FLASHCUT CNC vs MACH 3

FlashCut is the original Windows based CNC control company. In fact, we began selling the FlashCut solution over 20 years ago. Back then, most PC based CNC controls were DOS based. As archaic as DOS was, it is a real time operating system which is capable of doing microsecond level control, which is appropriate for doing motion control and hence CNC control. Windows is NOT a real time operating system. Instead, it is a multi-tasking operating system with a very nice user interface which enables the user to have multiple windows open. The multi-tasking capability that Windows has is at the expense of not being able to do real time control – something 99% of windows users will never notice. For that reason Windows cannot reliably do direct motion control. We recognized this problem with windows right away and engineered a solution that uses Windows for what it is designed for with a nice user interface and offset the motion control to an external microcontroller (our signal generator) which is easily capable of doing microsecond level commands for smooth, uninterrupted motion control. The Windows system and the signal generator talk to each other with a simple USB interface making it true plug and play.

This architecture is also designed to Microsoft's standards which means that we have had zero problems working with any version of Windows from 3.1 in the 1990's to Windows 10 today. This includes any security patches or interim releases that Microsoft puts on the PC on a regular basis. Our customers use our software and controls easily, safely and in confidence that there will be no roadblocks along the way from Microsoft.

Mach is a different story. It is lower cost than FlashCut, but you certainly get what you pay for. It was designed to try and force Windows into being a real time operating system - which it is far from being. In doing this, there are only certain versions of Windows that it will "work" with and they still have hiccups every once in a while because, again, it is forcing a major and very complex operating system to do something that it was not designed to do. This becomes very important when you are moving motors – especially stepper motors. The motors are designed to be commanded by very precisely timed steps within microseconds which is what the FlashCut signal generator with its three separate microprocessors is designed to do. On a microsecond level, the FlashCut step train would typically look like this:

With the Mach controller, it uses the Windows timer which is not capable of consistently producing well timed steps so you could get a step train from time to time that looks like this:

When a motor see this, it will hiccup or stall and ruin the part being machined.

Also, because of the sensitivity of "hacking" the operating system, Mach users cannot download recommended Windows patches from Microsoft without compromising their CNC system even further.

Another huge benefit of FlashCut is that we designed the software and the electronics from the ground up and still have the original engineers along with a large, professional team to support our customers for many years to come. This is made up of real people who are available via phone or e-mail. The Mach

users have to rely on online forums for their support. Also, if there is a need for a software change or improvement for any reason, we can quickly do it in a quality way.

Every component in a FlashCut CNC controller is assembled and tested in our facility near Chicago. Many Mach systems are integrated from components all over the world and the support can end up being a lot of finger pointing.

Also, because FlashCut is a real Windows program, you can easily and safely have other programs loaded on the PC such as CAD/CAM to design your part. In fact, we now have an embedded CAD/CAM program that can be added to our CNC controls.

In a nutshell FlashCut combines the best of both worlds - an easy to use Windows user interface and a well-engineered motion controller for precise, smooth CNC motion in multiple axes. We have upgraded hundreds of Mach users over the years who bought their system to save a little money, but quickly learned that the time and compromised parts were not at all worth the savings. FlashCut is a quality control system with a quality reputation.