

Loudness Normalization™

“ Listen comfortably on your streaming media. ”

You might have an ear-splitting experience when you thoughtlessly chose the next program to listen to. That's the loudness* problem. Unfortunately, every OTT/music streaming platform has this problem and no dedicated solution had been in the market before Gaudio Lab came. Gaudio Loudness Normalization is the only complete and comprehensive solution to resolve the loudness problem for media streaming platforms. Meet Gaudio; then, you won't see 1-star reviews from annoying user complaints on the loudness matters anymore.

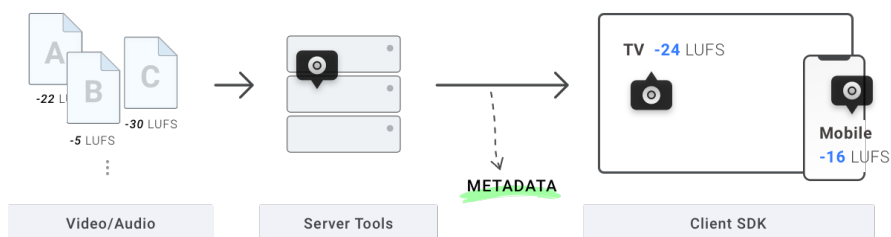
*loudness is a subjective "feeling" of how we perceive the strength of sound.

Where to apply ● MEDIA PLATFORM OTT • music streaming • live-streaming and more

FEATURES

- **International/national standards compliance** : ITU-R 1770 loudness measurement, EBU R-128 (Europe), ATSC A/85 (North America), TTAK.KO-07.0114 (Korea), ARIB TR-B32 (Japan), OP-59 (Australia), and more
- **High quality sound** : keeping original waveform to the greatest extent is always a primary goal of any of Gaudio Loudness Normalization technologies. As signal processing is performed at the last stage of playback, any alteration and/or transcoding is avoided during content delivery. In addition, advanced metadata precisely controls the normalization gain to secure sound quality ("Quality Secure Mode")
- **Wide normalization options** : Gaudio provides diverse options depending on how you want your loudness normalization to be like, including Strict, Basic, Quality Secure, Transparent, Album, and Dialogue-gated
- **Device-specific loudness control (DSLCTM)** : alteration of loudness originated from a connected transducer's frequency response is further considered and compensated
- **Very low-bitrate of metadata** : only less than 100 bytes per a program required
- **Codec-agnostic** : As the loudness metadata is independently analyzed, transmitted, and decoded on top of any audio codec system, a platform doesn't need to worry about the codec compatibility
- **Low complexity** : With many-year experience as a seasoned audio SDK provider for mobile, it is designed to consume very low power as embedded in any client devices
- **Easy integration** : intuitively designed API and accompanying target-dedicated example codes make integration simple and easy
- **Technical Support** : onsite & remote technical supports ensure complete integration

TECHNOLOGY



The metadata differentiates Gaudio Loudness Normalization from any legacy automatic level controls or file-based loudness solutions. On the server-side where audio sources are aggregated, the Loudness Server Tools (LST) measures

loudness and generates metadata. The metadata is delivered together with the audio signals to the client. On the client-side, it makes all content loudness the same towards a chosen target level. Since the target loudness can be determined on the client-side, it allows different targets with the same source signal to different devices as TVs and mobiles and it further adapts to the user's listening environment. Special modes like "Quality Secure" satisfy hi-fi listeners who don't want to sacrifice sound quality while pursuing convenience. With "Strict Mode," all the programs are precisely normalized to the target with a very strict tolerance of +/-1 LUFS**.

**LUFS is the loudness units relative to full scale unit introduced in EBU-R 128.

SOFTWARE SPECIFICATION

• Server Tools

Deliverable Type	<ul style="list-style-type: none">• CLI or FFmpeg filter-type• OS : Linux / FreeBSD / Win32
Processing Time	99x faster than real-time

• Client SDK

Deliverable Type	<ul style="list-style-type: none">• Cross platform native C/C++ library• Android · iOS native SDK or any DSP and embedded MCU
Complexity	37.7 MCPS on Qualcomm Hexagon DSP
Latency	12.3 msec (dynamic queue mode)
Memory	1.2 MB
Library Size	1.4 MB (GSM0 package)