



# Pandora – TCP – COM Bridge

## User Manual





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# 1 Product Overview

Pandora is a TCP to COM port bridge which allows a user to make an RS-232 COM port available to remote systems on the Ethernet. Pandora instantiates itself (Figure 1) on the host computer as a TCP socket server, so there is flexibility in how a remote client can establish a connection to the host. For example, a customized socket application can be used to connect to the Pandora server, but a simple telnet application is equally capable of establishing a connection.

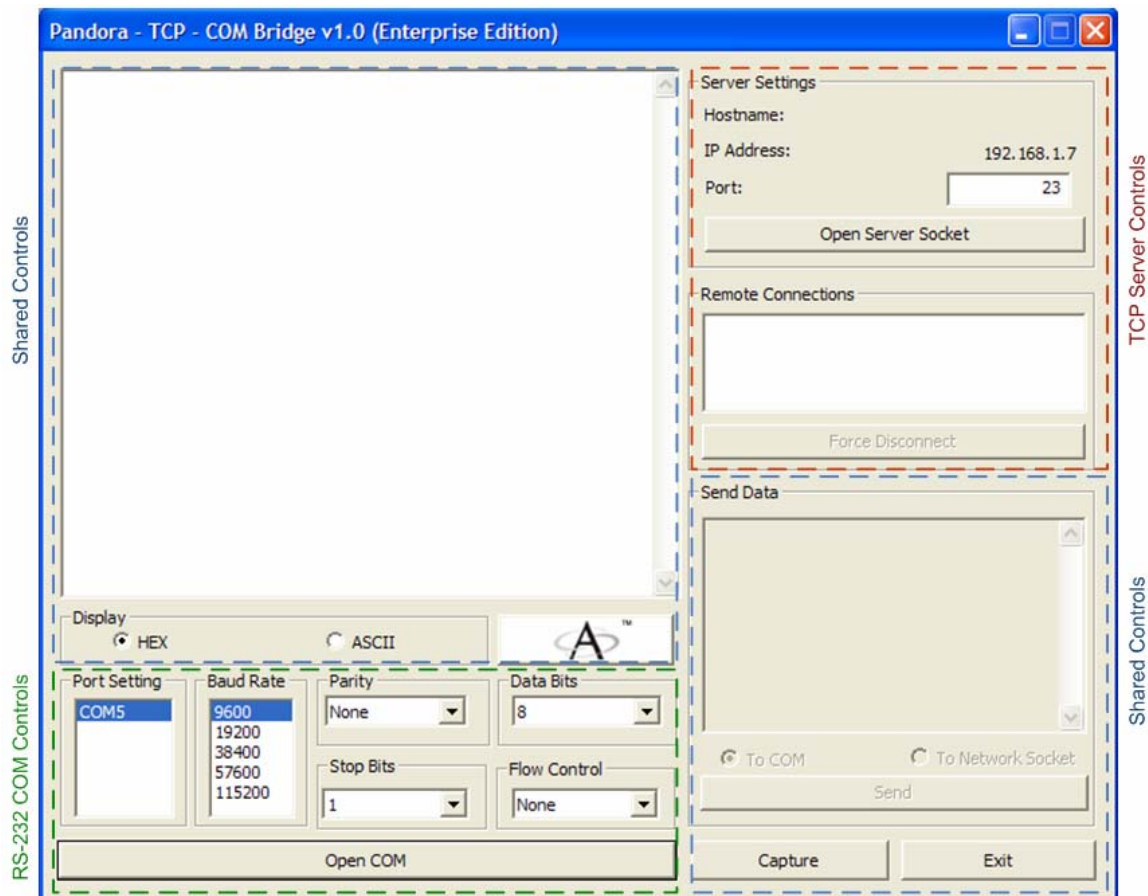


Figure 1 : Pandora user interface

The user interface panel on Pandora has been organized into three functional regions as shown in Figure 1. These are:

- RS-232 COM Controls – allows the user to configure the settings of the RS-232 COM port.
- TCP Server Controls – allows the user to configure the settings of the TCP server socket.
- Shared Controls – a grouping of controls that affect both the RS-232 COM port and TCP socket (i.e.- generating data on COM port or TCP socket, capturing data to file, exiting the application)



Detailed information on how to utilize these functional blocks is provided in section 3 of this manual. To activate the default settings, the "Open COM" button and "Open Server Socket" buttons can be pressed immediately after launching the Pandora application (as shown in Figure 2). This will cause the COM port highlighted in the "Port Settings" listbox to be opened at 9600baud, no parity, 8 data bits, 1 stop bit, and no flow control. It will also cause the TCP socket at port 23 to listen for a client connection. Any data received from the COM port will be simultaneously displayed in the display console and broadcast to all connected TCP clients. Likewise, any data received on the TCP socket from any client connection will be simultaneously displayed in the display console and sent to the RS-232 COM port.

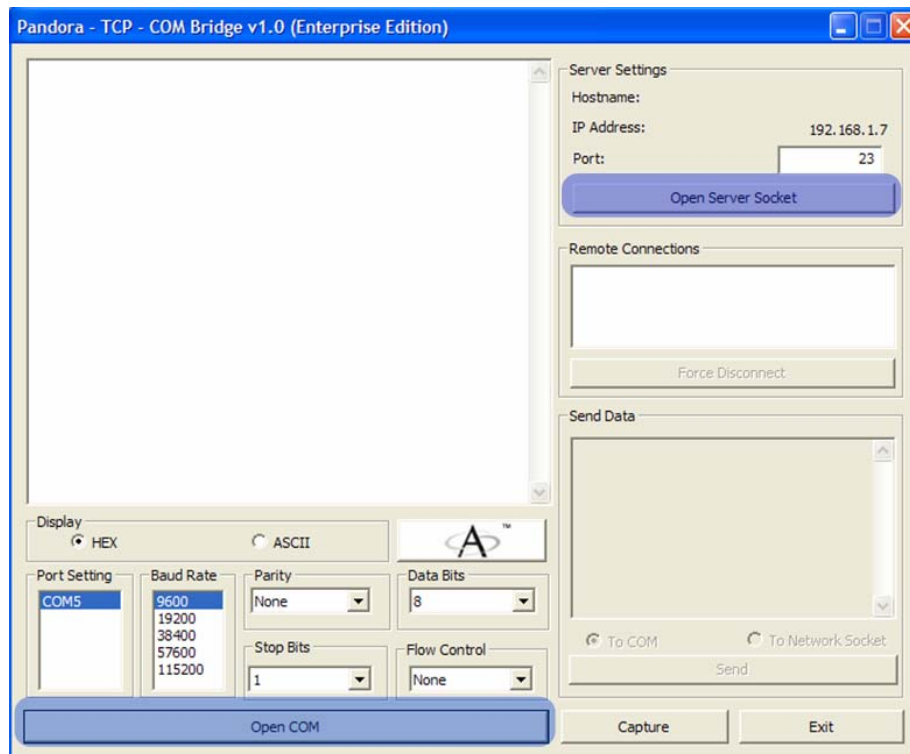


Figure 2 : The "Open COM" and "Open Server Socket" buttons cause the application to activate the associated communication hardware

## 1.1 System Requirements

- Windows 95, 98, 2000, XP, or Vista
- 200MHz Pentium or equivalent processor
- 32MB of RAM
- RS-232 COM port or USB-COM adapter
- An active network card and connection to Ethernet



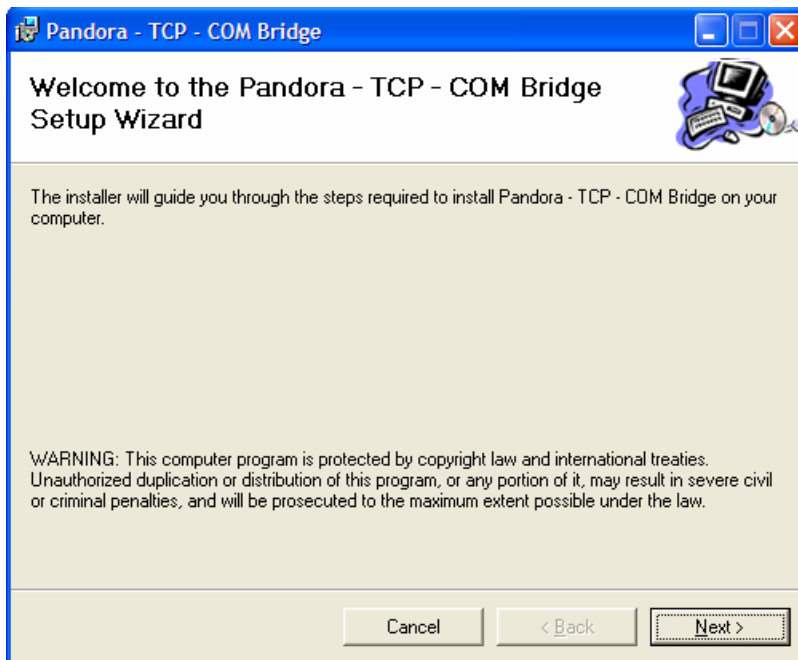
## 1.2 Licensing

Pandora requires a valid license key to fully operate. Without a license key, Pandora will operate in shareware mode – the application will only operate for 30minutes during the first 30 days of use. After this time period, the application will only operate for 30 seconds without a key. To obtain a license key for Pandora, visit [www.apexhyperion.com](http://www.apexhyperion.com).



## 2 Product Installation

1. For internet downloads, the compressed ZIP file must be decompressed to a temporary folder. The contents of the decompressed folder will contain a file called "setup.exe". Execute this file by double-clicking on the setup.exe icon. For CD purchases, inserting the CD into the CD-ROM drive should begin the installation process. If not, the file called "setup.exe" can be executed from the root directory of the installation CD-ROM.
2. A self-extracting installation wizard will guide the rest of the installation process.



**Figure 3 : A self extracting installer will guide the rest of the installation of the software**

3. When the installation completes, the installation wizard will automatically close. The software can be accessed by traversing to the installation destination directory specified in the wizard (the default directory is C:\Program Files\ApexHyperion, Inc\Pandora - TCP - COM Bridge\)
4. The software can also be accessed from the Start menu under "Programs\ApexHyperion"
5. The software can be completely removed by using the "Add or Remove Programs" manager in the Control Panel.

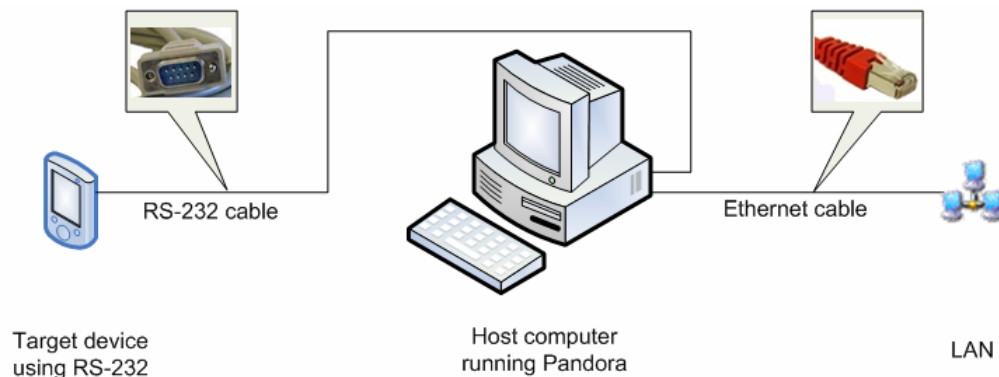


## 3 Product Interface

### 3.1 Getting Started

The Pandora application bridges an RS-232 COM port connection on the host PC to computers that are visible on an Ethernet network. As a result, the first step in getting Pandora integrated into a user environment is to establish the RS-232 connection and the Ethernet connection.

To establish a connection to a target device using an RS-232 COM port, an RS-232 cable, as shown in Figure 4, needs to be used to connect the COM port of the target device with that of the Host computer. Many computers no longer have an RS-232 COM port built-in. In these cases, it is necessary to either purchase an RS-232 communication card for the PCI bus of the computer or purchase a third-party USB-to-RS-232 converter wedge which allows the user to use an existing USB port as an RS-232 COM port.



**Figure 4 : Cabling diagram of Pandora connections**

Establishing a connection to the local area network (LAN) can be made by connecting a standard RJ-45 Ethernet cable, as shown in Figure 4, between the Host computer and the socket that establishes a link to the LAN. In most networks, the link to the LAN is made available through a network hub, router, or wireless system. In specific cases, it may be necessary to contact your system administrator to determine the method in which you can connect to the network.

Once these connections are established, the Pandora application is ready to be used on the Host computer. Until the hardware connections above are established, Pandora cannot be utilized to bridge an RS-232 connection to the Ethernet.

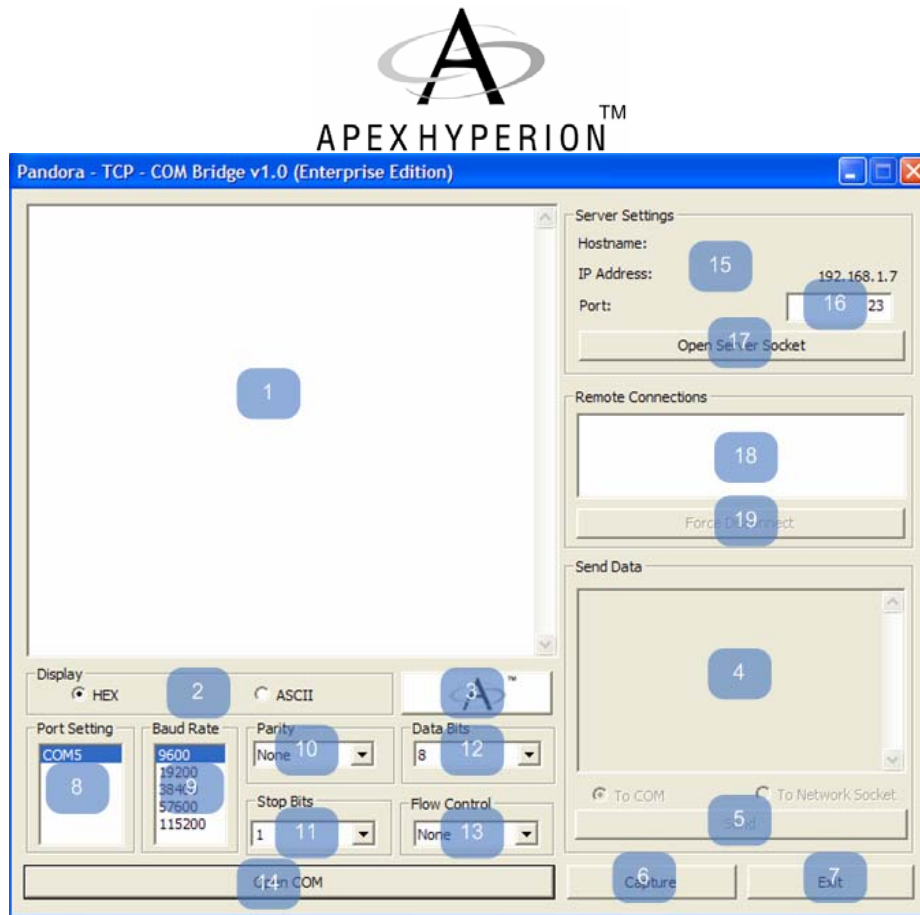


Figure 5 : Pandora Interface Controls

The interface controls of the application, shown in Figure 5, can be categorized into three basic control blocks – shared controls, RS-232 COM controls, and TCP server controls. The mapping of these controls are listed below and the usage is described in greater detail in subsequent sections.

#### Shared Controls

1. Display Window – Displays all data that passes through communication bridge. Also displays error and status messages generated by Pandora for the user (The error and status messages are not injected into the communication bridge).
2. Display Format – Allows display in either Hex or ASCII. This settings applies for the display (1) and the data parsed in (4).
3. About Info – Provides additional information about Pandora.
4. Send Data Window - Allows user to inject data into communication bridge.
5. Send Button – Causes data typed in Send Data Window to be output to either COM or TCP connection. For TCP connection, the data typed in (4) will be sent to client highlighted in (18).
6. Capture – Saves communication on bridge connection to file
7. Exit – Exit the application.

#### RS-232 COM Controls

8. Port Setting – Selection of available COM ports to connect to.
9. Baud Rate – Selection of baud rate of COM port.
10. Parity – Selection of standard parity settings for COM port.
11. Stop Bits – Selection of standard stop bit settings for COM port.
12. Data Bits – Selection of standard data bit settings for COM port.



- 13. Flow Control – Selection of standard flow control settings for COM port.
- 14. Open COM – Establishes connection to COM port highlighted in (8) with settings highlighted in (9-13).

**TCP Server Controls**

- 15. Server Info – A network query is made by Pandora at program launch to determine the host name and IP address of the local PC.
- 16. Port – Pandora is a TCP Server. This control establishes the port number to listen to.
- 17. Open Server Socket – Opens a server connection to the port number described in (16). The Pandora server allows up to 10 simultaneous client connections.
- 18. Remote Connections – Lists the Ethernet clients currently connected to Pandora.
- 19. Force Disconnect – Allows user to force a disconnect of the client connection highlighted in (18).



### 3.1.1 Connecting an RS-232 COM Device

The first step in establishing a connection to a device capable of communicating via RS-232 is to connect the hardware cable as described in section 3.1 and shown in Figure 4. Make sure that any available COM ports are installed and not utilized by a different application prior to executing Pandora. Pandora auto-detects the availability of all COM ports (in the range of COM1-COM32) when the application first launches. If COM ports are installed while Pandora is already executing, the COM port associated with the new installation will not be auto-detected. In this situation, simply exit Pandora and run it again. It will auto-detect the new port.

Once a COM port (or COM ports) connection to a target device is made available, the user must configure the settings of the COM port (items 8-13 of Figure 5). In most cases, these settings are determined by the hardware restrictions of the target device. For the purposes of this example, assume the target device expects a COM connection with the settings 115,200 baud, 8 data bits, 1 stop bit, no parity, and no flow control. The COM items on the Pandora interface must be configured as shown in Figure 6.

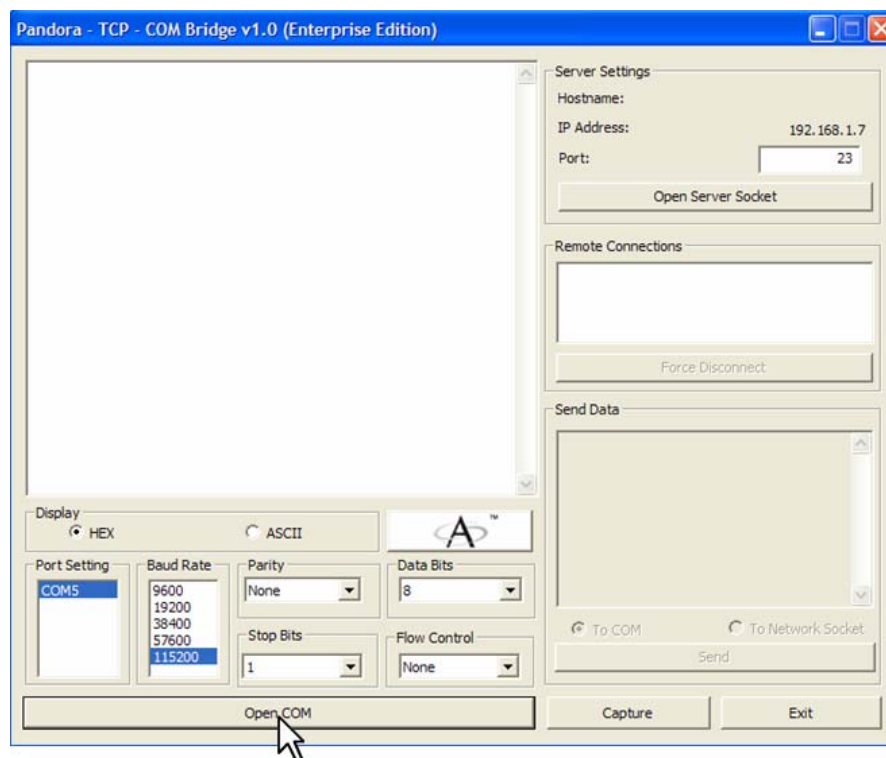


Figure 6 : COM settings configured for 115200baud, 8bits, 1stop, no parity, no flow control



Once the settings are established, the "Open COM" button must be pressed in order to activate the COM connection which, in this case, happens to be for COM5. Note that several things happen when the COM port is opened. The display window shows that the "Port is open" and the configuration settings for Port Setting, Baud Rate, Parity, etc are all disabled and locked into the setting that was configured prior to opening the port. In addition, the "Open COM" button can now be used to "Close COM", in which case the port configuration options will be re-enabled. Note also that the "Send" button is enabled in the "Send Data" group box. Now that a valid COM port has been opened, Pandora has the option to inject data to the port. These changes are shown in Figure 7. In the sense that Pandora can monitor RS-232 data and inject data into the COM port, the software provides great utility even in the absence of a network connection.

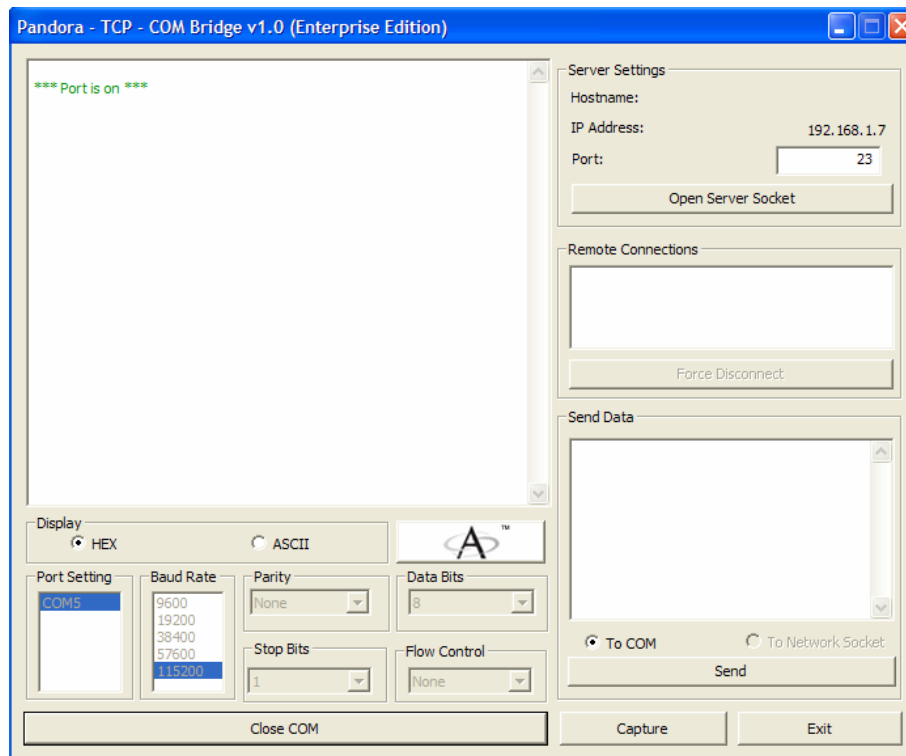


Figure 7 : COM port connection established



### 3.1.2 Connecting Remote TCP Sockets

Provided that Pandora resides on a host computer that is established on an Ethernet network, setting up Pandora as a server requires only two steps - setting up the connection port and opening the server socket.

Selecting the socket port can be done by entering a numeric value (up to 4 digits) into the port box denoted as item (16) in Figure 5. For most networks, the specific port number selected is arbitrary. Some firewalls only LAN access on certain ports. You may need to contact your system administrator to determine such restrictions on your specific network. For the purposes of this example, port 23 (a port typically available to telnet clients) will be used. Once a port is selected, the "Open Server Socket" button must be pressed to make the server visible on the network with the selected port address. Note that several changes occur when the "Open Server Socket" button is pressed. The display window confirms that the server is "activated and listening" on the specified port. The port box is disabled and locked into the value that was present prior to pressing the "Open Server Socket" button. In addition, the "Open Server Socket" becomes a "Close Server Socket" button which is now used to terminate the server from the network.

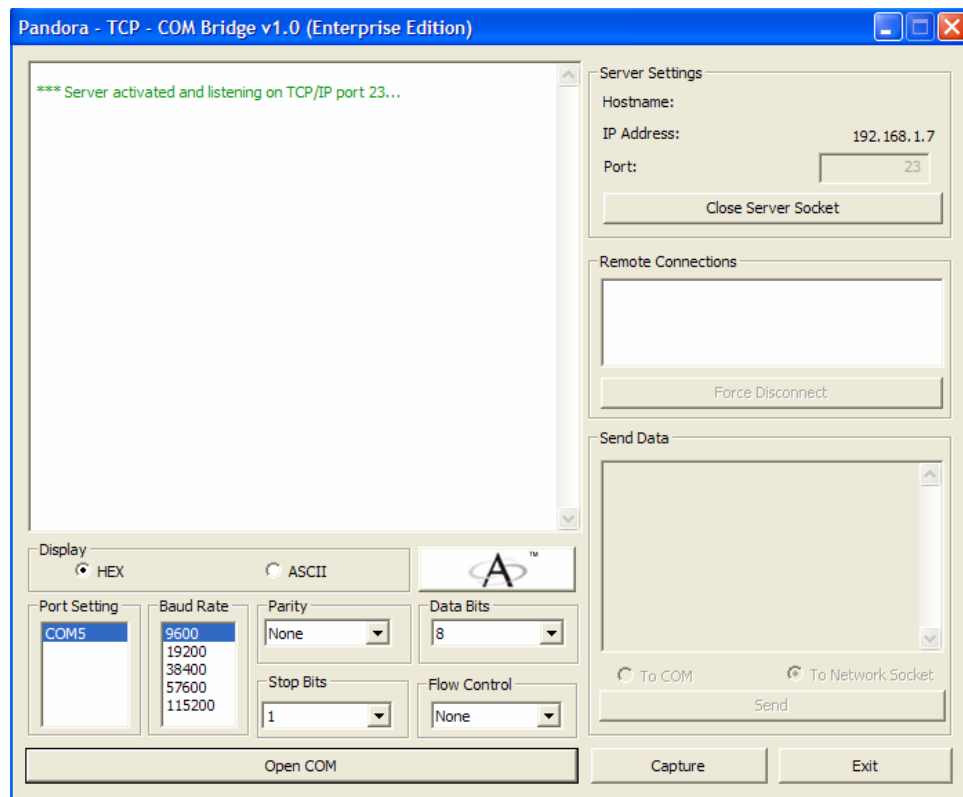


Figure 8 : Pandora connected to Ethernet as a server

Now that Pandora is available and visible on the network, a third-party application or telnet client can be used to connect to Pandora. For this example, a simple telnet client will be used to demonstrate a TCP connection. A telnet client will prompt the user for a host and port to connect to. Either the "hostname" or "IP address" which is auto-



detected by Pandora can be used as the “Host” in most client applications. The port must correspond to the port number established in the previous step (item 16 in Figure 5). Figure 9 shows how a sample Telnet application would be configured to connect to the Pandora application with the host settings shown in Figure 8.

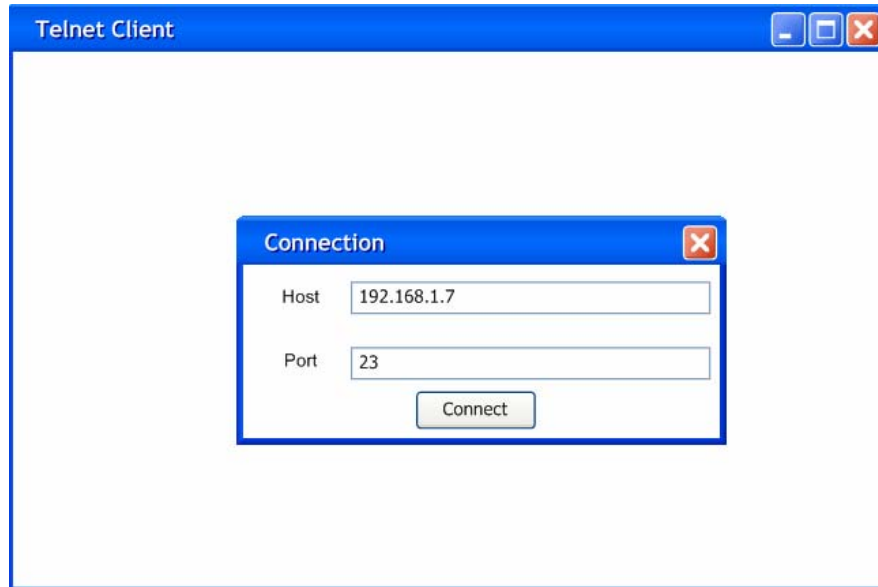
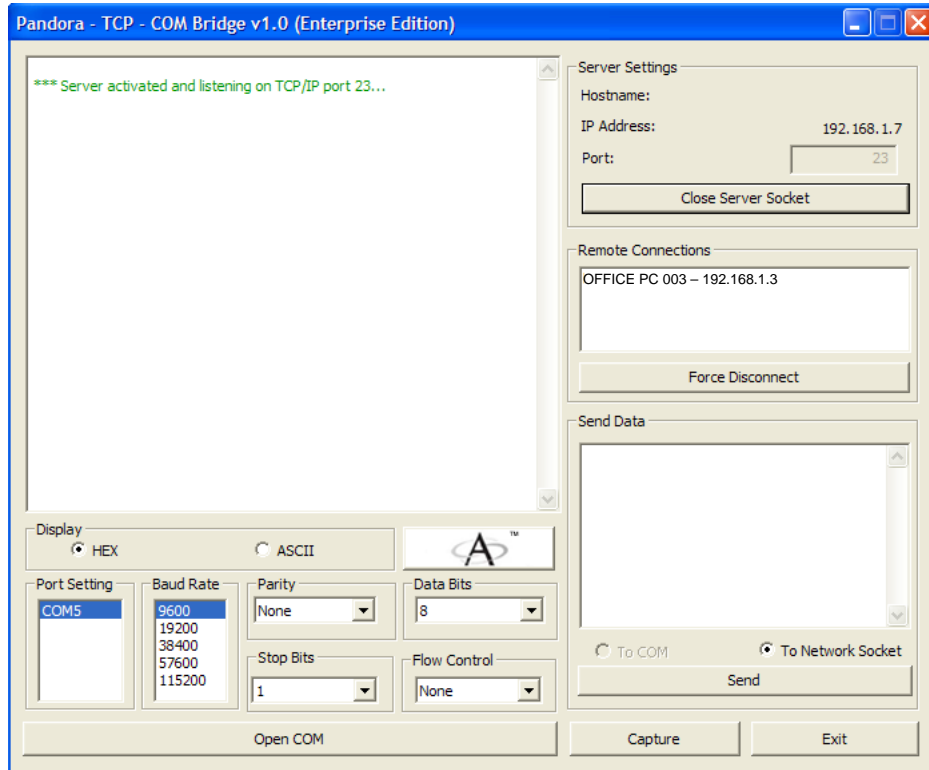


Figure 9 : Configuration of sample Telnet Client to connect to Pandora shown in Figure 8



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When a client makes a TCP connection to the Pandora server, several changes occur dynamically on Pandora's graphical interface. The Hostname and IP address of the client PC appear in the "Remote Connections" box. The "Force Disconnect" button becomes enabled to allow the user to force a client to disconnect (boot a connection). The "Send" button in the "Send Data" box is enabled and the radio button to send data to a "Network socket" becomes available.



**Figure 10 : Pandora dynamically detects a connection from a remote TCP client**

Pandora can be used with flexibility. In the absence of a RS-232 COM device, Pandora can be used to monitor and inject information to various TCP clients.



### 3.1.3 Bridge Operation

By successfully completing the setup procedures described in sections 3.1.1 and 3.1.2, the Pandora application will operate as a TCP to COM port bridge. In this mode of operation, all information received on the COM port will be both displayed to the display window of Pandora and broadcast to all TCP clients connected to the application (optionally, Pandora can capture the incoming data to a file using the "Capture" button). In addition, information received from any of the TCP clients will be displayed to Pandora's display window and forwarded to the active COM port. Note that data from one TCP client will not be re-directed to the other connected TCP clients. Figure 11 shows the Pandora application operating in a bridge mode.

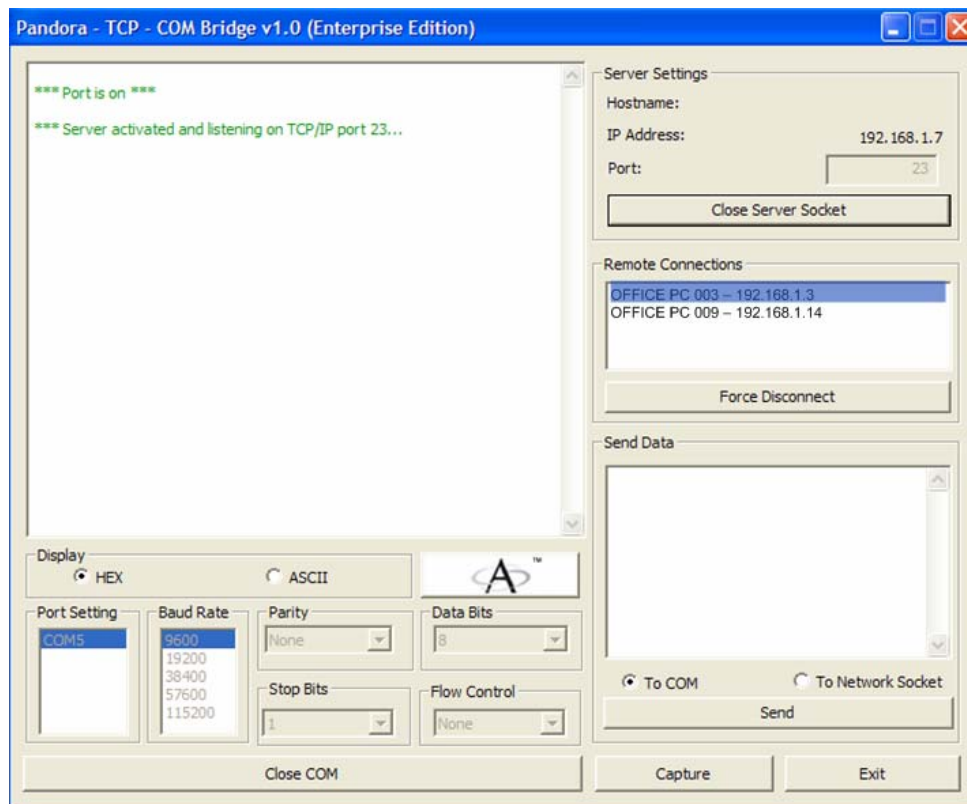


Figure 11 : Pandora operating in a bridge mode

In bridge mode, the user can inject data to either the COM port or to the highlighted TCP connection in the "Remote Connections" box by toggling either the "To COM" or "To Network Socket" radio button.



## 4 Support

**Q: Why can't I see any COM ports displayed in the COM port listbox?**

**A:** Pandora auto-detects available COM ports when the program is executed. If there are no COM ports on the system, or all available COM ports are being used by other devices, Pandora will not display those particular ports. Exit Pandora, free the desired COM port by exiting other applications which use COM ports. Then, relaunch Pandora.

**Q: Why can't I connect to Pandora from a remote telnet terminal?**

**A:** Ensure that hostname/IP-address and port number are specified correctly on the telnet client. Pandora displays this information on its screen. Also, ensure that the port selected is not blocked by a firewall or anti-virus agent.

**Q: Why does my Pandora software automatically exit after 30 minutes?**

**A:** The free evaluation version provides the user with full access to all the features of the software, but limits the usage to 30 minutes. A purchased license key will eliminate the 30 minute evaluation restriction.

For specific questions that are not covered in this document, contact [support@apexhyperion.com](mailto:support@apexhyperion.com)

