MPEG Signal Source/Source Scheduler

AD991

Product Information

AD991 MPEG Signal Source provides the ability to playout transport streams within a range of applications, repeatedly and without timing discontinuities. The large storage capacity means a selection of streams can be stored on the unit (at 20 Mb/s the standard 36 GB of storage provides over 220 minutes of transport streams). Transport streams can be easily transferred on and off AD991, and recording enables real time stream capture. A Web based open protocol allows customers to integrate the AD991 into their automated test environment and control the unit with any standard Web browser. Alternatively, a remote control scheduling application is available that controls the AD991 within automated environments (such as manufacturing or broadcast). Disk size can be increased using the external SCSI port.

- **AD991 MPEG Signal Source –** Flexible and cost-effective record and playout source for compressed digital video signals
- **Source Scheduler –** Broadcast or manufacturing scheduling and remote control for the AD991

Overview

AD991 has been designed to meet the requirements for flexible playout and capture of transport streams within a range of applications, such as development, manufacturing, integration and transmission.

Applications

Development

During development AD991 is an easy to use source for test transport streams. The fact that it can support multiple streams means that a set of test streams can be stored in a suitable folder using AD991's filing system. Streams can be repeatedly played out into development systems and equipment without timing discontinuities, simulating transmissions easily and consistently.

Software options such as the TS Packet Editor and Multiplexer enable users to modify the parameter of the streams through powerful user interfaces, and use those streams for subsequent testing and verification of their systems.

Features & Benefits

AD991

Supports MPEG-2/DVB/ISDB/ATSC Transport Streams

Time Stamps Updated Continuously on Looped Playout

Recording (Stream Capture)

Extendable Storage Capacity With Support for External Storage

Pre-installed Sample Transport Streams

19" 2RU Rack Mounted*[1] or Desktop Platforms

Seamless Looping Stream Adjustment

Web Based Open Protocol for User Implementation of Remote Control Using Any Standard Web Browser

Optional Stream Manipulation Software Applications

Automated Remote Control of Scheduled Playout, Recording, and Remote Control Using Optional Source Scheduler Application

AD991 with Source Scheduler Application

Automated Remote Control of an AD991 With a Broadcast or Production Line Schedule

Offline Schedule Creation

Remote Manual Control of Transport Stream Playout and Recording

Manage Transport Streams Using Standard Network File Management Tools

Applications

Test Stream Playout for Development and Manufacturing Environments

Testing and Commissioning of DVB/ATSC/ISDB Transmission Chains

Playout of Pre-encoded Transport Streams

Standby Signal Source for Use During Equipment Failure

Scheduling and Remote Control of Stream Playout for Broadcast and Production Line Applications

*[1] Rackmount ears included as standard.

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Enabling Innovation

Manufacturing

The ability to repeatedly playout a range of transport streams directly into equipment in a manufacturing environment is crucial when checking quality and conformance. The user interface makes control of AD991 intuitive and simple, and remote control interfaces provide the flexibility of remote and automated control.

Integration

AD991 can be used as a simulator when installing and debugging transmission chains by using test streams and recording transmissions. The integrator's control over the source material removes a major element of uncertainty when installing systems and equipment. This speeds up the installation and debugging process, and helps ensure a better end result. The large number of physical and electrical transport stream interfaces that Tektronix supports means that interfacing to other pieces of equipment in the transmission chain is easy.

Transmission

Source Scheduler remote control application enables AD991 to be used as a simple content scenario server for transport stream-based transmissions. The extendable storage allows users to tailor the amount of storage they require. For example, the basic AD991 could be used to repeatedly playout a clip, such as a message sequence for an overnight broadcast or to playout data (e.g., table or carousel data). With extended storage AD991 could be used to playout material such as entire feature films.

Features

Recording

Recording transport streams provides the ability to capture transport streams for later playout or for transfer for use within other applications (e.g., taking a snapshot for archiving).

Continuous Time Stamp Updating

Streams can be played out in single shot mode or looped repeatedly. Continuous time stamp updating provides a discontinuity free stream when playing short and long stream loops by removing any timing discontinuity in the transport stream at the loop point.

When looping the following parameters are updated: continuity count, PCR, PTS, DTS, Time Offset Table (DVB TOT), Time and Date Table (DVB TDT) and System Time Table (ATSC STT).

Pre-installed Transport Streams

AD991 comes with a selection of multi-program transport streams. These enable a user to immediately playout predefined streams or to generate customized streams by using the optional software Multiplexer or TS Packet Editor.

Seamless Looping Stream Adjustment

This application, available from the AD991 front panel, provides an easy way to adjust certain parameters at the stream endpoints in order to make one program seamless for subsequent looped playout. Operation is dependent on the characteristics of the transport stream and does not guarantee disturbance free picture decoding.

Options

- ▶ Source Scheduler remote control application*2
- ▶ Offline DVB, ATSC and ARIB software multiplexer and table editor
- ▶ TS Packet editor
- ▶ TS Cutter and Maker

Offline Multiplexer and Table Editor*2

The offline software multiplexer provides the ability to customize transport streams (e.g., the insertion of user defined PSI/SI/PSIP, elementary streams and PES), by decomposing existing streams, regrouping these streams, mapping, checking and then re-multiplexing the stream to the required bit rate. Transport streams can be modified to enable seamless wrap around at the end points, and the user is even permitted to generate illegal conditions that stress decoder or transmission chain equipment to verify robustness and performance.

BCDM – Broadcast Cable Digital Multiplexer

The BCDM allows insertion and editing of the TSMF (Transport Stream Multiplex Frame) information, allowing the user to demultiplex existing TSMF streams and add/remove transport streams. BCDM also allows the user to export a single TS from a TSMF stream. BCDM conforms to the Japanese JCTEA standards.

TS Packet Editor*2

The TS Packet Editor provides the user with the ability to view and edit transport stream packets. The hexadecimal packet display includes a semantic interpretation of the header and can be used to introduce low level artifacts to a transport stream.

Source Scheduler Remote Control*2

A remote control application enables AD991 to be manually controlled from a remote workstation or to schedule stream playout for use within automated environments.

TS Maker/TS Cutter

The TS Maker and TS Cutter utilities provide the facility to create and trim transport streams offline.

Source Scheduler

Source Scheduler is a software application that provides remote control and scheduling capabilities for an AD991.

The AD991 is a flexible and cost-effective playout source for compressed digital video transport streams. Source Scheduler provides an extra degree of control and flexibility when an AD991 is used as a disk store for pre-encoded transport streams by broadcasters, or for test stream playout within development and manufacturing environments.

- Scheduler application for automated remote control of stream playout
- Player application for manual remote control of stream playout
- Create/edit schedules of streams
- Flexible start modes (e.g., delay start of schedule)
- Absolute/relative start times for each stream
- Validation of schedule prior to execution
- Looped playout of a schedule/stream
- Log of events
- Ethernet control

*2 These are software options and require a separate processing platform. Please speak to your sales representative for further details.

Remote Scheduler

The Source Scheduler application enables the creation and modification of program playout schedules. For each stream within a schedule, properties such as start day and time, stream content standard (MPEG-2/DVB/ATSC), start/end packets and a textual comment can be selected. Schedules can be created in advance and saved for later use/modification.

Prior to execution, a schedule is validated to ensure all the streams in the schedule are available on the target server and to perform other consistency checks.

Several schedule start modes are available including delayed start, resynchronized start (to resynchronize the schedule based on start time) and skip start (to start the schedule part way through, based on the current time). At any point the user can easily resynchronize an entire schedule to alter the start times of all the streams within that schedule.

Several status indicators are available, e.g., a colored LED is used to indicate the connection status between the client and the server, and a slider and packet/time display are used to indicate progress through a stream.

A schedule can be looped for repeated playout of a sequence of streams.

The scheduler client generates a log of all key events.

Remote Player and Recorder

Available from within Source Scheduler, the remote player and recorder applications enable the manual remote control of a networked AD991. Properties such as start/end packets, stream content standard (MPEG-2/DVB/ATSC), and interface properties can be selected. Playout control of continuous time stamping and looping mode are also available.

System

The client application runs on a Windows NT 4.0 PC (not included), and the remote control is performed using DCOM over a TCP/IP Ethernet network.

▶ Characteristics

Product Specifications

AD991 System –
Built-in display and keypad.
CD/DVD drive.
External SCSI port.

Performance

Storage Capacity – 36 GB internal.

Max Data Rate – 60 Mb/s.*3

Min Data Rate –
Internal Clock: 2.5 Mb/s.*3
External Clock: 250 kb/s.*3

Clock Accuracy

Bit Rate Resolution – 1 bit/s.

Clock Accuracy – ±1 ppm.

Aging and Drift –
<1 ppm.
External clock input available.

Electrical

Voltage – 110/240 VAC (switched).

Frequency – 45 to 63 Hz.

Power – 300 W (max).

Cooling – Positive pressure front to back.

Operating Temperature – 5 ºC to 40 ºC.

Control Interfaces –
Web based open protocol for user implementation of remote control.
Ethernet for remote access to streams.
Source Scheduler client application for control over TCP/IP Ethernet network.

Transport Stream Interfaces –
DVB Synchronous Parallel Interface.
Asynchronous Serial Interface (ASI).

Safety –
CSA C22.2 No. 1010.1.
EN 61010-1.
IEC 61010-1.
UL 3111-1.

*3 Subject to specific interface used.

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▶ AD991

Physical Characteristics

Dimensions	cm	in.
Width	43.5	17.13
Height	9 (2RU)	3.54
Depth	56	22.05
Weight	**kg**	**lb.**
	12.5	27.56

Note: Only one interface can be supported in addition to the DVB Parallel interface. Additional interfaces are factory fitted and should be specified when ordered.

▶ Ordering Information

AD991

Options

ASI – ASI interface.

REMOT – Remote scheduler, player and recorder.

ADSA Opt MX – Offline software applications consisting of Multiplexer, Table Editor, TS Packet Editor, TS Maker, TS Cutter.

Service

Opt. R5 – Repair Service 5 Years.

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