

Integrated Automation Makes Big Sense for Small-Batch Jobs

Automation offers the manufacturing industry three fundamental benefits that align with the priorities facing virtually every shop. First, shops want to increase their overall productivity, especially in the face of a shift to high-mix, low-volume production. Second, shops look for ways to overcome a shrinking supply of skilled labor, as the expertise of an aging workforce disappears into retirement with no clear line of succession to an equally capable new generation. Lastly, shops want automation solutions that raise production accuracy and increase overall parts volume.

For today's machining shops and their production environments, integrated, pre-engineered single-machine automation systems from machine tool OEMs represent the best option for shops to leverage the benefits of that technology without facing the intricacies of DIY programming, equipment compatibility and selection, installation, troubleshooting and ongoing maintenance. When an OEM designs and supplies its own automation solutions, the results offer seamless compatibility with the machine tools themselves, along with holistic support for every aspect of the system and its functionality.

Of course, pre-engineered automation solutions only work as well as they match up with actual requirements. Before an equipment manufacturer can design these types of systems, it needs a keen sense of what will enable its customers to thrive at every possible level of production, anticipating the requirements of a wide range of shops and workflows. To answer the demand for fully integrated, fully supported options, manufacturing systems builder Mazak created its Automation Systems division. Shops that opt for Mazak automation systems receive full support from the company for all aspects of installation, configuration, optimization, problem analysis and repair. The result is a wide range of integrated OEM-installed options that meet the need for specific types of productivity boosts.

For a basic type of integrated automation, gantry loaders offer a quick-to-install turnkey option that provides fast loading and unloading of small batches of part families for immediate productivity results. For consistent efficiency, a rail-mounted gantry robot installs above a machine to load and unload workpieces rapidly without supervision. Additionally, a single operator can run multiple gantry-loaded machines. As examples, Mazak high-speed GR50 and modular GR100 gantry loaders offer options that include various conveyors, pallets, loading stations and robot hands. The GR50 achieves its high-speed performance with a two-axis design that positions one axis on top of the other for extremely fast workpiece load/unload cycle times.

Other forms of single-machine automation build into individual machine tools for optimized productivity, allowing shops to load and unload multiple parts and workholding/fixtures to and from a stocker and a machine tool. Ideally, OEM design and integration means that these solutions expand without the use of third-party components. For example, the Automated Work Changer (AWC) from Mazak pairs with its VARIAXIS i-300 AWC full simultaneous 5-axis

Vertical Machining Center, with direct control integration into the machine's CNC and its SMOOTH AWC software. Mazak's SMOOTH AWC software verifies sufficient tool life for 12 production hours at a time and flags any tools in the magazine that need to be replaced, eliminating machine down time during unattended operation.

Beyond single-machine solutions, many shops need larger-scale automation options but lack the space to accommodate pallet-stocker systems that expand horizontally. To meet this challenge, Mazak introduced its Multi-Pallet Pool (MPP) as a single-machine solution series with a fast, compact multiple-pallet stoker that expands vertically to six, 12 and 18-pallet capacities after initial installation. For smooth changeouts, the MPP design positions all pallets equidistant from the center of the stoker. Like the AWC, the MPP uses software that integrates directly with the machine tool and its MAZATROL Smooth CNC for easy operation, along with analysis of production results, system use and more, including available remote monitoring for networked machines.

Machine tool OEM-supplied, integrated automation systems such as the GR gantry robots, AWC and MPP allow shops to compete in the face of changing production mixes and dwindling skilled labor resources – and provide them with every possible advantage to capture ideal job volumes for profitable growth. Increasingly, manufacturing automation makes the difference between proficient and productive, making new opportunities possible without adding shifts or personnel. OEM automation options bring the efficient future into the productive present for a wide range of shops.