

VP-894 4-Line Voice Comm. Board

HARDWARE OVERVIEW

The VP-894 is a PC voice communications board with a high voice compression rate of 1:4 or 1:8. The board features an 8088 as its main CPU along with 256K voice buffer memory. It communicates with the host PC through a 32K shared memory buffer, in a highly efficient manner for reduced system overhead. Each VP-894 board can process 4 channels (telephone lines) simultaneously. The maximum capacity in a single PC is 16 VP-894 boards, or 64 channels.

Unlike the VP-890 or the VP-892, the VP-894 can share one interrupt request line (IRQ) among multiple boards. Since each channel is equipped with its own high-speed DSP processor, the VP-894 can provide very accurate call processing, such as call progress analysis and remote disconnect detection.

Please refer to the **VP-894 Hardware Description** sheet for more details.

API DESCRIPTIONS

The following programming languages are supported: Microsoft C, Clipper, Windows Visual C and Windows Visual Basic. The Windows Visual Basic can often speed up software development thanks to its "DIALOG" capability.

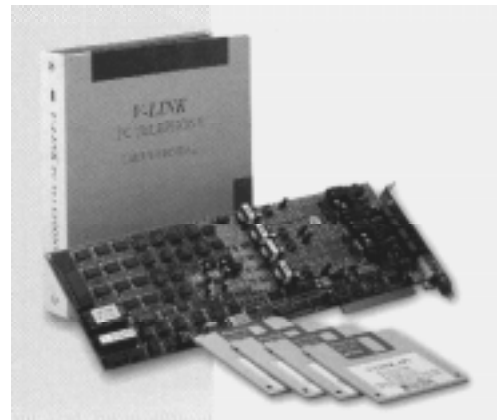
More than 20 functions are available. Some functions are event-driven such as PickUp(), Play() and GetDTMF(). Some functions are not event-driven such as Init894(), GetEnergy() and SetCPMpPARAM(). The events are generated when system attention is needed. There are about 20 different events such as EVT-DETECT-RING, EVT-PCMIO-ERROR and EVT-LINE-SILENT.

System configuration is customized with more than 20 parameters such as DialMode, PLAYGain and OFFthreshold.

Please refer to the **VP-894 Software Description** sheet for more details.

FEATURES & ADVANTAGES

- High voice compression rate (1:4 or 1:8)
- Channel bridging (internal, or use the EX-2424 for external)
- Local phone support
- Reverse-voltage detection
- Inbound pulse dialing detection
- Optional fax capability (by linking with the VP-924)



The VP-894 is certified by FCC (U.S.A.) and BABT (Germany) with CE compliance.

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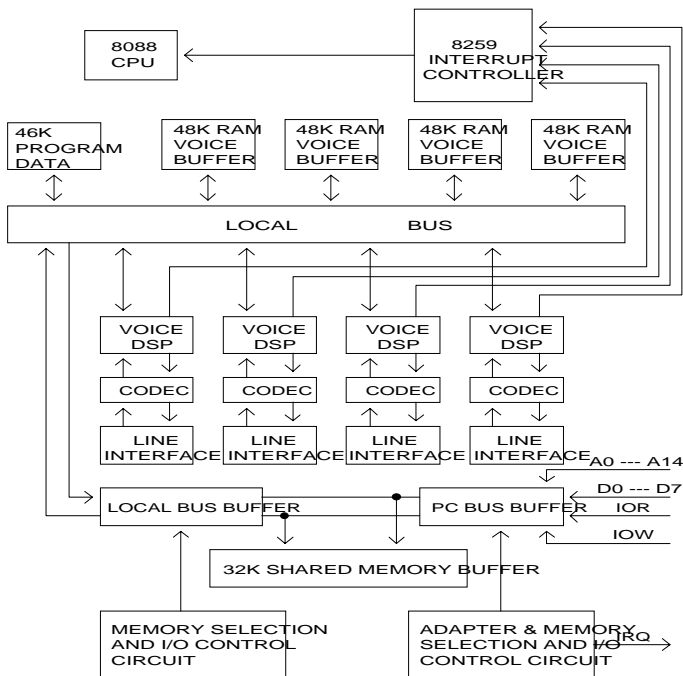
V-Link™ VP-894

Hardware Descriptions

The VP-894 voice board is designed to provide multi-line hardware platform for computer telephony applications such as voice mail, auto-attendant and interactive voice response systems. There are four channels on each board, and up to 16 boards may be installed into an IBM PC compatible host computer. Features are:

- Advanced Voice Compression
- Ring Detection with Loop Start Interface
- On-hook and Off-hook
- Touch Tone and Pulse Digit Detection
- Tone/Pulse Dialing
- Call Progress Monitoring & Remote Hangup Detection
- Local Phone Support
- Adjacent Channel Interlink
- Random Channel Interlink (via EX-24 or EX-2424)

The board features a high-speed 8088 with 48K bytes of voice buffer for each channel. A 32K shared memory is used to exchange data with the host computer, and all channels use the same IRQ to request service. The following is a block diagram:



Advanced Voice Compression

The VP-894 uses highly advanced voice compression technique to obtain these low data rates:

- 16 Kbps (4:1 compression)
- 9.8 Kbps (4:1 with silence compression)
- 8 Kbps (8:1 compression)
- 4.9 Kbps (8:1 with silence compression)

Loop Start Interface

There are four RJ-11 jacks on the VP-894 providing loop start interface to telephone lines. The system may be connected to CO lines directly or via a PABX (analog phone system), for both inbound and outbound applications.

Pulse Digit Detection

Although not as accurate as touch tone detection, the VP-894 can detect pulse digit input without any addition hardware. Since it is almost impossible to come up with a universal set of parameters to characterize all possible pulse digits from different central office around the world, the VP-894 adopts the "learn-per-call" method which requires the caller to dial a pulse digit first in order for the system to learn. The reward for this little inconvenience is higher detection accuracy than other methods.

Call Progress Monitoring

For outbound applications, the VP-894 can detect the following call progress status: ring-no-answer, answer, busy, no-dial-tone, no-ringback, as well as detection of user-defined tones and remote hangup.

Local Phone Support

Each channel may be independently configured to support local phone. The local phone is useful when the application calls for on-line monitoring/recording.

Channel Interlink

The VP-894 has a special feature which allows two adjacent channels on the same board to be interlinked together without any additional hardware. Channels may be randomly interlinked with additional EX-24 or EX-2424 multiplexer card. Channel interlink, similar to call conferencing, can be used for call forwarding and call back applications.

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V-Link™ VP-894

Software Descriptions

The VP-894 Software Developer's Kit consists of a device driver, a library of API functions (Application Program Interface) and some demo programs. It currently supports the following programming languages:

- (DOS) Microsoft C 7.00 and above
- (DOS) Borland C++ 2.00 and above
- (DOS) Clipper 5.01 and above
- (Windows 3.1) DLL
- (Windows 3.1) VBX

The Device Driver

The device driver is memory resident and must be installed before running the application program. For the most part, the device driver is hidden behind the API and handles low-level hardware control.

The API Functions

There are two types: the event-driven type and the non-event-driven type. The event-driven type usually take a long time to complete, therefore must return before the operation is finished. When the operation is actually finished, the result (an event) is then posted in the event queue. It is up to the application program to process the events in a timely fashion to avoid event queue overflow.

The non-event-driven type functions usually takes a short time to complete, and the operation is always done when the function returns. The following is a list of API functions:

Event-Driven Type:

SetCtrlParam
PickUp
HangUp
Flash
Play
Record
GetDTMF
FlushDTMF
Dial
StopCh
CallLocal
CallRemote
CallBeeper

Non-Event-Driven Type

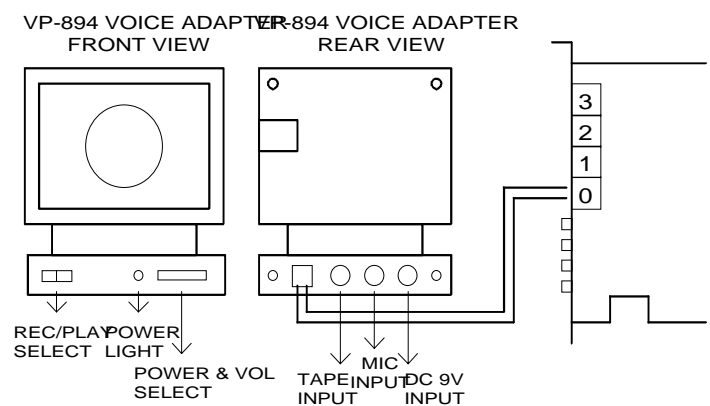
Init894
Close894
GetEvent
FlushEvent
GetEnergy
InsertEnergy
GetCtrlParam
GetCPMParam
SetCPMParam
GetHungUpParam
SetHungUpParam

The event queue is a FIFO queue where events are posted. Events are posted by the device driver when errors occur, or when event-driven functions are finished. The following is a list of event types:

EVT_EOP_NORMAL
EVT_DTMF_INTERCEPT
EVT_TIME_OUT
EVT_ENDOF_STOP
EVT_INTRN_QUEUE_OVERFLOW
EVT_DETECT_RING
EVT_LOCAL_PHONE_PICKED_UP
EVT_LOCAL_PHONE_HANG_UP
EVT_DETECT_DTMF
EVT_REPORT_ENERGY
EVT_PCMIO_ERROR
EVT_NO_DIAL_TONE
EVT_CPM_COMPLETE
EVT_LINE_ROARING_REMOTE_HANG_UP
EVT_LINE_BUSY_REMOTE_HANG_UP
EVT_LINE_VOLT_REVERSE_TOGGLE
EVT_LINE_SILENT
EVT_DISPOSE_PCM_DATA
EVT_LEARN_PULSE_SUCCESS
EVT_DETECT_PULSE

Voice Development Support

The VP-894 Voice Adaptor is an optional hardware device which can be used during software development to test the board and record system prompt messages.



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