000-2 with overall dimensions and spacing between the 6 mounting holes on the front panel. The unit is typically secured with either 10-32 flat head or 10-32 pan head screws and is supplied with 6 pan head, bit-spanner screws. If flat head screws are used, the threaded devices that the screws are fastened to should be floating to ensure that the screws seat properly in order to prevent easy removal.

The IP 6000-2 requires 2.75 inches of space behind the front panel. If the unit is mounted in a wall, an in-wall enclosure should be used to ensure greater environmental integrity. A bezel is available to hide the rough-in of in-wall mounting. Emcom Systems can provide the bezel and both in-wall and surface mount enclosures. It is recommended that where possible, all access to enclosures be from the bottom.

### 2.2 Electrical

The opening at the bottom of the IP6000-2 back box provides access to the unit's external connections. There are 13 connectors, in this application 5 connectors are used which provide: power out, power in, two isolated Ethernet connections, and a RJ-11 connection. The additional connectors provide for auxiliary contact closures, for a second Ethernet connection, a diagnostic port, an external trigger, an external audio output, an external audio input and for retransmitted power out. The function of each connector is marked on the back case of the unit and is shown in FIG. 1.



## 2.2.1 Power

J2 – 24VDC to 48VDC non-polarized

J3 – POE

The IP6000-2 may be operated from a 10 watt, ripple-free source of from 24 – 48VDC on connector J2. The connector is labeled EXT PWRIN on the back case. When POE is supplied on Ethernet connector J3 no additional power is required and the Ethernet extender will be effectively bypassed, which means J1 can be disconnected. Connector J3 is labeled PoE Port on the back case. The maximum rated current of the units is 1 amp. The electronics are protected by F1, a self-resettable fuse rated at 1 amp at 60 C.

## 2.2.2 Ethernet Connections

J3, J4 – The IP6000-2 contains a 100 Mbit 3-port Ethernet switch. One of the switch ports is the IP phone itself. The other 2 switch ports, RJ45 connectors J3 and J4, allow for connection to the unit, for adding another Ethernet device or for daisy-chaining IP6000 units. Connector J3 is labeled PoE Port and J4 is labeled Ether Port.

## 2.2.3 Auxiliary Contact Closures

J28 – There are two auxiliary contact closures available on the unit. These are opto-isolated, normally open, connections capable of operating at 120 volts DC with 120 milliamps maximum current. The contact closures may be used for gate release, beacon activation, etc. These contact closures are labeled AUX 1 and AUX 2 on the back case of the unit. In the standard configuration AUX 1 opens and closes at a 1 second rate when a phone is active and AUX 2 is continually closed when a phone is active.

## 2.2.4 Diagnostic Connector

J17 – This 8-pin connector allows a serial port connection and is normally used for factory trouble-shooting. This connector is labeled SERIAL on the back case of the unit.

## 2.2.5 External Trigger

J26 – This connector provides for an external means of activating the unit. It is internally isolated from the core electronics. A momentary closure at J26 provides activation. This connector is labeled CTRL on the back case.

## 2.2.6 External Audio Output

J24 – This connector provides output for an external amplifier and speaker that may be attached to the unit. This 600 ohm output is AC coupled. It is labeled AUDIO OUT on the back case of the unit.

## 2.2.7 External Audio Input

J27 – This connector provides for an external line-level audio source that may be placed in parallel with the internal microphone of the unit. This 600 ohm input is AC coupled and should not exceed 2 volts peak-to-peak. This connector is labeled AUDIO IN on the back case of the unit.

## 2.2.8 Ancillary Power

J1 – This connector provides redirected input power to drive subsidiary boards that may be used in various versions of the IP6000-2. When not used i.e., when powered by POE, this connector is covered over or void of a connection. This connector is labeled PWR OUT on the back case of the unit.

## 2.2.9 Ethernet Extender Configuration

The configuration of the Ethernet extenders is crucial to achieving a proper data rate of 100 Mbps. The configuration is dictated by three switches on the Ethernet extenders. With respect to the first switch one device must be set to LOC mode and the other to AUTO mode when two devices are connected. For continuity, the Ethernet extender that is local to the Ethernet source is set LOC mode and the far-end within the IP6000-2 is set to AUTO mode. The second switch for both Ethernet extenders are set to SYM mode because this is the most suitable mode for network extension. The SYM mode sets the data rate for the upstream and downstream to be equal. For the third and last switch, both Ethernet extenders are set to Std mode which is ideal with long distance cables as well as poor quality cables with noise interference.

## 2.3 Operating Temperature Range

The operating temperature range of the IP6000-2 is from -30 to +55 C (-22 to +131 F).

## 2.4 Connections

### 2.4.1 Connections within 100 Meters

When the IP6000-2 is located within 100 meters (330 feet) of an Ethernet connection, it is not necessary to use the DSL interface. The DSL board is disconnected and all external connections are made to the IP6000 phone board.

Step 1 – On the phone board, remove the connector labeled PWR OUT and let it hang loose.

Step 2 – Remove the RJ45 connector from the Ether Port and let it hang loose.

Step 3 – If external power is used, provide 24 – 48VDC at the connector labeled EXT PWRIN. If POE is used, eliminate this step.

Step 4 – Connect a network RJ45 connector, either POE or non-POE to the connector labeled PoE port.

### 2.4.2 Connections Beyond 100 Meters

When the IP6000-2 is located beyond 100 meters (330 feet) of an Ethernet connection, it is necessary to extend the network connection using the incorporated DSL module. This far end DSL module is used in a pair with a matching Etherwan ED3501 near end module. The connection steps at the IP6000-2 are as follows:

Step 1 – Remove any connections from the IP6000 phone board.

Step 2 – Plug the RJ45 cable from the DSL board into the Ether Port connector of the IP6000 phone board.

Step 3 – Connect the blue floating connector into the connector on the phone board labeled PWR OUT.

Step 4 – Connect 24-48VDC to the connector on the phone board labeled EXT PWRIN.

Step 5 – Connect an RJ11 connector cable from the near end DSL module to the connector labeled RJ-11 Port on the DSL board.

### 3 Operation

The IP6000-2 communicates with other VoIP networked devices using SIP. Voice connections can be made to other SIP devices directly or to other non-SIP devices such as analog telephones through SIP intermediaries called gateways.

#### 3.1 Calls From An IP6000-2

When the “PUSH FOR HELP” button is pressed on the IP6000-2, the unit, using SIP, places a call via the Ethernet port to the far end communication device whose access information has been previously programmed into the IP6000 phone book. At the same time, the red LED of the unit flashes to indicate that a call has been placed and a ring back tone is heard from the unit’s speaker. If the far end communication device responds, a SIP dialog is held with the IP6000. The red LED is extinguished, the ring back tone ceases, the green LED begins flashing and a two way conversation may be held between the IP6000-2 and the far end communication device. When the far end communication device hangs up, another SIP dialog takes place, the call is terminated and the green LED is extinguished.

The phone book of the IP6000-2 can be programmed with the access information of up to 100 far end devices that can be arranged in a fall through list. That is, if the first device does not respond or is busy, the IP6000-2 tries the next one, and so on, until an available device is reached or until the complete list has been tried.

#### 3.2 Calls to An IP6000-2

Calls are made to the IP6000-2 from a far end communications device in the reverse manner. The far end device simply dials (or autodials) the access information of the IP6000-2 and a SIP dialog is begun. The IP6000-2 acknowledges the receipt of the call, issues a shrill ringing tone and turns on its flashing green LED. Two-way conversation can then take place. When the far end communications device hangs up, another SIP dialog takes place, the call is terminated and the green LED is extinguished.

## 4 Programming

Programming of the functions and phonebook of the IP6000-2 may be accomplished through a web interface from any current browser or by using the EmVista Maintenance Station.

### 4.1 Programming Using the Browser Interface

#### 4.1.1 Entering the Browser Interface

The phone setup is reached by placing the IP address of the IP6000-2 in the address line of the browser and pressing enter.

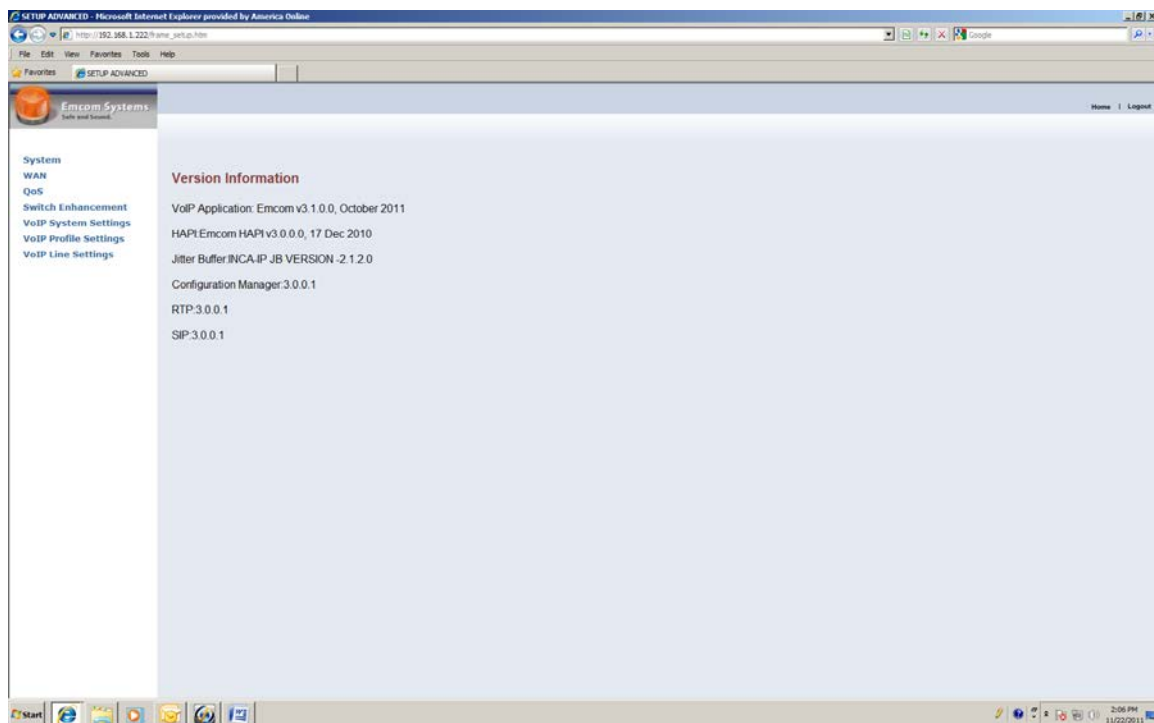
As shipped from the factory, the IP address of the unit is 192.168.1.22X where X is equal to the last digit of the serial number of the unit. The serial number is on the back case of the unit.

Example: Serial number is 653                      IP address is 192.168.1.223

Upon pressing enter, the login page will appear.

The default password is: "1234"

Upon entering the password and pressing enter, the following menu screen will appear.



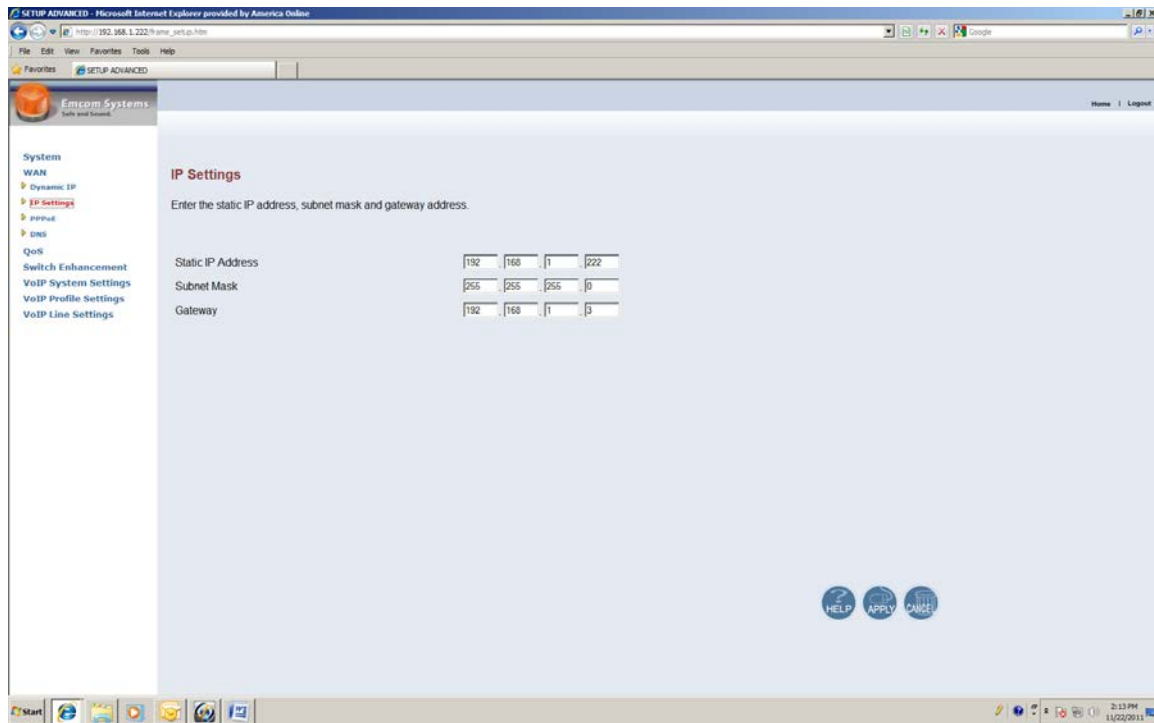
The right pane of this screen provides software version information. The left pane of the screen provides a menu that is always available to navigate to other setup functions.



#### 4.1.2 Changing the IP Address, Subnet Mask and Default Gateway

Using the left pane navigator, click on WAN. The navigation tree will expand and three selection buttons will appear in the right pane. Make sure that the Static IP Address button is selected.

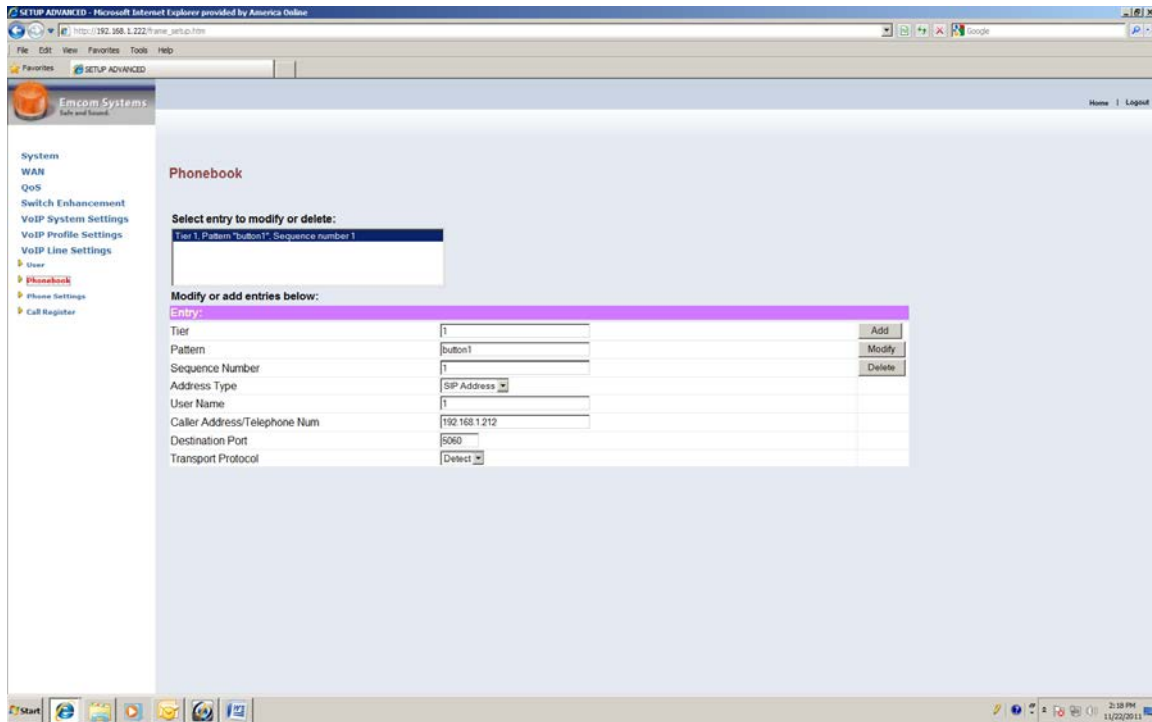
In the navigation tree, click on IP Settings. The following screen will appear:



Change the IP Address, the Subnet Mask and the IP Gateway to the desired settings and click on apply. The IP6000-2 will automatically enter the new values and will restart itself. Since the IP6000-2 has been restarted, the connection to the browser will have been lost. The connection is re-established by again entering the IP address in the browser access line.

### 4.1.3 Changing the Phonebook

The phonebook of the IP6000-2 is changed by clicking on VoIP Line Settings in the navigation tree pane and then by clicking on Phonebook in the submenu. The following window will appear:



The setup functions in this screen are defined as follows:

**Tier** – Tier is a sequencing mechanism used for complex searches that are sometimes required for other models of Emcom phones. All IP6000-2 calls should be assigned to Tier “1”.

**Pattern** – Pattern defines the event that enables a call. For the IP6000-2 it is the pressing of “Button1”. Note that there is no space in “Button1”.

**Sequence Number** – Sequence Number defines the sequence in which succeeding calls are placed if the first call does not go through. Sequence “1” would be the first attempt, Sequence “2” the second attempt, etc.

**Address Type** – Address Type defines the method of communication. This should be left at SIP Address.

**User Name** – This is the local number of the device attached to the receiving SIP device. It is normally designated in the setup of the receiving device. For Example: If the final receiving device is an analog phone connected to one of the ports of a SIP gateway, the User Name would be the port number assigned to the port that the analog phone is connected to. If the SIP receiving device is the final destination (such as another IP phone) nothing need be entered here.

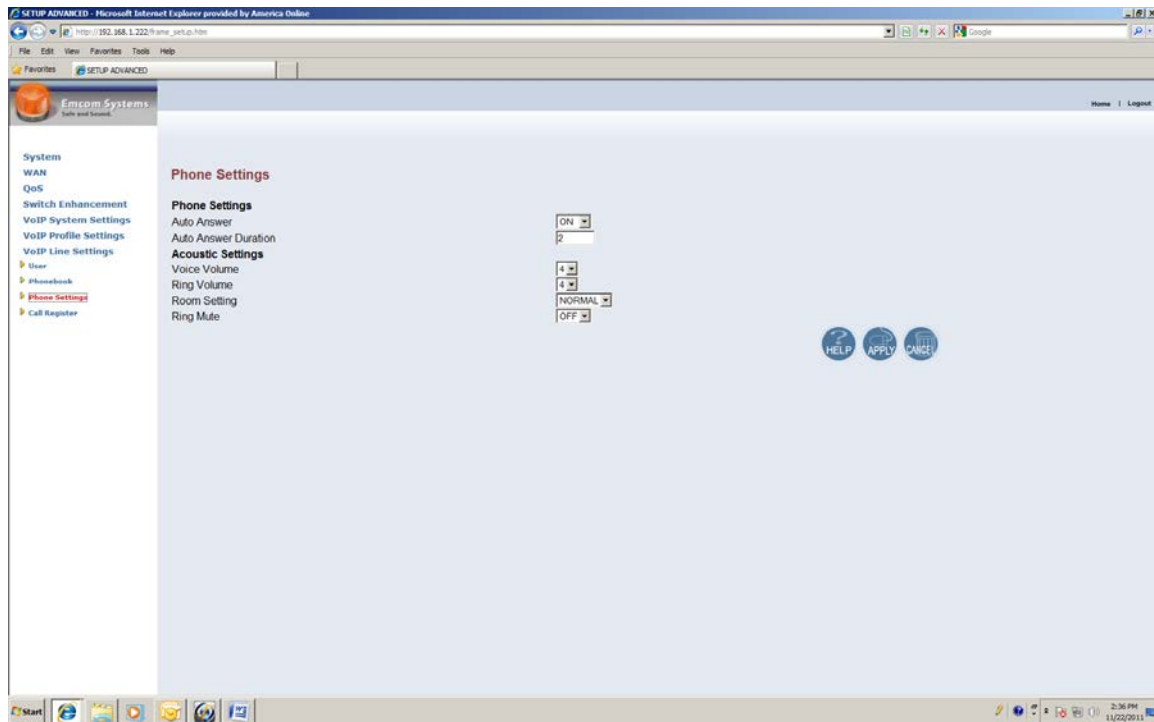
**Destination Port** – The Destination Port is a standard port number assigned to IP phones and should be left at 5060.

**Caller Address/Telephone Num** – This is the IP address of the SIP device that is to receive the call.

**Transport Protocol** – The Transport Protocol should be left at Default

#### 4.1.4 Changing the Acoustic Environment and Audio Levels

The acoustic environment and audio level settings are also reached as a subdirectory of the VoIP Line Settings menu. Click on VoIP Line Settings and then click on Phone Settings. The following screen will appear:



**Auto Answer** – With auto answer “on”, the IP6000 will ring and then automatically go off hook on an incoming call. With auto answer “off”, the IP6000-2 will continue to ring until the activation button is pressed. It will then go off hook.

**Auto Answer Duration** – This setting establishes how long, from 2 to 5 seconds, that the IP6000 will ring when Auto Answer is set to “on”.

**Voice Volume** - Voice volume sets the level heard from the IP6000-2 speaker. The adjustment levels are from 0 to 7 with 7 the loudest. The numbers on this screen may be changed when the phone is in idle mode. The next conversation through the IP6000-2 will reflect the new level.

**Ring Volume** – Ring Volume adjusts the alerting level first heard from the IP6000-2 when a call is placed to it. The scale is from 0 to 7.

**Room Setting** – This setting allows adjusting for Normal, Noisy or Echoic rooms.

**Ring Mute** – When Ring Mute is set to “on”, the ringer is disabled.

## 4.2 Additional Browser Programmable Functions

A number of additional programmable functions are available through the various submenus of the left navigation pane. These functions are typically used only for unique applications. It is recommended that the user first communicate with factory support before any setup changes in these areas are attempted.

## 4.3 Programming Using EmVista Maintenance Station

EmVista Maintenance workstation is an application that resides on a laptop or workstation on the network and provides an automated interface for programming the IP6000-2. It also maintains a database of all of the phonebook information and programming parameters of each IP6000-2 and automatically tests each unit.

The use of the EmVista Maintenance workstation is discussed in the document EmVista Maintenance Station User Guide.