ARC® H.264 Encoder

ARC Video Subsystem Family H.264 Baseline Profile Encoder

Release Notes 1.2

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Chapter 1 — Introduction

This release contains the ARC® H.264 Encoder for the ARC Video Subsystem Family.

The following release summary is provided:

Supported IP Libraries, Tools and OS Platforms

The ARC H.264 Encoder implementation supports the following IP Libraries, tools and host operating systems:-

Company	Product	Version
ARC	ARChitect 2	2.9.51 or later
ARC	ARC 700 IP Library	4.6 or later for MXP [1]
ARC	ARC Media Extensions Processor IP Library (MXP)	1.2 or later
MetaWare	High C/C++ Toolset	7.4.3 Patch 2 or later
Microsoft	Windows XP	2002 Service pack 2
Red Hat	Linux	RHEL 3.0

Notes

1 ARC 700 IP Library version 4.6 or later is compatible with MXP

Supported ARC Video Subsystems

The ARC H.264 Encoder implementation supports the following ARC Video Subsystems:

Product	IP Library Version
AV 417V	MXP 1.2
AV 407V	MXP 1.2
AV 406V	MXP 1.2
AV 404V	MXP 1.2
AV 402V	MXP 1.2

Features

The following standards are supported:

- H.264 Baseline, compliant with ITU-T H.264 | ISO/IEC 14496-10

Release Details

The following table contains the release details for the ARC H.264 Encoder implementation on the ARC 700 processor.

Software	H264 Encoder
Processor	ARC 700
Version No	1.2
Release Date	April 2008

Installation Structure

The ARC H.264 Encoder library is supplied as a single ARChitect IP Library file using the file extension `.iplib`.

Building with ARChitect creates the full build structure of the ARC H.264 Encoder.

Documentation

The *ARC H.264 Encoder Bookshelf* is the starting point for all the documentation, and provides links to the following:

- *ARC H.264 Encoder Release Notes*: Containing a summary of the release, and changes since the last release.
- *ARC H.264 Encoder Getting Started*: Containing a summary on using the product.
- *ARC H.264 Encoder API Reference*: contains details on interfacing to, and controlling, the encoder.
- *ARC Video Subsystem Family Encoders API Programmer's Guide*: provides a basic reference guide to interfacing to this encoder, and the other encoders supported by the ARC Video Subsystem Family.

To view the on-line documentation, select **Help > Contents** from the ARChitect menu.

Building the ARC H.264 Encoder using the ARChitect tool generates a set of documentation in portable document format (PDF).

Chapter 2 — Build Structure

Extracting the provided codec ZIP file creates a full build structure. The contents of the extracted system are described in the following sections:

Build Specification

The ARC H.264 Encoder module has the following build specifications:

- Makefile for building codec and example wrapper using the MetaWare C/C++ compiler toolchain
- You can execute the built codec using the MetaWare debugger instruction set simulator or on an ARCangel 4 FPGA platform using an ARC 700 FPGA image.
- The codec requires the ARC 700 Media Extensions Processor, and is built in release mode (no debug information is contained in the object files).

Build Directory Structure

The directory structure for the build related files and the associated documents is as follows.

Table 1 Directory Structure

Directory	Files	Description
\docs\pdf	*.pdf	*Release Notes*, *Getting Started*, *Reference*
ARCEncoder ARCEncoder\ARC ARCEncoder\H264	*.h, *.cpp *.sss	H.264 Encoder source files
ARC_H264_API	*.h, *.c, *.cpp	H.264 Encoder API and test harness source
ARC_API_Base	*.h, *.c	Base API source
lib\deps ARCEncoder\deps ARC_H264_API\deps ARC_API_Base\deps	*.dep	C/C++ dependency files
ARCEncoder\obj ARC_H264_API\obj ARC_API_Base\obj	*.o	Compiled and assembled relocatable object files
lib	*.a	Library/archive files

Build File Descriptions

The following sections detail the specific files contained in the installation structure:

Build Files

The root directory contains the following files used for building the projects for the ARC H.264 Encoder using the project space provided.

- `Makefile.win32.h264` – Makefile to build the encoder library and the test harness on Windows;
- `Makefile.linux.h264` – Makefile to build the encoder library and the test harness on Linux.

Documents

The `docs\pdf` directory contains the following documents related to the project.

- `contents.pdf` – *ARC H.264 Encoder Bookshelf*
- `h264_encoder_rel_notes.pdf` – *ARC H.264 Encoder Release Notes*
- `h264_encoder_getting_started.pdf` – *ARC H.264 Encoder Getting Started*
- `h264_rf.pdf` – *ARC H.264 Encoder API Reference*
- `av_family_encoders_api_prog_gd.pdf` – *ARC Video Subsystem Family Encoders API Programmer's Guide*

Source Files

The source directories contain the following files, which are the source for making the projects.

- `ARCEncoder` – contains the H.264 Encoder source files;
- `ARC_H264_API` – contains API wrapper code specific to the H/.264 Encoder;
- `ARC_API_Base` - contains core API code;
- `ARC_H264_API\h264_encoder_app.c` – the test harness, an example application using the encoder.

Header Files

The `ARC_H264_API` directory contains the following files, which are the header required for using the API in other projects.

- `h264_interface.h` – header file required by any code that wishes to use the ARC H.264 Encoder library
- `arc_encoder_malloc.h` – memory allocation primitives.

Chapter 3 — Release Change Information

The major changes from previous releases of the ARC H.264 Encoder module are described here.

The following release change information is available:

Release v1.2

This release of the ARC H.264 Encoder contains improvements to the Motion Estimation search algorithms for hardware platform configurations that do not contain the Motion Estimation hardware unit (the motion search for these configurations is performed using the SIMD unit).

The improvements made to the motion search algorithms include an increased search range of +/- 15.75, +/- 15.75 pixels and quarter pel motion vector accuracy. These improvements result in enhanced image encoding quality.

Release v1.1

This release of the ARC H.264 Encoder includes support for software based motion estimation. The software will automatically detect the configuration of the platform and utilize either the Motion Estimation unit for motion searches or the SIMD unit when the Motion Estimation unit is not present.

Release v1.0

This is the first release from ARC International.

Chapter 4 — Known Issues

An up to date list of product issues is located on the customer support site, https://support.arc.com/.