

Vertex VoIP Caller ID

(Version 1.5)

Introduction

The Vertex unit is designed to capture Caller ID and other telephony signaling on VoIP phone calls and send this information to computers. Depending on the software running on the computer, applications such as Caller ID popup screens for delivery, dispatch, phone billing, and logging calls are available.

Critical Information

1. In order to capture the incoming and outgoing telephone call signaling, the device must be connected to a network cable that carries all VoIP traffic of interest.
 - For Hosted systems (see below), the Vertex would be installed between a separate gateway router and a network switch in which the VoIP phones connect.
 - For Managed systems (see below), the Vertex would be installed between the SIP host and the network switch in which the VoIP phones connect.
2. Small organizations with Hosted VoIP using a combined gateway router/switch will have to install a separate network switch. VoIP phones will need to be connected to the network switch.

Types of VoIP

There are basically two types of VoIP service, Hosted VoIP and Managed VoIP.

Hosted VoIP is defined by the service provider performing all voice switching, routing, messages on hold, call queuing, and other functions. In most cases, the end user needs only to connect VoIP phones to their network. Any significant programming and configuration is done by the service provider. At the time of this writing, the more popular companies offering Hosted VoIP are firms such as Nextiva, Ring Central, Vocalocity, Jive, and 8x8,.

Note that Hosted VoIP service providers can also provide multi-line VoIP to analog conversion devices. If you are not using VoIP phones and still using analog or digital phones, then our analog devices may fit your needs better than the Vertex.

Managed VoIP involves additional equipment on site that handles most of the VoIP switching, routing, and call processing. Various terms and acronyms apply to Managed VoIP including SIP trunking, Asterisk PBX, ISDN PRI, and T1 feeds. There are many types of architectures available using particular combinations of these and other items. If you have a Managed VoIP system, your IT person and/or telephone switch provider should know the details.

Installation

Hosted VoIP Connections

Figure 1 shows typical network architecture with a Vertex unit connected. If a separate gateway router and network switch is not present, most likely you will need to install a network switch. In order to see all the inbound and outbound VoIP traffic, the Vertex must be connected between the gateway router and the network switch. The output of the Vertex is connected to a standard port on the network switch or the serial port can be used. All blue lines indicate new connections.

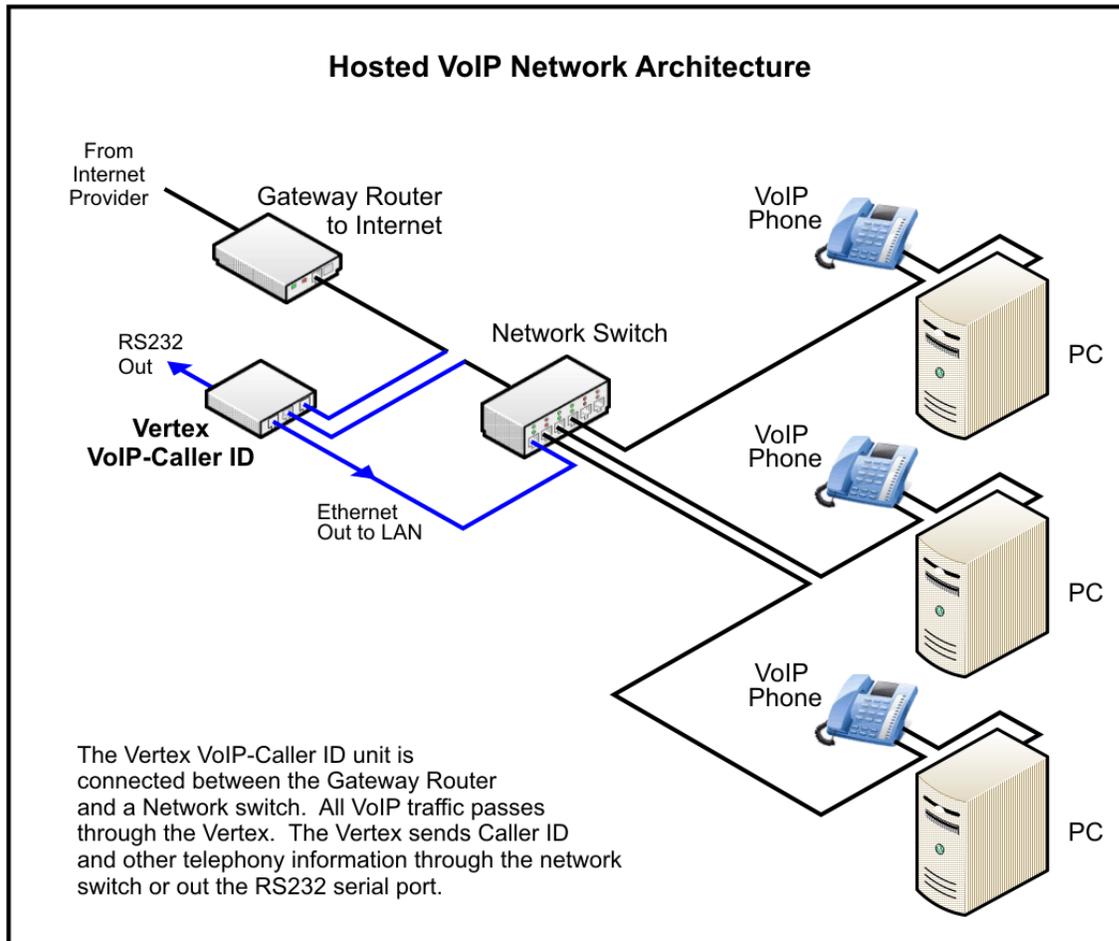


Fig. 1 – Hosted VoIP Architecture

Managed VoIP Connections

Every managed VoIP system uses a SIP host. At the very least, it performs all on-site routing and switching of VoIP calls. The SIP host can be either a VoIP card on a phone system, or perhaps a PC running Asterisk software. The Vertex device should be connected between the SIP Host and the network switch so it can monitor all VoIP traffic to and from the phones. All blue lines indicate new connections.

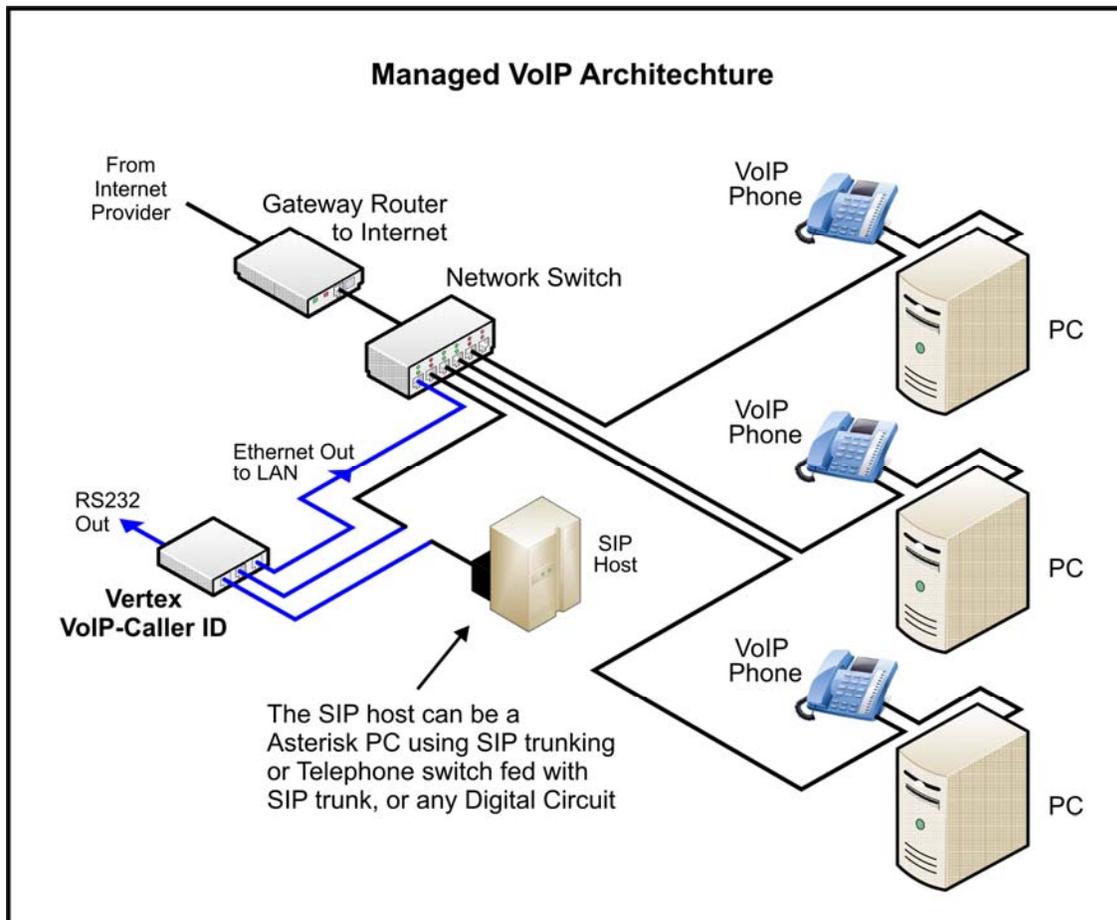


Fig. 2 – Managed VoIP Architecture

Hosted VoIP Physical Connections

Vertex Connected Between Router and Network Switch (refer to Fig. 1)

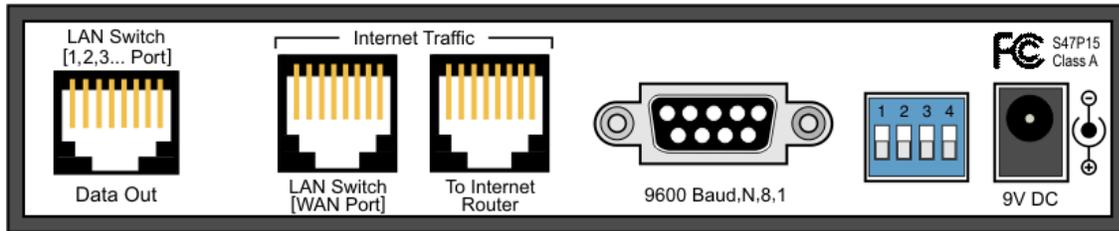


Fig 3. – Hosted VoIP network cable connections

1. Locate the network cable connecting your internet gateway router and your independent network (LAN) switch.
2. Note the designation marked on the connection jack for each device.
3. Disconnect the network cable from the router. Leave the other end connected to the network switch.
4. Connect the supplied Cat 5e cable to the same router port that was disconnected in step 3.
5. Connect the router to the Vertex jack marked “To Internet Router” with the supplied cable in step 4.
6. Connect the network switch to the Vertex jack marked “LAN Switch [WAN Port]”.
7. Connect the other supplied Cat 5e from the Vertex “Data Out” jack to a standard port on the network switch. Or, connect a DB9 serial cable to a computer.
8. Power up the unit only after all connections are made.

Managed VoIP Physical Connections

Vertex Connected Between Network Switch and SIP Host (refer to Fig. 2)

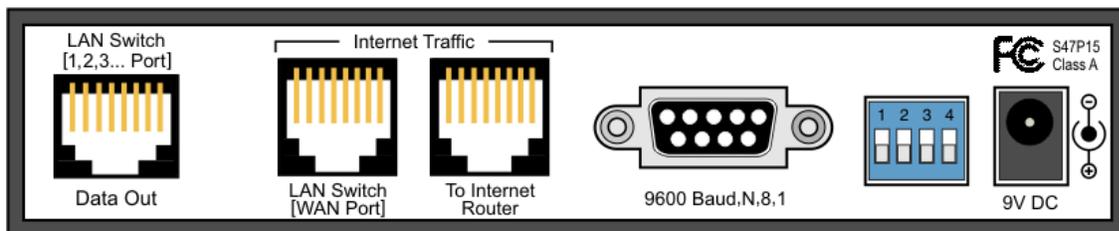


Fig 4. – Managed VoIP network cable connections

Note: The labels and connections below may not be intuitive since the labeling best matches the standard Hosted connection when the Vertex is placed between the Router and Network switch.

1. Locate the network cable connecting your network (LAN) switch to your SIP Host.
2. Note the designation marked on the connection jack for each device.
3. Disconnect the network cable from the network switch. Plug that into the “To Internet Router” jack.
4. Connect the supplied Cat 5e cable to the network switch port that was disconnected in step 3.
5. Connect the other end of the supplied Cat 5e cable to the “LAN Switch [WAN Port]” port on the Vertex
6. Connect “Data Out” to any network switch accessible by computers viewing the data or for unit setup.
7. If your application requires a serial port connection, connect a DB9 M-F serial cable.
8. Power up the unit only after all connections are made.

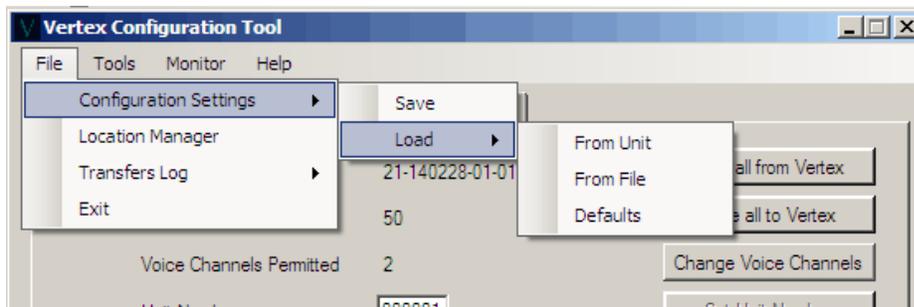
Vertex Configuration Tool

In most cases, you will need to configure the Vertex device for your network, your application software, and your VoIP configuration. Use the Vertex Configuration Tool to configure the unit located at

www.callerid.com/downloads/diagnostic-tools

When the program launches, a splash screen will show whether a Vertex device has been found on the local network. If found, choose whether to populate the program with parameters from that unit or from the default file.

After initial startup, the parameter set loaded into the Vertex Configuration program can be changed by File/Configuration Settings/Load/



The Vertex hardware parameters are usually changed manually by selecting each tab and sending those changes to the unit. Once the setup of the Vertex hardware is complete, we recommend saving the final parameters to a file. If the hardware has to be replaced or firmware upgraded, the saved file can be used to load your saved parameters back to the device.

Main Tab

Serial Number/Firmware Version

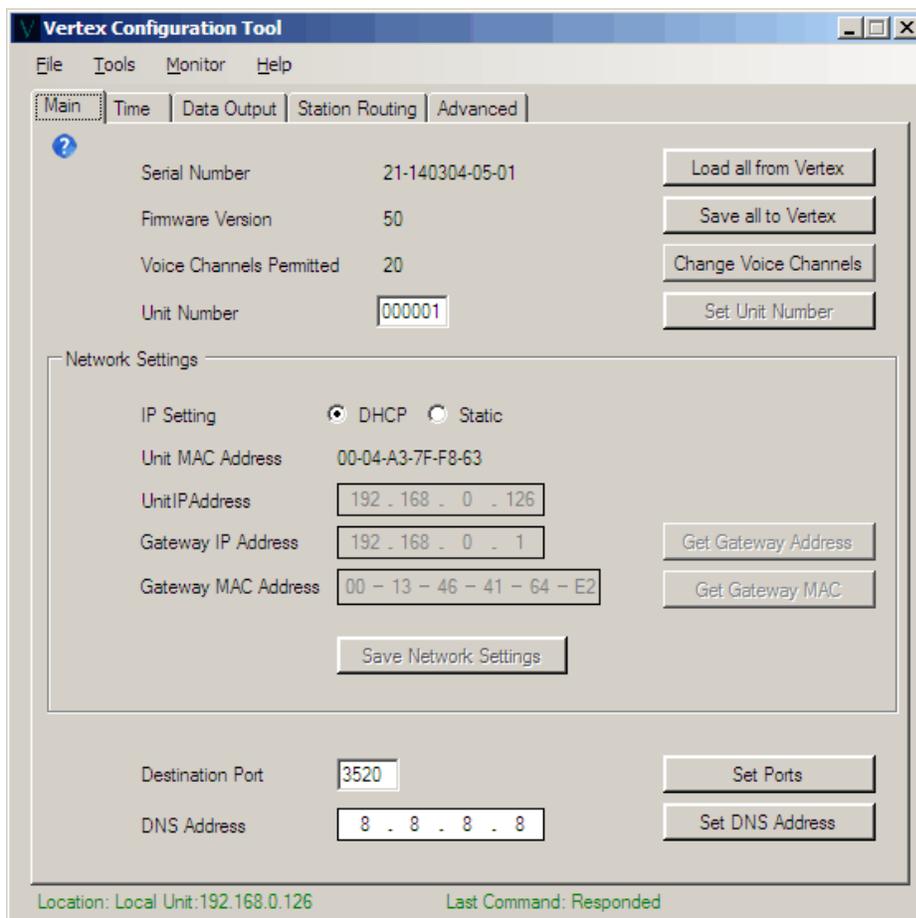
The serial number and firmware version is hard coded and cannot be changed. If necessary, the firmware can be updated using a program that comes with the Vertex Configuration package.

Voice Channels

The maximum number of voice channels permitted at one time can be changed only with a coded sequence number. Since the price structure of the Vertex product depends significantly on the number of simultaneous voice channels that can be processed at any time, there is usually a cost associated with increasing the number of voice channels permitted.

Unit Number

The unit number is normally used when a customer has more than one unit in a location or units in multiple locations.



Network Settings

Network Settings should be changed only by a qualified network administrator or IT professional. In most situations, DHCP is normally recommended.

Destination Port

The Destination Port is the network port number that the unit sends and receives on. Unless your application software is designed to use a different port number, it will not need to be changed from the default of 3520.

DNS Address

Changing the Directory Name Service (DNS) address is not advised unless it is deemed necessary for DNS lookups.

Time Tab

Time Offset

The Vertex queries official government time servers periodically to provide the Date and Time for phone calls. These servers issue Date and Greenwich Mean Time (GMT). The user must select or enter the time zone offset in which the unit is located. The time zone offset must be entered in non-daylight savings time.

Daylight Saving Time

If your location does not observe Daylight Saving Time (DST), disable DST. The default is DST Enabled with entries provided representing the present DST parameters in the USA.

The screenshot shows the 'Vertex Configuration Tool' window with the 'Time' tab selected. The interface includes a menu bar (File, Tools, Monitor, Help) and a tabbed navigation system (Main, Time, Data Output, Station Routing, Advanced). The 'Time' tab contains the following sections:

- Last Date/Time From Unit:** March 11, 2014 1:52 PM. An 'Update' button is located to the right.
- Time Offset:** A radio button labeled 'Select' is chosen, with a dropdown menu showing '(GMT -5:00) Eastern Time (US & Canada), Bogota, Lima'. Below this is the instruction 'Select Time Zone above or manually enter offset below.' and a 'Set Time Offset' button.
- Enter:** A radio button labeled 'Enter' is unchosen. It is followed by two dropdown menus for hours and minutes, currently set to '-5' and '00'. The text 'Enter in non Daylight Saving Time' is to the right.
- Daylight Saving Time:** A checkbox labeled 'Enabled' is checked. Below it are two rows of dropdown menus for 'DST Start' and 'DST End'. The first row is set to '2nd', 'Sunday', 'of', 'Mar'. The second row is set to '1st', 'Sunday', 'of', 'Nov'. A 'Set DST' button is to the right.
- Time Servers:** Four text input fields labeled 'Server #1' through 'Server #4' contain the addresses 'time.nist.gov', 'time-nw.nist.gov', 'time-a.nist.gov', and 'time-b.nist.gov' respectively. An 'Unlock' button is to the right of the first two servers, and a 'Set Time Servers' button is to the right of the last two.

At the bottom of the window, the status bar shows 'Location: Local Unit:192.168.0.110' and 'Last Command: Responded'.

Time Servers

The US government Time Server IP addresses are password protected and should not be changed unless directed by a CallerID.com representative.

Data Output Tab

The data output destination and format will be specific to the software being used for Caller ID popup screens and/or your intended application needs. The format options available match the options of CallerID.com analog devices. This enables the Vertex to be compatible with existing software written for our analog products.

Destination

If your software application allows data delivery via Ethernet, your choices are either Broadcast or Station Routing. For a smaller business, rarely using more than 4 lines (4 IP phone voice channels) at a time, broadcasting data to all computers (Destination IP = 255.255.255.255) is the recommended setup.

For a larger operation, an IT/computer technician will need to configure Station Routing.

If your software only accepts serial data, choose the baud rate used by your application.

Format

The Limited format is used by some software packages that accept serial data and is not available with Ethernet delivery. The Comprehensive format is used by most Caller ID software applications and allows for more options. Contact a CallerID.com representative for the exact format your application software requires.

Vertex Configuration Tool

File Tools Monitor Help

Main Time **Data Output** Station Routing Advanced

Destination

- Broadcast
IP address: 255 . 255 . 255 . 255
- Station Routing
Static computer IP addresses are matched to VoIP phones in Station Routing Tab.
- Serial Port
Baud Rate:
 - 1200
 - 9600
Most applications designed for CallerID.com serial devices use 9600 Baud.
 - 38400
- Call Accounting
IP address: 0 . 0 . 0 . 0

Format

- Limited Format
(Only available via Serial Port)

Comprehensive Options

Data Stream Delivery

- Send at Start of Call
- Send at End of Call
- Send at Both Start and End

- Send Outgoing Call Info.
- Send Detailed Data
- "S" Mode
("S" placed before data and phone number will not have dashes)

Write Changes to Vertex

Location: Local Unit:192.168.0.126 Last Command: Responded

Call Accounting

Call accounting information is used to historically analyze call activity. This information is usually sent to a single computer IP address running a Call Accounting program. Contact CallerID.com for software packages available for call accounting.

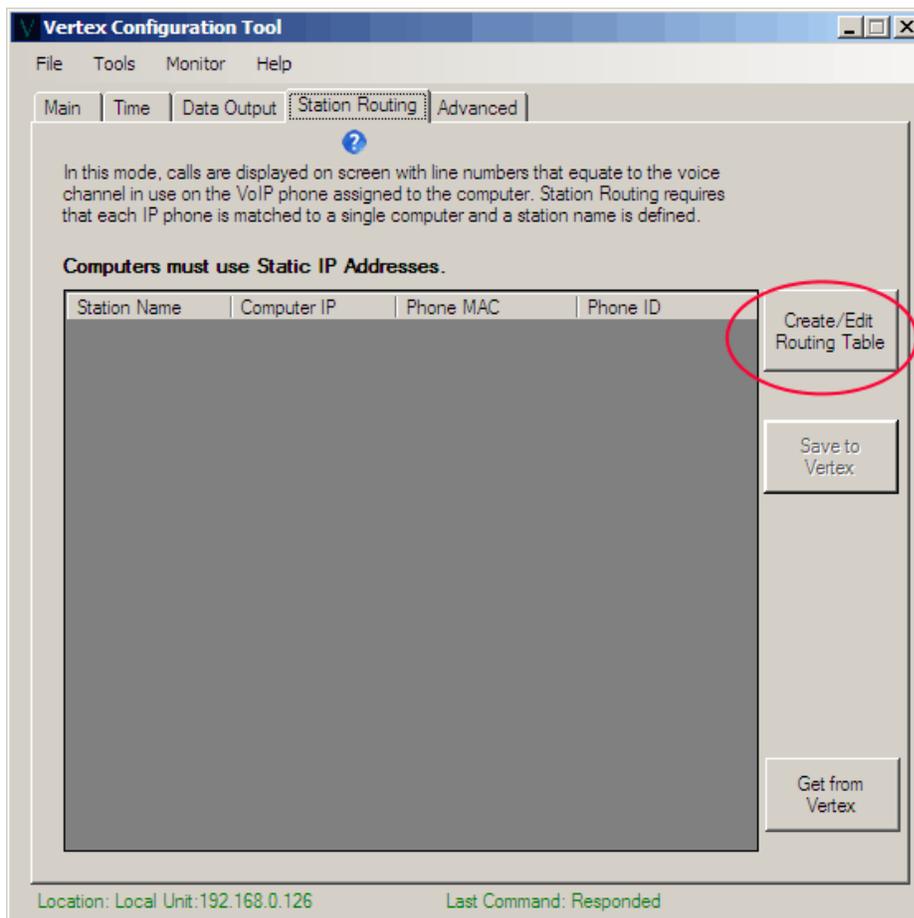
Station Routing Tab

The Station Routing method of data delivery is designed for locations having many VoIP phones and multiple voice channels available on each phone. Your software application must be written in a particular manor to take advantage of the Station Routing method.

The Station Routing mode sends data to computers with line numbers matching the voice channel on the associated VoIP phone. The line number of each call shown on the computer will equate to the voice channel in use on the VoIP phone assigned to it.

The Station Routing Mode will operate properly only if your computers have static IP addresses assigned to them.

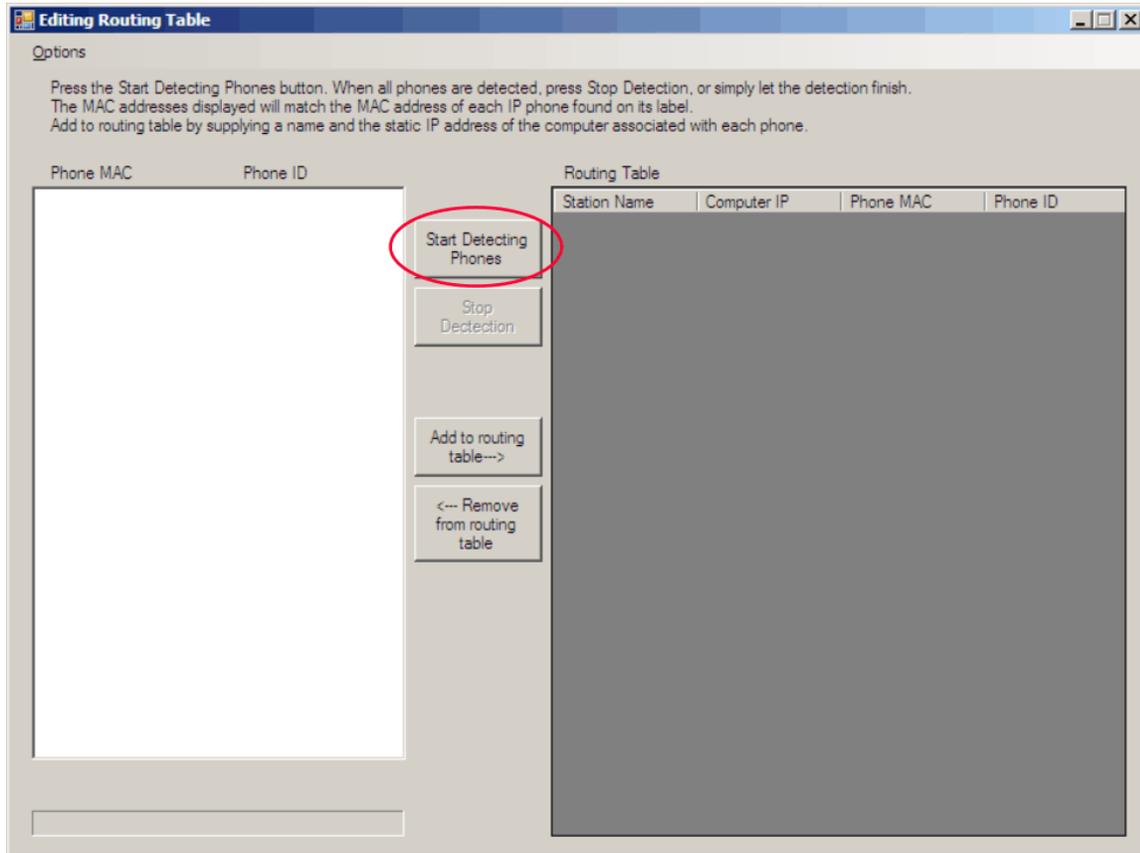
Initially, the Vertex will have no entries. Select the “Create/Edit Routing Table” button to add entries.



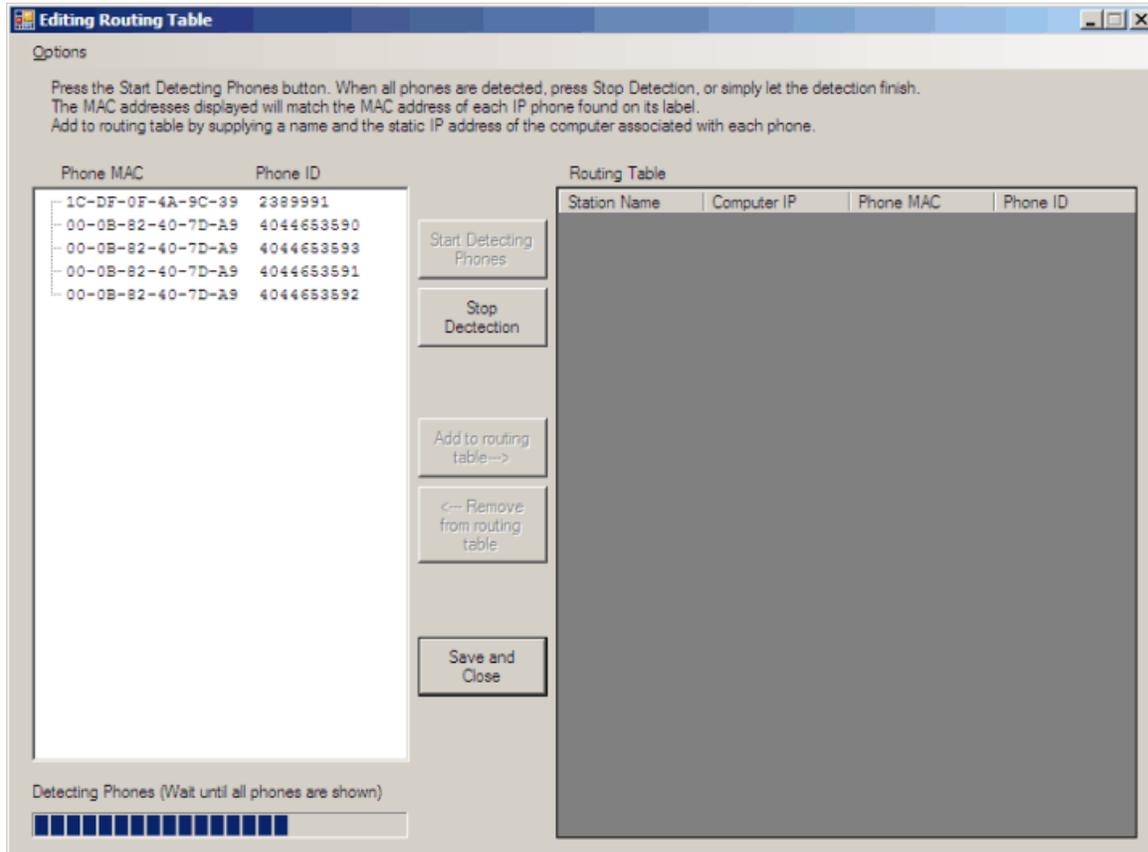
Edit Routing Table

The Edit Routing Table allows you to detect phones and assign them to individual computers based on the computers static IP address. A workstation name will be assigned to each phone/computer combination.

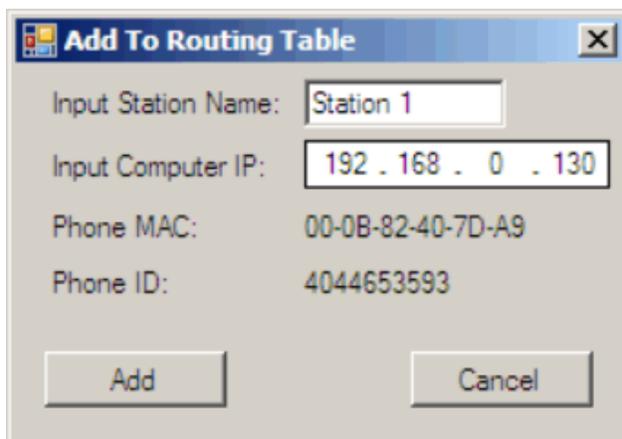
Select the “Start Detecting Phones” button. Wait until all your phones are detected or let the 2 minute process complete. If all your phones are not detected, check whether the undetected phones are operating normally and start the detection process again.



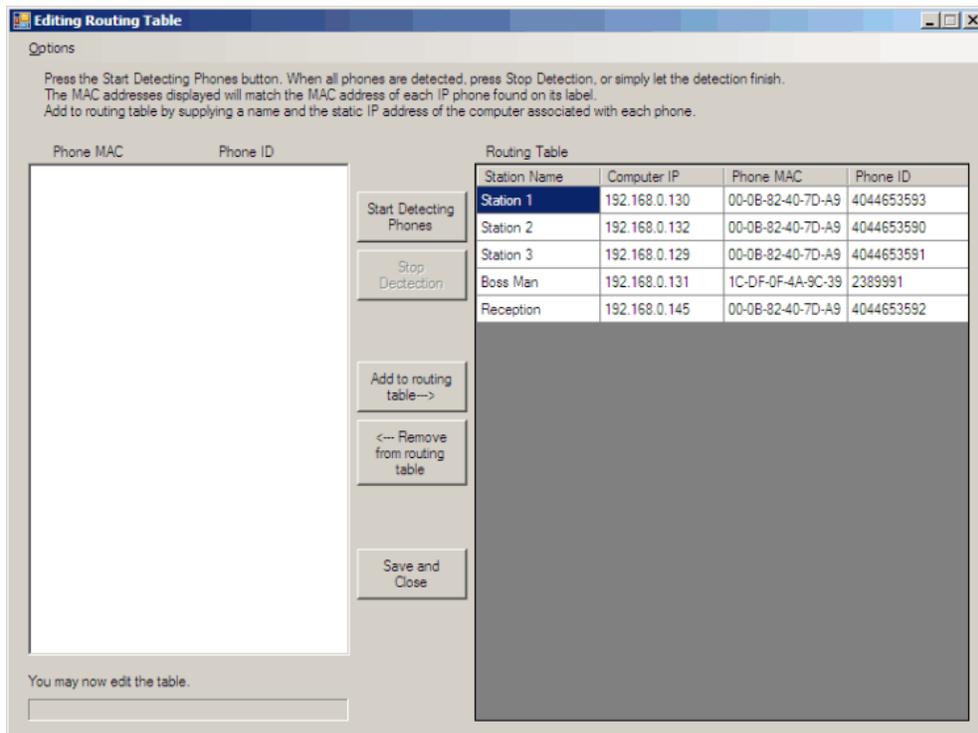
This example shows 5 IP phones detected. The MAC address and the Phone ID are shown. Match each MAC address that the program detects with your IP phone's MAC address printed on the manufactures label underneath each phone.



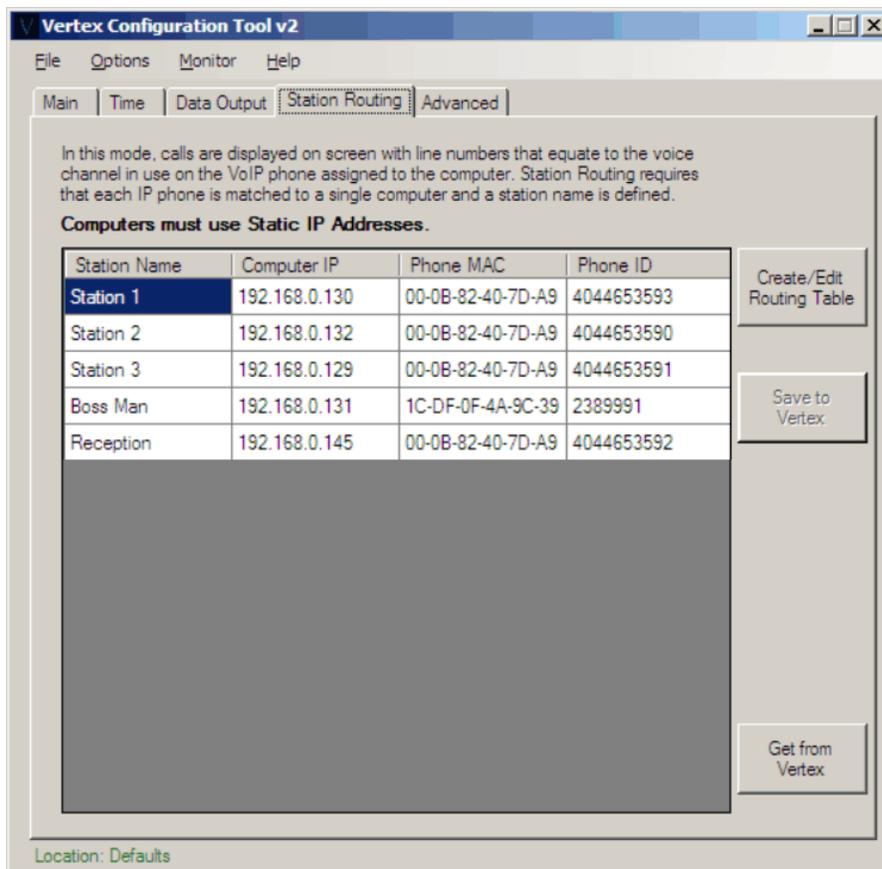
Select the MAC address on the left and press the Add to Routing Table button. Enter a workstation name and the IP address on the computer associated with that phone. (In order to determine an individual computer's IP address refer to Appendix A).



Add the remaining detected phones entries to the Routing Table. Select the “Save and Close” button to save entries to the Vertex.



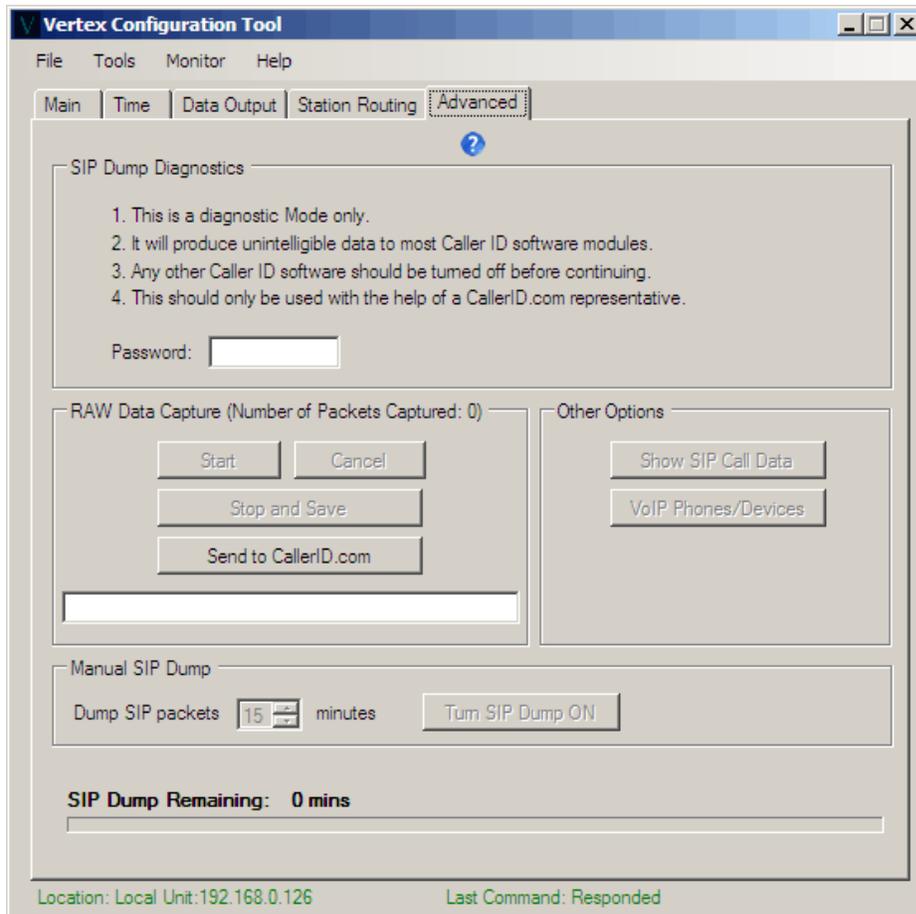
The Station Routing tab will display your entries.



Advanced Tab

SIP Dump diagnostics will produce unintelligible output that may crash Caller ID monitoring software applications. Confirm any Caller ID popup software is closed before running the SIP Dump.

SIP (Session Initiation Protocol) is the standard used when non-encrypted VoIP phone calls are made. We suggest that you only run this mode when working with a CallerID.com representative.



Once the Password is entered, advanced options can be used.

Raw Data Capture

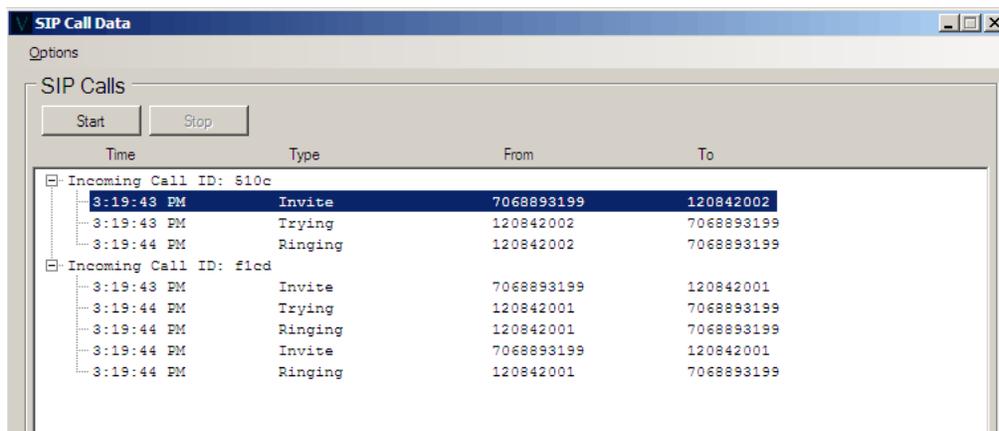
Starting the Raw Capture shows the number of packets captured. Once the prescribed phone calls are made, the “Stop and Save” button allows you to name the file.



The default name contains the serial number and hardware version of the unit which is important for diagnostics. You are welcome to append any other text to the file name for clarity. You can use the “Send to CallerID.com” button to upload it immediately or attach the file to an Email.

Button: Show SIP Call Data

Shown are the SIP commands important to the Vertex unit to correctly determine call data. This output should help your CallerID.com representative diagnose problems.



Button: VoIP Phones/Devices

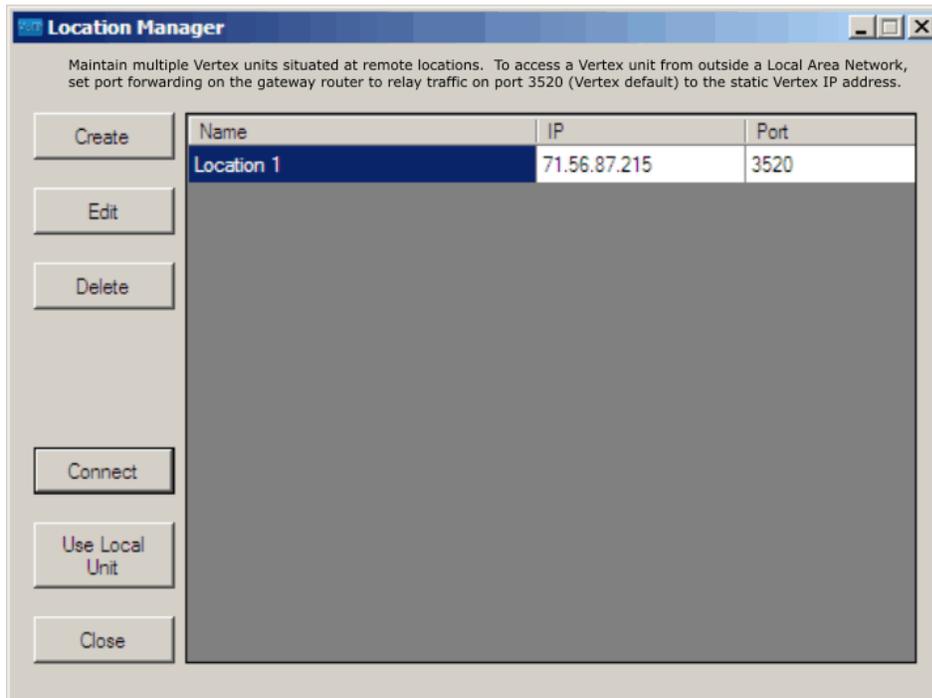
This displays all the SIP devices detected by the Vertex hardware. The Vertex will only be able to report call activity on phones or devices that are detected.



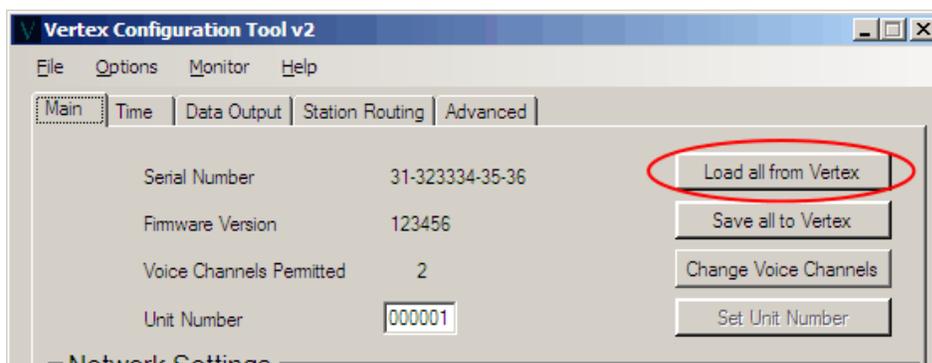
Menu Selection: File/Location Manager

The Vertex Configuration Tool can accommodate the maintenance of multiple units situated at remote locations. To access a Vertex unit from outside a Local Area Network, set Port Forwarding on the gateway router to direct port 3520 (the default Vertex network port) to the IP address of the Vertex. We recommended assigning a static IP on the Vertex hardware since DHCP may change the IP address.

Select: File/Location Manager.



When connecting to a different location, the parameters from the unit at the new location are loaded in the background of the Vertex Config program. The program tabs will simply show highlighted buttons indicating the differences between the parameters already loaded and the new unit just connected. In order to show parameters from the newly connected unit, use "Load all from Vertex" button on the main tab.



Menu Selection: File/Transfer Logs

Any configuration changes (or attempts) made to the Vertex Hardware is logged in these files. They may help diagnose problems with the operation of the unit or communication issues between the software and hardware.

Menu Selection: Monitor/Call Records

This screen will display UDP call records sent from the Vertex. This is the same information that is sent to your Caller ID program. This is useful when diagnosing issues with a Caller ID popup module within your application.

The screenshot shows a window titled 'Call Records' with a menu bar containing 'Options' and 'Filters'. A 'Capture to File' checkbox is checked, and the file path is 'C:\Vertex\MyLogs\log1.txt'. The main area contains a table with the following columns: Serial Number, Ln, I/O, S/E, Dur, CS, Ring, Date, Time, Number, and Name. The table contains six rows of call records. At the bottom, there is a status bar with 'Current Serial: 21-140304-05-01' and 'Filters: Incoming Outgoing Detailed Call Accounting'.

Serial Number	Ln	I/O	S/E	Dur	CS	Ring	Date	Time	Number	Name
21-140304-05-01	01	I	S	0000	G	A1	03/07	12:34 AM	770-263-7111	-- no name --
21-140304-05-01	01	I	E	0005	G	A1	03/07	12:34 AM	770-263-7111	-- no name --
21-140304-05-01	01	O	S	0000	G	A0	03/07	12:36 AM	770-263-7111	
21-140304-05-01	01	O	E	0004	G	A0	03/07	12:36 AM	770-263-7111	
21-140304-05-01	01	I	S	0000	G	A1	03/07	12:37 AM	404-736-9621	-- no name --
21-140304-05-01	01	I	E	0004	G	A1	03/07	12:37 AM	404-736-9621	-- no name --

When the Vertex is configured to send multiple data types such as Outgoing calls and Detailed Data, various filters can be used for narrowing results. Some filters may not apply if the Vertex is set to output limited data. (Refer to the Data Output tab section). For example, if you want to view Outgoing Calls, the Vertex must be set to "Send Outgoing Call Info" and you must select "Show Outgoing" within the Filters menu.

Menu Selection: Monitor/Raw Data

Raw data for exhausted investigation may be needed for complex troubleshooting. Many characters collected cannot be displayed in a basic text editor. More data can be seen when opened with a versatile raw text editor such as EditPad Pro. The data can be uploaded to CallerID.com for analysis using the options menu.

The screenshot shows a window titled 'Raw Data' with an 'Options' menu. The main area contains a table with two columns: 'Serial' and 'Data'. The 'Serial' column contains values like '31-32-33343...'. The 'Data' column contains hex and ASCII representations of call data, such as '000@}0,0E(c900E 0@bX0030A0E00>0000'.

Serial	Data
31-32-33343...	000@}0,0E(c900E 0@bX0030A0E00>0000
31-32-33343...	,0E(c9000@)00E00;0"00@00000E00>0
31-32-33343...	,0E(c9000@)00E00;0#00@00A0000E00>0
31-32-33343...	000@}0,0E(c900E 0@b[0030A0E00>0000
31-32-33343...	00)8&0,0E(c900E 0N0_0030A;+E00>0000
31-32-33343...	00)8&0,0E(c900E 0Kb`0030A;E00>0000

Specifications

Physical

Actual Unit Size - 6.0"W x 7.1"L x 1.4"H

Actual Unit Weight - 0.81 lbs.

Size of Entire Product Box - 12" x 10" x 6"

Weight of Entire Product w/ Peripherals - 2.2 lbs

Shipping Weight (Domestic) - 3 lbs

Dimensional Shipping Weight (International) - 7 lbs

Electrical

Supply Voltage - 9V DC, 2.1mm Center Negative Connection

Current Draw - ~400mA

Communications Ethernet Port

Speed - 10/100 mbs Half and Full Duplex

Polarity - MDI/MDI-X auto crossover

Pass-through Ethernet Ports

Connection - Parallel tap, no retransmission of packets (packet sniffing only)

Pass-through Speeds – 10/100 mbs, (not certified for 1000 mbs operation)

Manufacture's Information

CallerID.com
5680 Oakbrook Parkway, #150
Norcross, GA 30093

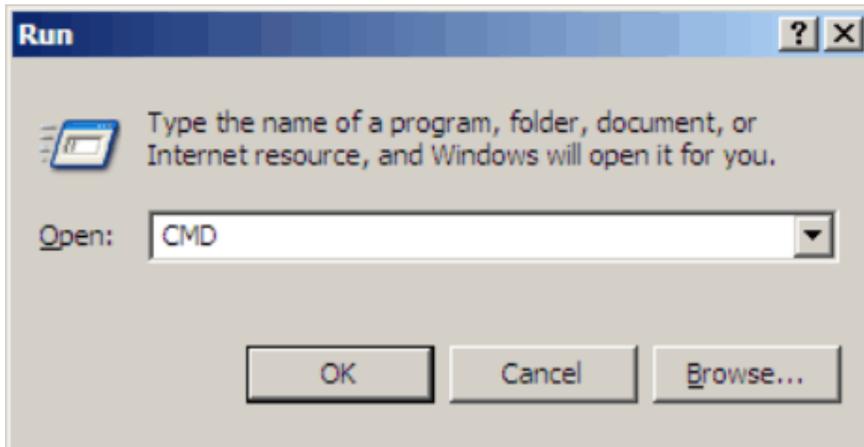
Sales 800.240.4637
Service 770.263.7111
Email Info@CallerID.com
Web Site www.CallerID.com

Warranty Information

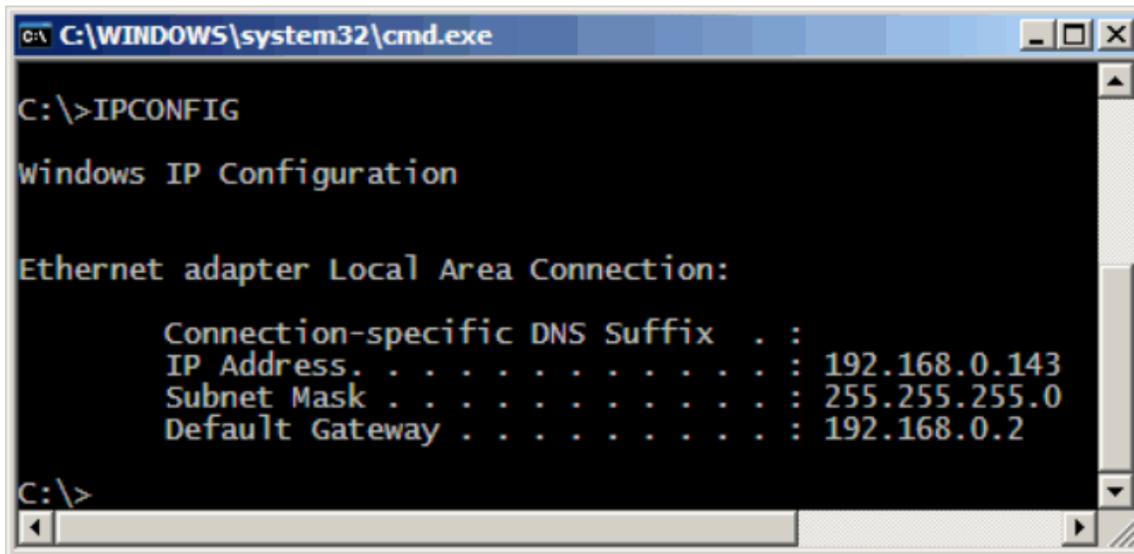
1. Any product manufactured by CallerID.com is covered under a 2-year, limited warranty.
2. This warranty is extended to the original purchaser of the equipment direct from CallerID.com as well as customers of dealers and distributors for CallerID.com products. This warranty is not transferable to any other parties.
3. The 2-year, limited warranty covers all parts and labor required to repair equipment manufactured by CallerID.com.
4. Purchase date will be determined by purchase receipt, other proof of purchase date, or serial number.
5. A return material authorization (RMA) number is required before returning equipment for repair. All repairs are covered under a 90 day limited warranty. Please contact CallerID.com to obtain a RMA number.
6. The warranty covers failures in materials or components occurring during normal use. It does not cover damage which occurs in shipment; failures which result from water damage, fire damage, accident, misuse, abuse, neglect, mishandling, misapplication, alteration, modification or unintended use of product; or service by anyone other than an authorized CallerID.com repair facility.
7. The warranty does not cover equipment struck by lightning or catastrophic power surges on either AC power line or phone lines. Such events are identified when three or more components on the circuit board have suffered damage and/or electrical traces have been burned or vaporized.

Appendix A – Determining a Computer’s IP address

You can determine each computers static IP address by Selecting Start, Run, (or, select the Windows Key + R) then type CMD and Select OK.



In the Command Window type IPCONFIG and hit Enter.



In this example screen, the Computer’s IP Address is 192.168.0.143.