DVB-T/T2
DIGITAL TERRESTRIAL TELEVISION HEADEND SOLUTIONS
Thomson Video Networks offers a global solution for digital terrestrial television including multiplex generation, customization, and distribution, combined with management and quality of service monitoring.

**Delivering Innovative Services**

Delivering a large channel bouquet, including HD, puts constraints on the compression engine. At the same time, video quality has become more important with larger consumer screen sizes aimed at HD content and Blu-ray players. Thomson Video Networks has a tradition for delivering premium video compression through the ViBE family, from ultra-low bit rates in large statmux pools to high-quality HD content. Our philosophy is to deliver premium picture quality for all networks.

**Powerful Content Processing**

As content is increasing in value and distributed across multiple networks, content processing is increasingly important. As different networks have varying characteristics, content needs further adaptation, including 24/7 local channel insertion, seamless national/local channel switch, and advertising regionalization. In addition, interactive services and electronic program guide (EPG) scheduling and insertion are fully integrated. Thomson Video Networks is the only provider able to combine all of these features in a fully integrated headend to suit all networks.

**End-to-End Management**

Equipment management and redundancy scheduling is critical to achieve reliability. Thomson XMS™ control and monitoring with GO-S logging and the support of remote probes provides increased freedom and flexibility, while offering a suite of applications and graphical user interfaces for controlling operational parameters such as bit rates, MPEG services, telecom, and RF transmission.

**Video Compression**

Our ViBE EMx000 line of encoders for standard- and high-definition (SD and HD) video delivers MPEG-4 AVC and MPEG-2 compression. Leveraging our Mustang video compression architecture, ViBE combines compression efficiency and advanced pre-processing to deliver clearer pictures with increased depth and clarity. With the ability to use all available compression toolsets, including true High Profile, our MPEG encoders let you broadcast high-quality SD and HD content at very low bit rates, e.g., up to 4/7 HD services in a DVB-T/T2 multiplex. With integrated Dolby Digital Plus 5.1 surround sound generation or the latest AAC audio codec, you can deliver audio that matches the high quality of your video.

**Flexstream™: Statistical Multiplexing**

Flexstream statistical multiplexing is a field proven solution for dynamically sharing the fixed multiplex bandwidth among multiple ViBE encoders with a high degree of precision. This provides an increase in the number of channels offered by up to 30% versus using the encoders in CBR mode. Highly flexible, Flexstream supports any mix of SD and HD channels as well as MPEG-2 and MPEG-4 compression. Flexstream also features support for remote encoding pools, removing contribution codecs and bandwidth costs, leading to better quality at a lower cost.

**Support for Pay TV**

Robust protection of revenue streams and fine control of subscription-based services with proper user rights management is achieved by the PayTV solution. It’s based on the NetProcessor as a DVB-Simulcrypt scrambler and the XMS as the DVB-SC interface to the CAS/ECM generators. This solution is open, supporting all conditional access systems (CASs) on the market. It’s powerful and scalable from one to multiple CASs, running with large numbers of ECM generators, delivering a mix of payTV and free-to-air services in the same multiplex.
MULTIPLEX REGIONALIZATION

NetProcessor 9030/40: The DTTV Toolbox

In many cases, the NetProcessor 9030/40 will be the only unit at the headend location, addressing all of your needs from basic remultiplexing up to live to live regional switchover, performing network adaptation (ASI, IP, PDH, SDH, ATM, DVB-S/S2), MPEG processing (descrambling, multiplexing, PSI/SI processing, scrambling, SFN and DVB-T2 adaptation), and content processing (seamless splicing and transrating) simultaneously on multiple multiplexes.

FlexCarbon™: Cost Effective Regionalization

The FlexCarbon technology is to build a statmux pool with the national services and the regional services, all regional service encoders being driven by the same bitrate allocation computed from all complexity inputs. FlexCarbon benefits are full VBR quality for the optimum cost of one encoder per regional. Thanks to the FlexSplice technology, the splicing is performed within a VBR pool without transrating or over provisioning null packets.

Permanent Insertion of Local Services

At the regional headends, the NetProcessor contributes to multiplex customization by adding content locally delivered by the VBE encoder and modifying the SI/PSI information accordingly.

Seamless Regional Switchover

This is a three-step process. First, from the playout center the splice in and splice out cue tone commands are sent to the headend (SCTE104 or IP or SDI, analog cue tone, GPI). Second, the encoder at the headend translates the cue tones to SCTE35 in-band commands. Third, in the regions the NetProcessor uses the SCTE35 commands to trigger the seamless splicing between the national and the regional channels (SD/HD, MPEG-2/4). Thanks to the FlexSplice technology the splicing is performed within a VBR pool without transrating or over provisioning null packets.

Advertising Insertion

Ad insertion increases revenues through regional customization while minimizing costs. ThomsonVideo Networks’ ad insertion solution is based on digital program insertion (DPI) within the compressed domain using SCTE standards (SCTE30, SCTE35, and SCTE104) in order to create the complete ad insertion chain. This gives you frame-accurate ad clip ingest, clip distribution to regions, playlist definition and distribution, digital cue tone insertion at the headend, seamless splicing for clip substitution in region (SD/HD, MPEG-2/4), and the generation of “as run” log reports for billing. The key components for ad insertion at the headend are the Sapphire broadcast server (ingest and ad server), VBE encoders, and NetProcessor 9030/40 for seamless splicing. FlexSplice allows ad insertion within a VBR pool without transrating or over provisioning null packets.

Local PSI/SI Processing

EPG service information can be built centrally for multiple regions and filtered/injected locally with the PSI/SI processing power of the NetProcessor 9030/40.

MULTIPLEX DISTRIBUTION – MINIMIZE TRANSPORT COSTS

Telecom Distribution to the Transmitters

The NetProcessor provides transport and delivery of the multiplexes to the transmitters transparently bit-accurate whatever the medium (IP, PDH, SDH, ωwaves, and ATM) thanks to a large range of interfaces, the network impairment capabilities and SFN alignment.

Satellite Transport

Concentration – The DVB-S2 multi-TS feature offers a standard solution to concentrate independent multiplexes within the same satellite transponder. The RD100x transparently and accurately filters and delivers the original transport streams to the transmitter for both SFN and MFN networks.

Protection of the Free-to-Air Content

Transport – Free-to-air services must be protected on the headend-to-satellite link. ThomsonVideo Networks offers a range of solutions for both SFN and MFN networks before feeding the DTTV transmitter (DVB-BISS fixed key, DVB-SC CAS).
Command and Control
The XMS Management System controls and monitors all Thomson compression, MPEG processing, transmission products, and number of third-party products. In client-server architecture the XMS offers a suite of applications and graphical user interfaces for controlling not just hardware, but also operational parameters. With its NetOp client application the XMS system provides a clear view of an entire system, including the fault-monitoring correlation of affected services, MPEG rate monitoring and audio plus video confidence monitoring on a workstation. This view allows supervisory staff to make the best use of resources, and to accelerate fault finding and resolution.

Resiliency for Mission-Critical Systems
With redundancy at all stages of the systems, the XMS plus the XMU mediation device present a unique design for a zero-fault system. The proposed architecture supports N+P redundancy for a pool of IRDs, encoders, multiplexers, or modulators in ASI and/or IP infrastructures. For 1+1 redundancy schemes the Amethyst switcher is a scalable and intelligent device performing monitoring, delay compensation and seamless switch of multiplexes.

QOS Monitoring
The XMS performs live QOS monitoring in any stage of the system, from the central headend down to the transmitter based on Granite MPEG-over-ASI/IP/RF probes, a multi-layer MPEG monitor that reports a transport stream’s health status from the interfaces to the audio/video levels. It monitors QOS in an easy-to-understand manner, allowing non-MPEG experts to make decisions and maximize service availability.

ORDERING INFORMATION
Please contact your authorized Thomson Video Networks representative for more information. Each component of the Digital Terrestrial Television Headend Solutions is also available separately.

SPECIFICATIONS
Please visit www.thomson-networks.com for detailed product information and specifications for each component of this brochure.

PROFESSIONAL SERVICES
Our professional service offerings ensure optimal system performance and maximized uptime. These services include call centers staffed 24/7; system planning, design and commissioning; professional training courses; and technical maintenance programs and service agreements.

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