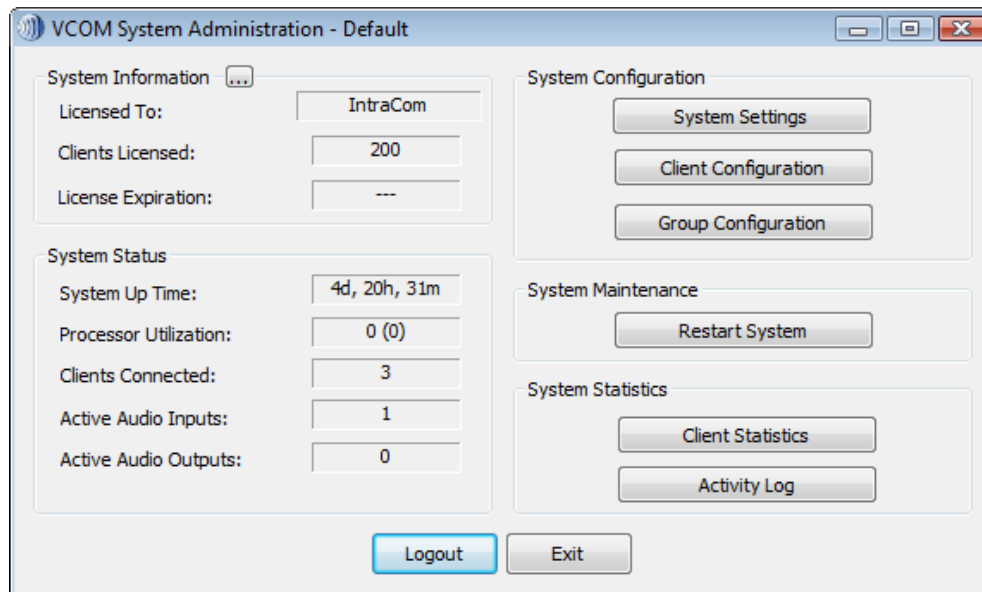




# VCOM System Administration User Guide

Patent Pending: U.S. Serial # 11/970,871; International Serial # PCT/US08/50481



*Revised: 8-1-08*

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# 1. INTRODUCTION

## 1.1 VCOM System Administration

VCOM is configured via the client-side System Administration application which allows for dynamic configuration from any workstation. This application can also be run on the server hosting the VCOM Virtual Matrix and is installed automatically along with it.

This short document provides information on how to install, configure, and use the VCOM System Administration software.

## 1.2 SYSTEM REQUIREMENTS

### Hardware Requirements

- Dedicated: Pentium Celeron 1.0 Ghz or equivalent w/ 1 Gb Memory
- Multi-purpose: Pentium 4, 2.0 Ghz or equivalent w/ 1 Gb Memory

### Software Requirements

-Windows XP, Windows Vista

### Network Requirements

100BaseT connection

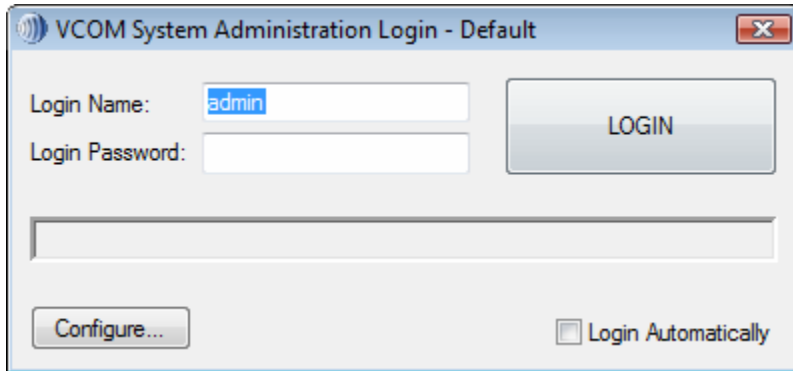
# 2. INSTALLATION

Locate the VCOM System Administration setup application, typically named 'VCOM\_System\_Administration.exe,' that was provided either electronically or on CD.

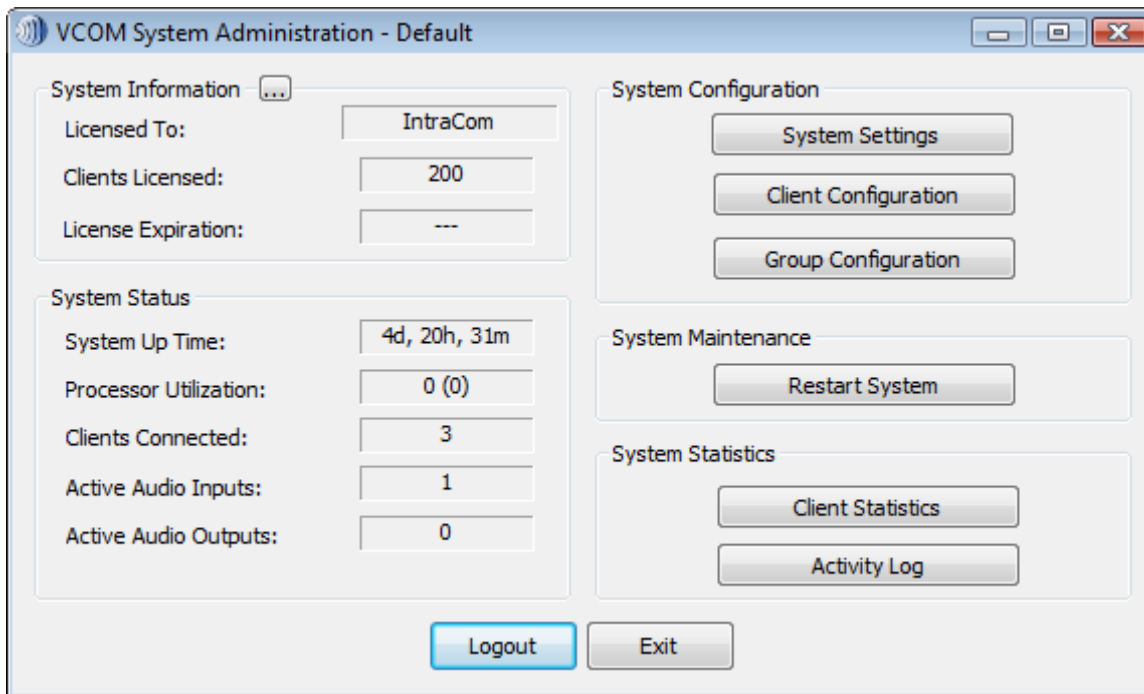
Run the installer and follow the prompts. You will need to accept IntraCom Systems' License Agreement to install the software.

To open the VCOM System Administration application once installed click on your 'VCOM System Administration' shortcut icon on your desktop or click on your start menu and select 'All Programs.' Find 'IntraCom' and select 'VCOM System Administration.'

The default master 'Loin Name' is 'admin' and there is no default master 'Login Password' so leave the field blank. Once logged in credentials can be changed.



### 3. Configuration

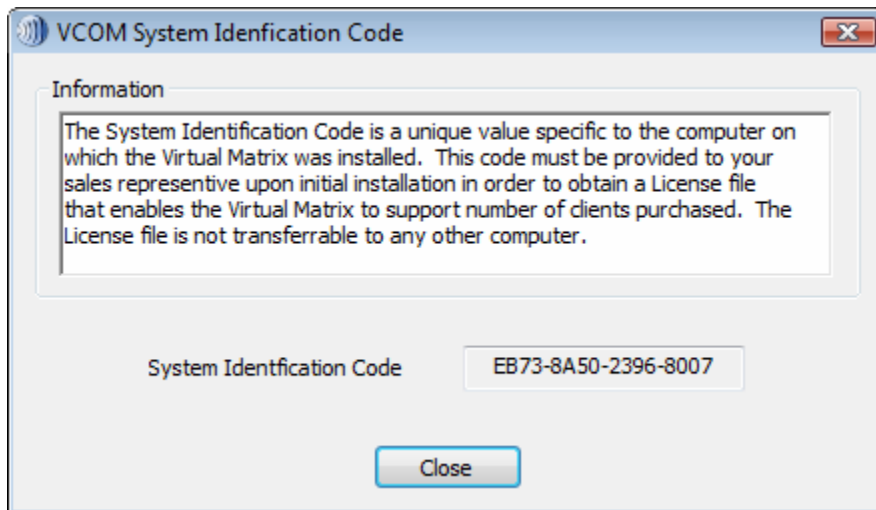


#### 3.1 SYSTEM INFORMATION

The 'System Information' area in the upper left hand side of the System Administration main window displays the name of the licensee, the number of clients licensed, and expiration date. 'License Expiration' will typically display '---' which means a system has been purchased and a perpetual license has been granted. Demo, trail, and rental systems will display a

numerical value in days reflecting the limited duration for which a license has been granted.

Click '...' to view the 'System Identification Code' which is a unique value specific to the computer on which the Virtual Matrix was installed. This code must be provided to your sales representative upon initial installation in order to obtain a license file that enables the Virtual Matrix to support the number of clients purchased. The license file is not transferable to any other computer. Refer to the VCOM Virtual Matrix User Guide for instructions on how to activate your license file.



### 3.2 SYSTEM STATUS

The 'System Status' area in the lower left hand side of the System Administration main window displays general system metrics.

- System Up Time: Displays how long the VCOM Virtual Matrix has been running in days, hours, and minutes.
- Processor Utilization: Displays CPU utilization of the server or PC hosting the VCOM Virtual Matrix.
- Clients Connected: Displays how many clients are connected to the Virtual Matrix at any given moment. Clients include VCOM Control Panels and VCOM Device Interfaces.
- Active Audio Inputs: Displays how many active audio channels are being streamed from clients into the Virtual Matrix at any given time.

- Active Audio Outputs: Displays how many active audio channels are being streamed out of the Virtual Matrix to clients at any given time.

### 3.3 SYSTEM CONFIGURATION

#### *System Settings*

The 'System Settings' tab found in the 'System Configuration' area in the upper right hand side of the System Administration main window is used to set system-wide parameters.

The screenshot shows the 'VCOM System Settings - Default' dialog box. It contains the following sections and controls:

- Master System Administrator Login:** Login Name: ; Login Password:
- Virtual Matrix Network Settings:** Virtual Matrix IP Address:  : ; Virtual Matrix IP Port for Audio:
- Failover Virtual Matrix Network Settings:** Failover Virtual Matrix IP Address:  : ; Failover Virtual Matrix IP Port for Audio:
- Audio Settings:** Audio Mix Sample Rate: ; Audio Output Level Gain (Post-Mix):  with a slider control.
- Voice Activity Indication:** Voice Activity Indication Color:

Buttons:

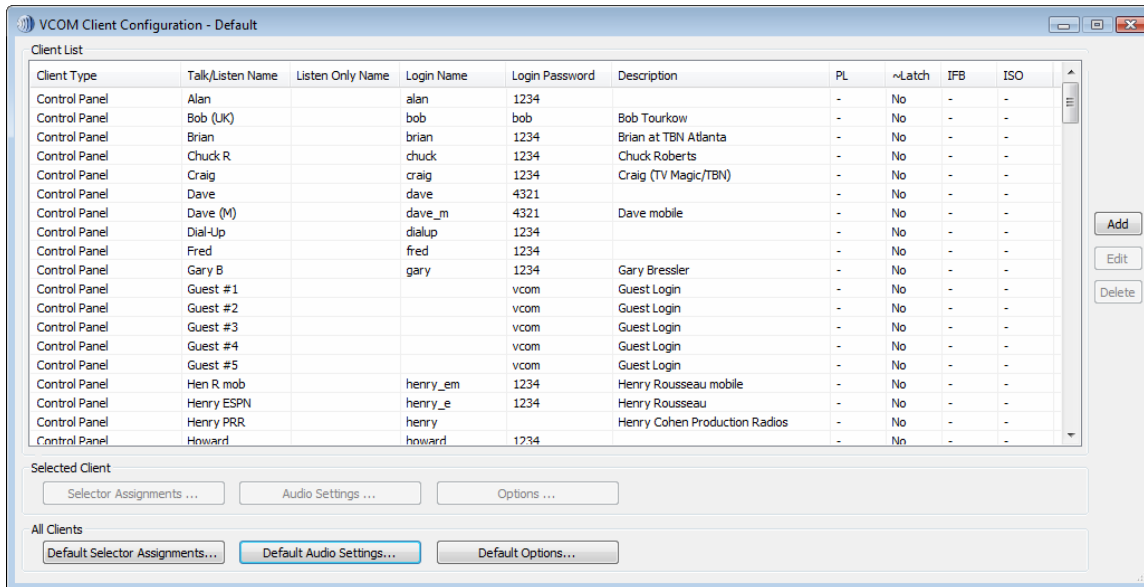
- Master System Administrator Login: Displays and allows you to edit the master system administrator login name and login password.
- Virtual Matrix Network Settings: Enter the 'Virtual Matrix IP Address' which is the IP address of the server hosting the Virtual Matrix. After the colon (':') enter the IP port for data transport (default: port 1000) which controls the TCP/IP port that all client side Control Panels and Device Interfaces use to transport data to the Virtual Matrix. The system has no restriction other than reserved ports. If the Virtual Matrix is behind a firewall and external access is required, a Port Forwarding entry must be added to route all traffic on this port to the

internal Virtual Matrix IP address. Enter the 'Virtual Matrix IP Port for Audio' (default: port 1000) which controls the UDP port that all client side Control Panels and Device Interfaces use to transport audio to the Virtual Matrix. The system has no restriction other than reserved ports. If the Virtual Matrix is behind a firewall and external access is required, a Port Forwarding entry must be added to route all traffic on this port to the internal Virtual Matrix IP address.

- **Failover Virtual Matrix Network Settings:** If you wish to set up a failover server for a second Virtual Matrix enter the relevant values. In an instance of a hardware or connectivity failure client applications will reconnect to the failover server.
- **Audio Settings:** The 'Audio Mix Sample Rate' controls the maximum sampling rate supported by the Virtual Matrix and thereby dictates the maximum fidelity for all Client connections. There are 3 possible settings: Narrowband (8KHz), Wideband (16KHz), and Ultra Wideband (32KHz), which is the default setting. Narrowband is approximately the same fidelity as a phone connection while Wideband more closely approximates the fidelity of a professional analog hardware based Intercom system. Clients by default will be set to the System's Audio sampling rate however the client audio sampling rate can be specified at lower rate but never at a higher rate. Higher audio sampling rates have more significant requirements both in computational speed and network bandwidth so careful consideration must be made when choosing this setting with respect to server hardware and network infrastructure. The 'Audio Output Level Gain (Post-Mix)' allows you to adjust the output level from the VCOM Virtual Matrix to the Control Panels and Device Interfaces in 6 dB intervals 3 times to a maximum 18 dB.
- **Voice Activity Indication:** Use the 'Change Activity Indication Color' feature to change the text color and background color used to indicate voice activity on a given selector. The system interchanges its base colors (yellow text / navy background) with the selected activity indication colors (variable). For typical applications the default color provides a subtle but noticeable indicator. For some applications such as maintenance panels for hoot and holler systems a more pronounced indicator (black text / white background) is generally required.  
[Default: White text / light navy background]

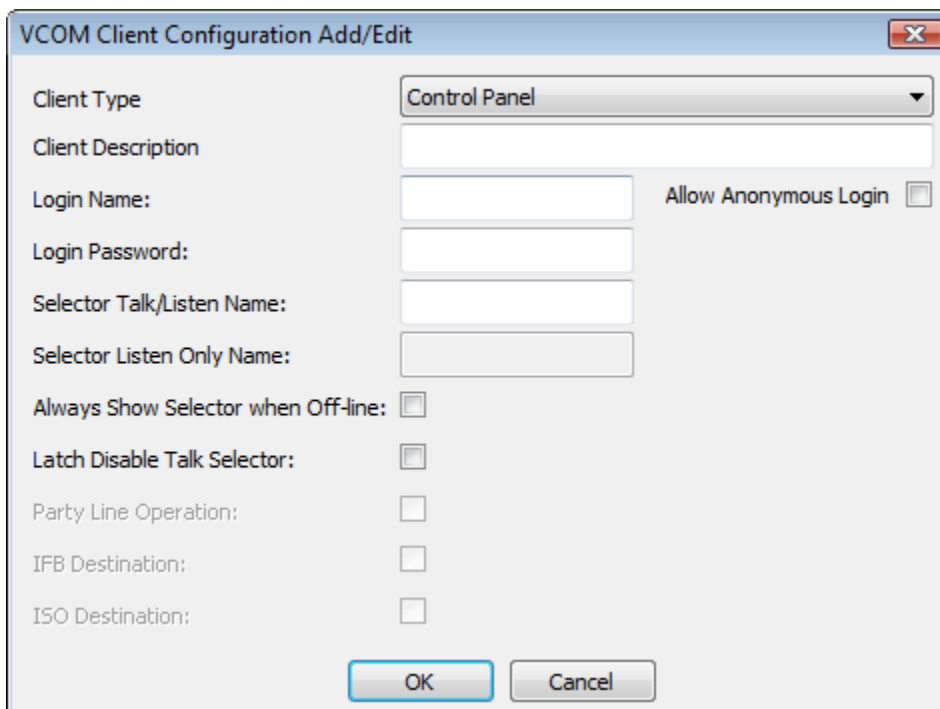
### ***Client Configuration***

The 'Client Configuration' tab found in the 'System Configuration' area is used to set system-wide parameters.



The upper section of the 'Client Configuration' window displays all configured users and devices, log in names, passwords, selector labels, client type, and if the given channel is set as a party line.

Click on a client description name and then 'Edit' to change a parameter, 'Delete' to delete a user or device, or 'New' to add a user or device.

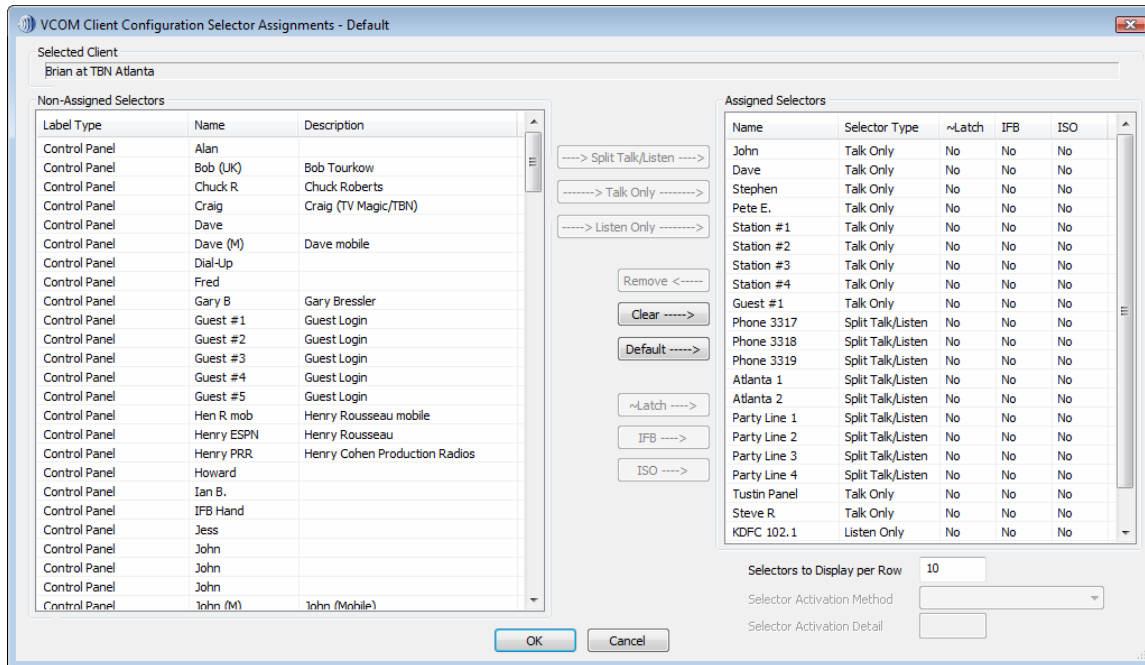


Under 'Edit' you can change the following settings:

- Client Type: Specifies the type of Client that allows the system to modify the internal operational behavior for proper operation of specific devices such as Telephones and Two-Way radios.
- Client Description: The name given to identify the client that is used exclusively in the System Administration application. This allows a complete description of a user (typically first and last name) that cannot otherwise be assigned to the selectors due to space restrictions.
- Login Name: The name assigned to a user or device and used to login a Control Panel or Device Interface to the Virtual Matrix. Select 'Allow Anonymous Login' to allow a user to login a Control Panel by entering any login name he or she chooses followed by the designated password. The chosen login name will appear on the selector.
- Login Password: The password assigned to a user or device and used to login a Control Panel or Device Interface to the Virtual Matrix.
- Selector Talk/Listen Name: The alphanumeric identifier that appears on Control Panel 'Talk only' and 'Talk with Listen' selectors.
- Selector Listen Only Name: The alphanumeric identifier that appears on Control Panel 'Listen only' selectors. This is generally only assigned when a client has split functionality for the audio input and output as with a Program Feed input and IFB output.
- Always Show Selector when Off-line:
- Latch Disable Talk Selector: Select to operate associated selector as a momentary, meaning that an audio path will only persist as long as the selector is clicked and held.
- Party Line Operation: This specifies that a given client operates like a Party Line. This means that anyone talking to that client will also talk to anyone listening to that client and anyone listening to that client will also hear everyone talking to that client.
- IFB Destination: *available in the next VCOM release*
- ISO Destination: *available in the next VCOM release*

The lower portion of the 'Client Configuration' window named 'All Clients' is used to set parameters for all clients.

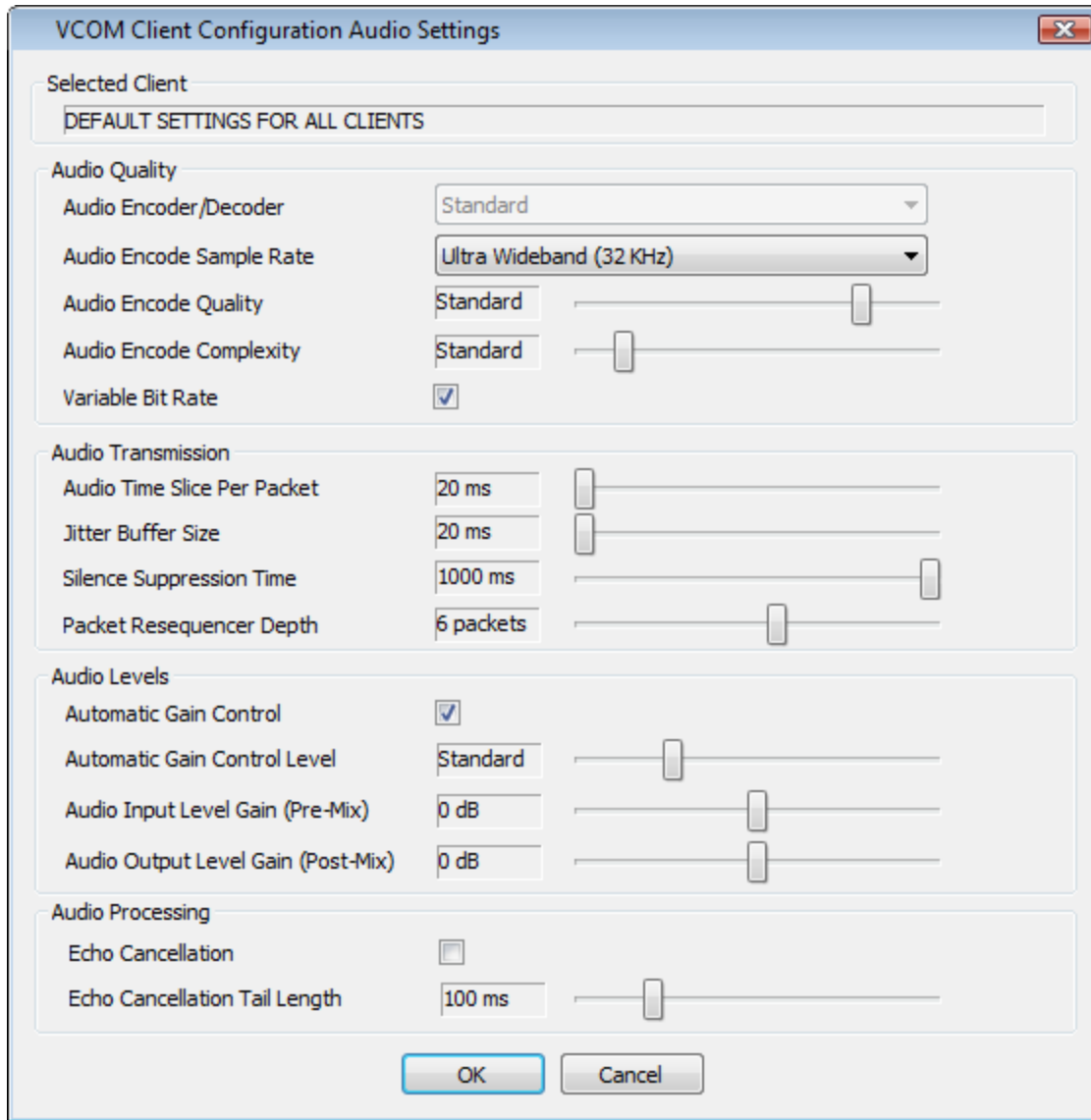
### Default Selector Assignments



This page allows assignment of a Control Panel's selectors. The selectors can be the label associated with any other Control Panel, Device Interface, Party Line or Fixed Group. Additionally the layout of the panel can be dictated by specification of the number of selectors to be displayed per row.

The 'Selected Client' area found in the lower portion of the main window allows you to highlight a client listed in the middle area of the main window and configure that client only.

### Default Audio Settings



- Audio Encoder/Decoder: This setting enabled for the master administrator only allows you to select between the VCOM System's 'Standard' encoder/decoder, no encoder/decoder, or custom encoders/decoders. If you are running the VCOM System with sufficient bandwidth, meaning a gigabyte network for most deployments, you can use no encoder to minimize latency.
- Audio Encode Sample Rate: This setting controls the sampling rate supported by the Clients and thereby dictates default fidelity for the Client connections. This setting is typically the same as the System Audio Sampling rate however it can be specified at lower rate but never at a higher rate (refer to System Audio Sampling Rate for additional detail). Higher audio sampling rates have more significant

requirements both in computational speed and network bandwidth so careful consideration must be made when choosing this setting with respect to client hardware and the client network connection.

[Default: Same as System Audio Sampling Rate]

- **Audio Encode Quality:** The VCOM System codec achieves compression at the expense of fidelity of the input speech signal. Unlike some other speech codecs, it is possible to control the tradeoff made between quality and bit-rate. The VCOM System codec encoding process is controlled most of the time by a quality parameter that ranges from 0 to 10. In constant bit-rate (CBR) operation, the quality parameter is an integer, while for variable bit-rate (VBR), the parameter is a float.
- **Audio Encode Complexity:** With the VCOM System codec, it is possible to vary the complexity allowed for the encoder. This is done by controlling how the search is performed with an integer ranging from 1 to 10. For normal use, the noise level at complexity 1 is between 1 and 2 dB higher than at complexity 10, but the CPU requirements for complexity 10 is about 5 times higher than for complexity 1. In practice, the best trade-off is between complexity 2 and 4, though higher settings are often useful when encoding non-speech sounds.
- **Variable Bit Rate:** Allows the system's codec to dynamically change the bit rate at which audio is being encoded. As sounds like vowels require a higher bit rate to achieve good quality as compared to "s" and "f" sounds, this setting efficiently achieves the best sound quality within the given confines. The system can be set for variable rate or fixed rate.

[Default: variable]

- **Audio Time Slice Per Packet:** Controls how many 20ms audio frames are transmitted within a single UDP packet. As each UDP packet represents a fixed amount of overhead, the more frames sent at the same time the less UDP overhead which conserves network bandwidth. Conversely, the more frames sent per transmission, the greater the system latency and audible consequence of lost packets, e.g. 20ms of lost frames is generally hardly audible whereas 40ms typically is.

[Default: 40ms]

- **Jitter Buffer Minimum Size:** This setting specifies the depth of the jitter buffer in milliseconds. In network-based communications, the delivery time of audio packets across the network may not be uniform. This characteristic is known as jitter. As such, audio received from a network connection must be buffered to compensate for this such that

a continuous time-relative stream of audio can be delivered to the consumer of the audio. Different network topologies will have different jitter characteristics for example a public Internet connection will have significantly more jitter than an internal local network. The effect of a jitter buffer that is too small will result in audio gaps. The value is specified in milliseconds.

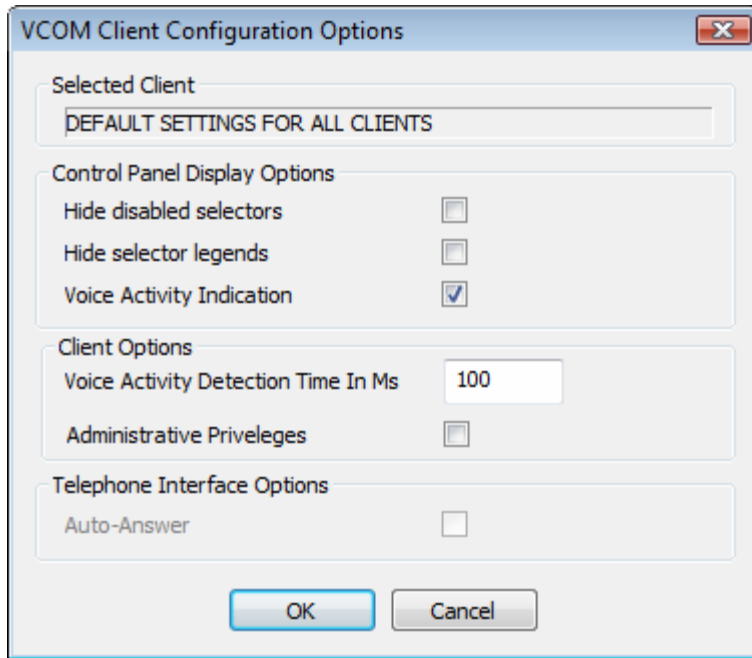
[Default: 100ms]

- **Silence Suppression:** Ceases all transmission of audio data when no voice activity is detected from a Control Panel or Device Interface after the specified time lapse. This virtually eliminates background noise during multiparty conferences however it may be initially disconcerting to some individuals as the 'comfort noise' typically associated with analog systems is suppressed. Additionally this feature minimizes the overall required network bandwidth. The value is specified in milliseconds in the range of 250-2000 ms. To disable Silence suppression set this value to 0.  
[Default: 1000 milliseconds]
- **Packet Re-sequencer Depth:** This setting specifies the number of packets that are stored when waiting for an out of sequence audio packet. In some network topologies, UDP packets while sent in sequential order are received non-sequentially. As such these packets must be re-sequenced before use. After the maximum re-sequencer depth has been reached, the packet being waited for is declared to be lost and the re-sequencing is re-started at the next earliest received packet. Valid settings are from 2 to 10 packets.  
[Default: 6 packets]
- **Automatic Gain Control (AGC):** This setting enables or disables AGC on the audio path from Client to the Server. AGC automatically increases or decreases the audio level such that the client presents a uniform audio level to the Virtual Matrix. AGC is primarily appropriate for use with a Control Panel when used with a headset microphone. In some situations where there is a high amount of background noise or some return audio leakage the AGC may incorrectly amplify the noise to normal audio levels.  
[Default: Enabled]
- **Automatic Gain Control (AGC) Level:** This setting increases or decreases the sensitivity of the AGC. Increasing or decreasing the sensitivity of the ACG changes the behavior of the AGC such that it adapts faster or slower respectively to audio levels not considered to be at uniform level. Decreasing the sensitivity may be useful in cases

where there is a high amount of background noise or some return audio leakage. The valid settings are from 25000 to -25000  
[Default: 0]

- **Audio Input Level Gain (Pre-Mix):** This setting controls the audio input level sent from the Client to the Virtual Matrix. This setting is typically used only when the client's audio input device does not provide a sufficiently audible level (as heard by all other clients) and does not have a local gain control to compensate. The value can be adjusted a maximum of +/-18dB in 6dB steps. Valid settings are +3 to -3 corresponding to +18dB to -18dB respectively.  
[Default: 0]
- **Audio Output Level Gain (Post-Mix):** This setting controls the audio output level sent to the Client from the Virtual Matrix. This setting is typically used only when the client's audio output device does not provide a sufficiently audible level and does not have a local gain control to compensate. The value can be adjusted a maximum of +/-18dB in 6dB steps. Valid settings are +3 to -3 corresponding to +18dB to -18dB respectively.  
[Default: 0]
- **Echo Cancellation:** This setting enables or disables the client's Echo Cancellation. Echo Cancellation is useful if there is any return audio leakage from the client's speaker back to their microphone as this may result in an audible echo heard by any other client that is talking and listening to the client with the return audio leakage.  
[Default: On]
- **Echo Cancellation Tail Length:** This setting controls the duration the echo canceller waits to receive the echo before it begins the cancellation process. The recommended tail length is approximately a third of the room reverberation time. For example, in a small room, reverberation time is in the order of 300ms, so a tail length of 100ms is recommended.  
[Default: 100ms]

### Default Options



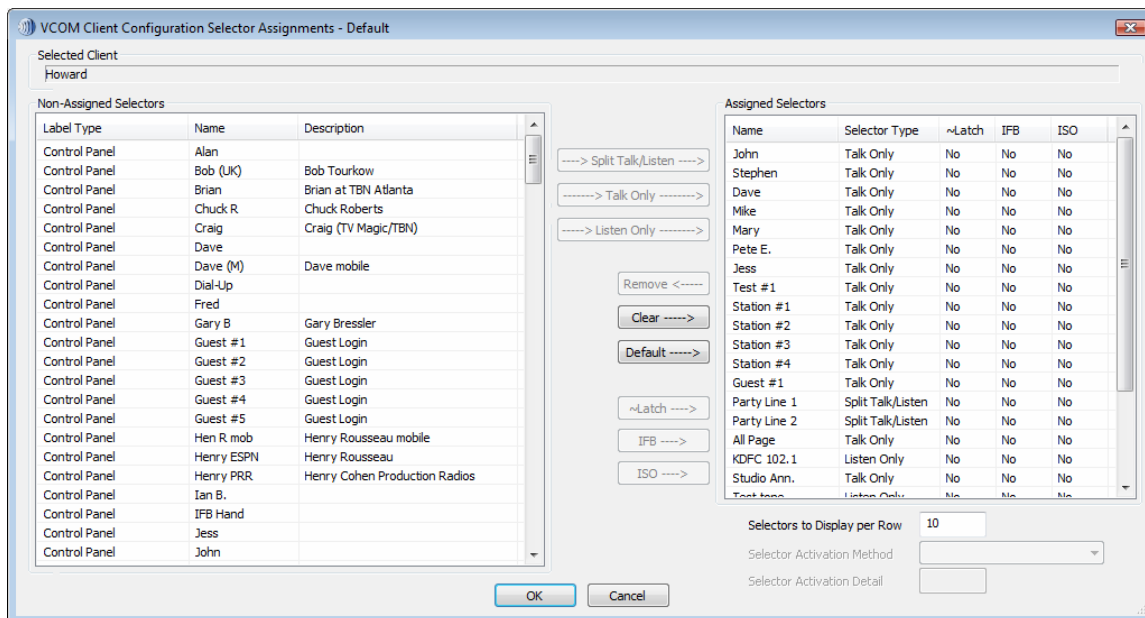
- **Hide Disabled Selectors:** This setting hides selectors assigned to other clients that are not logged into the system. When the clients come online, their selector will dynamically appear.  
[Default: Not hidden]
- **Hide Selector Legends:** This setting hides the overlaid selector legends displayed on listen selectors ('L') and talk selectors ('T').  
[Default: Not hidden]
- **Voice Activity Indication:** This setting is used to visually indicate voice activity on Control Panel selectors, represented by selector text and background color switching between base state (yellow text / navy background) and default activity indication colors (white text / light navy background) or selected activity indication colors (variable). Voice Activity Indication is only available if the Control Panel has the ability to listen to or is being talked to by the client indicating voice activity.  
[Default: On]
- **Voice Activity Detection:** This setting determines the duration in milliseconds after which a voice or sound is valid for indication.
- **Administrative Privileges:** This setting gives administrative privileges to all users to log in to the System Administration application with their assigned username and password.

- Auto-Answer: This setting enables the system to automatically answer an incoming telephone call.

The middle portion of the 'Client Configuration' window named 'Selected Clients' is used to set parameters for individual users or devices.

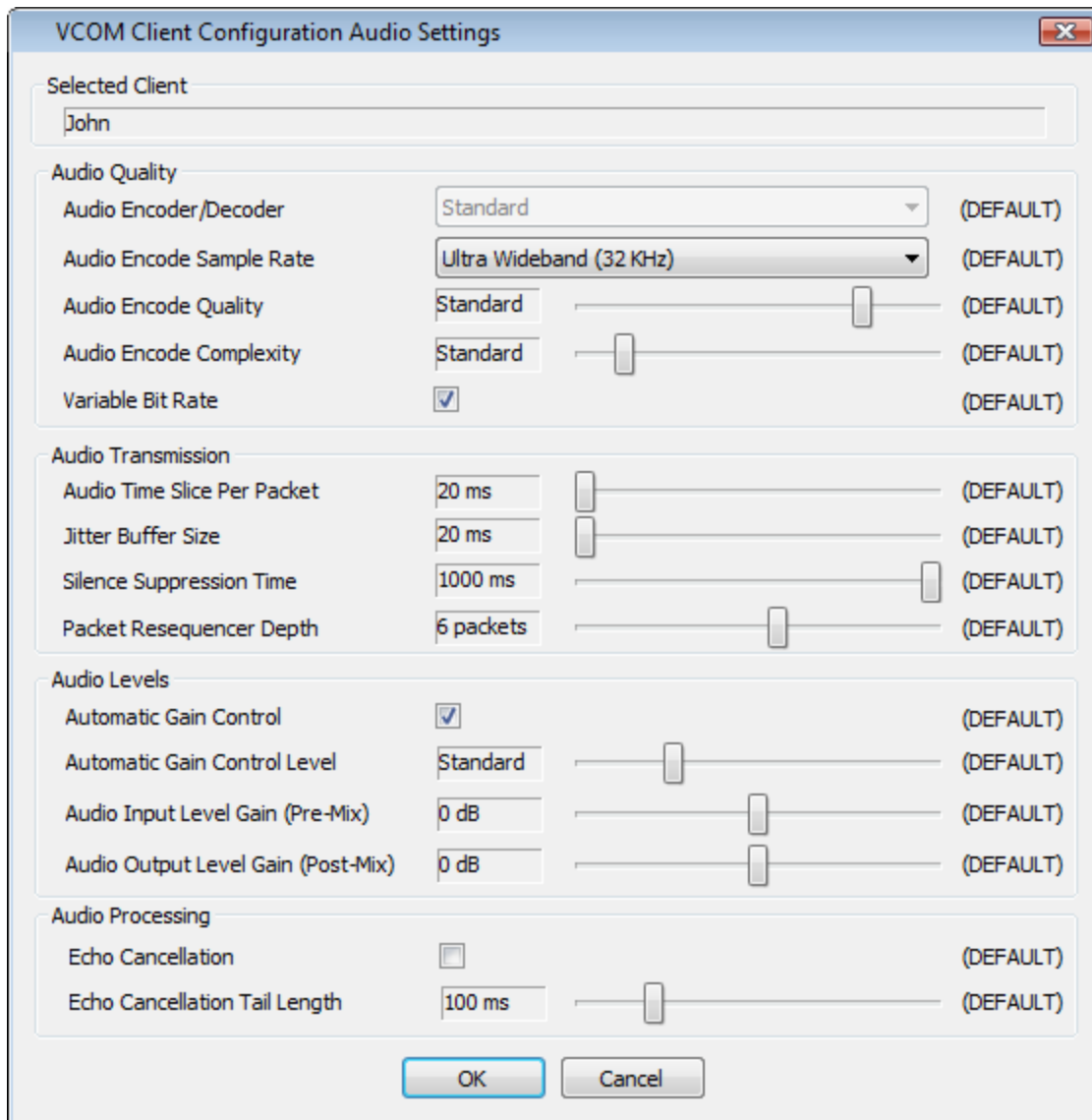
### Selector Assignments

The settings in this section are mirrored in the 'Default Selector Assignments' section but can be changed here for individual users or devices.



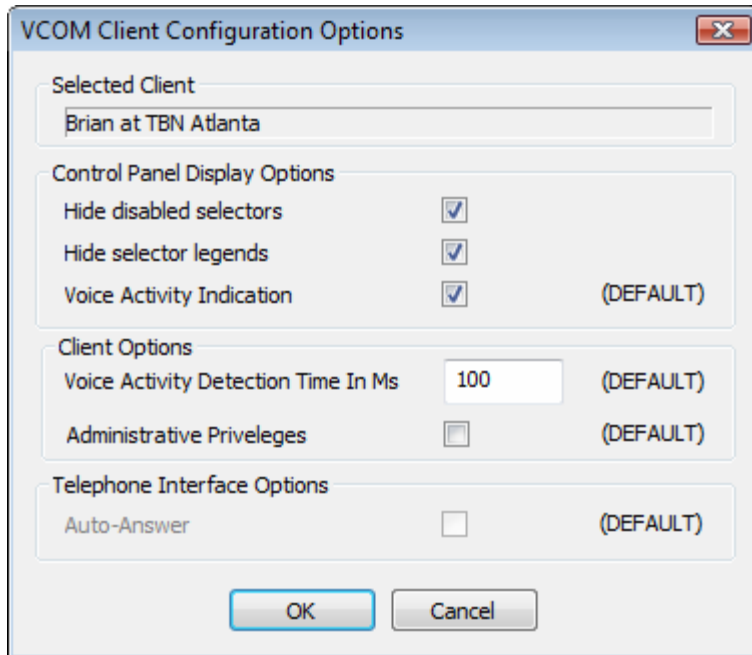
### Audio Settings

The settings in this section are mirrored in the 'Default Audio Settings' section but can be changed here for individual users or devices.



## Options

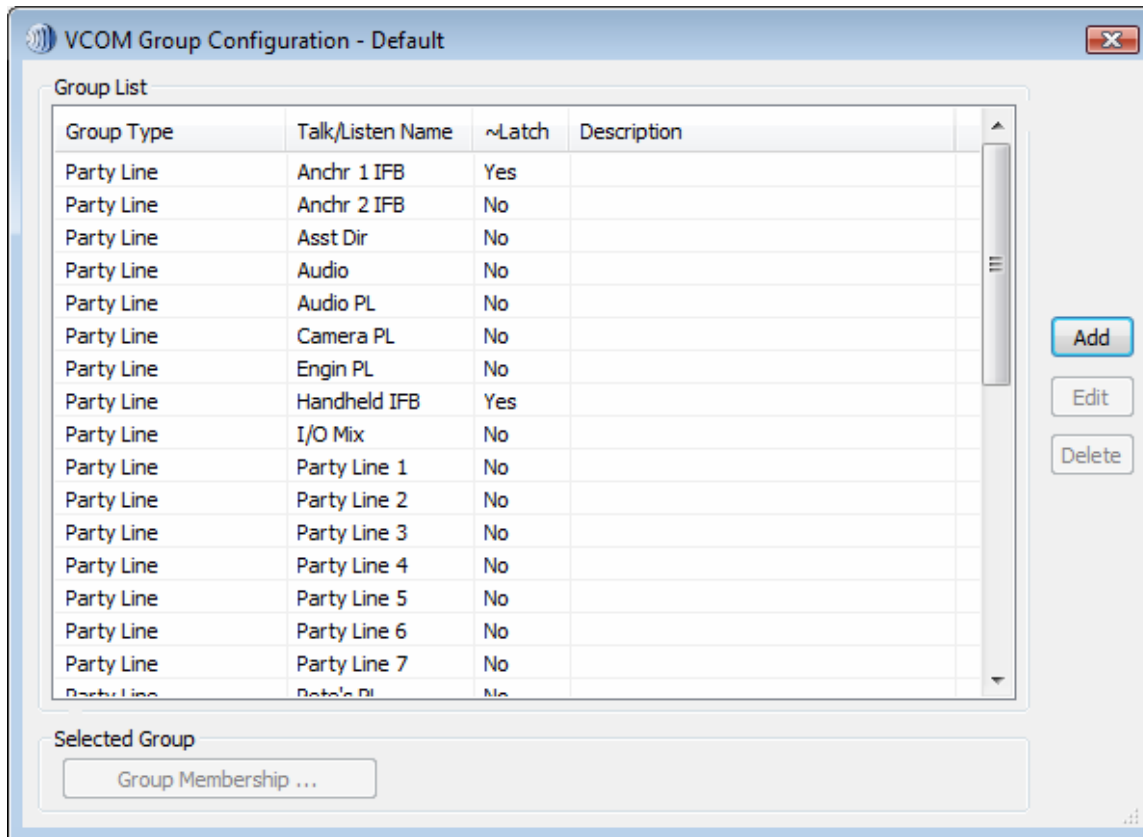
The settings in this section are mirrored in the 'Default Options' section but can be changed here for individual users or devices.



### ***Group Configuration***

The 'Group Configuration' tab found in the 'System Configuration' area is used to add/edit/delete Party Lines and Fixed Groups, change selector names, and change group membership.

The main 'Group Configuration' window displays configured Party Lines and Fixed Groups.

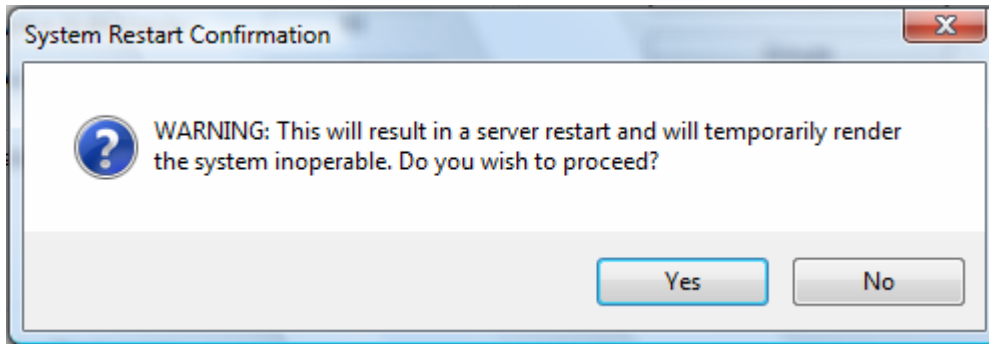


To add a Party Line or Fixed Group click the 'Add' button.

- Type: Choose from the drop down box 'Party Line' or 'Fixed Group.'
- Description: You may add a short description for the Party Line or Fixed Group or leave it blank.
- Selector Talk Label: Add a name of up to 10 alphanumerical characters which will appear on the selector.
- Latch Disable: Select latch disable to have the selector work as a momentary key.



Restart System: This feature restarts the system. A warning message will first appear noting that selecting this feature will temporarily render the system inoperable and asking if you wish to proceed. This feature is only available to the system administrator logged in with the master username and password.



### 3.5 SYSTEM STATISTICS

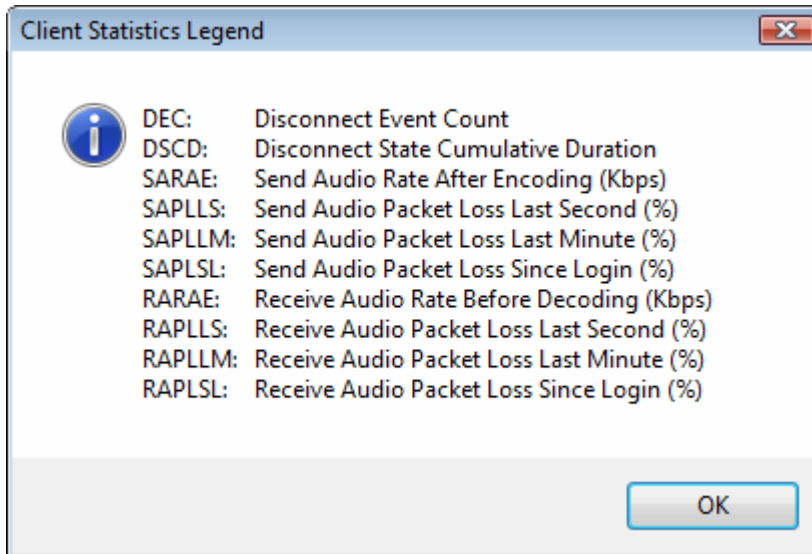
Client Statistics: Displays individual send and receive audio and packet loss statistics for all client connections.

Client	State	Duration	DEC	DSCD	SARAE	SAPLLS	SAPLLM	SAPLSL	RARBD	RAPLLS	RAPLLM	RAPLSL	CPU	IP Address	Version
Alan	On-Line	5h, 58m	17	2d, 1h, 4m	1537....	0.00	0.00	0.00	-	-	-	-	n/a	71.131.186.152	2.0.0
Beijing	Off-Line	11h, 56m	98	2d, 17h, ...	-	-	-	-	-	-	-	-	-	123.113.32.219	2.1.0.34 (Pre...
Bloomberg	On-Line	8h, 11m	7	2d, 0h, 13m	63,344	0.00	0.00	0.09	-	-	-	-	17%	76.91.143.250	2.1.0.37 (Pre...
Dave	On-Line	3h, 43m	21	3d, 11h, ...	-	-	-	-	-	-	-	-	n/a	76.95.161.79	2.1.0.49 (Pre...
Dave (M)	Off-Line	1d, 6h, 21m	9	5d, 2h, 38m	-	-	-	-	-	-	-	-	-	208.54.14.18	2.1.0.136 (Pr...
Fred	Off-Line	1h, 40m	7	1d, 9h, 35m	-	-	-	-	-	-	-	-	-	72.173.16.71	2.0.0
Guest #1	Off-Line	12m	15	2d, 7h, 18m	-	-	-	-	-	-	-	-	-	96.231.151.235	2.1.0.2 (Pre...
Guest #2	Off-Line	32m	3	2d, 8h, 52m	-	-	-	-	-	-	-	-	-	96.231.151.235	2.1.0.2 (Pre...
In/Out #41	Off-Line	22h, 45m	1	22h, 45m	-	-	-	-	-	-	-	-	-	76.95.161.79	2.1.0.38 (Pre...
In/Out #42	Off-Line	22h, 45m	1	22h, 45m	-	-	-	-	-	-	-	-	-	76.95.161.79	2.1.0.38 (Pre...
John	On-Line	55m	20	3d, 19h, ...	-	0.00	0.40	0.27	24.272	0.00	0.17	0.53	6%	67.163.5.42	2.1.0.53 (De...
John (M)	Off-Line	2d, 6h, 50m	7	2d, 6h, 53m	-	-	-	-	-	-	-	-	-	32.159.231.36	2.1.0.236 (Pr...
KVBC	Off-Line	4d, 17h, 32m	1	4d, 17h, ...	-	-	-	-	-	-	-	-	-	12.179.97.125	2.1.0.2 (Pre...
Larry L	Off-Line	4d, 9h, 54m	1	4d, 9h, 54m	-	-	-	-	-	-	-	-	-	76.235.1.180	2.0.0
Larry L (M)	Off-Line	5h, 35m	1	5h, 35m	-	-	-	-	-	-	-	-	-	70.210.166.14	2.1.0.136 (Pr...
Mark	Off-Line	23h, 41m	3	1d, 4h, 43m	-	-	-	-	-	-	-	-	-	69.229.126.13	2.0.0
Mem PGM	Off-Line	4d, 9h, 54m	1	4d, 9h, 54m	-	-	-	-	-	-	-	-	-	76.235.1.180	2.0.0
Mike	Off-Line	1h, 5m	1	1h, 5m	-	-	-	-	-	-	-	-	-	75.80.147.195	2.0.0
Pete	Off-Line	2d, 12h, 26m	4	2d, 13h, 3m	-	-	-	-	-	-	-	-	-	123.113.34.82	2.1.0.49 (Pre...
Pete E.	Off-Line	11h, 56m	22	3d, 3h, 25m	-	-	-	-	-	-	-	-	-	123.113.32.219	2.1.0.49 (Pre...
Phone 3317	Off-Line	1d, 1h, 16m	3	2d, 4h, 32m	-	-	-	-	-	-	-	-	-	71.131.186.152	2.1.0.44 (Pre...
Piotr	Off-Line	3d, 8h, 39m	15	3d, 17h, ...	-	-	-	-	-	-	-	-	-	123.113.47.137	2.1.0.49 (Pre...
Radio 42	Off-Line	11h, 56m	94	2d, 17h, ...	-	-	-	-	-	-	-	-	-	123.113.32.219	2.1.0.34 (Pre...
Simon K	Off-Line	10h, 33m	9	2d, 21h, ...	-	-	-	-	-	-	-	-	-	82.207.169.34	2.1.0.49 (Pre...
Station #1	Off-Line	1d, 9h, 54m	4	4d, 6h, 1m	-	-	-	-	-	-	-	-	-	96.242.134.126	2.0.0

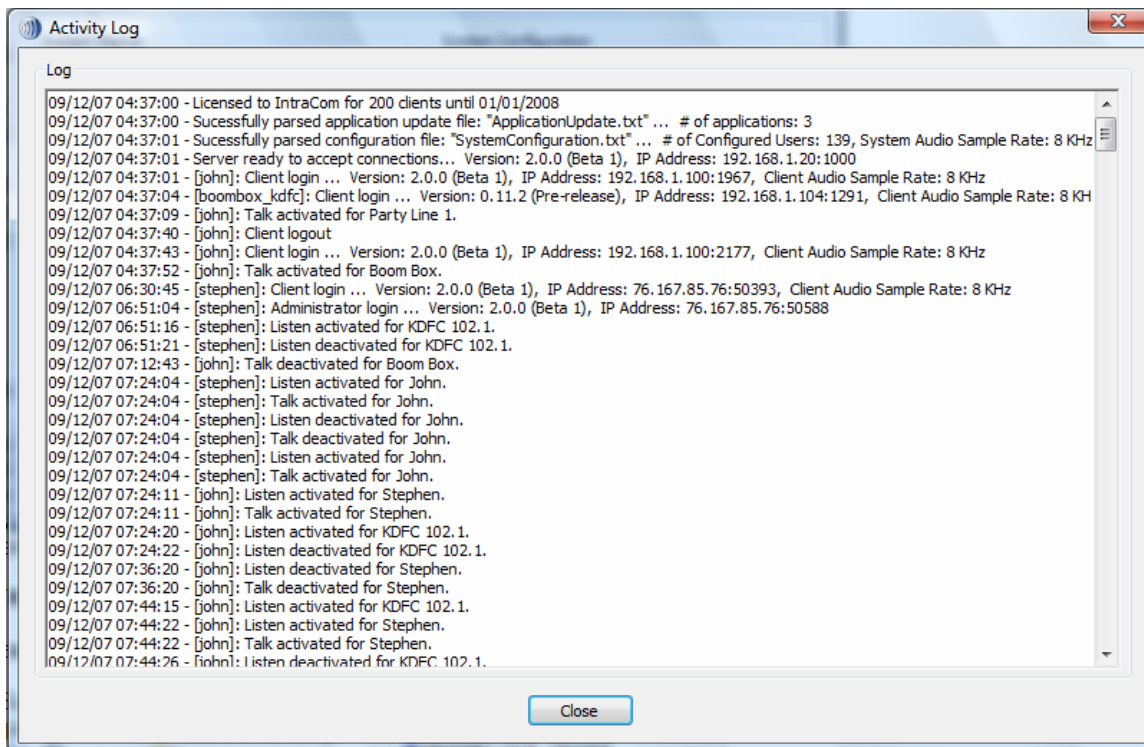
Click the 'Reset Statistics' button in the lower left corner to reset all client statistics or highlight a user or device and then click 'Reset Statistics' to reset the statistics of an individual user or device.

Select 'Show Unused Clients' to display users and devices programmed for your system but that are off-line.

Click the 'Column Legend' button in the lower right side of the 'Client Statistics' window to display the legend.



Activity Log: During system operation the logging feature displays a time stamped entry for each client connection/disconnection and key changes.



## 4. SUPPORT

Visit our web site at [www.intracomsystem.com](http://www.intracomsystem.com) for general information.

Email us at [support@intracomsystem.com](mailto:support@intracomsystem.com) for questions not addressed in the sections above or call our technical support hotline at 818-357-2347.