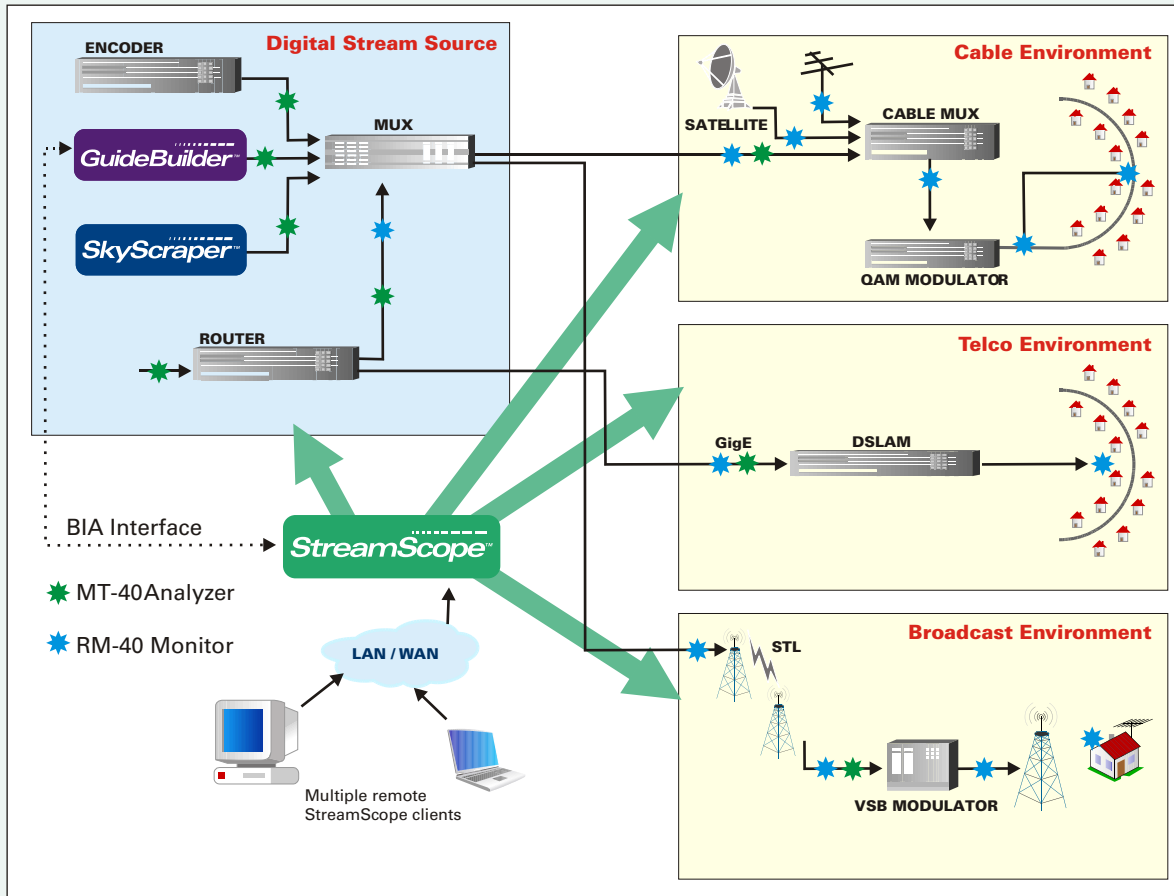


Ensuring Integrity of DTV Streams

The StreamScope RM-40 is an unattended constant monitor for digital television (DTV) transport streams. The RM-40 is a powerful, user-friendly, low-cost monitoring solution that verifies DTV transport streams carried by service providers such as broadcasters, cable, telcos, satellite, mobileTV and IPTV operators.

The RM-40 can remotely monitor, alarm, record and measure DTV transport streams in order to ensure their integrity, reliability and compliance with standards (ATSC, ATSC A/78, SCTE, ETR 101 290) and stream templates. For high bandwidth streams, our new RM-40 High Bandwidth Edition (HBE) can be deployed to monitor several high bandwidth (aggregate upto 1 Gbps) DTV transport streams.

In the face of emerging digital data broadcast and enhanced high-definition DTV applications along with complex and evolving standards, the StreamScope product family plays an increasingly vital role ensuring the integrity and reliability of the transport streams on which service providers' reputations and diverse new revenue opportunities depend.



HIGHLIGHTS

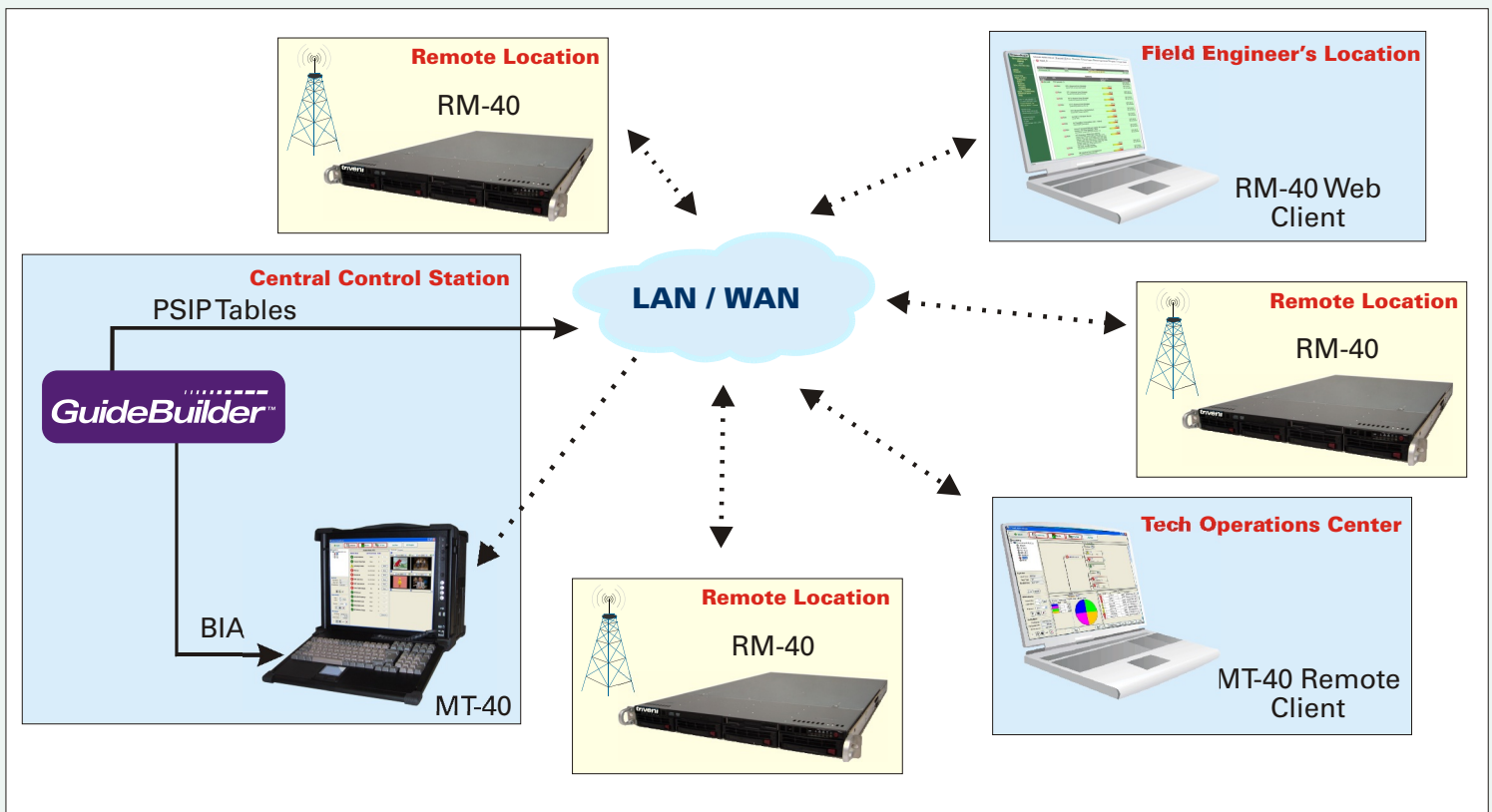
- Base model
 - 160 Mbps transport stream monitoring
 - Upto 4 simultaneous logical input streams
- High Bandwidth Edition (HBE)
 - 1 Gbps transport stream monitoring
 - Upto 25 simultaneous logical input streams
- Web-based client user interface
- ATSC, ATSC A/78, SCTE and ETR 101 290 support
- Integration with Volicon Observer RPM
- Interface to MT-40 for in-depth remote analysis
- Business Intent Assurance (BIA) interface to GuideBuilder (SI)
- IGMP v2/v3 support with GigE scan feature
- Real-time PCR and buffer analysis with MPEG-4 support
- Alarms to trigger SNMP traps, emails, SMS

Remote Real-Time Stream Monitoring

Remote Monitoring

DTV service providers are investing heavily in the digital transmission of TV content and data content. Therefore, there is a need for round the year 24/7 monitoring of DTV transport streams at all service provider sampling points. Typically, the StreamScope MT-40 analyzer can monitor and troubleshoot these signals in an easy-to-use manner. However, DTV service providers can now benefit from the low-cost RM-40 monitor, which can be deployed enterprise-wide at many remote locations that may be unmanned. From a central control station, service providers can now monitor several remote points at the same instant of time. This manner of remote and centralized monitoring paradigm assures:

- Comprehensive monitoring capabilities
- Rapid troubleshooting of remote problem
- Dispatch of support personnel to pin-pointed alarmed locations
- Enhanced quality of service
- Improved asset utilization
- Reduced OPEX
- Viewer retention and high revenues

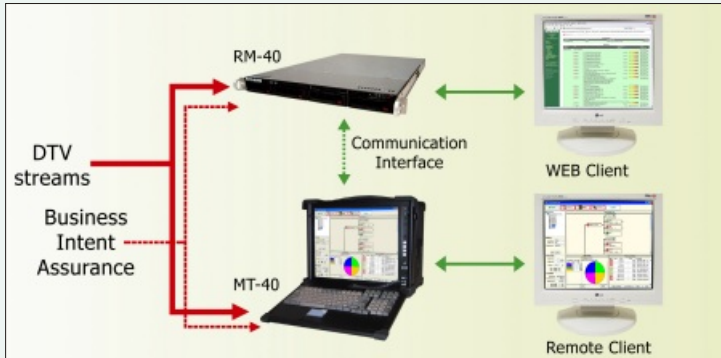


SNMP

The Simple Network Management Protocol (SNMP) feature with a well-defined MIB in StreamScope RM-40 supports both trap notifications to NMS and facilitates SNMP manager MIB browsing. The RM-40 SNMP agent can be configured to report only preferred errors as "trap notifications". This preference may be based on severity of errors or their time interval of occurrence. The RM-40 SNMP agent's trap notifications about system anomalies and observed transport stream errors are compatible with most of the SNMP managers in the field today.

Enterprise-Wide Quality Monitoring

The StreamScope RM-40 focuses on comprehensive remote monitoring of DTV transport streams via the network. Additionally, remote network-wide monitoring via RM-40 is now feasible with a new **"communication interface"** feature from our well-established MT-40 analyzer to RM-40 monitor. This new feature facilitates the MT-40 analyzer to perform detailed in-depth analysis of the same DTV transport streams monitored by RM-40. Additionally, a centralized and enterprise-wide paradigm for monitoring of DTV streams quality can be implemented with this new feature within the StreamScope product family.



Detailed Monitoring

The RM-40's **"dashboard"** cleanly summarizes the source and identity of the transport stream, its bitrate and the full error status at a glance while displaying the MPEG-2 program composition in the transport stream.

The **"summary"** section lists the transport stream error status for each of the chosen standards (or rule sets). This section displays errors, how often they occur and when they last occurred. Even without detailed knowledge of ATSC, ATSC A/78, SCTE or ETR 101 290 rule sets, the user can rapidly identify where a problem exists, and communicate them to station engineers or equipment vendors.

Rule Set	Info	Status	Count or Pct	Last Occurrence
atsc.msi	TOA (priority 1)	100.0%	0	2007-04-03 09:43:50:091
Rule	EIT-0 Absence Error (Missing) [Level:TOA] [Unresolved:Missing]	100.0%	0	2007-04-03 09:43:50:091
Rule	EIT-1 Absence Error (Missing) [Level:TOA] [Unresolved:Missing]	100.0%	0	2007-04-03 09:43:50:091
Rule	EIT-2 Absence Error (Missing) [Level:TOA] [Unresolved:Missing]	100.0%	0	2007-04-03 09:43:50:091
Rule	EIT-3 Absence Error (Missing) [Level:TOA] [Unresolved:Missing]	100.0%	0	2007-04-03 09:43:50:091
Rule	MGT Absence Error (Not Detected) [Level:TOA] [Unresolved:NotDetected]	100.0%	0	2007-04-03 09:43:50:091
Rule	No PEP in Transport Stream [Level:TOA] [Unresolved:NoPEP]	100.0%	0	2007-04-03 09:43:50:091
Rule	PAT Repetition Interval Error (201 - 500ms) [Level:TOA] [Unresolved:PatRepeat]	95.4%	0	2007-04-03 09:43:50:091
Rule	PAT/VCT Mismatch (Different number of programs found in VCT than signaled in PAT) [Level:TOA] [Unresolved:PatVctMismatch]	100.0%	0	2007-04-03 09:43:50:091
Rule	PCR Frequency Offset (810-4050 Hz) [Level:TOA] [Unresolved:PCRFreqOffset]	100.0%	0	2007-04-03 09:43:50:091
Rule	SPC E187 (Do-Not-Use) Mismatch [Level:TOA] [Unresolved:SPCE187]	100.0%	0	2007-04-03 09:43:50:091

The **"program summary"** section lists all programs with their numbers, video & audio streams, virtual channel numbers & names and their individual bitrates for easy monitoring.

Program Number	Channel #	Channel Name	Bitrate
01	2.1	Unspecified	3725078
02	2.1	Unspecified	2621910
03	2.1	Unspecified	2764971
04	2.1	Unspecified	2009500
05	2.1	Unspecified	4716144
06	2.1	Unspecified	2183089
07	2.1	Unspecified	2581658
08	2.1	Unspecified	3937064

Alarms Feature

When an alarm occurs the RM-40 is setup to locally record the DTV transport streams for future replay and analyses. All triggered alarms are also stored in the RM-40 logs for future examinations. The following are the mechanisms for signaling alarms to the external systems:

Contact Closure: The RM-40 provides an interface to an external contact closure device supporting up to 64 contact closures or analog signals.

E-mail: An email can be sent from the RM-40 upon occurrence of alarm or desired event.

SMS: Text messages from the RM-40 to destinations can also be setup if an alarm occurs.

SNMP Trap: The SNMP agent within the RM-40 sends a trap to NMS if an alarm occurs.

Auto Report Generation: The RM-40 will generate a report and transfer the report to a configured location when certain defined exceptions occur.

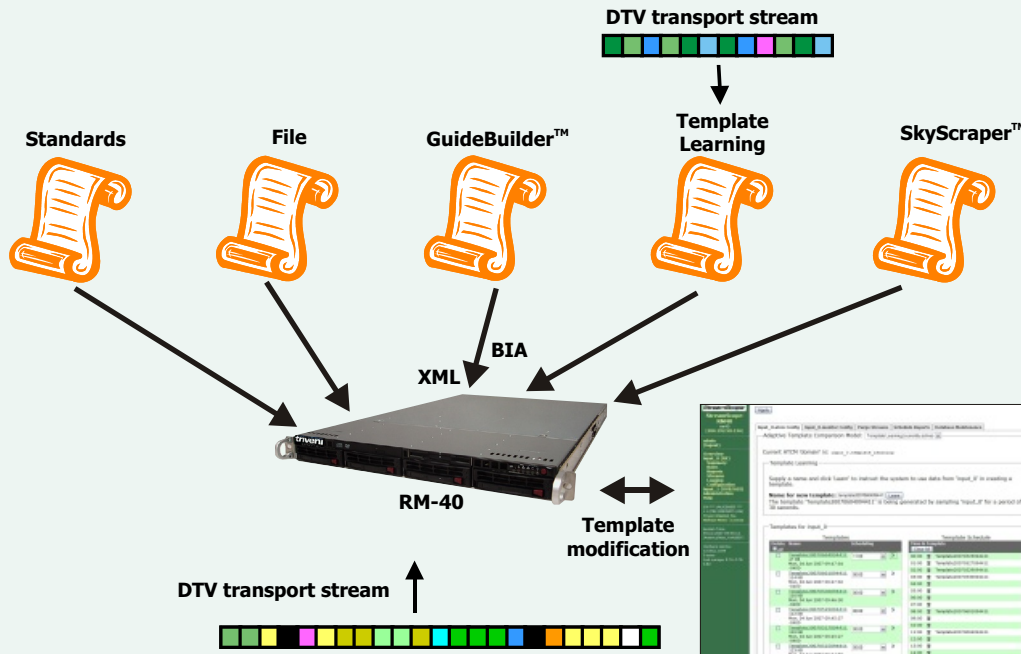
Auto-Purge Data Feature

The integrated hard drive of the RM-40 stores alarms, logs and all recorded DTV transport streams for future analyses. The RM-40 users can also use the auto-purge feature to selectively purge the stored data from the RM-40 hard drive that may not be necessary for further analyses.

Stream Profiling and Templates

Versatile Profiling and Template Comparison

StreamScope RM-40 monitor can compare live transport streams against transport stream template files. Template files can be created from any transport streams using RM-40. The stream to template comparison is then done based on either ATSC, ATSC A/78, SCTE or ETR 101 290 rule sets or based on rule set created from customer's business intent. Rule set based on customer's business intent (also called Business Intent Assurance, BIA) may be ingested from Triveni Digital's GuideBuilder product.



Template Learning

Template learning is a feature that allows a user to create a new template from the original monitored DTV streams. The RM-40 allows the user to tap into the monitored DTV stream at the desired state and generate an accurate "profile" of the stream. The tapped profile can then be used to generate a "template" that would contain the expectations of the transport stream as derived from the current profile. The user could then adjust template parameters as necessary to either tighten or relax the DTV stream constraints.

Volicon Integration

An integrated solution of StreamScope and Volicon Observer-RPM system is available for unattended and simultaneous monitoring of all channels 24/7. Observer RPM detects problems such as video sync missing, frozen/static video, low audio level, no audio level and StreamScope RM-40 detects problems such as PCR jitter, adherence to MPEG buffer model, table timings, ad insertion signals (SCTE35). With this integrated solution one can now:

- Identify most of problems in compressed MPEG streams as well as in the uncompressed video layers
- Alarm on impairments and record streams for full knowledge of problem source
- Ensure to improve viewer experience

RM-40 Technical Specifications

System Specifications

- 1 RU rackmountable chassis
- 1.75"(H) x 19"(W) x 27"(D), 38.5 lbs (approx.)
- 10/100/1000 BaseT RJ-45 ethernet ports (2)
- Floppy, DVD-ROM
- Linux Operating Systems

Models

Base Model

- One 80 GB hard disk drive
- 3x3.5" hot swap drive bays
- 1 drive dedicated for Linux OS
- 160 Mbps DTV transport stream monitoring
- Upto 4 simultaneous logical input streams

High Bandwidth Edition (HBE)

- Two 73 GB hard disk drives
- 1 Gbps DTV transport stream monitoring
- Upto 25 simultaneous logical input streams

DTV Inputs (optional)

- 8-VSB & 64/256 QAM RF 75 F
- DVB ASI 75 BNC
- Quad DVB ASI 75 BNC
- SMPTE-310M 75 BNC
- Gigabit ethernet, SFP (1 copper and 1 optical)

Environmental

- 100-240VAC @ 50-60Hz, 5-10A AC
- Operating temperature 0° to 45°C
- Non-operating temperature -40° to 45°C
- Humidity 10% to 90%

Data Communications

- USB ports (2) 4-pin USB type (standard)
- 10/100/1000 BaseT RJ-45 ethernet ports (2) (standard)
- Serial COM port 9-pin D type (standard)



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