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CA1500AV MPEG-2 Transport Stream Encoder Datasheet

The Cimarron Systems CS150AV MPEG-2 Transport Stream Encoder application conforms to ISO/IEC 13818-1, 2, 3, and 7; ITU-T Recommendation H.264; and ISO/IEC 14946-3 for audio/video objects. The application multiplexes encoded H.264/AAC bitstreams files into a canonical MPEG-2 Transport Stream (TS).

User Environment

Figure 1 shows a context diagram of the typical environment in which the CS1500AV MPEG-2 TS Encoder application operates (refer to any of the Digital Media SDK datasheets, e.g., the CS368-TI, for details).

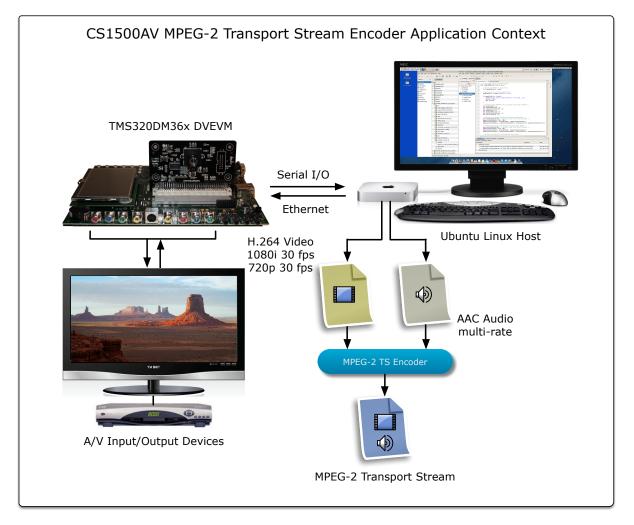


Figure 1: CS1500AV MPEG-2 Transport Stream Encoder Application Context Diagram.

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Application Features

The CS1500AV MPEG-2 Transport Stream Encoder application—which includes well-commented 'C' source code, make and utility files, a software developers guide, and example H.264/AAC source as well as encoded test clips—is implemented in accordance with international standards such that MPEG-2 Transport Streams it produces are playable on many popular media players—Figure 2 shows the output from a MPEG-2 Analyzer for a typically encoded stream.¹

The encoder implements the following functions:

• For 1080i, 720p, or D1 30 fps H.264 encoded video plus AAC-LC ADTS encoded audio, synchronizes the encoded H.264 video with the simultaneously-encoded AAC audio by programmatically adjusting the start of video relative to audio such that A/V start is synchronized.

Additionally, the application features an embedded analysis tool that examines both the H.264 video / AAC audio files for correctness, e.g., it identifies missing, corrupted, and miss-encoded frames, which allows immediate corrective action to be taken.

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\Users\Chuck Newby\Desktop\outFile.ts	0x00000000	Transport Packet { PID = 0x11, Payload = Yes (184), Counter = 0, Start indicator }	0
le size: 53 628 128	0x000000005		1 😵
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ount packets: 300 756 sible packets: 300 756	0x000000BC		
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E		constraint_set1_flag = 0	
		constraint_set2_flag = 0	
ES (AVC/H. 264)		constraint_set3_flag = 0	
🖃 📝 JS (PID = 0x101(257))		constraint_set4_flag = 0	
		constraint_set5_flag = 0	
ES (AAC)		reserved_zero_2bits = 0	
		level_idc = 40	
		<pre>seq_parameter_set_id = 0</pre>	
		chroma_format_idc = 1	
		bit_depth_luma_minus8 = 0	
		bit_depth_chroma_minus8 = 0	
		<pre>qpprime_y_zero_transform_bypass_flag = 0</pre>	
		seq scaling matrix present flag = 1	
		log2 max_frame_num_minus4 = 0	
		pic order ont type = 2	
		num ref frames = 1	
		gaps in frame num value allowed flag = 0	
		pic width in mbs minus1 = 119 (1920)	
		pic height in map units minus1 = 67 (1088)	
		frame mbs only flag = 1	
		direct 8x8 inference flag = 1	
		frame cropping flag = 1	
		frame crop left offset = 0	
		frame crop right offset = 0	
		frame crop top offset = 0	
		frame crop bottom offset = 4	
		vui parameters present flag = 1	
		<pre>vui_putumeters():</pre>	
		<pre>aspect_ratio_info_present_flag = 1</pre>	
		<pre>aspect_ratio_idc = 1</pre>	
		overscan_info_present_flag = 0	
		<pre>video_signal_type_present_flag = 1</pre>	
		<pre>video_format = 2</pre>	
		video_full_range_flag = 1	

Figure 2: MPEG-2 Transport Stream Analyzer Output for a CS1500AV Encoded Stream.

¹ Typically, the H.264/AAC source files are encoded from a Cimarron Systems Digital Media SDK but other encoding tools that produce proper H.264 video / AAC audio streams will operate with the MPEG-2 Transport Stream Encoder application.

- Creates then updates Service Definition Table (SDT), Program Association Table (PAT), and Program Map Table (PMT) Service Information (SI) tables.
- Creates then updates the Program Clock Reference (PCR) and Presentation Time Stamp (PTS) within the Packetized Elementary Streams (PES).
- Multiplexes H.264 I and P frames into a video PES.
- Multiplexes AAC-LC ADTS frames into an audio PES.
- Multiplexes the video PES and audio PES into the MPEG-2 Transport Stream.
- Writes the MPEG-2 Transport Stream to the specified file, for example, outFile.ts.

Importantly, the stream files produced by the MPEG-2 Transport Stream Encoder application have been validated by several industry standard MPEG-2 Transport Stream Analyzers including from Elecard and others.

System Requirements

The CS1500AV MPEG-2 Transport Stream Encoder application has been designed for and tested with Ubuntu Linux OS (10.04 or later) and Mac OS X (Snow Leopard or later).

For more information regarding this and other Cimarron Systems products, please contact us using the contact information below.

Contact Information:

Cimarron Systems, LLC Evergreen, Colorado telephone: (303) 674-9207 email: <u>info@cimarronsystems.com</u> www.cimarronsystems.com

Revision History:

Date	Version	Notes
12/1/2012	version 1.0	İnitial version.
1/5/2014	version 2.0	minor editorial changes.
4/17/2017	version 2.5	minor editorial changes.