

DDC H.264 Encoder

Low latency, high quality MPEG-4 AVC (H.264) encoder

A high quality FPGA/ASIC based H.264 encoder designed for camera and other video sources. DDC traffics in camera based electronics, and has it's own line of video recorders, which utilize this and other compression and image processing technologies. This encoder is uniquely targeted for high quality applications such as military, medical, industrial, and other applications.

Features:

Providing unique features:

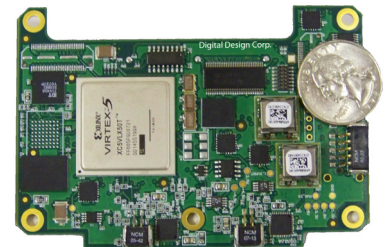
- Designed for use in real time video applications (cameras or video feeds)
- High dynamic range recording up to 14 bits, and Lossless compression mode (this preserves the high dynamic range allowing for extreme detail extraction and forensic analysis of the video).
- Low latency: 16 line times.
- No temporal artifacts or error across frames. If there is ever an error in a frame in the transmitted (or stored) H.264 sequence (as might happen in wireless transmission), the next clean frame will be displayed unadulterated. That is, errors don't propagate across frames. This will help mitigate long drop outs in wireless links.
- Uses Intra prediction for low latency encoding.
- Uses Integer Transforms for smaller size.
- Entropy encoding with NAL encoding of Macroblocks:
 - Exp-Golomb code is used universally for almost all symbols
 - Context adaptive VLCs (CAVLC) for coding of transform coefficients
- Encoding for bit depths from 8-14 bits depths.
- Lossless encoding mode supported.

DDC Recorder Platforms:



DDC VAADR
Ruggedized video and data recorder

[Click to view more information.](#)

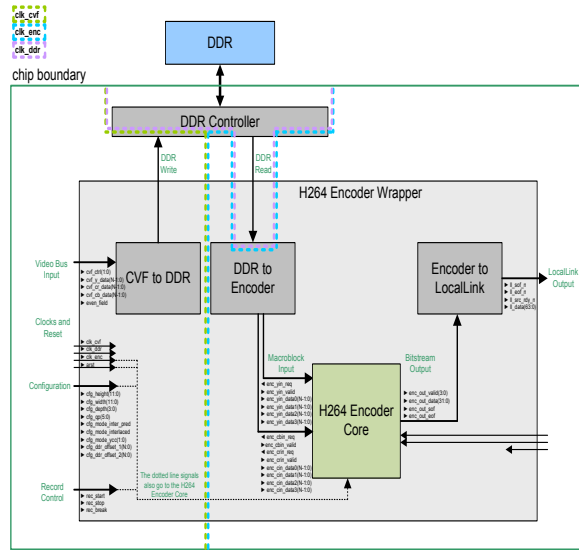


DDC nVAADR - small form factor ruggedized video and data recorder board.

Resources:

MPEG-4/ h.264 encoder type	Description	LUTS	Registers	Slices	BRAMs (18k equiv)	DSP48Es
Standard h.264	8-bit encoder	6,847	3,412	2,390	4	8
	8 bit encoder + wrapper	9,066	4,389	3,276	6	8
High dynamic range and lossless h.264 encoder	14 - bit encoder	7,802	4,339	3,111	4	9
	14 - bit encoder + wrapper	10,009	5,359	3,820	6	9

DDC H.264 Encoder



Raw, uncompressed

Compression factor 1

	H	V	frames /sec	bytes /pixel	MB/sec		GB needed based on hours setting	hours of recording desired 1	drive size in GB 32	hours of recording based on drive size above
					raw	compressed				
RS-170	640	480	30	1	9.22	9.22	32.40	1	32	1.0
NTSC	640	480	30	2	18.43	18.43	64.80	1	32	0.5
D1	720	480	30	2	20.74	20.74	72.90	1	32	0.5
FLIR	640	512	60	2	39.32	39.32	138.24	1	32	0.2
1K FLIR	1024	1024	60	2	125.83	125.83	442.37	1	32	0.1
720P	1280	720	60	2	110.59	110.59	388.80	1	32	0.1
1080i	1920	1080	30	2	124.42	124.42	437.40	1	32	0.1
1080P	1920	1080	60	2	248.83	248.83	874.80	1	32	0.0

Lossless is approx 1.5x-2x

Compression factor 2

	H	V	frames /sec	bytes /pixel	MB/sec		GB needed based on hours setting	hours of recording desired 1	drive size in GB 32	hours of recording based on drive size above
					raw	compressed				
RS-170	640	480	30	1	9.22	4.61	16.20	1	32	2.1
NTSC	640	480	30	2	18.43	9.22	32.40	1	32	1.0
D1	720	480	30	2	20.74	10.37	36.45	1	32	0.9
FLIR	640	512	60	2	39.32	19.66	69.12	1	32	0.5
1K FLIR	1024	1024	60	2	125.83	62.91	221.18	1	32	0.2
720P	1280	720	60	2	110.59	55.30	194.40	1	32	0.2
1080i	1920	1080	30	2	124.42	62.21	218.70	1	32	0.2
1080P	1920	1080	60	2	248.83	124.42	437.40	1	32	0.1

Visually lossless is approx 7x-10x

Compression factor 10

	H	V	frames /sec	bytes /pixel	MB/sec		GB needed based on hours setting	hours of recording desired 1	drive size in GB 32	hours of recording based on drive size above
					raw	compressed				
RS-170	640	480	30	1	9.22	0.92	3.24	1	32	10.4
NTSC	640	480	30	2	18.43	1.84	6.48	1	32	5.2
D1	720	480	30	2	20.74	2.07	7.29	1	32	4.6
FLIR	640	512	60	2	39.32	3.93	13.82	1	32	2.4
1K FLIR	1024	1024	60	2	125.83	12.58	44.24	1	32	0.8
720P	1280	720	60	2	110.59	11.06	38.88	1	32	0.9
1080i	1920	1080	30	2	124.42	12.44	43.74	1	32	0.8
1080P	1920	1080	60	2	248.83	24.88	87.48	1	32	0.4

Typical good quality is 15x-25x

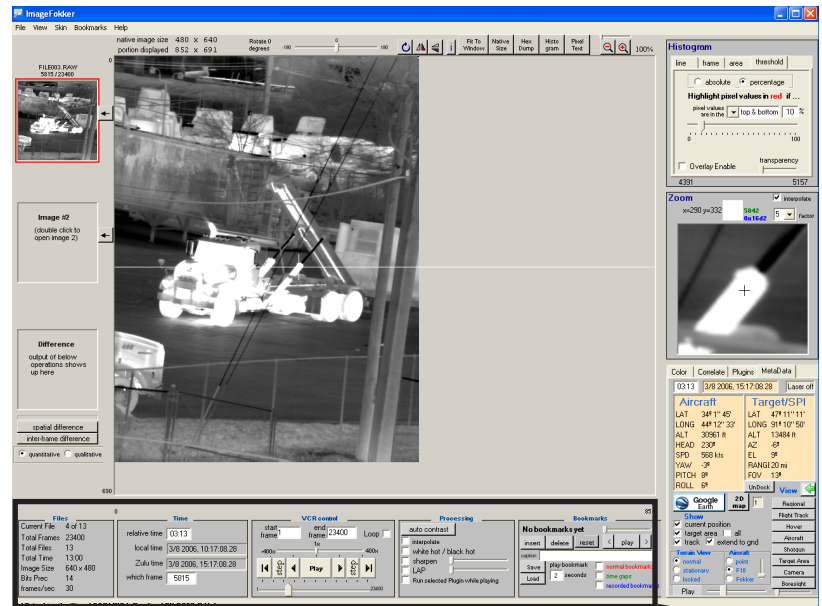
Compression factor 20

	H	V	frames /sec	bytes /pixel	MB/sec		GB needed based on hours setting	hours of recording desired 1	drive size in GB 32	hours of recording based on drive size above
					raw	compressed				
RS-170	640	480	30	1	9.22	0.46	1.62	1	32	20.7
NTSC	640	480	30	2	18.43	0.92	3.24	1	32	10.4
D1	720	480	30	2	20.74	1.04	3.65	1	32	9.2
FLIR	640	512	60	2	39.32	1.97	6.91	1	32	4.9
1K FLIR	1024	1024	60	2	125.83	6.29	22.12	1	32	1.5
720P	1280	720	60	2	110.59	5.53	19.44	1	32	1.7
1080i	1920	1080	30	2	124.42	6.22	21.87	1	32	1.5
1080P	1920	1080	60	2	248.83	12.44	43.74	1	32	0.8

IMAGEFOKKER

Running on almost any PC or laptop, ImageFokker can instantly open up (or drag and drop) all of the H.264 video and data, and pan through it, play it, single step thru it, fast forward, rewind, all while zoomed, or with other contrast, analysis, or processing operations. Works with all DDC recorders or other imagery. Other standard decoders can decode DDC H.264 as well.

Click to view more information.



Files	Time	VCR control	Processing	Bookmarks
Current File 4 of 13 Total Frames 23400 Total Files 13 Total Time 13:00 Image Size 640 x 480 Bits Prec 14 frames/sec 30	relative time 03:13 local time 3/8 2006, 10:17:08.28 Zulu time 3/8 2006, 15:17:08.28 which frame 5815	start frame 1 end frame 23400 Loop -400w 1x 400w Play	auto contrast <input type="checkbox"/> interpolate <input type="checkbox"/> white hot / black hot <input type="checkbox"/> sharpen <input type="checkbox"/> LAP <input type="checkbox"/> Run selected Plugin while playing	No bookmarks yet insert delete reset play Save play bookmark normal bookmarks Load 2 seconds time gaps recorded bookmarks

I/O

- Reads RAW, jpg, gif, png, tiff, FTS, MPEG2
- Write out AVI movies in RAW or compressed for playback in Windows Media Player (or other). Also writes bmp, jpeg, png, gif, tiff of selected images
- Extract selected raw images for own processing
- Supports drag and drop of countless amount of video
- Completely configurable RAW data dialog box, to view your RAW imagery: resolution, byte ordering, header bytes, timestamps, rotation, decimation, etc.

Look/feel

- Multiple 'skins' for simple or advanced controls
- Many view modes: Native size, Fit To Window, Rotated, PixelText, and hexdump\
- Other data: actual pixel data with mouse, histogram (line, frame, and area), line intensity,

Bookmarks

- Add bookmarks during debriefing, or display operator inserted bookmarks during recording.
- Add highlight-boxes, captions, etc. to each bookmark
- Playback only bookmarks, or index thru them
- Write out an AVI movie of bookmarks only
- Selectable playback time of each individual bookmark
- Different individuals can bookmark the same video with their own points of interest.
- Save bookmarks off for future use

Multiple videos

- Supports 2 movies loaded simultaneously, so that they might be compared to one another. Also a mosaic mode to view 2 movies simultaneously
- Any field or frame from one movie can be differenced with any field or frame from another movie

Processing

- Dynamic controls for zoom, contrast, rotation, flip, brightness, LAP, sharpen, histogram stretch, AGC, invert, color corrections, interpolate, white hot / black hot, etc.
- RAW video untouched, despite the processing done to enhance the playback.
- Supports plugins. Simple API to create other processing functions
- Bring out the most amount of detail with plugins such as: LAP (dynamic gamma), sharpening, various filters, tracker, thresholding, TRZ (translate/rotate/zoom), etc.
- Statistical and histogram analysis to analyze and detect defects or oddities in your sensor.
- Declassify mode for black boxing desired areas

Metadata

- Meta data retrieval and display, time-synchronized with video. Support for IRIG as well.
- Displays metadata (track, position of current video frame, etc.) in 3D over Google Earth