DIGITAL VOICE SYSTEMS, INC.
The Speech Compression Specialists

Net-2000™-P25 Voice Codec Unit

The Net-2000™-P25 Voice Codec Unit combines AMBE® Vocoder Technology with UDP/IP network connectivity!

Features

Flexibility and Performance

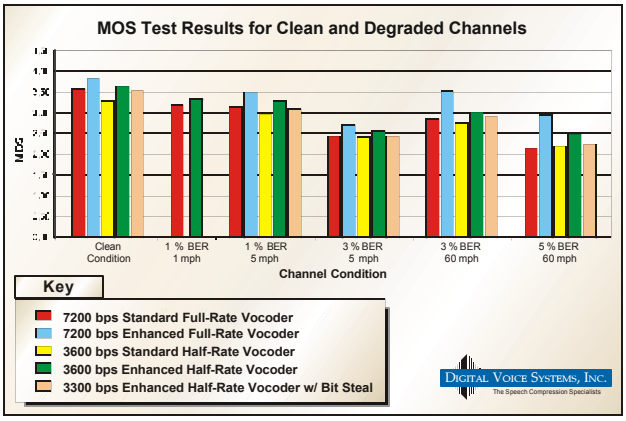
- Network enabled voice codec unit interfaces APCO P25 vocoders with Analog I/O and Ethernet networks.
- Real-time, full-duplex communications to other Net-2000™-P25 units via UDP/IP Ethernet interface.
- Both voice and channel data can be transmitted over the Ethernet interface at the same time.
- Encode/Decode files across a Local Area Network.
- High performance audio using 16-bit linear codec.
- 4-wire analog input/outputs.

Half-Rate Vocoder Mode

- Easily switch between Full-Rate and Half-Rate modes.
- Built-in FEC with capability to decode up to 8 bits of soft descision error correction delivers robust performance over channels degraded by bit errors and/or background noise.
- Half-Rate Vocoder Mode can detect and transmit DTMF and Knox tones, single tones, and North American Call Progress tones DTX capability, Voice Activity Detection, Comfort Noise Insertion,

Easy to Integrate and Operate

- Built-in web server User Interface provides access from any PC on the LAN.
- RS-232 serial port provides system setup and control.
- Built-in DHCP capability simplifies network setup.
- The embedded system software is field upgradeable.
- Rack mountable aluminum chassis design.



The Net-2000™-P25 Voice Codec Unit (VCU) represents Digital Voice Systems, Inc. (DVSI) latest advancement in voice compression technology. The Net-2000™-P25 VCU hardware incorporates DVSI's patented vocoder software for voice compression applications geared toward the next generation of APCO Project 25 (P25) digital mobile radio communication systems. The Net-2000™-P25 VCU includes two vocoder modes, the standard Full-Rate APCO P25 vocoder and DVSI's new 3600 bps Half-Rate vocoder that has been proposed to APCO Project 25 system in order to double public safety communication channels. The Net-2000™-P25 VCU is designed for flexibile integration into a variety of other OEM digital communication applications including Voice Over Internet Protocol (VoIP), wireless telephony and voice monitoring / recording systems.

The key element of the Net-2000™-P25 VCU is DVSI's new Half-Rate Vocoder that operates at 2450 bps and adds 1150 bps of integrated forward error correction (FEC). This low-bit-rate technology maximizes communications system resources by improving channel efficiency up to 2-3 times that of vocoders currently used in most mobile radio and cellular systems. The new Half-Rate Vocoder advances even further by incorporating DVSI's latest quantization and FEC technology to provide optimum voice comprehension even in degraded channel conditions due to significant bit errors or acoustic background noise conditions. These superior performance characteristics make the Half-Rate Vocoder ideal for use in digital communication applications where bandwidth is at a premium and high quality voice is imperative.

The new Half-Rate vocoder is an extension of the current 7200 bps standard Full-Rate IMBE™ Vocoder that is used throughout P25. Both the new Half-Rate and the older Full-Rate are based on DVSI's Multi-Band Excitation (MBE) technology that codes speech using a set of MBE model parameters for each frame of speech. However, the new Half-Rate vocoder includes a number of enhanced features such as high performance FEC (capable of up to eight bits of soft decision decoding) built-in Voice/Silence detection (DTX), adaptive comfort noise generation, tone detection and generation of DTMF / KNOX tone and North American call progress tones.

Ethernet Connectivity

The Net-2000™-P25 VCU goes beyond just implementing DVSI's patented Half-Rate Voice Compression Software, it also integrates an Ethernet interface for remote access and control. The 10Base-T Ethernet connection on the Net-2000™-P25 VCU allows full-duplex real-time or half-duplex non-real time voice compression applications over a Local Area Network (LAN). Using the LAN, two Net-2000™-P25 VCU's can communicate to create a Voice Over Internet Protocol (VOIP) Ethernet based vocoder communication system. Communicating between two Net-2000™-P25 VCU is as easy as entering the IP address (or hostname) of the Net-2000™-P25 VCU units, selecting the desired voice interface and the Full-Rate or Half-Rate Vocoder mode.

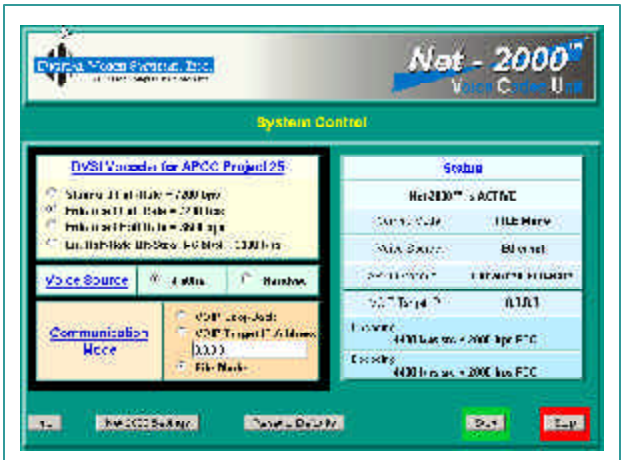
When two Net-2000™-P25 VCU communicate, each converts the input analog speech into digital speech samples, encodes the speech using the selected APCO Full-Rate or Half-Rate mode and then sends the compressed bit stream out as UDP packets over the Ethernet interface. Simultaneously, the compressed bit stream of UDP packets from the other Net-2000™-P25 VCU is read in from the Ethernet interface and decoded back in to digital speech samples. The decoded samples are converted back into analog speech via the AIC-10 codec whose output is sent to both the handset and line-level output connections. Since the channel data is a packet based UDP Ethernet protocol users can develop their own customized controls and user interfaces so that the Net-2000™-P25 VCU can fit into an endless array of applications.

The Ethernet LAN connection can also be used to encode/decode files from a PC making the Net-2000™-P25 VCU ideal for compressed-voice storage applications or non-real-time testing. Alternatively, the Net-2000™-P25 VCU can loop back the VoIP information back to itself for voice monitoring and evaluation applications.

The Ethernet connection to a LAN provides the ability for any PC on the network to use a standard web browser to control the Net-2000™-P25 VCU. The user-friendly web server built-into the Net-2000™-P25 makes it easy to select analog audio I/O interfaces, select the vocoder mode and to establish communication across the Ethernet connection. In addition to the control, the web pages display information about network settings, operating mode and system status. Since the Net-2000™-P25 uses Ethernet, its web page can even be accessed from notebook or tablet PC via wireless network.

Fast and Easy Set-up

Initial set-up of the Net-2000™-P25 VCU is straightforward and fast thanks to its Ethernet network connection. It is equipped to handle IP address information from a DHCP server when available on the LAN. Alternatively, the Net-2000™-P25 VCU's RS-232 serial port can be used as a console terminal to allow low-level network setup and selection among the various input and output audio interfaces.



Built-In Web Server User Interface

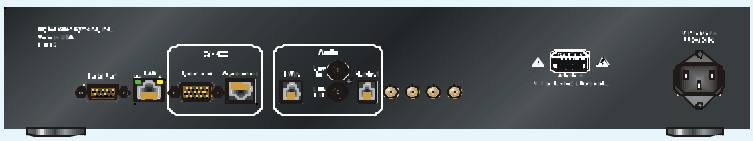
Variety of I/O

To meet a wide range of communication system requirements the Net-2000™-P25 Voice Codec Unit hosts a variety of inputs and outputs. For uncompressed analog voice I/O the Net-2000™-P25 VCU supports 4-wire and handset analog interfaces. For compressed voice data communication across a channel, digitized speech can be transmitted and received through the Ethernet interface. A unique feature of the Net-2000™-P25 VCU is that both voice and channel data can be transmitted over the Ethernet interface at the same time.

DVSI developed the Net-2000™-P25 VCU to package the latest software into a hardware platform that does not require licensing fees or royalties. With off-the-shelf availability the Net-2000™-P25 VCU provides cost effective voice compression without the risks and engineering expenses associated with new product development.

Contact Us

Digital Voice Systems, Inc. is the accepted leader in the development of low-bit-rate, high quality voice compression technology. DVSI provides both software and hardware based voice coding solutions to equipment manufacturers throughout the world. DVSI's high performance vocoder technology combined with innovative designs and advanced features, benefit a wide range of digital communications and voice storage applications. For additional information or to learn more about DVSI and its products visit us on-line at www.dvsinc.com.



Mechanical Specifications

Dimensions: 17.25 X 3.5 X 7.25 inch
Weight: 4.5 pounds

AC Power Requirements

Voltage: 100 - 240 V ~
Frequency: 50 / 60 Hz.
Power: 28 W

Rear Panel Connections

Serial Port	DB9s
LAN	RJ-45
Analog Line In	RCA Jack
Analog Line Out	RCA Jack
Handset	RJ-14
AC Line In	Pwr. Recp.

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