



DVStation: Advanced Monitoring for Digital Networks

## Transport Stream Processor Module

The TSP series analyzes and monitors MPEG-2 transport streams, the Program Specific Information and the services carried in them. These modules accept transport stream input from a variety of sources like ASI, SMPTE-310 and SPI. The TSP series can be configured to raise alarms on exception from the expected state.

The TSP series consists of three models:

- Entry level transport stream analysis: TSP090
- Full featured TS analysis for MPEG-2 video services with ASI/SMPTE-310 input: TSP100
- Full featured TS analysis with both MPEG-2 and H.264 support, full line rate and ASI input: TSP120

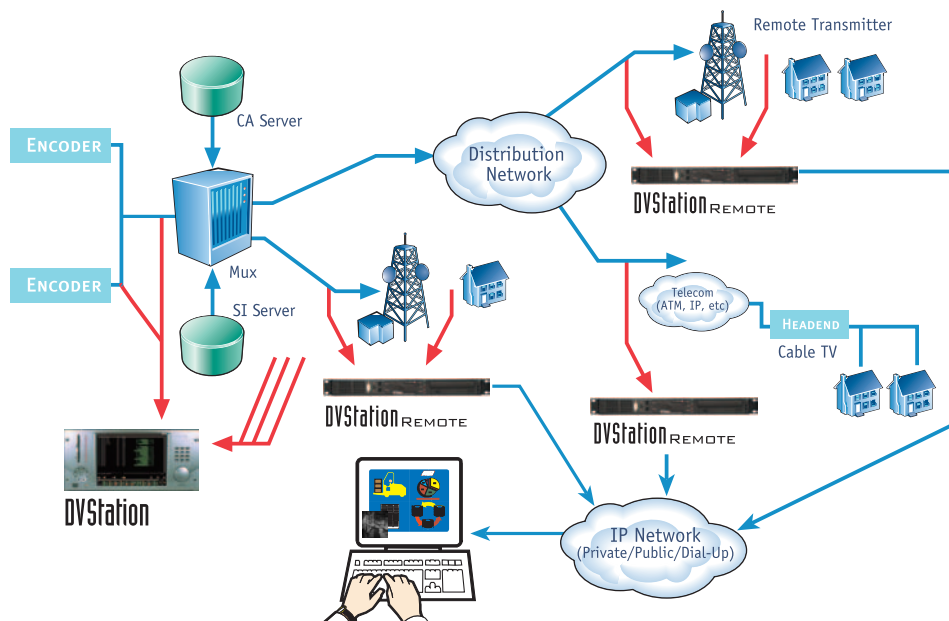
### KEY FEATURES

- Real-time comprehensive transport stream monitoring
  - TR101-290, ISDB ARIB TR-B14 and Motorola DC-II compliance checks
  - Real-time PSI, DVB SI and ATSC PSIP decode
  - Bandwidth usage
  - PCR jitter checks
- Freeze-frame and black out checks for unencrypted video services
- Service thumbnail view for remote confidence monitoring
- Round-robin checks using configuration profiles
- Video back-hauling for quality verification
- Transport stream capture (TSP100, TSP120)
- Multiple input ports
  - ASI (TSP090, TSP100, TSP120)
  - SMPTE-310 (TSP090, TSP100)
  - SPI (TSP090, TSP100)
- On-air service validation
- HTML, SNMP, CORBA, X-Windows and VNC interfaces

### STATUS AT A GLANCE

The intuitive interface gives you all the important status at a glance. View important information together with the visual display so you can monitor the general situation.

At the same time, the powerful software allows you to drill down to examine errors.



### CONFIGURABLE ALARM SYSTEM

Alarm thresholds can be set for the following measurements:

- Bandwidth of individual PIDs
- Packet Interval
- PCR jitter
- TR101-290 tests
- Incorrect content, subtitles, services, etc

Timeouts and reporting intervals for individual PIDs can also be set.

### REAL-TIME SI TABLE MONITORING

ATSC, DVB-SI and ISDB SI tables are displayed in real time in a number of easy-to-read formats. The system also supports Motorola's DigiCipher® standard. Full international text display supports any combination of roman and non-roman alphabets such as Russian, Japanese, Chinese, etc.

Dynamic compliance of DVB-SI is assessed according to TR101-290. Additionally, as any error in PSIP information can render a set up box inoperable, the complex structures for PSIP (ATSC) and ISDB (ARIB) are analyzed in real time and alarms can be set if any parameter deviates from the recommended value – exposing problems before they hit your viewers.

However, as real networks frequently include proprietary and/or non-standard SI and that the structure of SI is constantly evolving and growing in complexity, DVStation includes a powerful Table Description Language™ table parsing system which insures future support and compliance to evolving standards. With TDL, decoding and displaying of private tables are as simple as editing a template file!

## BANDWIDTH BY SERVICE

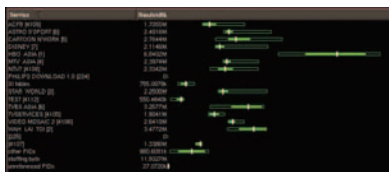
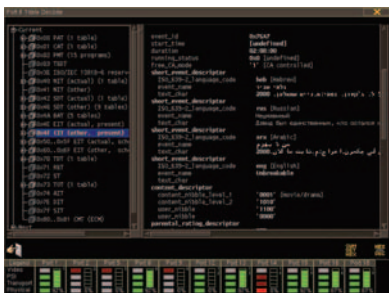
The bandwidth of each PID is listed by its service name for easier monitoring. Whether you are viewing a bar chart, pie chart or time dimension, the service names are presented to allow resolving errors quickly.

The user-friendly interface enables you to sort the display by service name, type (video/audio/data) or bandwidth usage. Variable display resolution also allows you to zoom in to examine bandwidth usage more closely.



## OPTIMAL MONITORING

A visual display (eg bandwidth bar chart, PCR jitter graph) works best for monitoring the general state of the stream, while a structured text display allows the operator to drill down to problematic PIDs to examine the problem. Information presented differently also reveals the relationships between different PIDs.



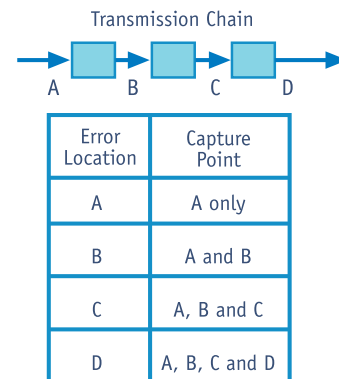
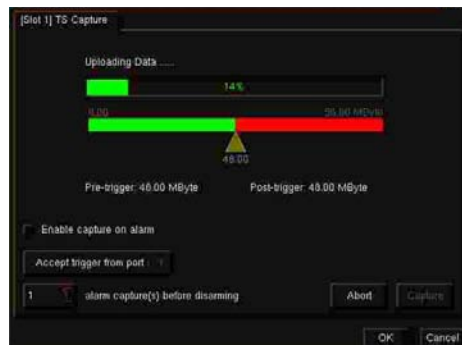
## EXTENSIBLE ARCHITECTURE

Real world equipment may not exactly comply with technical standards, while test equipment can verify if the systems are compliant with the standard. A monitoring system should alert you if the broadcast deviates from your expectations. DVStation is fully configurable to compensate for the minor variations between real equipment and the standards.

## TRANSPORT STREAM CAPTURE

The TSP module allows you to capture the transport stream whenever an error occurs. You can capture up to 256 MB of the transport stream. Flexible pre-event and post-event triggering allow you to capture transport stream packets before and after the event that triggered the capture. Once the transport stream is captured, use the web interface to export it for analysis.

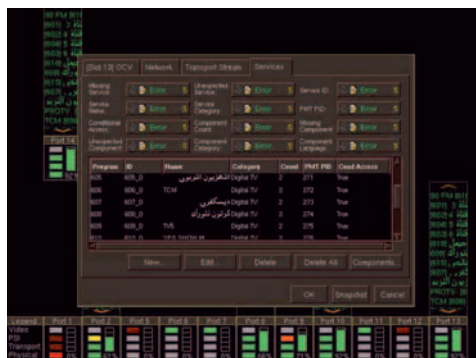
Transport stream capture can be initiated manually or as the result of an alarm occurring on that card or another card. This powerful cross triggering feature enables you to locate at which along the broadcast chain problems are being introduced.



## AUTOMATIC ON-AIR CONTENT VALIDATION

While digital compression enables broadcast operators to transmit more services over the same bandwidth, there never seems to be enough knowledgeable personnel to manually monitor, identify and resolve problems before they become serious. Observing hundreds of programs on multiple signals at the same time, the On-air Content Validation (OCV) feature automatically identifies discrepancies between the expected baseline and actual broadcast content.

Take a snapshot of the current broadcast content and OCV will identify in real time any number of discrepancies from that baseline. Examples include missing or extra services, incorrect service name, loss of subtitles, wrong language or other more detailed parameters. Parameters can also be manually set. Each error condition can be individually configured to generate a beep, pop-up text message, GPI closure or initiate a 96 MB capture of the transport stream. Furthermore, to reduce false alarms created by transient errors (for example, subtitles are momentarily lost, then resumed), each alarm condition has a programmable hold off period.



## VIDEO BACKHAUL FOR CONFIDENCE MONITORING

The TSP family can stream a selected video service or the entire transport stream to any destination in the same network space to allow operators to ensure that the service is error-free. The video is streamed at full broadcast quality. Hence, implements telepresence from any point in the network. The TSP090 and TSP100 uses the WAN port on the mainframe (DVStation-210/DVStation-Remote II/DVStation-Mini) to stream the video out. In addition to this interface, the TSP120 has an on-board RJ-45 connector to stream video to a dedicated media network, keeping the management network uncluttered.

## POWERFUL SCHEDULING SYSTEM

Verification of broadcast integrity and problem identification, whether relating to the transport stream or the services within it, can take place on a continuous real-time basis or alternatively, using periodic sampling. Additionally, the content and characteristics of the expected broadcast could change according to the time of day. For example, the number of programs, the bit rate assigned to each program or whether a particular program is scrambled or not.

The built-in scheduling facility of DVStation allows you easily implement a round-robin or time variant scanning system. There are two possibilities in such a system – either many inputs are scanned through with the aid of an external router or alternatively, the items of interest on a single input vary over time.



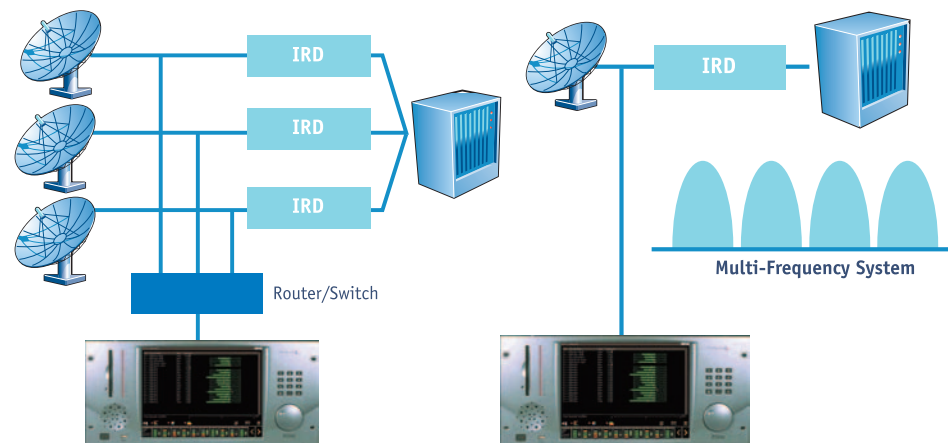
## CAROUSEL MONITORING

This optional software package allows you to monitor DSM-CC data carousels and MHP object carousels. Vital to validate the smooth operation of interactive TV services, the package displays all modules within the carousels as well as the cycle time and duration for each object. Threshold levels can be set on the various parameters, setting off alarms should anything go wrong.



## ROUND-ROBIN MONITOR

In a round-robin system, each input signal is selected for a particular period of time, say 10 minutes. Over that interval, DVStation collects performance information after which it moves on to the next input. The obvious shortcoming of such a configuration is not the time spent monitoring your signals and manually watching for problems, but the time you are not watching what is happening. In the second case above, your signals are not under observation 75% of the time!



The DVStation router control utility provides round-robin scanning control of an external router for implementation of exactly this kind of system. Which inputs to scan across and the time to spend on each input are individually selectable.

With the DVStation Profile and Scheduler facilities, both scenarios above are easily accomplished. Each parameter, frequency, alarm setting, etc. can be saved in a configuration file or profile. These settings can be loaded into a specific card (for example, the ASI interface in slot 6) or they may apply to the system as a whole.

Profiles can also be named to simplify management and administration. Profiles can be loaded manually, loaded by an external NMS or control system or via the DVStation built-in scheduler facility. On a one minute resolution, the scheduler allows you to dynamically alter configuration settings.



## LIVE VIDEO DISPLAY AND THUMBNAILS

The system incorporates video thumbnails of all unencrypted services enabling fast, effective confidence verification of program content. The feature decodes a user-selectable program within a transport stream and shows full motion video within the DVStation GUI.

Supporting automatic detection and switching between 4:3 and 16:9 aspect ratios, all available video services can quickly be verified by selecting its service name via the convenient pull-down menu. Additionally, the system can be configured to automatically scan amongst the available services, the round-robin way.

The video thumbnail display is another key feature enabling you to see a snapshot view of all your services on a single screen.

Full information about each service is presented, including video size, frame rate and aspect ratio. Additionally, the name of the current program is extracted from the EPG and displayed.

Finally, the system automatically detects picture freeze or black out.



## OPTIONS

### Data/Object Carousel monitoring [DSM-MHP]

Field upgradable software option. Monitor DSM-CC data carousels and MHP object carousels.

### DPI message monitoring [DVS-DPI]

Field upgradable software option. Monitor DPI (SCTE-35) messages in the transport stream.

### ASI input router option [TSP120-ASI]

Factory option. Enable all three ASI inputs on the TSP120/REM-TSP120. One ASI input will be active at a time with the option to sequentially monitor all three ASI inputs automatically.

## MODEL COMPARISON

FEATURES	PRODUCTS		
	TSP090	TSP100	TSP120
H.264 support			✓
TR101-290, ATSC A/78, ARIB TR-B14 checks	✓	✓	✓
Bandwidth Measurement	✓	✓	✓
PCR Measurement	✓	✓	✓
Table Decode	✓	✓	✓
Video Thumbnail Display	✓	✓	✓
PID View	✓	✓	✓
Remote Service View		✓	✓
Content Streaming			✓
Video Display on Local Console (MPEG-2 only)		✓	✓
Packet Interval Measurement		✓	✓
Transport Stream Capture		96 M	256 M
On-air Service Validation		✓	✓
Data Carousel Monitoring		Option	Option

## SPECIFICATIONS

### TSP090/100 INTERFACE

#### ASYNCHRONOUS SERIAL INTERFACE (ASI)

Connector Type  
• Dual BNC

Signal Level  
• 250 mVpp to 800 mVpp

Input Impedance  
• 75 ohms to Hi-Z pass through

Standards  
• MPEG-2 ISO/IEC 13818-1  
ANSI X3T11/Levels FC-1 and FC-0

#### SYNCHRONOUS PARALLEL INTERFACE (SPI)

Connector Type  
• DB-25S female connector

Signal Level  
• EIA/TIA-644 (LVDS)

Input Impedance  
• 100 ohms (Differential)

Standards  
• DVB-PI-232 TM 1449/EN 50083 Part 9

#### SMPTE-310M

Connector Type  
• Dual BNC

Signal Level  
• 200 mVpp to 2 Vpp

Clock Rate  
• 19,392,658.46 Hz (8-VSB)

Input Impedance  
• 75 ohms to Hi-Z pass through

Standards  
• SMPTE-310M/IEC 60169-9

### TSP120 INTERFACE

#### ASYNCHRONOUS SERIAL INTERFACE (ASI)

Connector Type  
• 3 BNC

Signal Level  
• 150 mVpp to 2 Vpp

Input Impedance  
• 75 ohms

IP Interface  
• 3 RJ-45 connectors  
• 10/100/1000 Mbps  
• 1 Monitor, 1 Tap & 1 Forward

Standards  
• 1 ASI BNC connector (ASI A)  
• Forward IP connector

Options  
• 3 ASI BNC connector (ASI A, B, C)

PRODUCT	FUNCTIONALITY		
	MEASUREMENTS	ANALYSIS	TESTS
TSP090/100	<ul style="list-style-type: none"> <li>• TR101290 Priority 1, 2, 3</li> <li>• ISDB (ARIB TR-B14)</li> <li>• Bandwidth measurement</li> <li>• PCR jitter</li> <li>• Packet Interval (TSP100 only)</li> </ul>	<ul style="list-style-type: none"> <li>• Table Decode</li> <li>• PID View</li> <li>• Service view thumbnails (MPEG-2)</li> <li>• Remote Service View (video back-haul using the WAN connector on a DVStation-210 or DVStation-Remote II)</li> </ul>	<ul style="list-style-type: none"> <li>• Video Black-out/Freeze-frame (MPEG-2)</li> <li>• Audio Tone Silence (MPEG-1/MPEG-2)</li> <li>• On-air content validation (OCV) (TSP100 only)</li> </ul>
TSP120	<ul style="list-style-type: none"> <li>• TR101290 Priority 1, 2, 3</li> <li>• ISDB (ARIB TR-B14)</li> <li>• Bandwidth measurement</li> <li>• PCR jitter</li> <li>• Packet Interval</li> </ul>	<ul style="list-style-type: none"> <li>• Table Decode</li> <li>• PID View</li> <li>• Service view thumbnails (MPEG-2)/H.264</li> <li>• Remote Service View (video back-haul using the WAN connector on a DVStation-210 or DVStation-Remote II)</li> <li>• Content Streaming (video back-haul using the Forward port on the TSP120/REM-TSP120)</li> </ul>	<ul style="list-style-type: none"> <li>• Video Black-out/Freeze-frame (MPEG-2/H.264)</li> <li>• Audio Tone Silence (MPEG-1/MPEG-2)</li> <li>• On-air content validation (OCV)</li> </ul>

## Pixelmetrix Corporation

### The Americas

10097 Cleary Boulevard  
Suite 114 Fort Lauderdale  
Florida 33324 USA  
Tel: +1 954 472 5445  
Fax: +1 212 671 1549

### Asia Pacific

31 Kaki Bukit Road 3  
#07-03 Techlink  
Singapore 417818  
Tel: +65 6547 4935  
Fax: +65 6547 4945

### Europe

Affolternstrasse 47a  
8913 Ottenbach  
Switzerland  
Tel: +41 56641 0317  
Fax: +41 56500 0161

[www.pixelmetrix.com](http://www.pixelmetrix.com)

Ref: PPN30180  
Copyright © 2010 Pixelmetrix Corporation. All rights reserved.  
All other products or service marks are the property of their respective owners.  
Preventive Monitoring, DVStation, DVStation-Remote, DVStation-Pod, DVStation-IP<sup>3</sup>, DVStation-Mini, DVStor, IPGen, DVShift, DVProbe-C, DPI Auditor, EndGame, Electronic Couch Potato, ECP Consolidator, VISUALmpeg and VISUALmpeg Qualify are trademarks of Pixelmetrix Corporation.  
Data subject to changes without prior notice.

### Distributor Contact

