Loudness Management Solutions
The scenario is all too familiar: The movie ends with a beautiful sunset and a soft melody. A second later, a salesman bursts onto the screen shouting the deal of the decade on a new car. The viewer, jarred and annoyed, scrambles for the remote. Such dramatic shifts in program volume continue to vex the viewer in the living room, as well as broadcasters and content producers who must address viewer complaints or risk alienating their audience.

The problem of audio loudness has intensified as digital TV has taken hold and broadcasters have embraced the dynamic range of audio signals that can now be sent to the home. In this new world of digital, the dynamic range is such that the dialogue level in the mix varies greatly, compelling the viewer to grab the remote and adjust the volume to a more comfortable level. Although traditional compression technologies can assist with this issue, more modern techniques based on perceptual loudness measurement and correction provide a better-sounding result.

Complicating the issue is that loudness differences have proven challenging to measure with conventional equipment, and there is often a lack of correlation between how the audio signal measures and how the listener actually perceives it. Viewer frustration about the wide variation in audio loudness has led governments around the world to consider passing legislation. In the U.S., public discontent led to the recent CALM Act, which establishes rules and a timeline for broadcasters to achieve loudness consistency.

Taking control of loudness monitoring, measurement and correction is one of the most pressing issues for broadcasters today. The issue will continue to demand attention — as viewers continue to demand the best-possible viewing experience.

Loudness control is not only a good idea – it’s the law!
The issue for viewers:
Sudden increases or decreases in volume that damage the viewing experience

The operational challenge for broadcasters:
Making the average audio level consistent – scene to scene, program to commercial or channel to channel

The ideal solution:
Harris Loudness Management
Harris Loudness Management
The Industry’s Most Comprehensive Approach to Achieving Consistency in Loudness

Because loudness problems can occur at nearly any point in the broadcast chain, loudness should be measured and managed throughout the entire workflow — along with the metadata that impacts how the audio content is delivered — using a combination of real-time and offline tools. Harris helps content producers and broadcasters implement a cost-effective loudness management solution that addresses loudness measurement and correction at every stage of the broadcast workflow.

Harris loudness solutions are also fully compliant with current loudness requirements, supporting the broadly implemented ITU-R BS.1770 recommendation, which was developed using extensive listening tests, and the recommendations of ATSC A/85 (basis for the CALM Act) and EBU R 128.

From loudness measurement to real-time loudness correction to file-based loudness analysis, Harris loudness management solutions enable broadcasters to achieve outstanding loudness consistency — so the viewer can set the desired volume once, and then sit back and enjoy the show.
Loudness Measurement

Before loudness can be properly controlled, it must be measured correctly, using tools that quickly locate any problems and their source.

Effectively displaying and interpreting loudness measurement information is more important than ever, due to recent international standards and recommendations regarding loudness compliance. Harris loudness measurement solutions enable channel-by-channel examination of loudness trending, allowing loudness results to be viewed by program segment or the entire day of programming.

LLM-1770 loudness logger and monitor
A compact audio monitoring tool that makes it easy to confirm compliance with the latest loudness requirements.

The LLM-1770 ensures that loudness and true peak measurements are made to the ITU-R BS.1770 international loudness standard with five times oversampling. Settings are included that match the EBU R 128 and ATSC A/85 recommendations. A surround and a stereo program can be logged simultaneously. The LLM-1770 comes with four AES inputs, with an option for SDI embedded from SD, HD or 3 Gb/s sources.

CMN-LA loudness analyzer
A comprehensive audio measurement tool that helps content producers and distributors verify program integrity.

The CMN-LA loudness analyzer provides a variety of metering, metadata readout, alarming and data logging about the audio content under analysis. Loudness and true peak measurements are made to the ITU-R BS.1770 standard with five times oversampling. Metering of up to 16 channels simultaneously makes for rapid alignment checks. Built into the same chassis as the Videotek® Compact Monitor series, the CMN-LA incorporates the TC Electronic-created radar display, which shows loudness on a short-term meter, a graph covering periods from one minute to 24 hours, and numeric display of the long-term center of gravity (average loudness) and consistency (loudness range). The CMN-LA works with SDI embedded audio, with options for AES I/O and Dolby® decoding.

APM-215 stereo audio program monitor
A compact, multipurpose audio monitoring tool that guarantees superior audio fidelity.

The APM-215 is designed for ease of integration with the VTM Series™ multiformat rasterizers and TVM Series™ multiformat waveform monitors. Its high-quality audio and low distortion are achieved using a two-way speaker system with a wide volume control range and balance adjustment. Front-panel, direct-input mode switching allows the selection of stereo monitoring for up to 10 different channels. Two 10-segment, color LED bargraph meters are provided, as well as a phase indication LED.

TVM Series and VTM Series
Harris has also made loudness enhancements to its TVM Series of multiformat waveform monitors and VTM Series of multiformat rasterizers, allowing existing TVM/VTM Series users to upgrade to support the ITU-R BS.1770 standard, as well as the EBU R 128 and ATSC A/85 recommendations.
When live material is being broadcast, broadcasters and network operators must quickly manage perceived loudness levels to a specific desired dialogue normalization. At the heart of all Harris loudness correction products is DTS Neural Loudness Control (NLC) — a complex, critical band-based measurement and control system that mimics the human perception of loudness. By detecting spectral and density differences, inter-channel relationships and temporal overlaps within the audio signal, NLC provides transparent processing and delivers a natural, open quality not found in traditional multiband compression technology.

DTS Neural Loudness Control has been integrated into the company’s 6800+™ core processing platform, the X85™/75™ multiple-application video/audio platforms, the Selenio™ media convergence platform and the NEO® format conversion products. All Harris real-time control products feature the ability to interface to Dolby® encoded audio, as well as the ability to implement DTS Neural Surround™ UpMix/DownMix/MultiMerge.

**6800+ Core Processing Platform**

**APM6801+**
The APM6801+ module offers a simple, streamlined solution for managing today’s advanced audio processing. The APM6801+ offers eight discrete AES inputs and outputs; and DTS Neural Loudness Control for up to 5.1+2.0 or 4x2.0 audio on a single module.

**APM6803+**
The APM6803+ multichannel audio processing station is a fully integrated loudness and surround sound processor. Flexible, user-defined workflows and intelligent metadata handling ensure that the right processing is applied at the right time, allowing broadcasters to meet regulations, while preserving the artistic integrity of the content. Features include SDI and discrete AES interfaces; full audio/video frame sync; automatic audio delay tracking for guaranteed lip sync; automation and manual control of loudness profiles; loudness and surround field protection; and mono-channel audio routing and proc amps.

**X85/X75 Multiple-Application Video and Audio Platforms**
The 1RU X85 multiple-application video and audio platform offers an optional plug-in capability to support DTS Neural Loudness Control. Customers who currently have the 1RU X75 platform can add support for DTS Neural Loudness Control with a field upgrade.

**Selenio Media Convergence Platform**
Selenio — an industry-first modular platform combining traditional baseband video/audio processing, compression and IP networking — offers the optional ability to add DTS Neural Loudness Control to its frame synchronizer and conversion modules.

**NEO Format Conversion**
The NEO-based XHD-3903 format converter offers an optional plug-in capability to support DTS Neural Loudness Control. Customers who currently have the XHD-3903 module can add support for DTS Neural Loudness Control with a field upgrade.
Increasingly, video and audio content is stored, repurposed and played from files, providing an opportunity to employ the full techniques of loudness analysis and use that analysis data to perform correction — without compromising dynamic range.

The Harris QuiC™ media analysis server is a fully automated, file-based test and measurement server platform that verifies the quality of compressed video, uncompressed audio and selected formats of compressed audio content residing on servers and storage networks — before content is distributed.

QuiC analyzes up to five mapped channels of audio at once for loudness (per ITU-R BS.1770), providing short-term loudness, consistency measurements and an overall “center of gravity” (average loudness over the entire run of a clip). Using optional file correction tools, coupled with the results of the loudness analysis pass, QuiC can then adjust uncompressed audio to a desired loudness level without compromising dynamic range. The analysis can be “faster than real time,” in parallel with video analysis processing, to enable full quality control of stored content — such as sports, music, news, commercials and movies — prior to air.

No matter the loudness issue, Harris can deliver a solution.

The Harris Advantage: We recognized as early as 2005 that loudness was becoming a major issue, and began field tests of our loudness-compliance products in 2007. Our loudness control solutions — the most comprehensive in the industry — are the culmination of years of internal research and development and extensive testing, as well as key industry partnerships.
ONE Company for Workflow Solutions Throughout the Media Chain

Harris is the ONE company delivering interoperable workflow solutions across the entire media delivery chain — providing today’s broadcaster with a single, integrated approach to capitalize on the benefits of IT and mobile applications. By providing unparalleled interoperability across our product portfolio, Harris is able to offer customers integrated solutions that improve workflows, save money, enable new revenue streams and provide a migration path to emerging media business models. To meet the evolving needs of broadcast, distribution, government agencies and entertainment businesses, Harris is the ONE answer for change.

Service And Support

At Harris, we are committed to customer service excellence. It is our goal to provide the highest level of support by applying a simple rule: We take ownership of helping our customers succeed. Our support teams consist of innovative technical experts who support all situations regarding product performance, integration and operational processing. We are adept at providing proven solutions, making workflows better and ensuring reliability of the product and system. At Harris, our experienced and dedicated teams stand ready to help you meet your goals for premium product performance, 100% up-time and reduced maintenance investment.

Warranty

Because we want to assure you that Harris stands beside its products and system solutions, our products carry a standard set of warranty services, which are competitive with — and in some cases outperform — others in the industry.

Service Packages

We offer value-add services that allow you to customize the level of services you need in meeting mission-critical performance levels. Our service package options offer many ways to upgrade your standard warranty by choosing the All-Inclusive OnePak, or by selecting individual services from our extensive portfolio. Our service and support advisors can assist in the selection of the individual services that best suit your requirements.

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