# Mividi Video over IP Monitoring System TSM100

Cloud-ready IP video monitoring system supports TS over UDP, RTP, HLS, HTTP, MPEG-DASH, RTMP, RTSP, MMS and SRT streaming protocols via IP interface. It can simultaneously monitor up to 300 video services by a single server. Applicable for IPTV and OTT video service monitoring, broadcast and MSO head-end video test and monitoring.

A versatile system for monitor IP video streams

The Mividi TSM100 is a MEPG transport stream analyzer and IP video monitoring system for monitoring the quality of digital video services (QoS) delivered via IP or ASI interfaces. It can simultaneously monitor up to 300 services and perform deep MPEG analysis and video quality check 24 x 7. The system can be used for analyzing MPEG-2, AVC and HEVC encoded videos delivered over the Internet or generated in local head-ends. The TSM100 provides IP layer analysis, MPEG transport layer analysis, key frame decoding, audio loudness measurement and service profiling. The system receives IP encapsulated digital audio and video data via 1G or 10G Network adaptors and can monitor all media flows in the network. It performs extensive test on standard compliance and user profile matching, and generates alarms when TS, video or audio errors occur.

The Mividi TSM100 supports DVB and ATSC broadcast standards, supports MPEG-2, AVC (H.264), HEVC (H.265) and video formats, as well as commonly used audio formats including MP3, AAC, AAC+ (HE AAC, HE AAC v2), AC3, EAC3 etc. Additionally, it supports many different OTT video streaming protocols including HLS, MPEG-DASH, RTMP, RTSP, MMS and SRT.

The monitoring system runs on Windows 7, 8, 10 or Windows Server 2008, 2012, 2016, 2019. It supports several error alarming capabilities for unattended monitoring. An optional web server can be used to connect to multiple monitoring servers in different locations for accessing test results and controlling the servers remotely via the Internet.
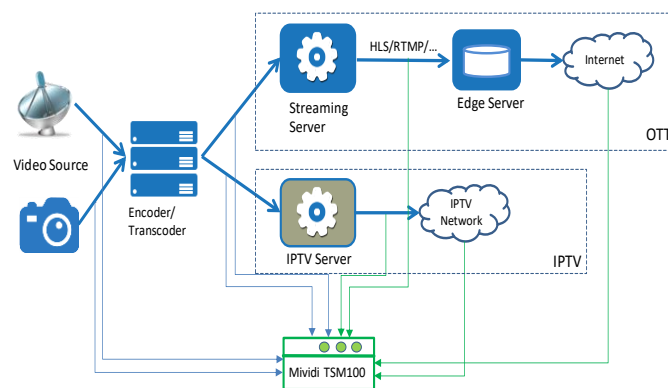
TSM100 Video Monitoring Application

Supported Streaming Protocols

The TSM100 supports most transport streaming protocols found in IPTV and OTT video services. Specifically, it supports:

- MPEG TS over UDP (single program and multi program TS)
- MPEG TS over RTP/UDP
- HTTP live streaming (HLS)
- TS over HTTP
- MPEG-DASH
- Real-time messaging protocol (RTMP)
- Real-time streaming protocol (RTSP)
- Microsoft media server (mms)
- Secure Reliable Transport (SRT)

A single system can analyze a combination of streams in mixed protocols, and monitors up to 300 services in single or multi program streams in various protocols.

In addition to streams over IP, the system takes transport stream input using DVB-ASI interface for traditional head-end monitoring applications.
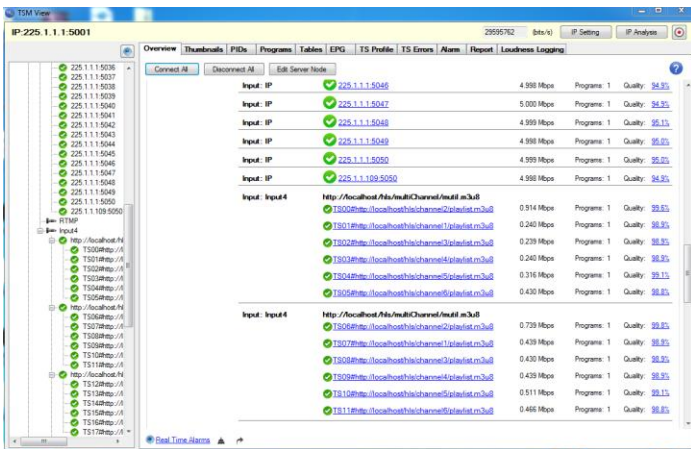
TSM View Overview Panel

Comprehensive TS Analysis

The Mividi TSM100 provides comprehensive TS analysis for both DVB and ATSC streams. It supports MPEG-2, AVC, and HEVC video encoding formats, as well as commonly used audio formats including MP3, AAC, AAC+ (HE AAC, HE AAC v2), AC3, EAC3. It can also decode DVB SI and ATSC PSIP metadata tables and perform standard compliance checks on these data.

The system performs detailed TS error checks based on DVB test guideline TR 101 290 and reports all three priority level errors. It analyzes transport stream program structure, measures PID bitrate, performs PCR and buffer analysis, detects any black and frozen frames, and monitors missing audio and video element streams.

Using the results of streaming analysis, the system will calculate a single value to represent the quality of video streams. Users can easily set an alarm trigger based on the value of overall stream quality.

Error Logs and Alarms

The TSM100 system detects errors on three layers:

- IP transport layer errors
- MPEG transport stream layer errors
- Video and audio data errors

All detected errors are saved in database files. Error can be exported in text format, and reports can be generated for error summary and trend analysis.

The system provides multiple ways of sending error alarms, including email, SMS, audio sound and SNMP traps. The alarms can be triggered by errors selected by users, such as loss of input, audio or video components, black or frozen frames, etc.

All errors and alarms are logged in the database and can be reviewed at a later time. Reports can be generated to summarize TS status over a period of time.

UDP Stream IP Layer Analysis

Media Delivery Index (MDI)
The Mividi TSM100 computes the Media Delivery Index on all IP flows. The MDI includes two measurements: Delay Factor (DF) that measures the IP packet jitter and Media Loss Rate (MLR) that measures the packet loss over time.

Bandwidth Monitoring
The TSM100 will monitor the bitrate of all media flows in the network. Users can create a profile to specify the minimum and maximum bitrates allowed for specific media flows and test if the actual bitrate is within the bands, and send an alarm if the bounds are violated.

HLS/MPEG-DASH Protocol Analysis

The Mividi TSM100 monitors HLS/DASH by downloading media segment files as HTTP clients. All HTTP sessions are monitored and a number of media and transfer parameters are monitored and recorded.

- Automatically start streaming analysis on all streaming profiles listed in the master playlist/MPD files;
- Analyze playlist/MPD files and validate their syntax;
- Measure the segment file downloading time, compare the downloading time to media time to check video delay;
- Record file name, sequence number and file size, calculate media bitrate;
- Perform synchronization analysis on different profile and elementary streams.

Stream Recording

The system provides a stream recording module. Three different recording methods are provided:

- Automated recording: Provides 24 x 7 recording for selected streams. Once configured, the recording will happen automatically when the system is rebooted.
- Error-triggered recording: A number errors can trigger stream recording. The recording length and the number of recordings by repetitive error can be pre-configured.
- Manually started recording.

All media are recorded in transport stream format. A remote user interface for managing recorded files is provided for playing recorded files, searching specific recordings, and cleaning the hard disks. Additionally, the system may be linked to a file storage server in order to support high bandwidth data recording.

The TSM100 can perform comprehensive transport stream analysis on recorded files. It also provides a list of advanced playback functions on recorded files, as well as video file merging and splitting functions.

Remote Access

The TS analysis, error logging, alarm configuration, and TS recording UI applications can all be run on remote computers for remote access to the testing data. In addition, an optional web server can be used to link multiple monitoring servers in different locations for single point data access and system management. The web server can be accessed using a standard web browser, and it is an ideal choice for network-wide video service monitoring.

The system provides multiple ways of viewing the conditions of video services remotely. Video key frames are decoded and may be displayed in a remote monitor. Additionally, the full multi-view display screen can be captured and streamed to a remote location for display.
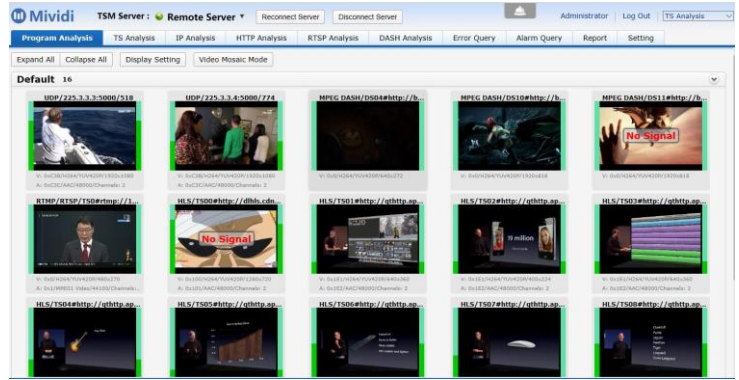
Remote Access to TSM100 Using Web Browser

SNMP Support and API

The TSM100 supports SNMP trap and query. It can send error alarms and computer status via SNMP trap and support SNMP query for transport stream information. An SNMP MIB is included in the TSM100 software installation. In addition, a C# based API with full access to analysis data is also available.

Features

- Input:
  - IP using UDP, RTP, TS over HTTP or HLS (HTTP Live Streaming), MPEG-DASH, RTMP, RTSP, MMS and SRT streaming protocols
  - DVB-ASI
  - Recorded transport stream files
- Supports MPEG-2, AVC (H.264), HEVC (H.265) video formats
- Supports MP3, AAC, AAC+ (HE AAC, HE AAC v2), AC3, EAC3, and other audio formats
- Supports both DVB and ATSC systems, including DVB SI and ATSC PSIP table decoding and EPG display
- Comprehensive transport analysis, including TR 101 290 priority level 1, 2, and 3 errors
- Stream and audio/video elementary stream bitrate measurement
- IP transport layer analysis including MDI measurements
- HTTP session analysis, including HLS playlist syntax, downloading time, media sequence, synchronization of profile streams
- RTMP and RTSP message monitoring and recording
- Black frame and freeze detection
- Audio loudness calculation and monitoring
- PID loss detection
- Input loss detection

- All errors are logged, and reports can be automatically generated and exported
- Error alerts can be communicated via SNMP trap, e-mail, SMS and audio
- Supported automatic, error-triggered and manual recording
- Support transport stream analysis and advanced file playback of recorded streams
- Supports remote visualization via key frame thumbnail extraction or http streaming of multi-viewer monitoring screens.
- Supports network-wide monitoring using a webserver to collect test results from multiple TS monitoring servers.
- Auto and manual report generation
- Integration with Mividi multi-viewer application for error visualization

Applications

- Broadcast monitoring
- Satellite center & cable head-end monitoring
- IPTV service monitoring
- Internet broadcast and OTT service monitoring
- Stream recording and validation
- Transport stream analysis and trouble-shooting

Specifications:

Performance:
Simultaneously monitoring up to 300 streams of combined streaming protocols.

Inputs

DVB-ASI:	DVB-ASI, 200 Mbps per port
IP:	UDP/RTP Unicast or Multicast TS over HTTP or HLS (HTTP Live Streaming), RTSP, RTMP, MMS, SRT Streaming protocols via 1G or 10G NIC
File:	Recorded transport stream files

Output

DVI or HDMI:	To standard computer monitors.
Audio:	3.5 mm mini jack

OS & Minimum Hardware Requirements

OS:	Windows 7, 8, 10 or Windows Server 2008, 2012, 2016, 2019
RAM:	4 GB minimum
Hard drive:	500 GB minimum
Graphic Cards:	Integrated or independent graphic board
Network Connectivity:	1 GB NIC adapter
Conformities:	UL, CSA, CE, RoHS

Purchase Information

Product Code: TSM100

Purchase options:
- Software only
- Fully built systems

Price: The product is priced according to the number of services to be monitored. Please contact Mividi info@mividi.com for a quote.

Optional Software Modules:
- Transport stream recorder
- Web server for remote access.

For Product Information

Mividi offers a series of products for testing and improving media service quality for broadcasters and Internet media providers. Related products include HLS Analyzer, Multi-view Monitoring System for Internet Media, and SCTE35 and Ad Insertion Monitoring, and Loudness Logging System.

To contact a customer service representative regarding Mividi products, please email to info@mividi.com or visit http://www.mividi.com.