IPTV and remote signal monitoring
The new SME-1901/1911 card puts it all together

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For several years, television facilities have used in-house IPTV and/or CATV systems to distribute high-quality video to the offices of an internal audience of journalists, producers, executives and engineering managers. A wide range of sources from the main studio outputs to on-air feeds, from affiliate returns to competing networks and even the output of production and playout multiviewers, are made available for viewing throughout the facilities. While this has helped drive productivity, it has also required an additional set of equipment, more power and valuable rack space in the equipment room. As a broadcaster planned to expand the system’s channel count, the related technology (and cost of operation) grew exponentially as well.
Working closely with a number of customers (including a major U.S. broadcast network operations center that required a massive 256-channel IPTV system), Grass Valley has developed a new streaming encoder that fits snugly into any DenseModular signal processing platform. The new DenseModular streaming media encoder card with built-in DA, called the SME-1901 and companion SME-1911 (without the distribution amplifier), brings new efficiencies in space, cost and power consumption. Yet it goes a step further by not only encoding a high-quality video signal, it also serves as an SDI probe that can report ongoing status and help identify the root of problems to individual channels as they occur. Information collected by the SME can also be used to complement control system views and provide more accurate signal path status.

CATV vs. IPTV

Traditionally, RF systems (CATV) have been used for monitoring incoming and outgoing feeds inside a building. Next-generation IPTV offers clear advantages for signal distribution over campuses or the Internet (making access possible from anywhere in the world). This means that the IPTV system can be “piggy-backed” onto the existing office network, enabling the SME card to also be used to generate HD H.264 for internal consumption. The SME can also be used to add channels to an existing CATV plant by feeding its output to QAM modulators with IP inputs. Many new TV sets have built-in decoders for H.264 (connected TV) in addition to MPEG-2 (ATSC), so the user can now easily take advantage of these new devices.

For broadcasters looking to upgrade their aging internal monitoring systems (which traditionally included SD signals over an internal CATV distribution network) the SME-1901/1911 is a natural choice. These older systems were built for a single purpose and required dedicated hardware. The SME card in return provides an efficient upgrade path by combining a high-quality encoder with other essential functions in one compact package.

A powerful combination

The SME card enables the convergence of two essential and different applications for broadcasters: Monitoring signals on critical paths, and generating high-quality video streams for an internal TV distribution system. In a typical broadcast environment SDI signals at various locations need to be monitored and probes must be deployed to verify their presence and to ensure that they have the proper audio, video and metadata attributes. This is normally done at the input or output of routers, at incoming feeds and around processing nodes. Most of these points need a DA in their signal path, so using an SME in place of a simple DA, at strategic locations, greatly simplifies wiring. The fact that the new SME card is integrated with Grass Valley’s iControl facility management software means it can complement information available from other devices in the signal path and provide a clearer view and more complete coverage of the facility.

A dual H.264 streaming encoder is at the heart of the SME-1901/1911. The main high-resolution stream at up to 10 Mb/s is intended for high-quality IPTV content distribution, while a secondary proxy stream, at lower resolution and bitrate, is targeted at transmission on the control network, therefore providing for display in the broadcast system control screens.

Grass Valley introduced video thumbnails over a decade ago in modular infrastructure products. These low frame-rate streams of JPEG images provided excellent visual signal presence information at various processing nodes and proved to be extremely useful to broadcasters. The SME takes this concept one step further by permitting the display of full-motion video so that signal quality and system health can quickly be assessed, and with greater confidence.

iControl ties all the pieces together and uses the information gathered from the system to implement Monitoring by Exception, effectively sending alarms when significant errors are detected and populating sections of the monitor walls to automatically highlight the signal path of interest.
The transport streams (MPEG-TS) generated by the SME can be decoded by a multitude of devices including IP multiviewers, professional decoders, consumer devices and software players such as VLC. The users then gain access to all channels, from the comfort of their desktop. It is also possible to use a standard consumer IP set-top-box in applications where standalone screens are dedicated to in-house content distribution.
A clear upgrade path to IP monitoring

Facility signal monitoring is rapidly becoming IP-based. Signals that were originally SDI are now being moved gradually in compressed domain. The new SME card is ideally suited to convert any remaining SDI islands to IP, cost effectively and with minimal changes in the signal flow.

Performing multiple tasks with the same card(s)

On the SME-1901, a combination of a DA and fiber interface built into the streaming encoder allows users to integrate seamlessly in the signal flow, while using virtually no more space than an existing DA and with minimal additional power consumption. With the additional lower resolution stream and signal probing, the SME card further addresses the needs of internal system monitoring. Indeed, although relatively simple in its outward appearance, the SME card features a unique combination of functionality that makes it more valuable than the sum of each of its components.

The SME-1901/1911 card saves broadcasters space, power and money, no matter how big or small the system is. The simple replacement of a DA card sitting already in the signal path brings powerful new functionalities to the system. No need for an external encoder plus a scaler. No need for separate signal probes. No need for additional wiring. Just connect Ethernet and it all comes together.

Leveraging Grass Valley’s extensive expertise in high-quality signal encoding, the SME-1901/1911 card puts it all together to help facilities run smoother and error free while allowing everyone on the team to participate more closely in the content production and distribution process. This means more transparency and control over the entire operations workflow as well as significantly increased productivity (and convenience) for all involved.