



A Simple Explanation of What 32-bit Programming Really Means

Legitronic Labeling Software 3.X is 32-bit software. This document explains what 32-bit software is, and the differences between 16-bit and 32-bit software.

32-bit Programming

To begin the explanation it helps to have a clear understanding of what a BIT actually is. A BIT is the smallest unit of computer information. A BIT contains either a 0 or a 1. The common PC user will never see the contents of a BIT. Eight BITS make one BYTE. One BYTE is equivalent to one character, either alphabetic, numeric, or symbol.

CHARACTER	BYTE Representation	8 BITS make up a BYTE
“ A”	01000001	0 or 1's

The difference between 16-bit and 32-bit programming lies in how much data the program can process in one operation.

- | <u>16-bit</u> | <u>32-bit</u> |
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| ➤ A 16-bit program processes 16 bits (or 2 characters) in one operation | ➤ A 32-bit program processes 32 bits (or 4 characters) in one operation |
| ➤ When using a 16-bit program to process a large number, at times the program is required to do several operations, which could slow down the processing of certain applications such as large spreadsheets | ➤ A 32-bit program can process 32 bits of data at once enabling a 32-bit program to do all calculations in one operation. This speeds the processing of your data. |

File Names

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| ➤ 16-bit programs only handle filenames that are 8 characters long plus the file extension. | ➤ 32-bit operating systems like Windows® 95 and Windows® NT can handle file names as long as 255 characters and also allow for spaces in a file name |
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Multitasking

- In 16-bit operating systems all open program reside in one “pool” of memory causing slower processing time.
- This is called cooperative multitasking. This means that another program can run only when the active program relinquishes control. If that program is buggy and crashes, or is poorly designed, another program may run slowly or not at all.
- Multitasking, the operation of running more than one program at a time, is better supported by memory in 32-bit operating system. Every program that is open requires memory. In 32-bit operating systems sections of the available memory are allocated per program.
 - This means programs are better insulated from one another. One ill-behaved program cannot cause another program, or even the whole system, to crash (in Windows NT especially).
 - Only files related to the specific program are processed in the allocation of memory speeding up processing. In 16-bit operating systems only the active program window can process.
 - In 32-bit operating systems (especially NT) the scheduler handles the multitasking, and a program that crashes will not affect other 32-bit programs that are running.

Example of a Multitasking Scenario

You are downloading large files from the Internet and it's taking too long. You also need to type a letter using your word processor. You ALT-Tab to put the Internet into the background and you make your word processor your active window.

- With a 16-bit program, the download process and the word processing program will take turns sharing the processor. Technically they do not run simultaneously, though it might appear that way. This technique is slower and offers the potential problems described above. This can include a program not allowing another program to run at all. Poorly written programs will often maintain control of the processor causing other programs to stop.
- With a 32-bit program, the Internet window will continue to download the file regardless of whether it is in an active window or not because the two programs have their own designated section of memory. Because they do not share the same location in processing both programs will run simultaneously regardless of which is in the active window.

If you have any questions on this memo or Legitronic Labeling Software 3.x, please contact Labeling Systems at 847.364.8500 ext 777.