

## PRODUCT PREVIEW

Zarlink's ZL38002 acoustic echo canceller delivers superior sound quality for hands-free communications, in car kits, speakerphones, intercom and other systems.

The low-voltage chip supports full-duplex speech to provide clear signal transmission in both audio path directions, even when signal levels are low. Full-duplex operation prevents subjective sound quality problems associated with noise gating or noise contrasting to ensure clear speech and uninterrupted background signals during conversation.

The ZL38002 chip deploys an advanced, field proven adaptive algorithm specifically designed to deliver exceptional performance in high background noise environments. Programmable noise reduction allows users to adjust noise cancellation levels to meet specific system requirements.

### Voice Processing for Hands-Free Communications

- ➔ Full-duplex operation and adaptive algorithm improves voice quality
- ➔ Optimized to reduce noise in hands-free communications
- ➔ Advanced NLP (non-linear processor) design provides full-duplex speech with no switched loss on audio paths
- ➔ Up to 12 dB of noise reduction
- ➔ Fast re-convergence time quickly tracks changing echo environment
- ➔ Control of adaptive filter convergence speed during periods of double-talk, far-end single-talk and near-end echo path changes
- ➔ Programmable digital gain pads at all input/output ports
- ➔ Provides protection against narrow-band signal divergence
- ➔ "Howling prevention" stops uncontrolled oscillation in high loop-gain conditions
- ➔ Automatic gain control on the receiver speaker path
- ➔ Bootable for future field upgrades

### Applications

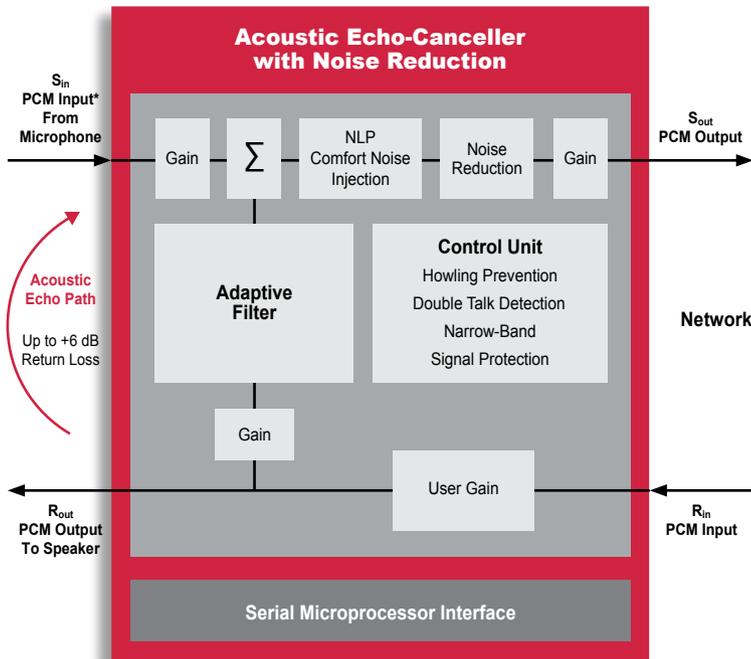
- ➔ Hands-free car kits
- ➔ Speakerphones and videoconference units
- ➔ Intercom and security systems

### Customer Support

The ZL38002 chip family is supported by a customer evaluation board, reference designs, on-line simulation tools and more.

Visit [www.voiceprocessing.zarlink.com](http://www.voiceprocessing.zarlink.com)

**ZL38002 Simplified Block Diagram**



# ZL38002 ACOUSTIC ECHO CANCELLER

## APPLICATION

### Voice Processing in Hands-Free Communications

Demand for higher quality hands-free cellular technology is growing, particularly as government legislators pass or consider laws that require drivers install a hands-free solution. Hands-free technology is also a key element in a wide range of communication systems, including speakerphones and videoconference units, wireless voice-enabled security systems and door entry, elevator and restaurant drive-thru intercom systems.

Hands-free communication tools must typically operate in locations such as cars or meeting rooms where echo and background noise degrade voice quality. The block diagram below illustrates the ZL38002 chip in a hands-free car kit system.

Acoustic echo, created when a voice signal is picked up by a microphone and retransmitted, degrades the voice quality

of hands-free systems. Lower performance systems deploy half-duplex operation, allowing only one person to speak at a time, resulting in an unnatural conversation.

In comparison, the ZL38002 utilizes an advanced non-linear processor design supporting full-duplex speech with no switched loss on the signals path. Voice signals are transmitted in both directions, allowing a natural two-way conversation, even when signal levels are low. In double-talk situations, the field-proven algorithm allows continual tracking of changes in the echo path.

To eliminate background noise picked up by hands-free communication systems, the ZL38002 chip uses an advanced adaptive algorithm that constantly tracks and reduces background noise up to 12 dB while leaving voice quality unaffected.

