



The World's Premier Supplier of Speech and Audio Codecs

AMR-WB+

Hi-Fi Audio Compression

The **Extended Adaptive Multi-Rate Wideband audio codec (AMR-WB+)** is the state of the art in hi-fi audio compression technology, providing top-quality mono and stereo sound for the full range of multimedia services.

With the ongoing rapid adoption of mobile multimedia services worldwide, AMR-WB+, through its highly effective audio compression, enables operators to get maximum use of their available service bandwidth on their GPRS, EDGE and UTRAN networks, resulting in maximum return on investment (ROI). Independent testing has established AMR-WB+ as providing **unrivalled quality at lower bit rates and excellent quality at higher rates**. AMR-WB+ not only provides scalability and flexibility but also addresses the capabilities of diverse networks and handsets. This means that content providers can reach customers on several networks without duplicating their hardware investments. In addition, with its ability to dynamically adjust its coding bit rates in response to varying network conditions while preserving audio quality even at very low bit rates, AMR-WB+ is the only codec that ensures that users of mobile streaming services experience a consistently high level of service quality as they move around. This ability of AMR-WB+, combined with its built-in robustness, enables operators to extend their network coverage areas.

AMR-WB+ was standardized by 3GPP and is **recommended for MMS, PSS, MBMS, IMS-based Messaging and Presence service and DVB-H applications**. Jointly developed by Ericsson, Nokia, and VoiceAge, AMR-WB+ proved itself in rigorous competitive testing across multiple content types and combines outstanding audio quality with great versatility and low complexity.

Benefits

State-of-the-art compression technology

- State-of-the-art compression technology allows 3G services to be delivered on 2.5G (GPRS, EDGE) networks with outstanding sound quality.
- High-efficiency parametric stereo (HE-PS) maintains high-fidelity stereo image reproduction at even the lowest bit rates and excellent quality at higher rates.
- Multiple mono and stereo bit rates enable seamless, dynamic link adaptation to network congestion or degradation on a frame-by-frame basis, ensuring consistent high service quality.
- High scalability from 6-36 kbps for mono and 7-48 kbps for stereo.
- Scales to cover the full audio spectrum.
- Shown in a US National Public Radio evaluative report to provide excellent user listening satisfaction even for long listening periods.

Versatility

- Coded AMR-WB+ media can be encapsulated in 3GPP (.3gp, i.e., MMS) or MPEG-4 (.mp4) file formats and used along the entire delivery chain in multimedia applications.
- Low complexity decoder consuming very low power enables advanced services even on low- and mid-tier handsets.
- Low complexity high-quality MMS encoder generates great-sounding messages.
- Backward compatible with AMR-WB (standardized in 3GPP and ITU-T), enabling the playback of AMR-WB content such as ringtones.

Robustness

- Provides consistent quality across speech, music, speech over music and speech between music.
- Excellent performance in speech background noise conditions, whether in the car, in the office or on the street.
- High-efficiency packet loss concealment, preserving end-user service in severely degraded conditions.
- RTP payload format defined by IETF, supporting interleaving for robust streaming and forward error correction (FEC) for enhanced robustness.

The AMR-WB+ Standard for Mobile Multimedia Content

The 3GPP adopted AMR-WB+ as a recommended audio codec standard for Packet-Switched Streaming (PSS), Multimedia Messaging Services (MMS), Multimedia Broadcast/Multicast Service (MBMS) and IP Multimedia Subsystem (IMS) based Messaging and Presence services in 2005. AMR-WB+ is also recommended by the Digital Video Broadcast Project for DVB-H applications.

Reference: 3GPP TR 26.290

AMR-WB+ at a Glance

Standardization	Recommended by 3GPP, ETSI and DVB	
Technology	Hybrid ACELP®/TCX (Algebraic Code Excited Linear Prediction/Transform Coded Excitation)	
Bit rates	Mono: 6-36 kbps Stereo: 7-48 kbps	
Encoded bandwidth	Ranges from 50 Hz -7.2 kHz up to 50 Hz-19.2 kHz	
Typical delay	60-90 ms	
Quality	<ul style="list-style-type: none">• For music at low bit rates, outperforms all other audio codecs• For music at high bit rates, equivalent to the latest audio codec• For speech, performs better than AMR-WB and any other latest audio codec	
Complexity worst case (wMOPS)	Decoder Mono 13 Stereo 24	MMS encoder Mono 63 Stereo 81
Fixed-point	C code available	
Floating-point	C code available	
VAD/DTX/CNG	Included for AMR-WB mode compatibility	

Applications

Server-Based Streaming (PSS)

• Music and other audio content in mono and stereo • Movies • Video clips • News programming • Sports events • Audio books • Commercial advertisements • Access to multimedia information systems • Interactive gaming • “Infotainment”

Download Services

• Hi-fi ringtones • Music • Video clips • Movie trailers • Audio books

Multimedia Messaging Services (MMS)

• Person-to-person messaging • Application-to-person messaging • Instant messaging

Multimedia Broadcast/Multicast Service (MBMS)

• Live TV • Radio programming • Multi-player interactive gaming • Commercial advertisements

Digital Video Broadcast – Handheld (DVB-H)

• Mobile digital TV broadcasting

Hearing is believing . . .

Hear the range and quality of AMR-WB+ for yourself. Experience a sampler of content types, bit rates and modes at <http://listen2wbplus.voiceage.com>; or to arrange a demo, contact sales@voiceage.com.

About VoiceAge

VoiceAge Corporation is the forerunner in the development and dissemination of speech and audio compression technologies and solutions at the convergence of wireless, 2.5G, 3G, Wi-Fi, and Internet protocols. Using designs based on our flagship ACELP® technology platform, VoiceAge® codec solutions deliver unsurpassed quality experienced daily by 2 billion users worldwide.

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VoiceAge Corporation 750 Lucerne Road, Suite 250 Montreal (Quebec) H3R 2H6 Canada
Tel: +1.514.737.4940 Fax: +1.514.908.2037 <http://www.voiceage.com> email: sales@voiceage.com

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