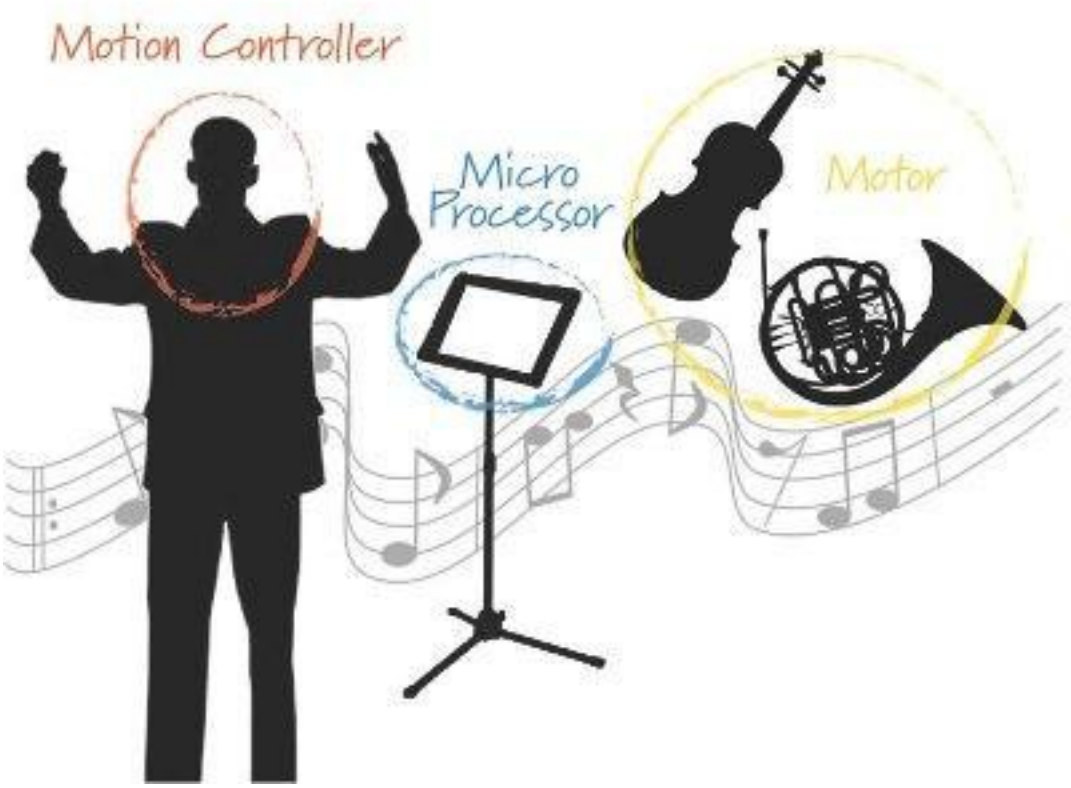
The Symphony Of Surgical Robotics

Phil Brown, VP & GM, Pro-Dex Inc. – OMS



Surgical robots are becoming more of a standard in operating rooms. As such, device designers are going to need to understand the motion control technology that makes them function. This article looks at the "sheet music" that offers the guidance to the "conductor" who is instructing the "instruments."

To understand how motors, motion controllers and microprocessors work in harmony to produce a robotic surgical system that can assist physicians with surgical procedures, it's helpful to think of an orchestra.

The motion controller within the surgical robot can be compared to the orchestra's conductor and the motor as an instrument. In order to unify the instruments (motors), set the tempo, or execute clear instructions, the conductor (motion controller) needs a musical score to follow. This is why the microprocessor is so essential. The microprocessor is the sheet music that the conductor follows to instruct the instruments.

Most technology has advanced significantly in the past decade due, in large part, to innovations in microprocessors. Microprocessors are small silicon chips that contain millions of tiny components that work together to process a sequential flow of precise instructions at speeds of millions—or even billions—of times a second. These instructions tell the machine what to do, how to do it, and when to do it.

Without motors and motion control, it would be impossible for the instructions to be carried out—just as there wouldn't be any music if there was no conductor or instruments to perform it.

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