

Full-Duplex Speakerphone

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VOCAL Technologies, Ltd. modem and telephony software libraries include Full-Duplex Speakerphone functions in ANSI-C and optimized assembly language for ADI, AMD-Alchemy, ARM, DSP Group, LSI Logic ZSP, MIPS and TI. This software is modular and can be executed as a single task under a variety of operating systems or it can execute standalone with its own kernel

The line interface for the full-duplex speakerphone may be an analog front end (codec and DAA) or a digital interface such as T1/E1, Switched 56, and ISDN.

This full-duplex speakerphone software can be combined with telephony functions, DSVD voice compression, data modulations (V.92, V.90, V.34, V.32bis/V.32 and V.22bis/V.22/V.23/V.21) and facsimile modulations (V.17, V.29, V.27ter and V.21 channel 2). Compatible with VOCAL controller firmware for data protocols and command set controls.

A full-duplex speakerphone device digitizes the signal coming out of its speaker. It then edits this info out of the signal it's transmitting using a built-in digital processor. This eliminates echo effect and more importantly, does away with the on-off mic/speaker dilemma. Full-duplex devices do all of this virtually instantaneously.

Full-duplex conversation, where both transmit and receive channels are active simultaneously, is the conversation. Full duplex for hands-free communications is achieved using Echo Cancellation. Echo Cancellation reduces overall loop gain and the acoustic coupling between speaker and microphone. This coupling reduction prevents the annoying effect of hearing one's own delayed speech, which is worsened when there is delay in the system, such as vocoder delay.

Features:

- Full-Duplex Speakerphone operation.
- Lower MIPS Half-Duplex version available.
- Acoustical Echo Cancellation.
- Line Echo Cancellation (G.165 (03/93) and G.168 (2000) compliant).
- Automatic Gain Controls.
- Frequency response (+/-3 dB referenced to 1kHz) of 300 Hz to 3.4 kHz.
- 2048 coefficients.
- Train on voice (no training tones) for the Full-Duplex Speakerphone operation.
- Convergence Time of 300 ms maximum.
- Acoustic Tail Length of up to 256 ms.

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Full-Duplex Speakerphone-01

Configurations:

- Seamlessly integrates into VOCAL's kernel.
- Can be combined with North American and International telephony platforms. These platforms feature voice activity detection, international call progress, caller ID.
- Full-Duplex Speakerphone operation can be combined with data modulations and protocols (modulations through V.92 and V.44/V.42/V.42bis and MNP 1-5 data protocols).
- Can be combined with facsimile modulations and protocols (modulations through V.34 fax and T.4/T.30 facsimile protocols).
- Full-Duplex Speakerphone can be combined with data, facsimile and voice command sets.
- Can be combined with speech coders including iLBC, MELP, G.723.1, G.723.2, G.728, G.729 Annex A, Annex B etc.

Full-Duplex Speakerphone operation Resource Requirements:

- 12 MIPS with Acoustic Echo Cancellation peak loading
- 14 MIPS with Acoustic and Line Echo Cancellation peak loading
- 4k words of program memory at an Acoustic Tail Length of 256 ms
- 4k words of data memory at an Acoustic Tail Length of 256 ms

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Full-Duplex Speakerphone-02