



The MCM-9000 provides a complete monitoring solution for all the transmission layers starting from the TS packet header all the way down to the encoded video content and quality. In addition, MCM-9000 creates a visual mosaic from the monitored services with rich data overlay, supplying the operator with a strong tool for error detection and alerting.

The created mosaic is an HD or UHD video stream, encoded and transmitted as 2110-21 and standard H.264/H.265 SPTS – enabling remote monitoring, mobile devices access and very flexible installation topology.

The device monitors complete ETR-101-290 compliance with a rich variety of properties: video freeze, black video, audio silence, audio levels, color space, resolution change, service bitrate, PMT structure and more.

FEATURES

- Flexible deployment, due to the unique mosaic over SPTS. Mosaic streaming over regular LAN/WAN network is available.
- High density solution; concurrent monitoring of up to 300 services per server.
- Ability to mix a variety of sources HEVC /H.264 /MPEG-2 /JEPG2000 TR-01/ HLS/ MPEG-DASH/ SMPTE-2022-6;7/ST-2110/UHD/HD/SD/RADIO/DATA
- Simultaneous, real-time analysis of all sources on all channels
- Unique alarm trigger settings for individual channels or groups of channels
- Source recording, triggered by any of the event detection rules
- On screen Tally, UMD's, DVB subtitling, Teletext subtitles, ID3 subtitling and Closed-captions rendering

PRODUCT DETAILS

The MCM-9000 provides three levels of monitoring: transport level monitoring based on ETR-101-290 compliance, content level monitoring, and template based monitoring for detection of configuration changes in the monitored stream.

Analysis

Transport layer monitoring: ETR-101-290, ATSC A/78A

Video content monitoring: freeze frame, black frame

Audio content monitoring: audio levels, audio Silence

Subtitles content monitoring: display and validity

Stream Capture

Automatic stream capture on error or external trigger

Data Traffic Monitoring and Logging

Logging of individual PIDs and service bitrates

Interval based statistics trap generation

SPECIFICATIONS

Supported Video Compression Formats

MPEG-2 Video	up to MP@5.1
H.264 Video	up to Hi@4.1
HEVC Video	up to MP@5.1
JPEG2000 TR-01.....	up to 200mbps
Color Space	YUV420, YUV422, YUV422-10bit

Audio Layer Analysis

Audio codec	MPEG2 / AAC / HE-AAC / A-52 / AES67
Audio channel mode	1 / 1+1 / 2 / 5.1
Loudness monitoring...	EBU-R-128/ITU-1770-3/ATSC A/85
Silence detection	Mono, stereo, dual mono, surround
Clipping detection	User adjustable threshold

Video Layer Analysis

Video codec ...	MPEG2 / H.264 / HEVC / UNCOMPRESSED
Video encoding	Level and profile
Video resolution	480i, 576i, 1080i, 1080p, UHD
Video aspect ratio	4:3 / 16:9
Video frame rate	25 / 29.97 / 30 / 50 / 59.94 / 60
Video content	Black / Freeze / Black with logo
Video quality	Blocking detection

Signaling Analysis

SCTE-35/104.....	XML & Binary
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Transport Protocols

Multicast & Unicast.....	TS over UDP
	TS over RTP, TS over HRTMP
HLS/MPEG-DASH	TS over HLS/ MPEG-DASH
RTMP	PUSH & PULL
SMPTE-2022-6/7.....	RTP over UDP
ST-2110	RTP over UDP

Subtitling Analysis

DVB subtitles	Overlay display
ID3 subtitles	Overlay display
CC errors	Separate rules
Closed Caption	CEA-708, CEA-608
Multi language support	Support for up to 8 PIDs

Notifications

SNMP	Configurable SNMP TRAPS
SYS LOG	Configurable sys-log notifications
SMTP	Email notifications
Overlay	Overlay error display on the mosaic
Centralized Error Display	Group error channels to a single display

Management

Web	Complete configuration via web
Remote	JSON WEB services
CLI	Network & software management
Stacking	Group multiple units to a single logical one

Transport Layer Analysis

ETR, First priority	TS sync loss
	Sync byte error
	PAT error
	Continuity count error
	PMT error
	PID error
ETR, Second priority	Transport error
	CRC error
	PCR repetition error
	PCR discontinuity
	PCR accuracy error
	PTS error
	CAT error
ETR, Third priority	NIT actual/other error
	SDT actual/other error
	EIT actual/other error
	RST/TDT Error
Table analysis	TS PSI, TS DVB_SI

Scrambling Analysis

Scrambling verification
Crypto period measurement
ECM/EMM existence tests
ECM Private data change notification
DVB Simulcrypt AES-ECB descrambling
HLS AES descrambling

Mosaic Layouts

User defined layouts, 1-100 channels per layout
Layout editor - via embedded web browser Round-Robin and Paneity Box (CED) layout displays
Up to 32 audio streams loudness display per service
Overlay display of errors, Tally, UMD's, events and DVB/Teletext/CC/ID3 subtitling overlay, encoded as standard HD or UHD service (Multicast SPTS and HLS)
Selectable encoding H.264 /H.265/ MPEG-2 and in parallel low latency mosaic ST-2110/2022-6/7 streaming, viewable on standard STB, ST-2110/2022-6 to HDMI convertors, mobile devices and web browsers

Channel Statistics

Service structure tree-view (per PID)
Display of each PID's bitrate
Display of service bitrate
Display of service properties
Graphical display of audio loudness and True-peak

License Management

Dynamic license sharing between devices
Field upgradable – via FTP, for all licensed features

Software Maintenance

Field upgradable – via FTP
Supports dual software image
Export/import complete system configuration to XML
Compatible with VmWare ESXi 6/6.5

Hardware Requirements

Operates on standard off the shelf hardware
Intel CPU based platforms
No software installation required

ORDERING INFORMATION

Base Device:	
MCM-9000	Flexible license model