

StreamScope

Real-time ATSC Transport Stream Monitor and Analyzer

MODEL: MT-20



Ensuring Integrity of DTV Streams

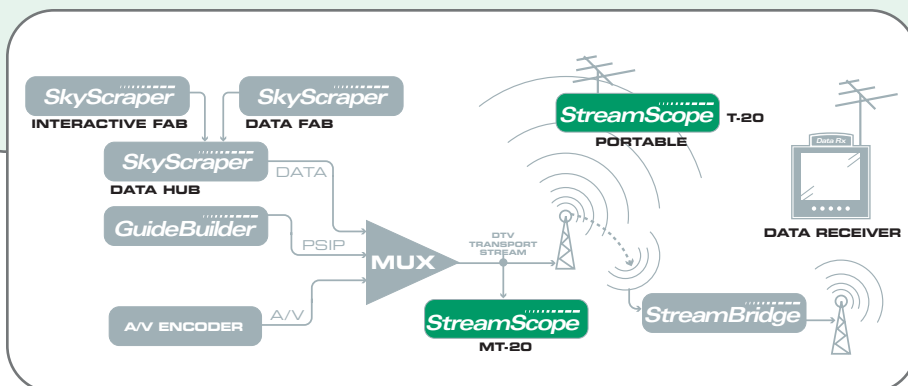
The StreamScope™ instrument from Triveni Digital is a powerful yet user-friendly monitor and analyzer for ATSC digital television (DTV) broadcast streams.

StreamScope combines in a single, affordable instrument the ability to monitor, measure, record, and analyze crucial properties of an ATSC DTV broadcast stream, all with an easy-to-use graphical interface.

In the face of emerging digital data broadcast and interactive TV applications, as well as complex and evolving ATSC standards, StreamScope plays an increasingly vital role: ensuring the integrity and reliability of the digital TV transport stream on which DTV broadcasters' reputations and diverse new revenues depend.

HIGHLIGHTS

- Real-time monitoring and analysis of ATSC DTV transport streams
- Graphical interface helps interpret complex information
- ATSC and MPEG-2 compliance analysis
- Live video display and AC-3 digital audio output
- 8-VSB, DVB ASI, and SMPTE-310M input support
- Video and audio buffer real-time analysis and graphing
- PCR timing analysis and jitter graphing in real time
- PSIP table and electronic program guide (EPG) display
- Patented "packet map" analysis of recorded transport streams
- Error-triggered recording of transport streams
- Configurable alarm relay output available for production monitoring



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REAL-TIME MONITORING

Stream Status at a Glance

StreamScope's Monitor Stream display (shown at right) presents the overall status of the transport stream, and also drills down to the details of many stream properties, in the convenient **Status Tree**. At a glance, you can see:

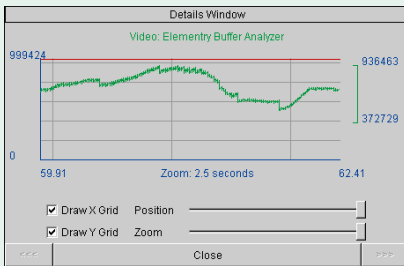
- The virtual channels, elementary streams, and PIDs in a transport stream.
- Errors where a stream property does not comply with the ATSC standards.
- Which stream properties exceed any of the many user-defined thresholds.
- Percentages of audio, video, data, and null packets in the entire stream, by program, or by packet identifier (PID).

The configurable **System Log** displays status messages and logs them in a file.

The **Details window** provides detailed analysis of many stream properties that are summarized in the Status Tree.

Video and Audio Buffer Graphs

StreamScope's graphs of audio and video buffer usage (video buffer shown below) can help determine the cause of buffer overruns and underruns.



Video buffer graph

Triggered Recording and Alarm Relay

Any error condition or user-defined threshold can be used to trigger recording or optional alarm relays integrated with station monitoring equipment.

Alarm relay configuration

The StreamScope Monitor Stream display provides high-level transport stream status at a glance in real time, plus the ability to access details of many stream properties, in one convenient interface.

PSIP and MPEG-2 System Tables

In addition to checking the transmission intervals of ATSC PSIP and MPEG-2 system tables, StreamScope shows the complete contents of the tables with semantic labels which display the tables in an easy-to-understand format.

Detailed display of the PSIP TVCT

EPG from PSIP Data

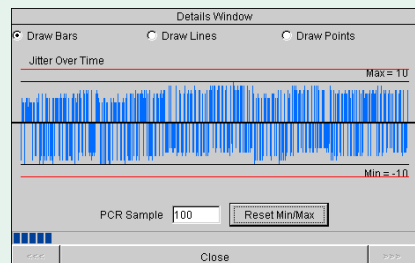
In addition to analyzing PSIP data for compliance with the ATSC A/65 standard, StreamScope constructs an electronic program guide (EPG,

shown below) from the PSIP data for easy verification.

Electronic program guide (EPG) from PSIP data

PCR Timing Information

StreamScope produces a detailed graph of PCR jitter (below), indicating the jitter amounts detected (blue bars) and the limits allowed in the ATSC standards (red lines).



PCR jitter graph

A SUITE OF TOOLS

Video and Audio Monitoring

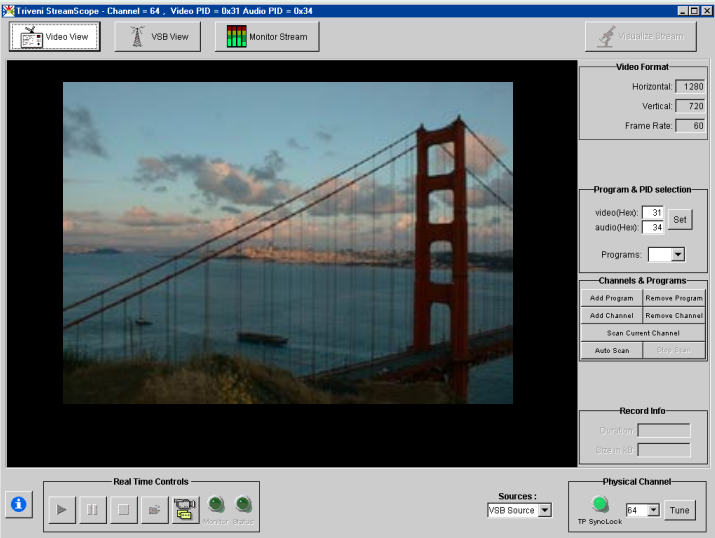
StreamScope's video and audio outputs enable monitoring DTV audio/video at a glance. StreamScope can also scan 8-VSB channels to automatically locate available programs and their video and audio PIDs.

StreamScope's video outputs include:

- SVGA monitor (shown at left, top), displays all 18 ATSC video formats in 720x480i resolution
- Standard S-video output
- Standard composite video output

StreamScope's audio outputs include:

- 5.1-channel AC-3 audio
- Stereo pair audio



The StreamScope video view display, showing channel and PID selection tools at right, and recording and playback tools at lower left.

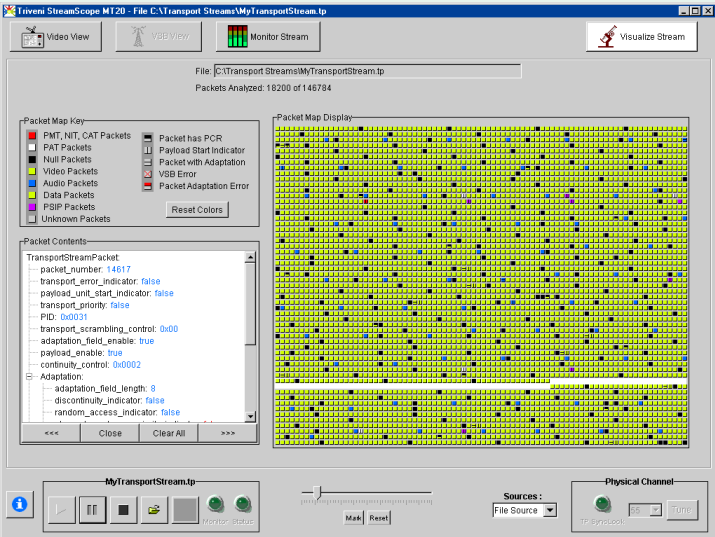
Recording and Playback

In addition to auto-triggered recording, StreamScope provides easy-to-use button controls for manually recording transport streams and playing them back for display or analysis:



Record and playback controls

StreamScope records ATSC DTV transport streams to MPEG-2 files, which are interoperable with a variety of other servers, players, and analyzers.



The StreamScope packet map display (right), showing detailed contents of a selected packet (left).

Visual Analysis of Recorded Transport Streams

StreamScope's **Visualize Stream** display (shown at left, middle) creates a patent-pending "packet map" of the packets in a recorded transport stream. Each type of packet, such as video, audio, data, or PSIP, is indicated by a different color.

Clicking individual packets displays their full content in the Packet Contents pane, which uses semantic labels to explain the contents of a packet.

Recorded streams can also be analyzed with any of the tools available for real-time monitoring.

8-VSB Signal Monitoring

StreamScope's **VSB View** (shown at left, bottom) analyzes the strength and quality of an 8-VSB signal. The VSB View continuously updates graphs of carrier-to-noise ratio and packet decoding errors, and plots equalizer tap energy and coefficients.



The StreamScope VSB signal monitor display.

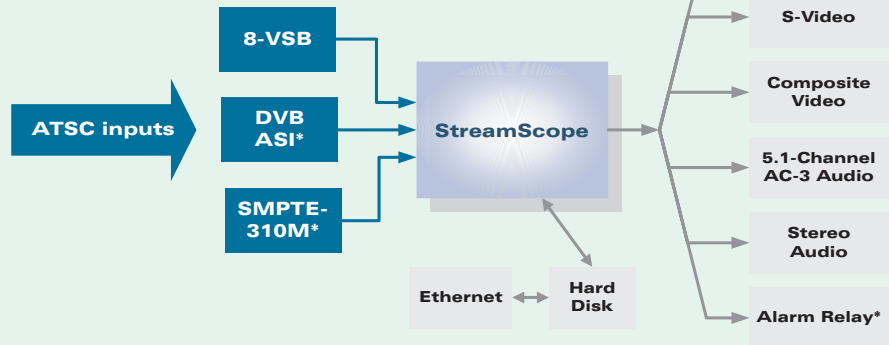
FLEXIBLE ARCHITECTURE

Convenient Integration

StreamScope is rack-mountable for convenient integration with other station equipment. A portable model is also available.

The diagram at right illustrates StreamScope's flexible system architecture. The 8-VSB RF input tunes in physical channels 2 through 69, to monitor DTV signals as they are actually broadcast on-air. Optional DVB ASI and SMPTE-310M inputs enable monitoring and analysis of the DTV signal during equipment installation when a live signal is not yet available.

StreamScope provides several outputs for ATSC video display. For audio, the stereo output allows easy monitoring of audio, while the 5.1-channel AC-3 audio outputs allow monitoring of complex audio signals.



The input and output interfaces of the StreamScope. Interfaces marked with an asterisk (*) are optional.

The optional alarm relay output provides contact closure relays that can be integrated with station monitoring equipment, configurable to respond to virtually any transport stream error or event.

StreamScope can also record and play ATSC MPEG-2 transport stream files, which can be conveniently exported and imported through the 10/100-BaseT Ethernet connection.

TECHNICAL SPECIFICATIONS

	Property	Value
Physical	Dimensions, H x W x D	7" x 17" x 18" (17.7 x 43.2 x 45.7 cm)
	Weight	Approx. 40 lbs (18 kg)
	AC Power Input	250 W @ 115/230 VAC, 50/60 Hz
	Rack-mounting rails and hardware	For 19" standard rack
General	Hard disk capacity	15 Gigabytes (GB)
	3 1/2-inch disk drive	1 internal
	CD-ROM drive	1 internal
DTV Inputs	8-VSB RF (standard)	75Ω F
	DVB ASI (optional)	75Ω BNC
	SMPTE-310M (optional)	75Ω BNC
Environment	Operating temperature	32° to 113°F (0° to 45°C)
	Non-operating temperature	-40° to 140°F (-40° to 45° C)
	Humidity (operating or non-operating)	10% to 90% RH non-condensing

	Property	Value
Outputs	SVGA video	15-pin D
	S-video	4-pin DIN
	Composite video	RCA phono
	5.1-channel AC-3 audio	three 1/8" (3.5 mm) mini connectors for: <ul style="list-style-type: none"> • left and right front channels • left and right surround channels • center and low-freq. effects channels
	Stereo audio down-mix	1/8" (3.5 mm) mini
	8-alarm relay (optional)	37-pin D connector
Data Communication	10/100-BaseT Ethernet	RJ-45
	Serial COM ports (2)	9-pin D
	Parallel port	25-pin D
	USB ports (2)	4-pin USB
	Mouse, keyboard	PS/2

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