

TECHNICAL Practice

TELECOM SOLUTIONS FOR THE 21ST CENTURY

PB-100

**Open Source PC to
Phone Line Interface**

December 26, 2001

Open Source PC Based Telecom Controller



The **PB-100** hardware and software provides inexpensive PC to Telephony applications on an open source basis and makes it easy to create your own application solutions using standard programming languages such as Microsoft's Visual Basic®. Applications such as message announcement centers, voice dialers and auto attendants may easily be created to your custom specifications.

The **PB-100** accepts simple ASCII serial commands to seize the phone line, dial or decode DTMF Touch Tones, watch for busy signal, detect loop status, perform timed hook-switch flashes or hang-up the line. If your PC is equipped with a sound card, the audio ports can also be coupled to the phone line through the **PB-100** for voice recording or playing announcements using standard file formats such as .wav files.

The **PB-100** hardware features a serial port interface, an "AUDIO IN" and "AUDIO OUT" port, an analog C.O. line interface and an analog phone port. Several pre-written applications are included and can be installed for use. In addition, all available source code is provided to allow changes or improvements to existing programs.

The **PB-100** accepts simple ASCII serial commands to seize the phone line, dial or decode DTMF Touch Tones, watch for busy signal,

Features

- Compatible with Windows 95, 98, ME, NT 4.0, 2000
- Male sub-D 9 pin cable provided
- 20 digit Touch Tone buffer
- Accepts standard RS-232 ASCII commands
- Dials Touch Tones 0-9, *, # and 2 second pauses
- Audio In jack for playing announcements
- Audio Out jack for recording announcements
- Able to send and receive 1200 baud data
- Analog C.O. line port
- Analog phone port

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Applications

Software Provided For:

- **1600A Series** Emergency Phone Polling
- Remote Programming of **AES-2000** Accessible Entry System
- Multi-Message Information Provider
- Database Driven "All-Call" Dialer and Announcer
- Smart Terminal Diagnostics Software

Build Your Own:

- Ring Trip Announcer
- Auto Attendant
- Message Center
- Voice Mail System
- Predictive Dialer

Specifications

Power: 120V AC/12V DC 500mA, UL listed adapter provided

Dimensions: 127mm x 127mm x 25mm (5" x 5" x 1.5")

Weight: 1.36 kg (3 lbs.)

Environmental: 0°C to 32°C (32°F to 90°F) with 5% to 95% non-condensing humidity

P.C. Interface: 9-pin RS-232 (cable included)

Software/Hardware Requirements:

- IBM Compatible personal computer with an available serial port
- CD-rom drive, and Windows compatible sound card
- Windows: 95 or 98 (with OLE32 updates), NT 4.0 (service pack 6 or higher), 2000 (service pack 2 or higher)
- 5MB of hard drive space
- 8MB of free physical RAM

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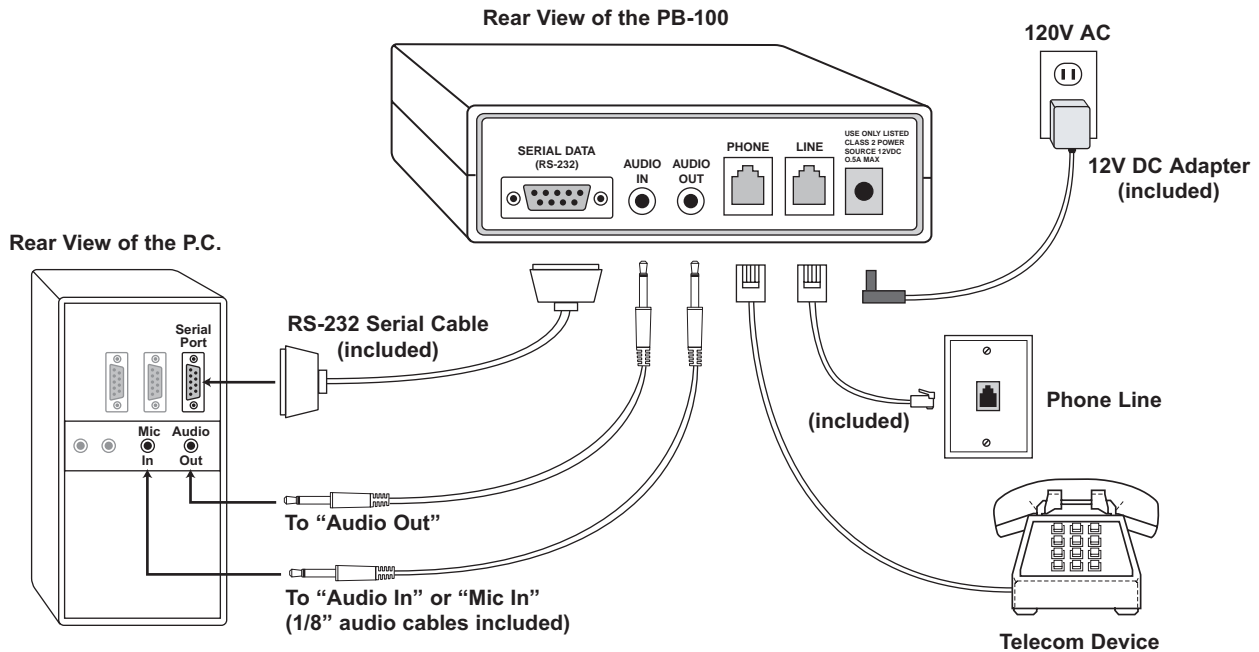
The information provider, smart terminal, voice recorder and AES-2000 programmer use a Sax Software Comm Objects third party driver for serial port communication. Due to licensing issues, this driver CAN NOT be supplied with the source code. If you use the source code as is, a pop-up message will inform you that you may use the Sax Software Comm Objects driver for evaluation purposes ONLY. YOU WILL NOT BE ABLE TO COMPILE THE SOURCE CODE!

If you wish to compile the source code, you must purchase the program from Sax Software. If you already own a Sax Software Comm Objects license, simply fill in your serial number in the properties box for each screen that uses the Sax Software Comm Objects driver.

Hardware Installation

The **PB-100** comes complete with a telco cord, serial cable, audio cables, (4) rubber feet and a 12V DC power adapter.

Step 1.	Using the telco cord, connect a phone line to the rear panel jack labeled "LINE". If the PB-100 is to be used in series with another piece of equipment, the telecom device can be plugged into the "PHONE" jack.
Step 2.	Connect one end of the 9 pin serial cable into the jack labeled "SERIAL DATA" and the other end into an open serial port of the P.C.
Step 3.	If audio is to be used through the PB-100 , connect the "Audio Out" port of the sound card to the "AUDIO IN" port of the PB-100 , and "Audio In" or "Mic In" of the sound card to the "AUDIO OUT" port of the PB-100 .
Step 4.	Plug the 12V DC power adapter (included) into the rear panel power jack.



Software and Installation

A. About the Software

The CD ROM that is included with the **PB-100** contains several different applications. The source code for each application is also included for those who wish to customize their own software. All programs are written in Microsoft Visual Basic Version 6.0. The following is a brief description of each program.

1. 1600A Series Polling Software

All Viking **1600A Series** emergency phones feature the ability to be remotely polled. The **PB-100** combined with the Polling Software allows the user to program his emergency phone numbers and locations into a centrally stored database. The polling software will dial these stored phone numbers and retrieve and poll the emergency phone for a response to verify that the phone is properly configured and operational. The Polling Software allows the user to organize the locations and phone numbers of emergency phones, as well as the date and time of polling and then stores the response of each phone polled. This is useful in maintaining and troubleshooting emergency phones without the need to send technicians on site. The **E-1600** Polling software stores and polls up to 500 locations or phone numbers. For more information, retrieve **Fax Back Document 860**.

2. AES-2000 Programming Software

The **AES-2000** Accessible Entry System can be programmed remotely using the **PB-100** and the **AES-2000** Programming Software. Both data and audio can be uploaded to the **AES-2000** including names, phone numbers, audio queues and other required programming variables. For more information, retrieve **Fax Back Document 202**.

3. All Call Dialer/Announcer

The All Call Dialing program maintains a list of names and phone numbers in a Microsoft Access database. When started, the software calls each number stored in the database and plays a selected wave (.wav) file stored on your computer's hard drive. For more information, retrieve **Fax Back Document 861**.

4. Multi-Message Information Provider Software

The Information Provider turns the **PB-100** and your PC into a multiple message ring trip announcer. The software allows you to organize messages into multiple menu levels (up to 10). The announcements can be any wave (.wav) file stored on your computer's hard drive. When a call is answered by the **PB-100**, the software starts the "answer" announcement. This message should contain a greeting as well as a menu for further message or menu selections via user selectable DTMF Touch Tones. Each of these messages can contain additional menus for even deeper levels of messages. The maximum number of announcements per level is 12 and the maximum number of menu levels is 10. The software can also perform a blind transfer (hook flash transfer) on a programmable Touch Tone command as well as a simple hang up. The Information Provider software provides an easy to follow spread sheet like display for organizing the messages and transfer functions. For more information, retrieve **Fax Back Document 862**.

5. Smart Terminal Diagnostic Software

Smart Terminal is diagnostic program that allows the user to send and receive data directly to COM1 or COM2 of your PC. ASCII, Hex and Decimal data can be entered, decoded and sent out the selected ports. Two separate display areas allow the user to view data coming in on either port. This utility is useful for troubleshooting the connection between the **PB-100** and your PC. If an "H" followed by Enter is received by the **PB-100**, it will send back a "K" and a carriage return. Do this to assure you have the correct com port configured for the **PB-100**. For more information, retrieve **Fax Back Document 863**.

B. System Requirements

1. Hardware Requirements

- IBM Compatible personal computer with: Windows 95, 98 or ME (with OLE32 updates), Windows NT 4.0 (service pack 6 or higher), Windows 2000 (service pack 2 or higher).
- **PB-100** hardware.
- Available RS-232 serial port.
- Male sub-D 9 pin cable (provided with **PB-100** hardware).
- Windows compatible sound card.
- 5MB minimum free hard drive space for each installation.
- 8MB of free physical RAM for each **Viking** application running.

2. Software Requirements

- Internet Explorer or Netscape Navigator Version 4 or newer to navigate CD contents.
- Adobe Acrobat Reader® version 4.x or newer to view Product and Software Documentation.
- Microsoft® Visual Basic version 6 or newer to change, edit, compile, or publish the supplied source code.
- A license for the Sax Software Comm Objects serial communication driver to change, edit, compile, or publish the supplied source code.

C. Installing Software

Step 1.	Connect the hardware as shown in "Hardware Installation".
Step 2.	Insert the Viking master CD to start the program.
Step 3.	Follow the instructions on the CD.

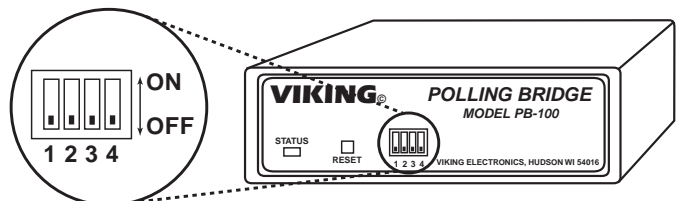
Note: If you have disabled the "Auto-Run" feature on your computer and the CD does not automatically start, double click the *setup.htm* file in the root directory of your CD-Rom drive.

D. Un-Installing Software

Step 1.	Go to "Control Panel", then select "Add/Remove Programs".
Step 2.	Select the Viking software you want to remove.
Step 3.	Click "Remove".

Programming

Switch	ON/OFF	Description
1	OFF	1600A Series polling mode enabled
1	ON	1600A Series polling mode disabled
2	OFF	AES-2000 programming disabled
2	ON	AES-2000 programming enabled
3	-	(not used)
4	-	(not used)



Manual Hardware Operation

When using the **PB-100** as a telecom controller without the included software or with your custom software, place DIP switch 1 on the front panel in the “on” (up) position. This inhibits the unit from sending **1600** polling tones. The **PB-100** accepts a simple set of ASCII commands as follows:

D, xxxx...<cr> Dial the number string “xxxx...”
Response is K<cr>

H<cr> Hang up
Response is K<cr>

A<cr> Abort call in E-1600 mode
Response is K<cr>

N<cr> Request touch tones four at a time
Response is NONE<cr> if four tones not received else XXXX<cr> where x is the ASCII character of the tone

R<cr> Read single touch tone
Response is rx<cr> where X is the ASCII character of the tone or r<sp><cr> if no tones are available

V<cr> Switch to Audio mode
Response is K<cr>

Gxxxx...<cr> Dial the number “xxxx...”, wait for carrier, then go into the transmit mode
Response is K<cr>

S<cr> Request status
Response is S(status)<cr> where status is one bite as follows:

D0	Line seized
D1	On line
D2	Loop detect
D3	Ring detected

D4	Audio past 400ms detected
D5	Error
D6	Modern record received
D7	Audio between 200ms and 400ms

T,(28 data bytes),cs,<cr> Transmit 28 data bytes with check sum
Response is N<cr>

O<cr> Watch for 2 seconds of carrier then switch to transmit mode
Response is K<cr>

C<cr> Grab line, send carrier tone for 2 seconds, then switch to receive
Response is K<cr>

I<cr> Read modem data, 28 bytes at a time with check sum
Response is (28 bytes of data), cs,<cr> where cs is the check sum

F<cr> Force modem carrier back on in the transmit mode
Response is K<cr>

Product Support Line...715.386.8666

Fax Back Line...715.386.4345

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