Oasys

Oasys LS-DYNA Environment Software

Decode Binary Documentation

Contents

1   Summary

The free "decode_binary" utility converts Oasys PRIMER's proprietary binary format keyword files (typically called *name*.**kby)** back into conventional ASCII format.

Binary files store numbers in the computer's native "binary" format making LS-DYNA keyword files smaller and faster to read and write. The format of each line is preserved maintaining the correct LS-DYNA fixed or comma-separated formatting when converted back into ASCII format. This also means that "i10" and "long" keyword formats are fully supported.

Binary format however, cannot be read or modified in normal text editors nor read directly by LS-DYNA. Users with the Oasys LS-DYNA Environment software can use Oasys PRIMER to convert files in both directions between ASCII and binary formats. Those that do not have access to Oasys PRIMER can use this "decode_binary" utility to perform the conversion.

The decode_binary utility is free, does not require a licence, and may be used for any purpose.

2   Usage

Decode_binary is a command-line only utility that converts a single file at a time. The command syntax is:

Windows: **decode_binary16_x64.exe**   *input binary filename output ascii filename*

Linux: **decode_binary16_64.exe**   *input binary filename output ascii filename*

Input and output filenames should not be the same. If both filenames are omitted the code will report its current major and minor version numbers, then exit.

It is recommended that Windows users working manually should open a "Command prompt" or "PowerShell" in the same directory as the files to be converted. This will remove the need to type in pathnames.

3   More about the binary format

As finite element models get larger it becomes increasingly impractical to edit them using conventional text editors, so the value of having "human readable" files is diminished. The ASCII format can be quite wasteful of disk space, sometimes using up to 5x the amount of space to store a number compared to the computer's single precision storage. By storing numbers in the computer's native binary format, files are typically around 25% of the original ASCII file. This saves disk space and cuts down transmission time across networks.

Using binary format has a dramatic impact on file input and output speed as it also cuts down the converting of numbers between formats which is a numerically expensive operation. In Oasys PRIMER v16.0 binary output is approximately 9x faster than ASCII output. In Oasys PRIMER v17.0 ASCII output times have been reduced but binary output is still at least 3x faster.

Binary files always start off in ASCII format. Depending on the output settings in Oasys PRIMER, they may have some conventional text and ASCII keywords at their top. There will then be a special keyword ***START_BINARY** after which the remainder of the file will be in binary format.

This means that the relevant commands ("head" and "more" on Linux, and "cat" on Windows) can inspect the top lines of the file which usually contain comments describing its content. Be aware that opening these files in a text editor may fail with a message such as "line is too long" or even a crash. It is therefore best to avoid opening these files in conventional text editors.

4 File Versions

Binary files have Major.Minor version numbers. These version numbers refer to the formatting of the file, not the Oasys LS-DYNA Environment version number. The correlation between file and Oasys LS-DYNA Environment version numbering is:

Oasys LS-DYNA suite version	File version	Comment
15.0	1.0	Initial introduction
16.0	1.0	No change
17.0	1.1	Support for "i10" format added

The format is backwards compatible so a newer version of decode_binary will always read older files.

5 File Naming

By convention Oasys PRIMER will give binary files the extension **.kby** when it writes them. This is only a convention, not a requirement.

The decode_binary executable is agnostic about filenames. It will treat *<input filename>* as having binary content and will write *<output filename>* in ASCII, regardless of the file names or extensions.

6 Compressed files using .zip or .gz formats

Oasys PRIMER can compress binary files to .gz or .zip formats if requested. This will give a further reduction in file size, typically down to around 15% of the original ASCII file size.

Decode_binary however, does not include decompression. If you have a file that is already compressed (e.g *name*.**kby.gz** or *name*.**kby.zip)** you will need to uncompress it first then run the result through decode_binary. Programs such as "gunzip" or "winzip" are available for this.

In the case of a .zip bundle containing multiple files you will need to run each file individually through decode_binary.

7 More information

If you need more information or have any questions please contact us:

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