MOTION BUSES VS ETHERNET

Is one or more of the Ethernet-based protocols fast and reliable enough to be used for high-speed, real-time motion control?

Yes. EtherCAT® was specifically designed to handle the high bandwidth requirements of motion control unlike some other Ethernet based industrial communication buses. We chose this bus for our Kollmorgen Automation Suite™ control platform for this reason as well as others. Kollmorgen had one of the first servo drives running over EtherCAT so we have lots of significant experiences that have proven the performance and capability of EtherCAT in critical motion applications.

Or, are SERCOS or the other protocols dedicated to motion still the best choice for high-speed motion applications?

If you are referring to SERCOS II over fiber-optic, it is not our recommended choice. The protocol has undergone an update, where many aspects were improved in SERCOS III. One notable change is the adoption of Ethernet at the physical layer for SERCOS III. We have had many control and drive platforms that support SERCOS II and perform well. Fiber optics are a good choice for noise resistance of the transferred data. It is a very capable motion bus.

> Quote from EtherCAT.org
> http://www.ethercat.org/en/ethercat.html
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> _The EtherCAT technology system overcomes the limitations of other Ethernet solutions: The Ethernet packet is no longer received, then interpreted and copied as process data at every connection. Instead the Ethernet frame is processed on the fly: the newly developed FMMU (fieldbus memory management unit) in each slave node reads the data addressed to it, while the telegram is forwarded to the next device. Similarly, input data is inserted while the telegram passes through. The telegrams are only delayed by a few nanoseconds._

One aspect that plagued SERCOS II was the lack of industry wide adoption that limited choices or left OEMs with systems that were only compatible with certain vendor hardware.

Are their certain situations where Ethernet or traditional motion protocols still provide more functionality and advantages than the other?

Fiber optics are extremely noise resilient. Industrial Ethernet buses should use shielded Ethernet cables (not just office patch cables). This evens the playing field concerning the reliability of communications in an electrically noisy environment.

How is Ethernet versus traditional motion methods likely to evolve in the future?

Ethernet will prevail. Ethernet-based industrial protocols take advantage of costs due to the economies of scale for the Ethernet NIC's (the port electronics that are switching and routing), as well as a well-developed supply chain for the cabling. These are resultant from the PC and office networking revolution since the mid-nineties. The present generation of engineers is very comfortable with the look and feel of Ethernet hardware. It represents universal connectivity, even if in practice there are other layers of compatibility that are specific to automation control which gets managed by vendors and integrators.

ABOUT KOLLMORGEN

Kollmorgen is a leading provider of motion systems and components for machine builders around the globe, with over 70 years of motion control design and application expertise.

Through world-class knowledge in motion, industry-leading quality and deep expertise in linking and integrating standard and custom products, Kollmorgen delivers breakthrough solutions unmatched in performance, reliability and ease-of-use, giving machine builders an irrefutable marketplace advantage.

For more information visit www.kollmorgen.com, email support@kollmorgen.com or call 1-540-633-3534.