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.
- 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 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 ........................................ XML & Binary
### Transport Protocols
- Multicast & Unicast: TS over UDP
- HLS/MPEG-DASH: TS over HLS/MPEG-DASH
- RTMP: PUSH & PULL
- SMPTE-2022-6/7: RTP over UDP
- ST-2110: RTP over UDP

### 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 layout display
- Up to 32 audio streams loudness display per service
- Overlay display of errors and events (user customized)
- DVB/Teletext/CC/ID3 subtitling overlay
- Encoded as standard HD or UHD service (Multicast SPTS and HLS) Selectable encoding H.264 MP@L4 / MPEG-2MP@HL Parallel low latency mosaic SMPTE-2022-6/7 streaming Viewable on standard STB, 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