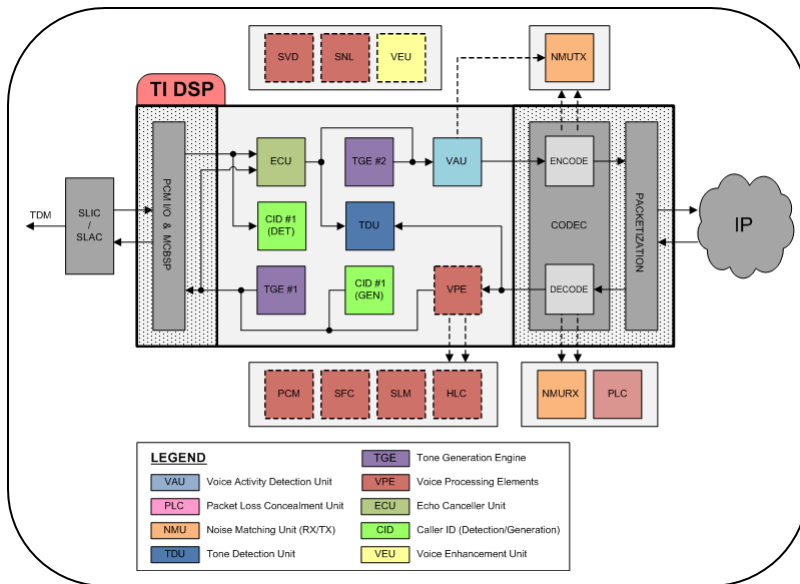


# Voice Library (VoLIB) Release 2.1.0



## Overview

The Texas Instruments Voice Library (VoLIB) provides components that, together, facilitate the development of the signal processing chain for Voice over IP applications such as infrastructure, enterprise, residential gateways and IP phones. Together with optimized implementations of ITU-T voice codecs, that can be acquired from TI separately, the components of VoLIB satisfy most of the fundamental building blocks required to develop a complete VoIP signal processing chain.

The VoLIB library is composed of nine independent component packages, each of which performs a specific voice processing task (or tasks). Each component adheres to TI's Embedded Communication Object (ECO) standard, thus providing a consistent, C callable, model for the object lifecycle. The result is a standard interface that greatly simplifies generation and management of multiple voice processing signal chains.

## Functionality

VoLIB components provide the following functionality:

- Caller ID generation & detection
- Line echo cancellation
- Tone generation
- Tone detection
- Voice activity detection
- Matched level noise generation
- Packet loss concealment
- High-level compensation
- 8kHz/16kHz & 16kHz/8kHz conversion
- Adaptive noise reduction
- Automatic level control

## Supported Architectures

- C55x (COFF, Rev 2.x & 3.x)
- C64x+ (little-endian, big-endian, COFF, ELF)
- C66x (little-endian, big-endian, COFF, ELF)

## Technical Specifications

### Caller ID (CID)

- Telcordia (North America)
- ETSI (Europe)
- NTT (Japan)
- BT (UK)
- YDN (China)
- AUS (Australian)

### Echo Cancellation Unit (ECU)

- G.168 compliant
- Normalized Least Mean Square (NLMS) algorithm
- Dual filter approach for increased stability
- Multiple filter segments for reduced MIPS and increased stability
- Zero delay frame-based echo removal
- Double-talk detection for enhanced stability
- Four-wire detection logic
- Wideband (16 KHz) support
- 128ms maximum tail

### Noise Matching Unit (NMU)

- Fixed level CNG
- RFC3389 level matching
- G.711 Appendix II spectral matching

### Packet Loss Concealment (PLC)

- G.711 Appendix I concealment

### Tone Detection Unit (TDU)

- DTMF, MFR1, MFR2 (fwd/back)
- V.25 (CED), T.30 (CNG), ANSAM
- V.21 flags & marks
- V.8 CM & CI
- Bell 103, Bell 202
- SIA tones
- SS7 continuity
- ... more

### Tone Generation Engine (TGE)

- Up to four individual frequencies & amplitudes
- Amplitude modulation
- Phase reversals

### Voice Activity Detection Unit (VAD)

- Fixed threshold
- Adaptive threshold

### Voice Enhancement Unit (VEU)

- Adaptive Noise Reduction
- Acoustic Echo Control
- Automatic Level Control
- Adaptive Listener Enhancement

### Voice Processing Elements

- High Level Compensation
- PCM encode/decode
- 8/16 kHz conversion
- Signal limiter
- Speech/noise level estimation
- Simple voice activity detection