



Packetcraft LC3

Product Brief

Highlights:

- Highly optimized for Arm® Cortex®-M4, M33, M55 and others as requested
- CPU efficiency and performance delivering high-quality audio
- Complete Bluetooth LC3 feature set for varied audio applications
- Supports advanced LC3plus features for ultra-low latency
- Bluetooth® qualified accelerates TTM

Applications:

- Hearing aids
- Earbuds & headsets
- Microphone & speaker
- Talking sensors
- Audio source devices (tablet, camera, etc.)
- Auracast™ broadcast audio infrastructure

Contact:

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High-Quality Audio with LC3 Codec

One of the key characteristics of Bluetooth LE Audio is the new high performing standards-based LC3 audio codec. LE Audio requires the LC3 codec which supports scaling from 345kbps to just 16kbps while ensuring high-quality audio in both congested radio environments and at long distances. LC3 is both higher quality and more efficient than the SBC codec used in Classic Audio. LC3 aims to reduce dependency on proprietary codecs that supplemented SBC but don't offer multi-vendor interoperability, which is necessary for applications like Auracast™ broadcast audio.

Packetcraft LC3 supports demanding audio use cases running multiple codec instances on a single processor, without requiring a dedicated DSP. LC3 is part of the overall LE Audio solution offered by Packetcraft, and when combined with Packetcraft Host and Packetcraft Controller, licensees receive a comprehensive, fully-integrated Bluetooth LE Audio solution from a single software supplier.

Packetcraft LC3 is highly optimized for Arm® Cortex® processors and can be used with your preferred Bluetooth SoC complemented with exceptional engineering support.

Also available is Packetcraft LC3 Tester, a companion test tool which allows the Packetcraft LC3 codec to be validated, characterized, and qualified on a target hardware platform.

Packetcraft LC3 Features

- 7.5ms and 10ms frame lengths
- All sample rates: 8, 16, 24, 32, 44.1, and 48kHz
- Compressed bitrates: 16kbps-320kbps (10ms frame)
21.3kbps-426.6kbps (7.5ms frame)
- 16, 24, and 32-bit input samples
- Packet loss concealment (LC3 specification standard)
- External rate control
- Multiple instances of encoder and decoder
- 2.5ms and 5ms LC3plus frame lengths (optional add-on)

Packetcraft, Inc

With several hundred million devices enabled, Packetcraft continues to deliver a legacy of extensively used and well-tested embedded software and protocol stacks for Bluetooth Low Energy.

Packetcraft prides itself on both efficient design and achieving first-to-market qualifications which help ensure their customers are at the leading-edge for product innovation and distinction.

Packetcraft's leadership in Bluetooth LE began in 2009 with the founding of Wicentric, continued through Arm's ownership in 2015, and is maintained today as new technological innovations such as LE Audio, PAwR, and Channel Sounding come to market.

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Performance

Memory utilization: 122kB Code, 14kB RAM.

Codec Configuration	Encoder Max CPU	Encoder Avg. CPU	Decoder Max CPU	Decoder Avg. CPU
16kHz • 32kbps • 10ms	12.5MHz	11.1MHz	6.6MHz	5.1MHz
24kHz • 48kbps • 10ms	15.8MHz	13.8MHz	9.8MHz	7.5MHz
48kHz • 96kbps • 10ms	24.4MHz	21.2MHz	17.8MHz	13.1MHz
48kHz • 96kbps • 7.5ms	26.8MHz	23.5MHz	19.5MHz	14.5MHz

Example data from Arm Cortex-M4 executing from flash and gcc compiler configured with -Ofast. Software rel. 12/21. Performance data subject to change.

- Optimized codec supports 2 stream stereo audio encode
- Supports gaming use cases

Compliance

Packetcraft LC3 is qualified to the Bluetooth LC3 specification v1.0. Fully qualified and listed with the Bluetooth SIG, QDID is 175925.

Deliverables

- API source code files
- Codec full source code or object code library (license tier)
- Make files
- API documentation
- User's guide and release notes

Product Versions

- Fixed point math optimized for Arm Cortex-M4 & M33
- Fixed point math optimized for Arm Cortex-M55