

# IP Multiview System



## MultiScreen-instrumental monitoring system / multiviewer for UNLIMITED number of TV-and Radio-channels

Stream MultiScreen system is intended for simultaneous visual and instrumental monitoring of multiple video and audio sources in real-time using one or several LCD-panels in poly-screen mode.

Having been based on successful combination of versatile features, which include multi-channel and multi-format abilities and high-level reliability, MultiScreen system has been implemented in the projects of largest Satellite and Cable Head-End operators, TV Channels and OTT operators.

The screenshot displays the Stream MultiScreen v. 5 interface with several key components:

- Advanced Screen Layout Generator:** A grid of 16 video channels including BigMagic, SBTN, RTVI, GEO, Filipino, Abu Dhabi, RTR Planeta, Israeli, ProSieben, NTV Canada, Russia Today, Nova, ZeeCinema, MBC, Aaitak, and Melody Arabia.
- One Stream - Multiple Windows:** A large video window showing a crowd with text overlays like 'ENCOURAGE KIDS TO STUDY' and 'HEADLINES TODAY 11:55 AM Fri 5-YEAR-OLD RAPE'.
- Video Aspect Ratio:** A panel with 'Auto Detected', 'Manual set up', and 'Error detection' options, showing a video aspect ratio of 01m:13s.
- Video Formats:** Lists MPEG-1/2 and H.264.
- Service Info:** A panel for service information.
- Dynamic Text Fields:** Shows IP address (225.1.1.5:1200), TDT (2014-03-24 08:40:06), and Bit rate (0.000).
- DVB Teletext:** A panel displaying teletext data and a '364' indicator.
- Digital Audio Peak Level Meter:** A meter conforming to IEC 60268-18, showing audio levels from -50 to 0 dB.
- Audio Formats:** Lists MPEG-1/2/4 Audio, Dolby Digital AC-3, and SMPTE 302-M.
- Multi Channel Audio:** A panel showing audio levels for multiple channels.
- Time and Location:** Displays clocks for New York, London, and Tokyo (19:01:51), along with the date 'четверг, 3 апреля 2014'.

<http://www.stream-labs.com>

## Supported inputs:

Stream MultiScreen server represents an effective media platform, which provides simultaneous visual and instrumental control of unlimited number of TV- and Radio- channels. The number of physical inputs per 1 server depends on the installed input card.

- Composite (NTSC, PAL, SECAM);
- Analog (NTSC, PAL, SECAM);
- SD-SDI (SMPTE-259M, 10 bit, 270 Mbit/s);
- HD-SDI (SMPTE-292M, 10 bit, 1,5 Gbit/s);
- DVB-ASI (ETSI EN 50083-9). Bitrate range 0..214 Mbit/s;
- AES/EBU (24 bit/ 192 kHz) channels;
- DVB-T/T2 (ETSI EN 300 744, 302 755);
- DVB-S/S2 (ETSI EN 300 421, EN302-307, EN301-210);
- DVB-C/C2 (ETSI EN 300 429 Annex A/B/C);
- IP/Ethernet (ETSI TS 102 034).

### **Video input formats:**

- MPEG-1 (ISO/IEC 11172-1);
- MPEG-2 (ISO/IEC 13818-1);
- MPEG-4.2 (ISO/IEC 14496-2);
- MPEG-4.10 (H.264, ISO/IEC 14496-10).
- HEVC (ITU-T H.265 High efficiency video coding)

### **Audio input formats:**

- MPEG-2 Layer II (ISO 11172-3);
- Dolby Digital (E-AC3, AC-3, ATSC A.52b);
- AAC/ADTS/LATM/ADIF (ISO/IEC 13818-7, ISO 14496-3);
- AES SMPTE 302M

### **Data containers:**

- MPEG-2 TS (ISO/IEC 13818-1), MPTS or SPTS;
- DVB T2-MI Streams (ETSI TR 101 290-1, A14-1). **Option** DVB T2MI splitter;

### **Supported Mobile and Internet streaming (OTT) protocols:**

- FLASH RTMP streams (Real Time Messaging Protocol). The support of H.264 video and AAC and MP3 audio streams;
- HLS (HTTP Live Streaming Monitoring); supports encrypted streams
- MMS&MMSH (Microsoft Media Server Protocol & MMS over HTTP);
- RTSP (RFC 1889, 2326, 3550).

### **Metadata:**

- Teletext and Closed Captions (ETSI EN 300 472 , ETS 300 706)
- DVB Subtitles (ETSI EN 300 743)
- EPG (ETSI EN 300 468)
- Digital Program Insertion Cueing Message logging (SCTE-35 over MPEG2-TS)

### **Supported external events' notification:**

- SNMP Trap (RFC 3411-3418, STD0062);
- SNMP Get (RFC 1155, RFC 1212, RFC 1213, RFC 1157, RFC 3411).

### **Supported Outputs:**

- Video: up to 6 VGA, DVI-D, HDMI v.1.3, v1.4(Video+Audio), DisplayPort.
- Audio: 3,5" mini jack, stereo, unbalanced and balanced, S/PDIF, HDMI, Display Port.
- TSolP. Encoding Mosaic to IP (Optional): MPEG-2 transport stream, H264/AVC, HD up to 1080.
- TSolP. Encoding Video/Audio from input interfaces(SDI\Composite) to MPEG-2 transport stream, H264/AVC, HD up to 1080.

### **All measurement errors and clearing are signaled via multiple communication routes:**

- On-screen Visualization Alerts
- Audio Alerts
- Visual Alerts in MultiMonitor(State Panel)
- SNMP traps
- Email sending

### **TSL UMD**

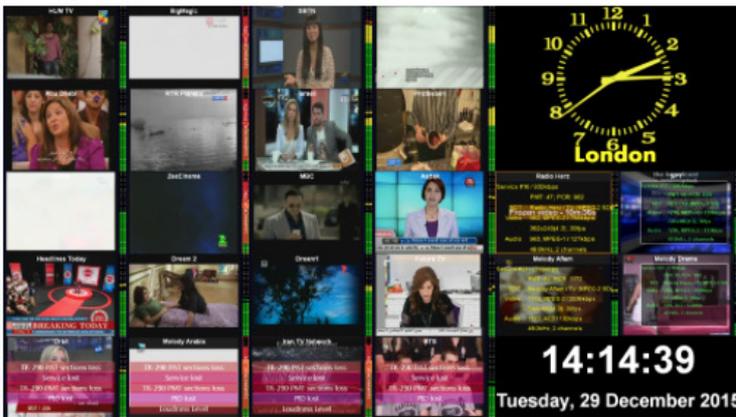
Integration of visualization with external devices in accordance with TSL UMD v.5.0 Protocol is implemented. Visual object for UMD, which includes 2 indicators and text box, can be added to visualization mosaics. Control of UMD is carried out by external devices (like TSL TallyMan controller) in accordance with TSL UMD v.5.0 Protocol.

## List of Alarms

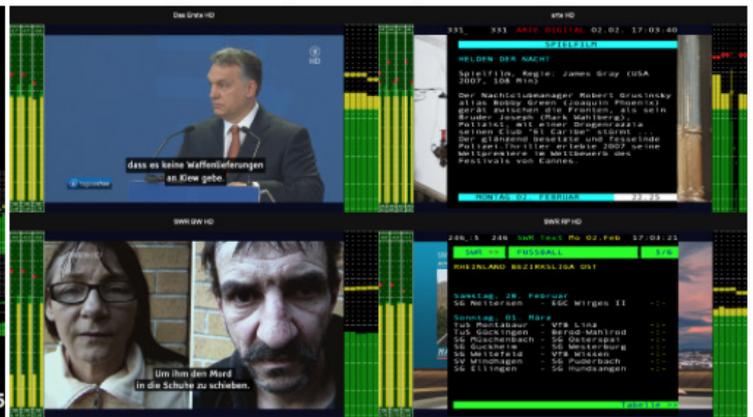
Reception and displaying of video/audio signals, facilitating instrumental intelligent analysis; and control of input signals for a number of important parameters according to ETSI TR 101-290 (ETR 290) level 1 and 2:

<p>No license          Low throughput          TR-290 TS_sync_loss          TR-290 transport_error          TR-290 PAT sections loss          Service lost          TR-290 PMT sections error          TR-290 CAT sections error          TR-290 PCR repetition error          TR-290 continuity counter error          PID scrambled          PES decoder error          Black video          Video aspect ratio          Audio signal level: overload          Transport Stream Bitrate          Teletext page loss          TR-290 EIT Error          TR-290 EIT PF Error</p>	<p>HLS Transport error          Sync loss          Signal loss          TR-290 sync_byte_error          TR-290 PAT sections error          TR-290 PMT sections loss          TR-290 CAT sections loss          TR-290 PCR discontinuity indicator error          PID lost          RTP sequence error          TR-290 PTS error          Decoder runtime error          Frozen video          R-128 Loudness Level          Audio signal level: silence          Service Bitrate          Subtitles Loss          TR-290 EIT Actual Sections Loss          TR-290 EIT Other Error</p>	<p>MultiMonitoring Settings          Monitoring 1860x980</p> <p>Alarms list:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> No license</li> <li><input checked="" type="checkbox"/> Low throughput</li> <li><input checked="" type="checkbox"/> TR-290 TS_sync_loss</li> <li><input checked="" type="checkbox"/> TR-290 transport_error</li> <li><input checked="" type="checkbox"/> TR-290 PAT sections loss</li> <li><input checked="" type="checkbox"/> Service lost</li> <li><input checked="" type="checkbox"/> TR-290 PMT sections error</li> <li><input checked="" type="checkbox"/> TR-290 CAT sections error</li> <li><input checked="" type="checkbox"/> TR-290 PCR repetition error</li> <li><input checked="" type="checkbox"/> TR-290 continuity_counter_error</li> <li><input checked="" type="checkbox"/> PID Scrambled</li> <li><input checked="" type="checkbox"/> PES decoder error</li> <li><input checked="" type="checkbox"/> Black video</li> <li><input checked="" type="checkbox"/> Video aspect ratio</li> <li><input checked="" type="checkbox"/> Audio signal level: overload</li> <li><input checked="" type="checkbox"/> Transport stream bitrate</li> <li><input checked="" type="checkbox"/> Teletext page loss</li> <li><input checked="" type="checkbox"/> TR-290 EIT Error</li> <li><input checked="" type="checkbox"/> TR-290 EIT PF Error</li> <li><input checked="" type="checkbox"/> HLS Transport error</li> <li><input checked="" type="checkbox"/> Sync loss</li> <li><input checked="" type="checkbox"/> Signal loss</li> <li><input checked="" type="checkbox"/> TR-290 sync_byte_error</li> <li><input checked="" type="checkbox"/> TR-290 PAT sections error</li> <li><input checked="" type="checkbox"/> TR-290 PMT sections loss</li> <li><input checked="" type="checkbox"/> TR-290 CAT sections loss</li> <li><input checked="" type="checkbox"/> TR-290 PCR discontinuity indicator error</li> <li><input checked="" type="checkbox"/> PID lost</li> <li><input checked="" type="checkbox"/> RTP sequence error</li> <li><input checked="" type="checkbox"/> TR-290 PTS error</li> <li><input checked="" type="checkbox"/> Decoder runtime error</li> <li><input checked="" type="checkbox"/> Frozen video</li> <li><input checked="" type="checkbox"/> R-128 Loudness Level</li> <li><input checked="" type="checkbox"/> Audio signal level: silence</li> <li><input checked="" type="checkbox"/> Service bitrate</li> <li><input checked="" type="checkbox"/> Subtitles Loss</li> <li><input checked="" type="checkbox"/> TR-290 EIT Actual Sections Loss</li> <li><input checked="" type="checkbox"/> TR-290 EIT Other Error</li> </ul> <p>OK Cancel</p>
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## Example of Mosaic



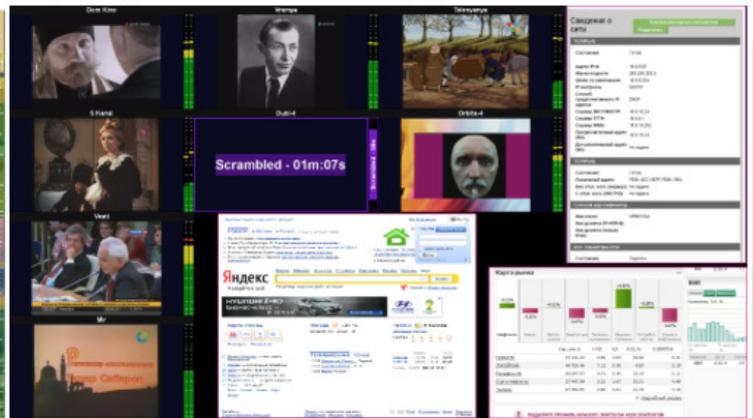
## DVB Subtitles, TeleText, Loudness, Multichannel Audio



## Displaying of EPG: EIT Present and EIT Following



## Displaying of the content of web pages



## Displaying of information about TS on a top of Video:

Service #10303 / 8272kbps  
 SWR >> PMT: 5120; PCR: 5121  
 SDT SWR BW HD / TV (AC HD)  
 Stream 1379 / 12kbps  
 Stream 2171 / 91kbps  
 Video 5121, AVC / 6940kbps  
 1280x720(0:0); 50fps  
 Audio 5122, MPEG-1 / 206kbps  
 Audio 6120, MPEG-1 / 206kbps  
 Stream 5124, Teletext / 305kbps  
 Stream 5125, DVB Subtitling / 26kbps  
 Audio 5126, AC3 / 477kbps  
 48.0kHz, 2 channels

- Service number and Service bitrate
- PID Program Map Table (PMT)
- PID Program Clock Reference (PCR)
- PID and audio stream codec of the program
- PID and video stream codec of the program
- Resolution of video stream and FPS
- Aspect Ratio
- Bitrate of Video stream
- Bitrate of Audio stream
- Teletext PID and bitrate
- DVB Subtitles PID and bitrate

## History of Alarms displayed on TV screen

**SBTN**  
 TR-290 PAT sections loss  
 Service lost  
 TR-290 PMT sections loss  
 PID lost

**RTVI**  
 TR-290 PAT sections loss  
 Service lost

**GEO**  
 TR-290 PAT sections loss  
 Service lost  
 TR-290 PMT sections loss

## Active Alarm displayed with timer + history inside

**Frozen video - 02m:21s**

- TR-290 PAT sections loss
- Service lost
- TR-290 PMT sections loss
- PID lost
- Frozen video

## On-screen visualization of Alarms

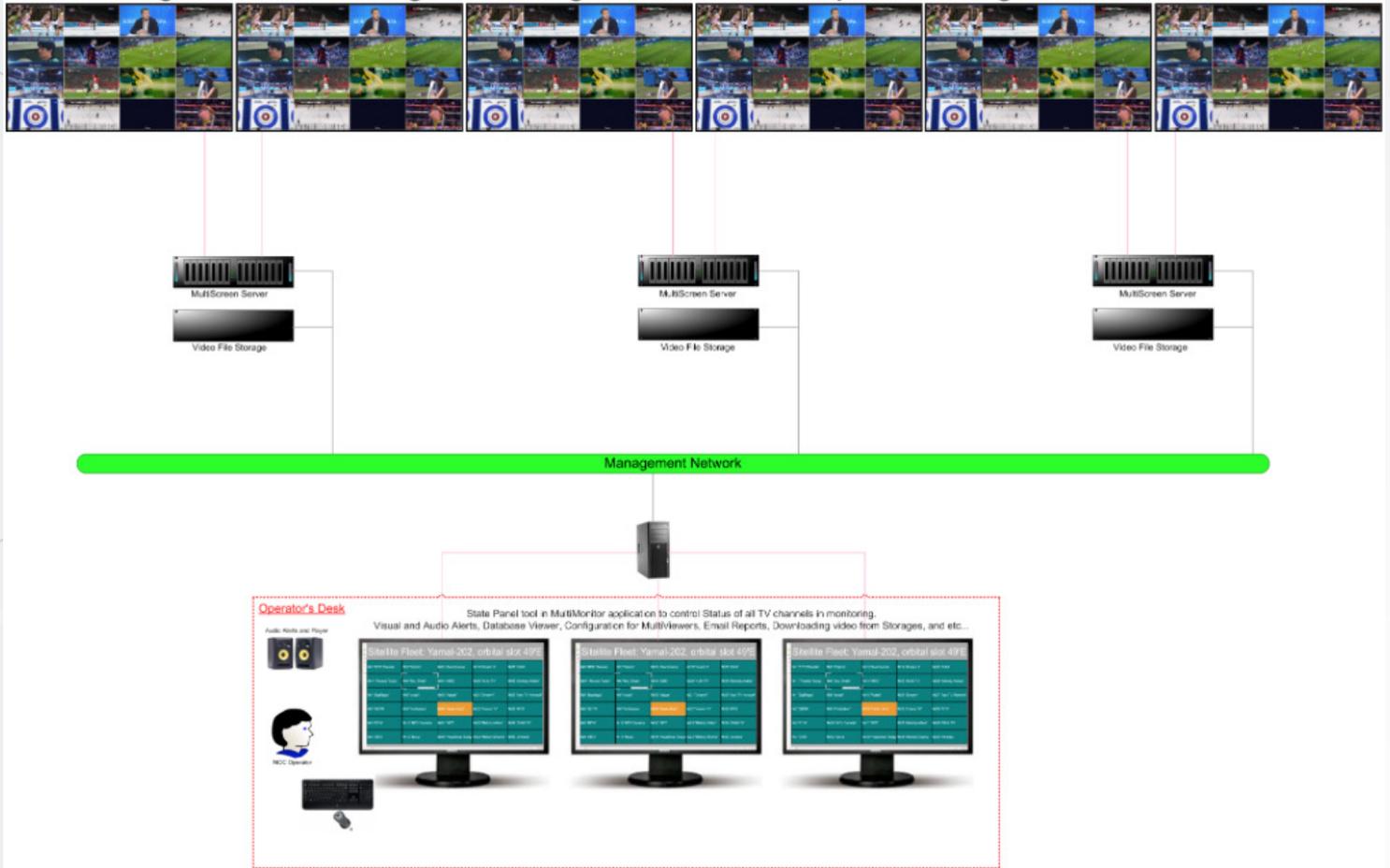
Black frame - 18m:37s  
 No stream license - 18m:51s  
 Frozen video - 18m:36s

TR-290 Continuity counter - 1273  
 TR-290 Continuity counter - 1321  
 TR-290 Continuity counter - 1175

TR-290 Continuity counter - 704  
 TR-290 Continuity counter - 1708  
 TR-290 Continuity counter - 1778  
 TR-290 Continuity counter - 1777

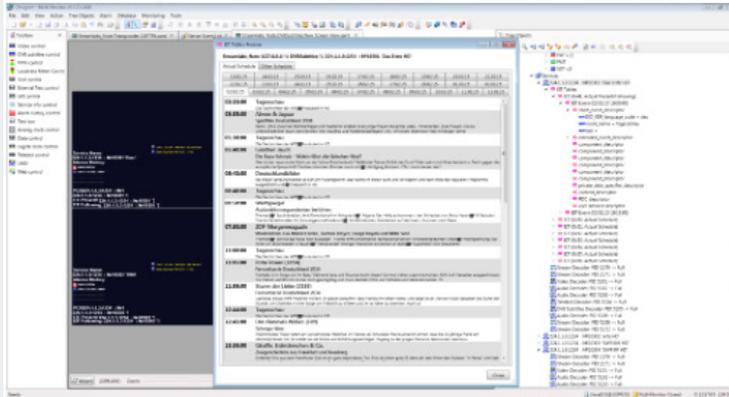
TR290 PCR Discontinuity - 22

**This basic diagram shows monitoring and recording of TV channels in compliance with regulations.**

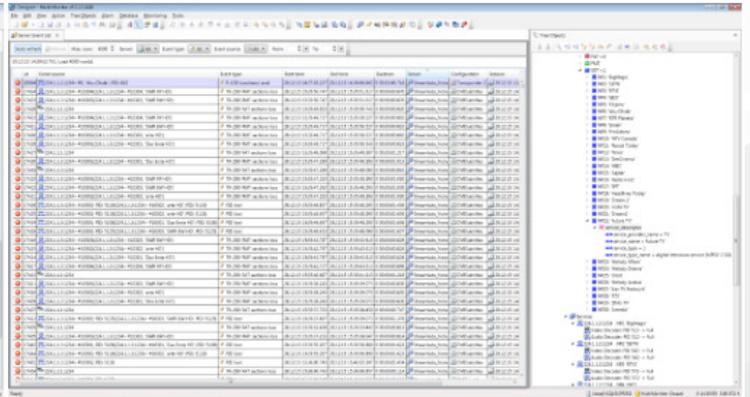


Client application MultiMonitor allows managing of all servers in the network, creating of Screen Views for MultiViewers, loading events from database for preview, watching of channels' statuses, redirecting channels with problems to Penalty Server, downloading video with errors from storage, providing visual and audio alerts to operator, emailing, etc.

**EPG Decoding in MultiMonitor app.(EIT tables + Toolbox)**



**Database Viewer**



Examples of configured Operator's application MultiMonitor- Statuses of all channels from all servers can be displayed in one MultiMonitor application on Operator's PC.

The screenshots show the following views:

- UPLINK/DOWNLINK:** A grid of channel status for various stations like RTR Planeta, Russia Today, and others, categorized by uplink and downlink.
- Satellite Fleet:** A grid titled 'Satellite Fleet: Yamal-202, orbital slot 49'E' showing channel assignments to specific satellite slots.
- Transponder Allocation:** A table showing how channels are mapped to Transponder 1 through Transponder 4.
- Processing/Transcoding:** A detailed view of the workflow from Downlink to H.264 Processing, H.265 Transcoding, and finally Uplink.

### Integration with MultiRec - Recording system

Stream MultiScreen can work jointly with system MultiRec, crafted for compliance recording. Database for alerts, generated by MultiScreen has been integrated with archive of recordings, produced by MultiRec; and allows downloading of fragments of archive, matching to alerts, straight from MultiScreen application in one click. You may view them later on at your convenience.

### Recorders in client application

This screenshot displays a table of recorders with columns for ID, Name, Status, and other technical details. A search bar and various filters are visible at the top of the interface.

### Downloading video fragment with Error from Storage

This screenshot shows a detailed view of a specific recording. It includes a list of frames, a video player, and a log of events. A red error message is visible, indicating a problem with downloading a video fragment from storage.

## Multi-view Server Hardware Datasheet

### Processor

Intel® Core™ i7-5820K 6Cores Processor 3.60GHz 15MB Cache LGA-2011(R3)

### Motherboard

Supermicro Workstation Board Intel® C612 Chipset Single Socket LGA-2011(R3)

### Realtek ALC1150 Hi-Definision 7.1 Audio Built-In

### Graphics Accelertor Unit

Nvidia GeForce GTX 950 with 2GB GDDR-5 ( 2DVi, 1HDMI, 1Display Port )

### Memory

ECC Registered DDR-4 SDRAM 16GB( 8GBx2 ) PC-2133..Intel Certified

### Storage

1xSSD 2.5inch SATA- 6Gb/s 256GB

### Chassis Unit

3U Rackmount Server Chassis 650watt Single Power Supply

Slided Rackmount Rail Kit Include

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