Image Convertor Tool

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1 Introduction

This document describes the usage of the firmware and configuration conversion tool included with the Microsemi VPROC SDK. The too is located in the /tools directory. This tool must be used to convert a Firmware .s3 image or a Configuration record *.cr2 into either a *.bin file format or a *.h c-code header format.

1.4 Abbreviations

Table 1 Abbreviations used in this document

Abbreviation	Explanation
HBI	Host Bus Interface
VPROC	Voice Processor
TW	Timberwolf

1.5 References

[1] ZL3804x/5x/6x/80/5x/90 firmware Manual, where x: 0 to 7 depending on the device.

1.6 Assumptions

This document assumes that user is aware of voice processor device HBI.

2 Output Image Format

2.1 Configuration Record

The Configuration Record file included within the ZLS380xx software packafe is provided as file with a .cr2 extension. The content of this file must be converted into a binyary *.bin or c-code format *.h using the converter tool tw_convertFirmware2c.c.

The tw_Convert_Firmware2c code is platform independent, therefore can be compiled and used on either a Linux or Windows platform.

Example to compile the tool on a Linux platform:

gcc twConvertFirmware2c.c -o twConvertFirmware2c

2.2 Boot Image Format

The ZL380xx Firmware image is provided as a file with an *.s3 extension. The tool must be used to convert it into either a binary file (*.bin) or a c-code header file (*.h)

Output file contains Header + image divided into chunks of equal
length, where length = Block size in range of 1 word to 128
words
word = 16-bit length

Block size is specified by user at the time of image generation. By default, value is 1-word.

2.2.1 Bin/C-based Boot Image Format

Here's block diagram showing input and output of tool

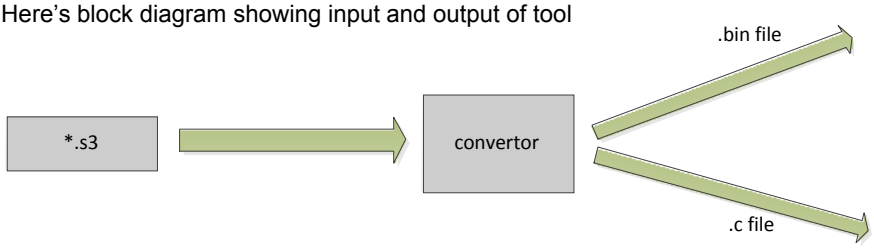
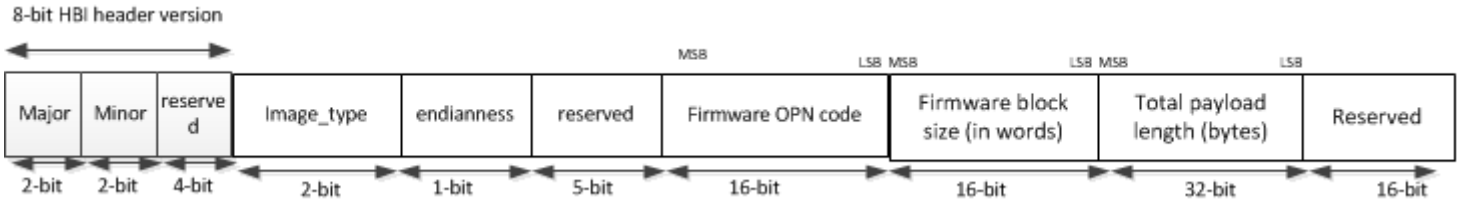


Figure 1 Convertor input/output

The reformatted boot image will begin with an HBI header. This header contains the following image information as in Figure



- Header version number.
  - Combination of Major.Minor
- Firmware image information:
  - Image_type
  - Endianness
    - Little / Big

- Firmware OPN number
  - 16 bit - match target device OPN for which image is generated with Most Significant Byte 1st
- Firmware Block Size
  - Length of each chunk in 16-bit word length with Most Significant Byte 1st.
  - Selected by user during conversion. Valid values are 16 to 128 words as per the following equation block size = 16 * 2^n (Where n: 0,1,2,3).
  - Example. If Firmware Block Size is 64, then image will be organized as chunk of size 64 words (128 byte) length.
- Total PayLoad Length
  - Length of the data following header in Bytes.
  - Number of chunks = (Total Payload length)/(Firmware Block Size * 2)

Prior to loading that image into the device, the application must call the SDK HBI_get_header() function to get header fields values and perform sanity check and error condition check on the generated image. And get chunk of size Firmware Block Size and send to device till Total Payload Length is achieved.

3 Using Convertor Tool

Microsemi VPROC SDK firmware image convertor tool is available inside /tools directory of release package and is applicable ONLY for Timberwolf Device Family.

3.2 Compiling Tool

Tool is simple c-based file can be compiled on any platform (windows or linux) using c-compiler installed on that platform

3.3 Running Tool

To displays help menu:

twConvertFirmware2c –h

To convert input firmware .s3 image for device mentioned by ‘ firmware code’ to output .bin or .c with specified block_size

(Note: block size must be as per this equation 16*2^n where n: 0,1,2, or 3)

For *.cr2 configuration file block size must be as per this equation 1*2^n where n: 0,1,2, 3, 4, 5,6 or 7)

twConvertFirmware2c.exe -i <input file> -o <output file> -b <block_size> -f <firmware code>

Example:

To convert a firmware file named zl38051_v1.3.0.s3 to bin file with block size of 32 words

twConvertFirmware2c -i zl38051_v1.3.0.s3 -o zl38051_firmware.bin -b 32 -f 38051

To convert the same firmware in c-code format

twConvertFirmware2c -i zl38051_v1.3.0.s3 -o zl38051_firmware.h -b 32 -f 38051

To convert a configuration record file named zl38051_v1.3.0.cr2 to bin file with block size of 32 words

twConvertFirmware2c -i zl38051_v1.3.0.cr2 -o zl38051_config.bin -b 32 -f 38051

To convert the same configuration in c-code format

twConvertFirmware2c -i zl38051_v1.3.0.cr2 -o zl38051_config.h -b 32 -f 38051