

Decentralized Control Achieves Repeatable Processes And Maximum Production Uptime At Lower Cost

Advances in technology are enabling manufacturers to get closer to a long-sought goal: factories that produce goods of uniform quality, just in time to meet customer demand, at the lowest possible cost. Decentralized control is one of the most useful of these developments, helping manufacturers achieve more repeatable processes with maximum system availability and that are able to more rapidly accommodate production line changes.

Like many of the new technologies being adopted by American manufacturers, decentralized or distributed control was first developed in Europe. By positioning control hardware and intelligence closer to the motors that govern machine operation, decentralized control pioneers like SEW-EURODRIVE are enabling OEMs and their customers to achieve more accurate control of machine processes at lower cost.

The sheer complexity of large, centralized control systems creates opportunities for communication failures or delays that can disrupt production processes. Long cable runs and large control panels packed with components make them expensive to create. Complex software programming and the attendant efforts to debug millions of lines of code add to the costs and increase the potential for delays in startup.

Decentralized control, in which islands of control surround motors and other operating devices, assures faster response times and improved control of machine operations. Each island needs only to control a discrete number of functions, simplifying programming. And by connecting these islands of control to fieldbus communication networks, entire systems can be monitored easily without disrupting local functionality. Decentralized control thus provides the advantages of centralized control in monitoring system health without the complexity and cost.

Automotive manufacturers were among the earliest adopters of decentralized control, using it to make faster production line changes and reduce vehicle manufacturing costs. Decentralized control eliminates the long cable runs that are expensive to install, easy to damage and time-consuming to change, an important benefit for automakers trying to respond more rapidly to changing customer demand. Now manufacturers in other industries whose processes use large numbers of motors, such as materials handling, packaging and logistics, are seeing advantages to decentralized control.

In a centralized control system, the greater the number of motors, the more cable and tray are required. Labor costs for installation increase proportionately. Longer cable runs have the same effect on system costs. But since a decentralized system relies on branch feeders, increasing the number of motors does not have the same cost impact. As a rule of thumb, any process that involves 10 or more motors should be a good candidate for decentralized control.

In an independent study of a decentralized SEW control system, systems integrator Applied Engineering Solutions compared centralized and decentralized control approaches. The study calculated potential total savings at 20 to 60 percent, depending on the size and configuration of the system. The largest savings were achieved in reduced labor costs for installation and panel construction, while material costs savings ranged up to 40 percent.



In a typical application such as a bottling line, which uses 600 feet of conveyor and 50 1 HP motors, moving from a centralized to a decentralized control system would reduce the amount of power cable from 9,700 to 1,200 feet, and field installation time would decline from 300 hours to just 40 hours because of fewer components. The total estimated cost for building a centralized control system for this bottling line, including panel construction, cable, cable tray, components, drives and labor, would be \$150,000

Panel building costs are particularly significant in centralized systems because of the large number of components required, including overload protection, drives, bus gateways and expensive heat dissipation devices like fans and heat sinks, as well as the larger panel size needed to accommodate these components.

In contrast, in a well-designed decentralized system, the motor disconnect, overload and bus capability are built into the drive, which is mounted near the motor. Local I/O can also be collected without adding the hardware normally associated with doing this, such as terminal blocks, junction boxes and remote I/O modules.

Another important benefit of decentralized control systems is that by having the drive in close proximity to the motor, the harmonic distortion, injected noise and other problems often experienced with variable speed drives on long motor runs are greatly reduced. Maintenance is also simplified because troubleshooting is easier. Look for a modular system design, such as SEW-EURODRIVE's MOVIFIT® Field Integrated Technology, which allows failed components to be quickly replaced to restore operations.

The advantages of decentralized control in reducing costs and improving uptime can be an important tool for achieving higher levels of productivity in any industry where the operation of large numbers of motors must be managed.

About SEW-EURODRIVE

Engineering excellence and customer responsiveness distinguish SEW-EURODRIVE, a leading manufacturer of integrated power transmission and motion control solutions. SEW introduced the world's first gearmotor more than 75 years ago and its systems are known for high performance and rugged reliability in the toughest operating conditions.

SEW-EURODRIVE offers a comprehensive range of electromechanical and electronic drive solutions. The company's modular product designs allow components to be quickly and cost-efficiently assembled in literally millions of different configurations to create a truly customized solution for every customer.

With its global headquarters in Germany and sales of more than 1.5 billion Euros, the privately held company has more than 11,000 employees with a presence in 46 countries worldwide. SEW operates from 12 manufacturing facilities and 63 regional assembly centers located around the world.

U.S. operations include a state-of-the-art manufacturing facility, five regional assembly centers, more than 60 technical sales offices and hundreds of distributors and support specialists. This enables SEW-EURODRIVE to provide local manufacturing, service and support, coast-to-coast and around the world.