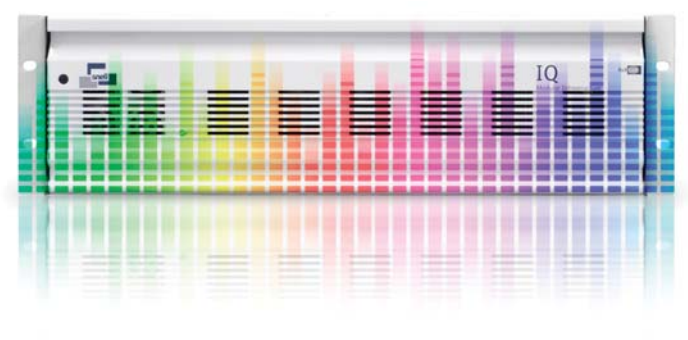
Application Note



Loudness Control

March 2011

IQ modules provide complete peace of mind, simple installation and intuitive operation.

HDTV is about so much more than just great picture quality – high resolution audio matters too. Just how disappointed will your viewers be if they experience loss of surround sound and sudden shifts in sound levels during their favorite TV program?

Loudness differences between programs and stations are a well known issue. Not only is the problem found during programs – the issue of loud commercials, where volume levels jump during commercial breaks is a common complaint amongst digital television viewers and can even drive them away from a channel.

The problem is often due to content creators contributing material with wide ranging audio levels – this is especially relevant to commercials. Some broadcast media organizations have adopted the policy of transmitting contributed material without alteration. This is a result of pressure from advertisers who threaten to withdraw commercials if the station changes their commercials' audio levels .

Such is the seriousness of the commercial loudness problem that the US government has addressed it through legislation. Voted on to the statute last year, the CALM Act (Commercial Advertisement Loudness Mitigation) recognizes that some advertisers have used volume peaks within their TV commercials in ways that viewers find unacceptable.

One solution to the requirements of the CALM Act is to implement technology which monitors and controls audio levels through broadcasts.

Traditionally, broadcast stations were allowed only to check compliance to the ITU/EBU recommendation, which solely addresses maximum Peak Program Meter (PPM) levels. Loudness is determined by average energy, not by peaks, so loudness can vary considerably between programs with equal peak levels.

International harmonization for this measurement is important. The ITU has developed the BS.1770 LKFS loudness measurement which has lead to better consistency in program loudness levels than overall dynamic range processing which is in use at the moment.

The challenge facing broadcast media organizations is to apply ITU 1770 to their program playout in ways that are cost-effective in today's operating environment. The ultimate challenge is to incorporate this facility within the playout automation architecture and this needs insight and invention from your technology partner.

Addressing loudness in playout applications

In today's business environment there is little scope to provide appropriate levels of staffing to monitor and control audio levels manually. There exists a requirement for intelligent technologies that can address the issue as a part of a wider scale playout automation system.

Using its wealth of expert knowledge and experience in this field, Snell has developed a range of system solutions that address the loudness issue. Furthermore, they have been developed in a modular form, so that their physical footprint, cooling requirement and power consumption are minimized within a broadcast operations center.

3G/HD/SD conversion modules from Snell's IQUAV10 range include comprehensive audio processing functions allowing complete control over external and embedded audio signals for applications requiring channel routing or mixing.

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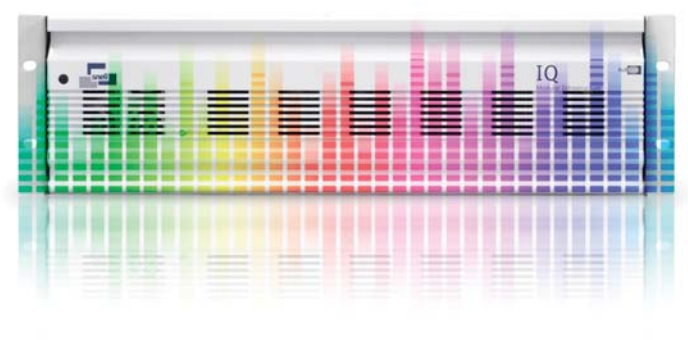

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These recently introduced 3G/HD/SD Conversion Modules from Snell's IQUAV10 range include comprehensive audio processing functions allowing complete control over external and embedded audio signals for applications requiring channel routing or mixing. An important addition to these standard audio functions is the inclusion of an optional 'loudness control and monitoring' feature.

The IQUAV10 will support loudness monitoring based on ITU 1770 guidelines. The ITU1770 standard gives an industry recognized measure of loudness of any audio material and was created to counter issues with content having varying loudness levels.

Loudness is very much a subjective measure, but after extensive trials and research an optimum measurement technique was chosen out of around 10 possible options. The original research was initiated in order to find an alternative to conventional 'Peak Level' meters which generally do not correlate to the overall "energy" of audio.

The IQUAV10 includes two loudness measuring blocks in which up to five channels can be processed, which is a requirement for surround-sound 5.1 audio signal handling. One measuring block involves a 'short term' cycle and the other for a 'long term' session. Another important feature is that loudness values can be monitored and reported over the integrated control and monitoring network to Snell's control and monitoring system, Centra, for visual monitoring of levels.

The Snell-developed modules represent a simple, cost-effective and reliable solution. Based on proven technology developed by Linear Acoustic – a leader in this field – the IQUAV10 provides you with complete peace of mind, and it possesses the company's trademark ultra-compact modular design, simple installation and intuitive operation.

Using its wealth of expert knowledge and experience in this field, Snell has developed a range of system solutions that address the loudness issue.