Contents

History of versions

The table below shows the history of versions of this document.

Ver-sion	Date	Author	Description
1.0	February 2018	Chalov K. V.	Initial version
1.0	February 2019	Lalik V.	Translation

Chapter 1. Stream MultiScreen interface elements

Image 1 presents the basic elements of Multi Monitor Designer Application interface.

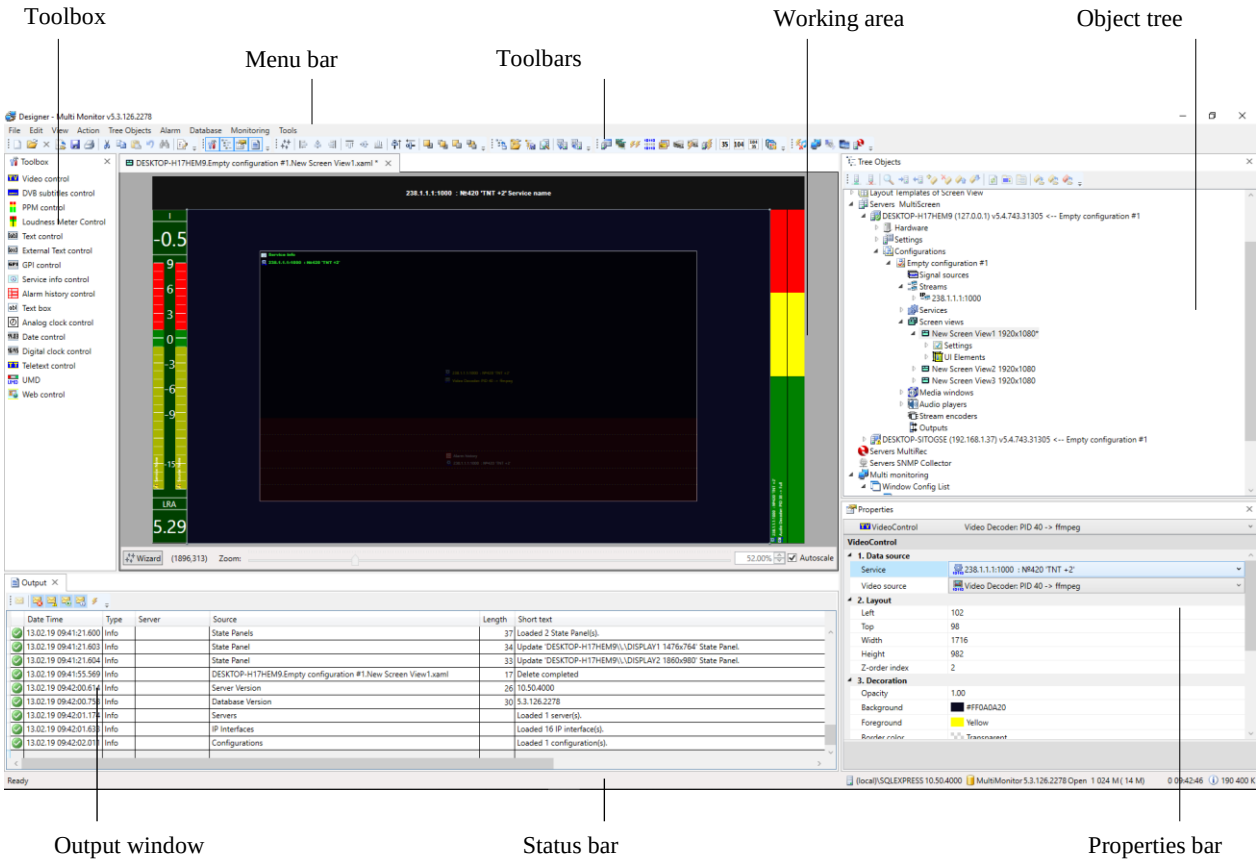


Image 1. Elements of Stream MultiScreen interface

Chapter 2. Detection of alarms

Detection of alarms is one of the key functions of Stream MultiScreen. When detecting alarms, the Multi Monitor Designer application performs visual, through status bar, and sound notification for the operator. Additionally, with a Data base server available, the system Stream MultiScreen may store the alarm reports in the database.

Overview of alarm types

There are two types of alarms:

1. Alarms that indicate errors in data streams depending on the type of input signals– see Table 1.
2. Alarms that indicate errors of program component SNMP Collector – see Table 2.

Table 1. Correspondence between alarms and types of data streams

Alarm	Data stream						
	MPEG-2 TS	RTMP	HLS	MMS	RTSP	SDI / HD-SDI	CVBS
No license	No license for processing service						
HLS transport error			✓				
Low throughput			✓	✓			
Sync loss	✓		✓				
TR-290 TS sync loss	✓		✓				
Signal loss		✓		✓	✓	✓	✓
TR-290 transport error	✓		✓				
TR-290 sync byte error	✓		✓				
TR-290 PAT sections loss	✓		✓				
TR-290 PAT sections error	✓		✓				
Service lost	✓		✓				
TR-290 PMT sections loss	✓		✓				
TR-290 PMT sections error	✓		✓				
TR-290 CAT sections loss	✓		✓				
TR-290 CAT sections error	✓		✓				
TR-290 PCR discontinuity indicator error	✓		✓				
TR-290 PCR repetition error	✓		✓				
PID lost	✓	✓	✓	✓	✓		
TR-290 continuity counter error	✓		✓				
RTP sequence error					✓		
PID scrambled	✓		✓				
TR-290 PTS error	✓		✓				
PES decoder error	✓		✓				
Decoder runtime error	✓	✓	✓	✓	✓		
Priority 1: Label Detected	✓		✓			✓	✓
Priority 2: Label Detected	✓		✓			✓	✓
Priority 3: Label Detected	✓		✓			✓	✓
Black video	✓	✓	✓	✓	✓	✓	✓
Frozen video	✓	✓	✓	✓	✓	✓	✓
Video artifacts detected	✓		✓			✓	✓
Video aspect ratio	✓		✓			✓	✓
R-128 Loudness Splash	✓	✓	✓	✓	✓	✓	✓

Alarm	Data stream						
	MPEG-2 TS	RTMP	HLS	MMS	RTSP	SDI / HD-SDI	CVBS
R-128 Loudness Level	✓	✓	✓	✓	✓	✓	✓
R-128 Loudness True Peak	✓	✓	✓	✓	✓	✓	✓
R-128 Loudness Short Term	✓	✓	✓	✓	✓	✓	✓
Audio signal level: overload	✓	✓	✓	✓	✓	✓	✓
Audio signal level: silence	✓	✓	✓	✓	✓	✓	✓
Transport stream bitrate	✓	✓	✓	✓	?		
Service bitrate	✓		✓		?		
Teletext page loss	✓					✓	
Subtitles loss	✓						
TR-290 EIT Error	✓						
TR-290 EIT Actual Sections Loss	✓						
Service EIT Gap	✓						
Service EIT Intersection	✓						
TR-290 EIT PF Error	✓						
TR-290 EIT Other Error	✓						

Table 2. Errors generated by the program component SNMP Collector

Alarm	WISI Tangram	Nevion TNS 547
SNMP Collector No license	No license for the component SMNP Collector	
SNMP Connection lost	✓	✓
Signal Unlocked	✓	
RF Level	✓	
Eb/N0 Level	✓	
SNR Level	✓	
BER Level	✓	
Incorrect port		✓
T2MI packet type error		✓
T2MI packet payload error		✓
T2MI packet count error		✓
T2MI CRC error		✓
T2MI payload error		✓
T2MI PLP num blocks error		✓
T2MI transmission order error		✓
T2MI timestamp error		✓
T2MI timestamp dicontinuity error		✓
T2MI T2 frame length error		✓

Parameters of notification and protocolling

The system Stream MultiScreen allows configuring parameters of notification and protocolling for each alarm individually. The parameters are defined in the menu **Object tree ⇒ System configuration ⇒ Alarms**. When clicking on an alarm, its properties are displayed in the Properties bar. (see image 2).

Stream MultiScreen supports the following ways of notification about detected alarms:

- Checkback of the alarm– notification with request of confirmation of the operator and recording history of the alarms;
- Sound notification on MultiScreen server;
- Sound notification in the Multi Monitor application;
- Visualization on the video wall – overall mosaic of the servers, where alarms for services are displayed when they happen;
- Visualization on the video wall of dynamic visualization– the video wall automatically displays the servers that have active alarms, also on the video wall of dynamic visualization the APM operator may manually display the servers, e.g. to control quality of the broadcasts that require extra attention;
- Protocolling of the alarms on the data base server;
- Displaying the alarms in the applications Multi Monitor and Multi Monitor Designer;
- E-mail notifications;
- Notifications via SNMP protocol.

The image 2 shows description of the general notification and protocolling parameters for every alarm. Point **2. Design** refers to the next paragraph **Parameters of visualization**.

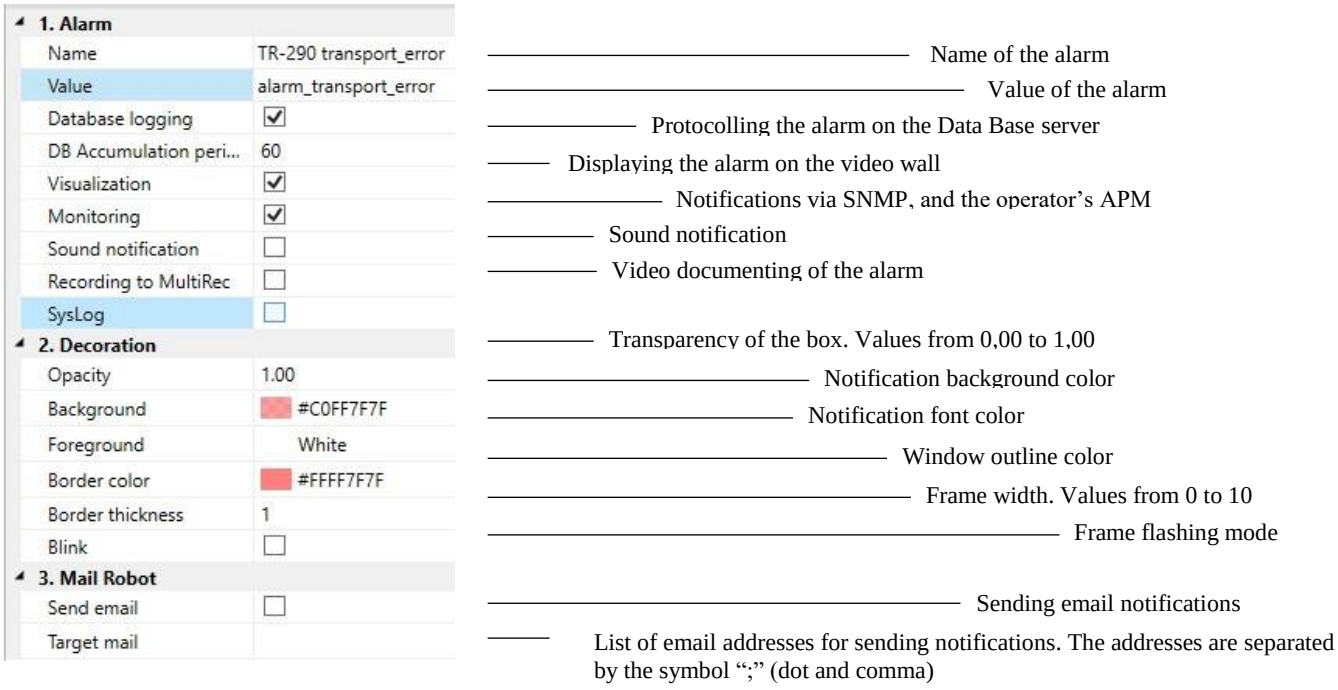


Image 2. Default parameters of notification, protocolling and visualization

When turning on the **Monitoring** parameter, it is required to install additional program module **SNMP extension agent** in order to correctly notifications via SNMP protocol.

When turning on the **Send email** parameter, you need to indicate the setting of SMTP-server in the Properties bar for **Object tree ⇒ System configuration ⇒ Mail robot** in order to correctly send e-mail notifications.

Parameters of visualization

Visualization of the alarm in the system Stream MultiScreen is represented by a text box with the alarm and framed video and/or audio indicators. An example is presented on image 3.

Image 3. Visualization of an alarm

The system Stream MultiScreen allows configuring parameters of visualization for each alarm. Image 2 in point **2. Design** presents parameters of visualization and their description.

Chapter 3. Detailed description of the alarms

In Stream MultiScreen, the alarms may have both global and local (user's) parameters:

- The global parameters determine default settings for all services. They are configured in the menu **Object tree ⇒ System configuration ⇒ Alarms**. When clicking on an alarm, its properties are displayed in point **1 Alarm**;
- The local (user's) parameters alter the global default settings and may be configured individually for any service. The local parameters are only available for a part of the alarms, the information about them is provided in the corresponding paragraphs, since for most alarms local configuration of parameters is not necessary.

A detailed description of the alarms and their properties is provided further in this Chapter, in the order that they appear in the menu **Object tree ⇒ System configuration ⇒ Alarms**, i.e. starting with the more important alarms and continuing with less important.

In order to quickly find an alarm, see **Alphabetic index of the alarms** on page 33 of this document.

No license

There is no license for processing service.

HLS transport error

The alarm indicates problems with delivering a data segment in the HLS transport stream. It occurs when the status returned to a HTTP inquiry is different from normal.

The error may be caused by:

- incorrect address of the stream;
- incorrect settings of proxy server;
- problems loading a data segment (see **Low throughput** error description).

For detailed diagnostics of this error it is recommended to launch Stream Multi Monitor Designer application, establish connection with the server that generates the error and open Output window. Every time the HLS Transport error occurs, the Output window will display an error message with description of the reason for its occurrence.

Parameters of the alarm:

—— the period of time during which errors for one record on the Data base server are accumulated (default value– 120 s).

Low throughput

The alarm indicates insufficient throughput of the input channel.

When forming a HLS stream, the incoming data stream is being buffered and separated to segments, with each segment being saved on the broadcast server as a separate file. When saving a segment, the broadcast server also saves its time length. The video processing module, in its turn, loads the current list of segments from the broadcast server as http links; the list of links also contains information on the length of each segment. According to the specification, the length of each segment equals about 10 seconds.

The Low throughput error occurs in case the time of loading the segment exceeds the length of the segment, i.e. the video processing module does not manage to load the data from the broadcast server on time.

Note: in case the video processing module constantly loads the segments with the speed that is slower than the speed of video signal broadcast, delay of the loading will increase. On the other hand, time of storing the data segments on the side of the server is limited, and the segments are removed upon expiration of the storing time. As a result, it comes to the point when the video processing module requests a segment that is not stored on the server anymore. In this case, the **HLS transport error** is generated**,** and there happens disruption of data, which can lead to errors of receiving the transport stream, decoding errors, and problems of video playback.

The MMS stream broadcast server with particular periodicity (usually once a second) transfers the parameter Optimal Bitrate, which gives quality assessment of the optimal speed of the bit rate for broadcasting, without delays for buffering and omission of frames on the side of the client. The video processing module calculates the current speed of bit stream reception when working, and in case the speed is slower than the Optimal Bitrate speed, the Low throughput error occurs.

The error may be caused by:

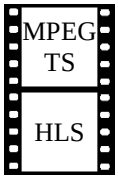
- problems with signal delivery channel;
- specific configuration of the broadcast server — e.g., using VBR or MBR encoding.

Parameters of the alarm Low throughput

Name	Default setting	Description
Throughput enabled	False	Enables detection of the alarm
Threshold, %	90	The parameter allows reducing sensitivity of the detector to the deviations of the calculated bit rate from the optimal meaning received from the broadcast server

Note: Detection of the alarm is disabled by default. Parameters are configured in the properties of MMS stream.

Sync loss



The alarm indicates absence of data in the video processing module during a designated period of time.

The error may be caused by:

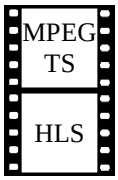
- incorrectly indicated parameters of the stream;
- problems with data delivery;
- absence of signal on the ASI input.

For HTTP Live Streaming (HLS) streams, the error may also be caused by incorrect parameters of the proxy server. In this case, the error is accompanied by the **HLS transport error**.

Parameters of the alarm:

— minimal period of time during which input data have to be absent for the error to occur.

TR-290 TS sync loss



The alarm indicates the loss of synchronization with the MPEG-2 TS transport stream. Every time the synchronization with the transport stream is lost, alarm counter increments to 1.

The standard ISO/IEC 13818-1, part G.01, indicates that for successful synchronization five successive bytes of transporting packages MPEG-2 TS are sufficient.

The error may be caused by:

- bad conditions for signal reception;
- malfunctions in stream source;
- format of the stream being different from MPEG-2 TS.

Parameters of the alarm:

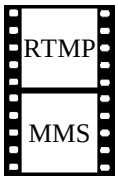
— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

Signal loss

The alarm signals the lack of incoming data during a designated period of time.

Parameters of the alarm:

— minimal period of time during which input data have to be unavailable for the error to occur.



The error may be caused by:

- incorrectly indicated link to the stream;
- problems with delivering data via different security system of the corporation network;
- problems with accessing the broadcast server.

The error may also occur if the video processing module can not access the broadcast server for a long time. In this case, the Window of Stream Multi Monitor application displays notifications on connection errors.

Note: Since the process of connecting to the broadcast server of MMS streams may take a long time (starting with 30 seconds), it is recommended to increase the setting of the Time-out parameter for this event.

The error may be caused by:

- lack of SDI/HD-SDI signal on the board input;
- problems with installing drivers to corresponding devices;
- hardware problems with SDI signal input boards.

The error may be caused by:

- problems with installing drivers to corresponding devices;
- hardware problems with CVBS signal input boards.

TR-290 transport error

MPEG TS
HLS

The alarm indicates reception of a packet with the **transport_error_indicator** flag.

The flag transport_error_indicator may be set by a receiver, in case a data reception error is detected. If a packet with the flag **transport_error_indicator** is received, transport_error_indicator, the server increments alarm counter and stops further processing of this packet.

The error may be caused by:

- bad conditions for signal reception;
- malfunctions in stream source.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

TR-290 sync byte error

MPEG TS
HLS

The alarm indicates reception of the transporting packet with incorrect synchronization byte.

The error occurs in case that after receiving 188 or 204 bytes of transport stream, a correct synchronization byte (0x47) is not detected. Unlike the **TR-290 TS sync loss** error, this alarm indicates single malfunctions in the reception of the transporting packets.

The error may be caused by:

- bad conditions for signal reception;
- malfunctions in stream source.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

TR-290 PAT sections loss

MPEG TS
HLS

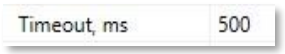
The alarm signals absence of some sections of tables of interconnection of PAT programs in the transport stream during a set period of time.

A table of interconnection of programs, indicating the services included in the transport stream, is transmitted in the transport stream. If the table is absent, no service may be decoded.

The error may be caused by:

- incorrect transport stream;
- bad conditions for signal reception;
- malfunctions in stream source.

Parameters of the alarm:



— minimal period of time during which input data have to be absent for the error to occur.

Note: for HTTP Live Streaming (HLS) streams, in order to avoid false operations, it is recommended to set the Time-out parameter to 10000-12000 ms (default setting – 500 ms). According to the specification, the tables PAT and PMT are only transmitted in the beginning of the segment, which are up to 10 seconds long.

TR-290 PAT sections error

MPEG TS
HLS

The alarm indicates detection of an incorrect section of the table of interconnection between PAT programs. A table of interconnection of programs is transmitted in the transport stream, indicating the services included in the transport stream. The error appears in case the table is enciphered, or when sections with incorrect table identifier are received.

The error may be caused by:

- incorrect transport stream;
- bad conditions for signal reception;
- malfunctions in stream source.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

Service lost

MPEG TS
HLS

The alarm indicates that the required service is absent in the table of interconnection between PAT programs. The video processing module checks the availability of the services added to the monitoring system. The error occurs in case the required server is not found.

The error may be caused by:

- changes in structure of transport stream services;
- incorrect transport stream;
- bad conditions for signal reception;
- malfunctions in stream source.

Parameters of the alarm:

— minimal period of time during which input data have to be absent for the error to occur.

TR-290 PMT sections loss

MPEG TS
HLS

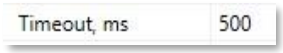
The alarm indicates absence of sections of the table of interconnection between PAT programs during a designated period of time. The period is designated by the parameter Time-out of the alarm.

In the transport stream, after each service a structure table of PMT program is transmitted, which determines streams of all elements of the service. If the table is absent, the service can not be decoded.

The error may be caused by:

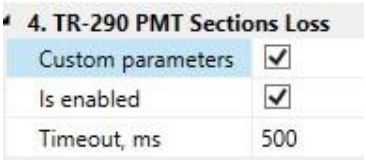
- incorrect transport stream;
- bad conditions for signal reception;
- malfunctions in stream source.

Parameters of the alarm:



— minimal period of time during which input data have to be absent for the error to occur.

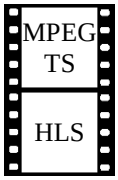
Parameters of the alarm may be redefined for any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service**, and find **point 4. TR-290 PMT sections loss** in the Properties bar. Then define the necessary parameters of the alarm:



— Enable using local parameters;
— Enable detecting alarm;
— See description of alarm parameters.

Note: In order to avoid false alarms for HTTP Live Streaming (HLS) streams, it is recommended to set the Time-out parameter to 10000-12000 ms (default setting – 500 ms). According to the specification, the PAT and PMT tables are only transmitted in the beginning of the segment, which are up to 10 seconds long.

TR-290 PMT sections error



The alarm indicates detection of an incorrect section in the PMT structure table.

The alarm indicates the detection of an incorrect section of the table of interconnection between PAT programs. A table of interconnection of programs is transmitted in the transport stream, indicating the services included in the transport stream. The error occurs in case the table is encrypted, or in case sections with incorrect table identifier are received.

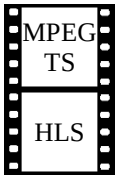
The error may be caused by:

- incorrect transport stream;
- bad conditions for signal reception;
- malfunctions in stream source.

Parameters of the alarm:

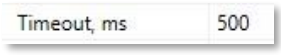
— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

TR-290 CAT sections loss



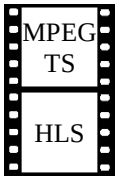
The alarm indicates presence of encrypted data in the transport stream, and absence of sections in the table of CAT structure during a period of time designated by the Time-out parameter.

Parameters of the alarm:



— minimal period of time during which input data have to be absent for the error to occur.

TR-290 CAT sections error

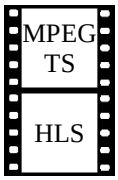


The alarm indicates presence of encrypted data in the transport stream, and absence of sections in the conditional access table of CAT structure (According to the document ETSI TR 101 290).

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 60 s).

TR-290 PCR discontinuity indicator error



The alarm indicates detection of discontinuity in time markers during reception of the service or transport stream.

A stream of time markers (PCR) of the base timer is transmitted for every stream; these markers are used for time synchronization in the decoder and playback of elementary streams.

The error occurs if the interval between two successive markers exceeds the designated ranch, and the header of the stream does not carry **discontinuity_indicator** flag.

The error may be caused by:

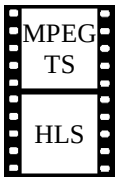
- incorrect transport stream;
- bad conditions for signal reception;
- losses of packages;
- malfunctions in stream source.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

— the maximal allowed interval between two successive time markers without the flag discontinuity_indicator.

TR-290 PCR repetition error



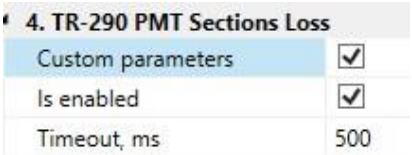
The time markers of the transport stream are used for regeneration of twenty-seven local Mhz system clock. If the time markers are not received with sufficient regularity, the clock may glork. Loss of synchronization with the receiver/decoder is also possible. Therefore it is recommended to set the interval between the markers for not less than 40 ms for DVB signal.

The error that may be generated after the repetition interval is checked is called PCR_repetition_error.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

Parameters of the alarm may be redefined for any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service**, and find point **5. TR-290 PCR repetition error** in the Properties bar. Then define the necessary parameters of the alarm:



— Enable detection of the alarm;
— Enable using the local parameters;
— See description of alarm parameters.

PID lost

MPEG TS
HLS

The alarm indicates that the data of the controlled elementary stream is not received.

The alarm indicates that data of the corresponding audio or video stream is not being received during a designated period of time.

The error may be caused by:

- malfunctions in stream source;
- changes in structure of services of the transport stream;
- incorrect transport stream;
- incorrect settings of the multiplexor.

RTMP
MMS

The alarm indicates that data of the corresponding audio or video stream is not being received during a designated period of time.

The error may be caused by:

- change of broadcast format;
- problems with broadcast server.

Parameters of the alarm:

— minimal period of time during which input data have to be absent for the error to occur.

Parameters of the alarm may be redefined for each decoder of any service.Для этого выберите пункт **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Stream decoder,** or **Audio decoder,** or **Video decoder**, and find point **1.1 PID lost** in the Properties bar. Then define the necessary parameters of the alarm:

— Enable using the local parameters;
— Enable detection of the alarm;
— See description of alarm parameters.

TR-290 continuity counter error

MPEG TS
HLS

The alarm indicates detection of incorrect continuity of transferring packets of elementary stream.

The error occurs in case repetitions, loss or incorrect order of the transporting packets are detected.

The error may be caused by:

- bad conditions for signal reception;
- incorrect settings of the network;
- incorrect settings of sources of the stream.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

RTP sequence error

RTSP

The alarm indicates detection of control error in RTP protocol continuity.

The error may be caused by:

- loss of data during transmission;
- incorrect settings of the network.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

PID scrambled

MPEG TS
HLS

The alarm indicates that the elementary stream is encrypted or scrambled.

The error may be caused by incorrect work or absence of CAM module of conditional access on the equipment of the source of the transport stream.

Parameters of the alarm:

— minimal period of time for receiving scrambled packets in order for the error to occur. If Timeout is set to 0, receiving one scrambled packet is sufficient for the error to occur.

TR-290 PTS error

MPEG TS
HLS

The alarm indicates detection of error in time margin of the elementary stream (PTS) (According to the document ETSI TR 101 290).

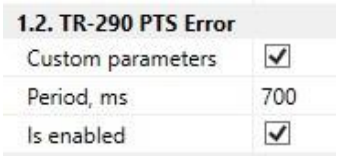
The error may be caused by:

- incorrectly formed transport stream;
- bad conditions for signal reception.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

Parameters of the alarm may be redefined for audio and video decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder** or **Video decoder**, and find point **1.2 TR-290 PTS error** in Properties bar. Then define the necessary parameters for the alarm:



— Enable using the local parameters;
— Enable detection of the alarm;
— See description of alarm parameters.

PES decoder error

MPEG TS
HLS

The alarm signals the detection of error of the decoding of the packeted elementary stream.

The error may be caused by incorrectly formed transport stream.

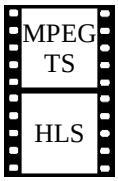
Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (default value – 120 s).

Decoder runtime error

The alarm indicates problems in decoding a block of the elementary stream.

The video processing module decodes input streams for analyzing and visualizing them on screen. Every time the decoder can not decode a frame for some reason, the Decoder runtime error occurs.



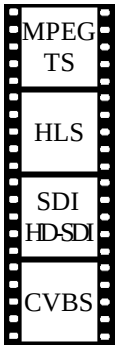
The error may be caused by:

- bad conditions for signal reception;
- loss of packets;
- incorrectly formed time margins;
- internal problems of the decoding subsystem in the video processing module.

The error may be caused by:

- loss of packets;
- incorrectly formed time markers;
- internal problems of the decoding subsystem in the video processing module.

Priority 1: Label Detected



The Priority X: Label Detected module monitors appearances of static images designated by the user in the incoming video signal. It can be used for detection of service messages displayed on the video signal by the receiver, e.g. “no signal” or “input signal decoded”.

The static images selected by the user are loaded to the repository and granted priority 1, 2 or 3. In this way, in case a static image appears in the video signal, the error alarm appears, with its priority indicated: Priority 1: Label Detected, Priority 2: Label Detected or Priority 3: Label Detected.

For detailed guide for loading static images and its setup, see separate guide **Image recognition module.**

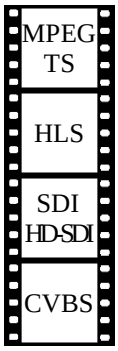
Parameters of the alarm:

— minimal period of time of image being displayed for the error to occur.

Parameters of the alarm may be redefined for video decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed con-figuration⇒ Services ⇒ The needed service ⇒ Video decoder**, and find point **3.1 Priority 1: Label Detected** in Properties bar. Then define the necessary parameters for the alarm:

— Enable using the local parameters;
— Enable detection of the alarm;
— See description of alarm parameters.

Priority 2: Label Detected



Description of the alarm – see. **Priority 1: Label Detected**.

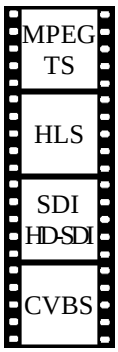
Parameters of the alarm:

— minimal period of time of image being displayed for the error to occur.

Parameters of the alarm may be redefined for video decoder of any service. Для этого выберите пункт **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Video decoder**, and find **3.2 Priority 2: Label Detected** in Properties bar. Then define the necessary parameters for the alarm:

— Enable using the local parameters;
— Enable detection of the alarm;
— See description of alarm parameters.

Priority 3: Label Detected



Description of the alarm – see **Priority 1: Label Detected**.

Parameters of the alarm:

— minimal period of time of image being displayed for the error to occur.

Parameters of the alarm may be redefined for video decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Video decoder**, and find point **3.3 Priority 3: Label Detected** in Properties bar. Then define the necessary parameters for the alarm:

— Enable using the local parameters;
— Enable detection of the alarm;
— See description of alarm parameters.

Black video

MPEG TS
RTMP
HLS
MMS
RTSP
SDI HD-SDI
CVBS

The alarm indicate that the input stream contains black frame during designated period of time.

The error may be caused by:

- black frame in the broadcast;
- malfunctions in stream source.

For CVBS streams, the error may be caused by the lack of signal on the CVBS input.

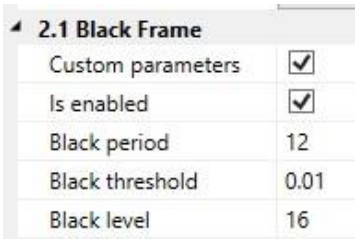
Parameters of the alarm:

— minimal duration of black frame being registered for the error to occur. It is designated in seconds;

— the lower this parameter is, the more sensitive the algorithm is to the noise in the analyzed stream. Values from 0 to 1;

— Threshold level of brightness, lower value is considered black. Values from 0 to 255.

Parameters of the alarm may be redefined for video decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Video decoder**, and find point **2.1 Black frame** in Properties bar. Then define the necessary parameters for the alarm:



Enable using the local parameters;

Enable detection of the alarm;

— See description of alarm parameters;

— See description of alarm parameters;

— See description of alarm parameters.

Frozen video

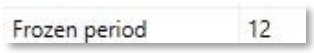
MPEG TS
RTMP
HLS
MMS
RTSP
SDI HD-SDI
CVBS

The alarm indicates still picture in input stream during designated time interval.

The error may be caused by:

- static picture in input signal;
- malfunctions in the equipment of the source signal..

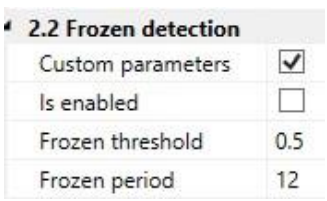
Parameters of the alarm:



— minimal period of time of image being static for the error to occur. Designated in seconds;

— the lower this parameter is, the more sensitive the algorithm is to the noise in the analyzed stream. Values from 0 to 1;

Parameters of the alarm may be redefined for video decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed con-figuration⇒ Services ⇒ The needed service ⇒ Video decoder**, and find point **2.2 Detection of frozen video** in the Properties bar. Then define the necessary parameters for the alarm:



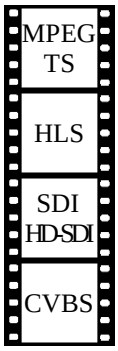
— Enable using local parameters;

— Enable detection of an alarm;

— See description of alarm parameters;

— See description of alarm parameters.

Video artifacts detected



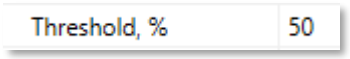
The alarm signals detection of artifacts in the video signal. This functional may be used for detecting deformations of the decoded video image in any point of the broadcast by capturing signal in this point, sending it to MultiScreen and checking presence of artifacts.

The appearance of artifacts is characterized by the following:

- appearance of blocking in the frame, detected by presence of vertical and horizontal block frames of various sizes;
- sudden evolution of blocks, which is an usually uncharacteristic of live broadcasts;
- presence of microfreezing and time cyclicity in areas of the image (jerking, freezing, reset).

The detection algorythm monitors presence of abovementioned diagnostic features and displays alarm message on increase of cumulative density of diagnostic features in the given interval.

Parameters of the alarm:



— threshold of sensitivity, allowed cumulative density of diagnostic features of the artifacts;

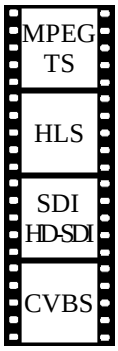
— the period of time during which errors for one record on the Data base server are accumulated.

Parameters of the alarm may be redefined for video decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Video decoder**, and find point **4. Video artifacts detected** in the Properties bar. Then define the necessary parameters for the alarm:

— Enable using local parameters;
— Enable detection of the alarm;
— See description of alarm parameters.

Note: By default, detection of the alarm is disabled because it requires a lot of computer resources. For that reason, it is only possible to enable detection of the alarm individually, via user's parameters of the service.

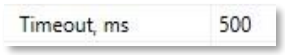
Video aspect ratio



The alarm indicates detection of incorrect ratio of the aspects of video signal.

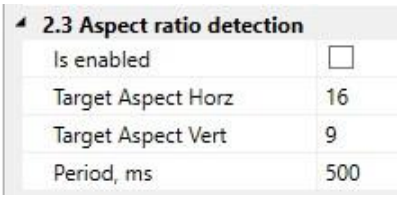
The error may be caused by incorrect settings of the video decoder.

Parameters of the alarm:



— Time given to stabilization of the image for the correct detection of the ratio of video aspects.

The estimated ratio of the aspects is predefined in the parameters of the video decoder of each service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Video decoder**, and find point **2.3 Detecting ratio of aspects** in the Properties bar. Then define the necessary parameters for the alarm:



— Enable detection of the alarm;

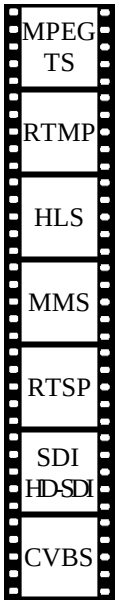
— Estimated aspect ratio;

— Estimated aspect ratio;

— See description of alarm parameters.

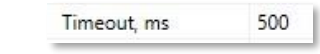
Note: By default, detection of the alarm is disabled because it requires configuring parameters of the alarm in the properties of corresponding streams.

R-128 Loudness Splash



The alarm indicates that the difference between the current value of the audio signal loudness and the loudness value 5 minutes prior exceeds the allowed value.

Parameters of the alarm:



— periodicity of measuring loudness splash;

— value of maximal difference between adjacent control points.

The parameters of the alarm may be redefined for the audio decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and find point **3.2 Loudness Splash** in the Properties bar. Then define the necessary parameters for the alarm.

Detection of the alarm is disabled by default, and must be enabled individually for each audio decoder of the service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and in the point **3. Loudness detection** in the Properties bar check the box for the Parameter **Loudness detection**.

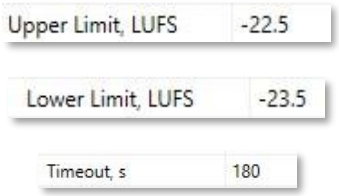
R-128 Loudness Level

MPEG TS
RTMP
HLS
MMS
RTSP
SDI HD-SDI
CVBS

The alarm indicates that the integral level of the audio signal loudness, computed during a designated period of time using the sliding window method, is beyond the predefined range. (According to the document EBU R128). The value of integral loudness on the given interval is computed in accordance with the recommendation ITU-R BS.1770-3.

The occurrence is caused by incorrect level of loudness in the audio program.

Parameters of the alarm:



—— maximal allowed level of loudness;

—— minimal allowed level of loudness;

—— period of measuring the integral level of loudness.

The parameters of the alarm may be redefined for the audio decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed con-figuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and find point **3.1 R-128 Loudness Level** in the Properties bar. Then define the necessary parameters for the alarm.

Detection of the alarm is disabled by default, and must be enabled individually for each audio decoder. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and in the point **3. Loudness detection** check the box of the parameter **Loudness detection**.

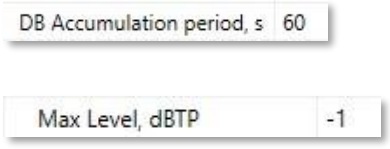
R-128 Loudness True Peak

MPEG TS
RTMP
HLS
MMS
RTSP
SDI HD-SDI
CVBS

The alarm indicates that the true level of audio signal peaks exceeds the predefined threshold value (In accordance with recommendation ITU-R BS.1770-3).

The occurrence is caused by incorrect level of loudness in the audio program.

Parameters of the alarm:



—— the period of time during which errors for one record on the Data base server are accumulated (by default – 120 s).

—— maximal allowed level of true peaks.

The parameters of the alarm may be redefined for the audio decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and find point **3.4 R-128 Loudness True Peak** in the Properties bar. Then define the necessary parameters for the alarm.

Detection of the alarm is disabled by default, and must be enabled individually for each audio decoder. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and in the point **3. Loudness detection** check the box of the parameter **Loudness detection**.

R-128 Loudness Short Term

MPEG TS
RTMP
HLS
MMS
RTSP
SDI HD-SDI
CVBS

The alarm signals that short-term loudness of the audio signal exceeds the maximal allowed level (In accordance with recommendation ITU-R BS.1770-3).

The occurrence is caused by incorrect level of loudness in the audio program.

Parameters of the alarm:

— the period of time during which errors for one record on the Data base server are accumulated (by default – 120 s);

— maximal allowed level of short term loudness.

The parameters of the alarm may be redefined for the audio decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed con-figuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and find the point **3.3 R-128 Loudness Short Term** in Properties bar. Then define the necessary parameters for the alarm.

Detection of the alarm is disabled by default, and must be enabled individually for each audio decoder. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and in the point **3. Loudness detection** check the box of the parameter **Loudness detection**.

Audio signal level: overload

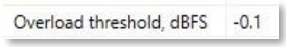
MPEG TS
RTMP
HLS
MMS
RTSP
SDI HD-SDI
CVBS

The alarm indicates that the level of sound in the input signal exceeds the predefined threshold.

The error may be caused by:

- amplification of sound level;
- decoding errors of the input stream.

Parameters of the alarm:



— level of loudness exceeding which will classify the audio signal as overloaded. Values from -90 to 0;

— the period of time during which errors for one record on the Data base server are accumulated (by default – 120 s).

The parameters of the alarm may be redefined for the audio decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and find the point. **2.2 Overload Detection** in Properties bar. Then define the necessary parameters for the alarm.

Audio signal level: silence

MPEG TS
RTMP
HLS
MMS
RTSP
SDI HD-SDI
CVBS

The alarm indicates that audio level in input stream has not exceeded the designated minimal value during the designated time interval, i.e. sound may be missing.

The error may be caused by:

- silence during broadcast;
- malfunctions in audio source.

For SDI/HD-SDI and CVBS streams the error may be caused by lack of signal in the analogue input audio device.

Parameters of the alarm:

___ period of time when the level of sound must not exceed threshold value in order for the error to occur;

___ level of loudness below which the audio signal is classified as silence.

The parameters of the alarm may be redefined for the audio decoder of any service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Audio decoder**, and find point **2.1 Silence Detection** in Properties bar. Then define the necessary parameters for the alarm.

Transport stream bitrate

MPEG TS
RTMP
HLS
MMS

The alarm indicates that the bit rate of the input transport stream exceeds the designated range.

The video processing module computes average bit rate on the designated interval and compares it with predefined threshold values. The error occurs if the average bit rate of input stream is beyond the predefined range.

The error may be caused by:

- problems with communication channel;
- incorrect settings of stream source.

Parameters of the alarm:

Name	Default value	Description
Bitrate enabled	False	Detection of the alarm
Bitrate period, c	8	Time interval for computation of average bit rate
Threshold high, Kb/s	0	The top threshold of bit rate. The error occurs if it is exceeded. It is disabled if the value is set to 0.
Threshold low, Kb/s	0	The bottom threshold of bit rate. The error occurs is it is not reached. It is disabled if the value is set to 0.

Note: Detection of the alarm is disabled by default since it requires configuring parameters of the alarm in the properties of corresponding streams.

Service bitrate

MPEG TS
HLS

The alarm indicates that the bit rate of input stream of the selected service is beyond the predefined range.

The video processing module computes average bit rate for the input transport stream and compares it with predefined threshold values. The bit rate is computed for all the components included in the service. The error occurs if the average bit rate is beyond the predefined range.

The error may be caused by:

- problems with connection channel;
- incorrect settings of stream source.

Parameters of the alarm:

Name	Default value	Description
Bitrate enabled	False	Detection of the alarm
Bitrate period, s	8	Time interval for computation of average bit rate
Threshold high, Kb/s	0	The top threshold of bit rate. The error occurs if it is exceeded. It is disabled if the value is set to 0.
Threshold low Kb/s	0	The bottom threshold of bit rate. The error occurs is it is not reached. It is disabled if the value is set to 0.

Note: By default, detection of the alarm is disabled, since it requires configuring parameters in the properties of the corresponding streams.

Teletext page loss

MPEG TS
HLS
SDI
HD-SDI

The alarm indicates that the required pages of teletext have not been found.

Teletext is demultiplexed in accordance with the standard ETSI EN 300 472. Teletext is decoded in accordance with the standard ETSI ETS 300 706.

The video processing module can demultiplex from the transport stream and decode teletext data. The function of controlling the designated pages of teletext is available. For example, it is possible to set up maximal time out for reception of teletext pages, controlling the existence of hidden subtitles in this way.

The parameters of the alarm are defined in the teletext decoder of the corresponding service. In order to do that, select **Objects tree ⇒ MultiScreen Servers ⇒ The needed server ⇒ Configurations ⇒ The needed configuration⇒ Services ⇒ The needed service ⇒ Teletext Decoder**, and find point **2.1 Teletext page loss** in Properties bar. Then define the necessary parameters for the alarm:

—— Enable detection of the alarm;

—— See next paragraph.

The **Page** parameter has the following syntax:
$x_1 : y_1 ; x_2 : y_2 ; \dots ;$ – where x_n is the teletext page number, and y_n, is its maximal periodicity of appearance in seconds. Error occurs if at least one page has not appeared in the designated period of time.

Note: Detection of alarms is disabled by default, since it requires configuring parameters of the event in the properties of corresponding streams.

Subtitles loss

MPEG TS

The alarm indicates absense of subtitles in the transport stream.

The video processing module is able to demultiplex from the transport stream and decode data of hidden subtitles in accordance with the specification ETSI EN 300 743.

Parameters of the alarm:

Timeout, m	60

— period of time when no frame with subtitles has to be decoded for the error to occur.

Note: By default, detection of the alarm is disabled. The parameters of the alarm may be reconfigured in the subtitle decoder of the corresponding service.

TR-290 EIT Error

MPEG TS

The alarm indicates an error in the information table on scheduled programs.

The conditions for the error occurrence are provided in the document ETSI TR 101 290, part 5.2.1, point 3.6.

TR-290 EIT Actual Sections Loss

MPEG TS

The alarm indicates detection of loss of sections of the EIT information table on scheduled programs (In accordance with the document ETSI TR 101 290).

The EIT table containing descriptions of the service events is transmitted to the transport stream. Control over the presence of the EIT PF table is executed for every service. The error occurs in case a section with the description of the current or subsequent event has not been received for 2 seconds.

The conditions for the error occurrence are provided in the document ETSI TR 101 290, part 5.2.1, point 3.6.a.

Service EIT Gap

MPEG TS

The alarm indicates time gaps between programs of the service. If one of the events ends earlier than the next event starts, and the time gap exceeds the amount of minutes designated in the parameter Gap duration, error notification is displayed.

Parameters of the alarm:

Analyse period, h	12

— Period of time in hours from the moment which is being checked;

Gap duration, m	1

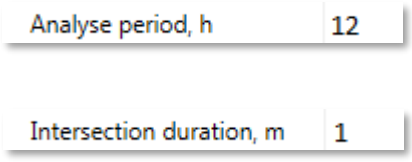
— Allowed gap between programs in minutes.

Service EIT Intersection

MPEG TS

The alarm indicates temporary overlaps between programs of the service. If one of the events ends later than the next event starts, and the overlap time exceeds the amount of minutes designated by the parameter Intersection duration, error notification is displayed.

Parameters of the alarm:



— Period of time in hours from the moment which is being checked;

— Allowed intersection between programs in minutes.

TR-290 EIT PF Error

MPEG TS

The alarm signals that the current and the following event are not found in the information table on scheduled programs (According to the document ETSI TR 101 290).

The conditions for the error occurrence are provided in the document ETSI TR 101 290, part 5.2.1, point 3.6.c.

TR-290 EIT Other Error

MPEG TS

The alarm signals detection of errors in the information table on scheduled programs (According to the document ETSI TR 101 290).

Table EIT containing descriptions of the service events for another transport stream may be transmitted to the transport stream. The error occurs in case packets of the EIT Other table are present in the stream and a section with the description of the current or subsequent event has not been received for 10 seconds.

The conditions for the error occurrence are provided in the document ETSI TR 101 290, part 5.2.1, point 3.6.b.

SNMP Collector No license

The alarm indicates the absence of license for the information collector in the SNMP protocol.

SNMP Connection lost

The alarm indicates the loss of connection via SNMP prtotocol. For details, see the separate guide **Stream MultiScreen SNMP Collector**.

Signal Unlocked

The alarm indicates that the signal has been ublocked. For details, see the separate guide **Stream MultiScreen SNMP Collector**.

RF Level

The alarm indicates problems in the level of signal frequency level (radio frequency). For details, see the separate guide **Stream MultiScreen SNMP Collector**.

Eb/N0 Level

The alarm indicates a problem with the level of Eb/N0. For details, see the separate guide **Stream MultiScreen SNMP Collector**.

SNR Level

The alarm indicates problems in the level of a S/N ratio. For details, see the separate guide **Stream MultiScreen SNMP Collector**.

BER Level

The alarm indicates increased frequency of error occurrence. For details, see the separate guide **Stream MultiScreen SNMP Collector**.

Incorrect port

The alarm indicates connection to incorrect port. For details, see the separate guide **Stream MultiScreen SNMP Collector**.

T2MI packet type error

The alarm indicates incorrect packet type for T2MI service.

T2MI packet payload error

The alarm indicates an error in the packet payload of T2MI interface.

T2MI packet count error

The alarm indicates an error in packet count of T2MI interface.

T2MI CRC error

The alarm indicates an error in CRC data.

T2MI payload error

The alarm indicates an error in payload of T2MI interface.

T2MI PLP num blocks error

The alarm indicates an error in personal license password blocks.

T2MI transmission order error

The alarm indicates an error in transmission order of T2MI interface.

T2MI timestamp error

The alarm indicates an error in time markers in T2MI protocol.

T2MI timestamp dicontinuity error

The alarm indicates an error in discontinuity of time markers.

T2MI T2 frame length error

The alarm indicates an error in the duration of a T2 frame of T2MI interface.

Alphabetic index of the alarms

Contact information

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