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## Let the System Integrator Lead the Way

The benefits of using professional integrators often outweigh any savings you might realize trying to create an automated system on your own.

By Joyce Laird

A system integrator is someone who can create a handshake across multiple machines to implement a complete automation solution. Integrators vary with regard to what types of products they use (their own and/or those made by others) but, to do their job, all must be experts in system communications.

Integrators also vary in size and capabilities. One of the larger integrators is Automation Tooling Systems (ATS; Cambridge, ON, Canada), with 3500 employees and 25 facilities worldwide. ATS uses both its own production-ready products and technology, and third-party equipment to provide automation solutions.

"We offer single-source capability that ensures control over every aspect of system development and cost,"

says Jim Beretta, ATS's manager of marketing services. The result, he says, is automation systems that deliver performance and reliability, with fast payback.

Meikle Automation Inc. (Kitchener, ON, Canada) also services a full range of automation integration, from assembly to testing. The company builds systems "to assemble tiny devices barely visible with the naked eye, all the way up to frames of cars," says Andrew Meikle, president and CEO. "Everything we do is custom."



Four robots in this arc welding system work in coordinated motion from one controller. (Photo courtesy Fanuc Robotics)

Some integrators specialize in specific areas. Kahle Automation (Summit, NJ), for example, deals only in high-speed medical assembly and test automation. "Since all processes must meet specific FDA regulations, there are specific things we know well that an integrator who is excellent in other areas may not be as familiar with," says Kahle president Julie Logothetis. "Our ideal project is to control both the automation and integration. If you can control the whole process, you can control the outcome."

Other forms of system integrators include manufacturers that have added partial or full integration services to their own product offerings. At Fanuc Robotics (Rochester Hills, MI), J. Patrick Fitzpatrick, western regional sales manager, says the company

works with outside integrators that have expertise in specialized applications, but that Fanuc also maintains an in-house integration staff. "Depending on the application, we can do a full system integration for customers, sell a robot to a system integrator or directly to an end-user," he says. "We do the full gamut."

Even small projects can benefit from a custom solution. Recently, a major candy manufacturer approached Fanuc with such a challenge. The application involved the

company's semiautomated peanut brittle line. The problem was that one task was physically harming the operators. After the peanut brittle was extruded onto a flat, stainless-steel conveyor, operators had to cut it and flip it as it moved to the final packaging step. As a result, operators were experiencing arm and wrist problems. The company knew the process needed to be automated in a way that would communicate with the line, upstream and downstream. The application had proprietary special needs, and the customer finally went to Fanuc for a solution. It involved integrating line tracking and a robot, and having specialized end effectors developed for that robot. Now, a robot with a large paddle happily flips peanut brittle all day. "Nobody was happier than the employees, who are now handling more value-added jobs," says Fitzpatrick.

As a company with multiple divisions devoted to different products, Bosch Rexroth (Buchanan, MI) offers time-saving solutions to both integrators and end customers. On its Web site, Bosch Rexroth provides a list of key integrators for end-users. "Some end-users have enough engineering talent in-house to do their own integration and, in that case, we work directly with them," says Kevin Gingerich, director of marketing services. "If the end-user is trying to integrate a lot of sophisticated products from a range of different companies, it pays to have one company coordinate all the various manufacturers so everyone is on the same slate."

Edgewater Automation (St. Joseph, MI), which specializes in test equipment, also works closely with other outside suppliers to integrate products to their own systems that add value to their end customer. They typically integrate pre-engineered solutions, such as robotics, vision, and various specialized forms of test technology, into their own machine platforms to best meet the end-user requirements.

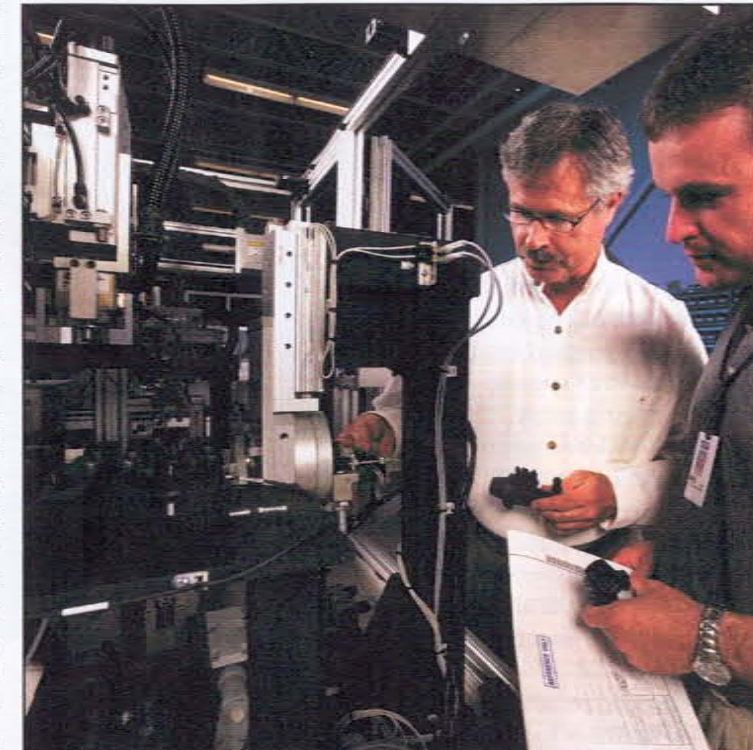
### The Big Question

Manufacturers often ask why they should invest in an integration service when they have engineers on staff. The biggest benefit is time savings. System integrators bring experience to a project. Experience saves time. If in-house engineers are used, other workers must be appointed to complete the engineers' normal duties while they deal with the system design—a process that includes dealing with outside vendors, attending training sessions, developing CAD drawings, experimenting with layouts, and learning all the interface languages needed to implement a full new production line or subsystem.

Under today's lean production procedures, most companies maintain only key engineering personnel to oversee line operators. If the automation addition is small, such as a stand-alone test station,

an in-house staff may be capable of taking on the additional workload. But to integrate anything large, professional assistance is required.

Kahle, for example, recently handled the installation of a new high-speed line for a specialized pharmaceutical product. Aside from the overall flow, a continual set of inspections with red flags had to be built into each stage of the assembly to ensure no value steps would ever be added to a faulty assembly. Multiple machine vendors were involved, and each machine needed to be integrated into the whole line. Each company had its core competency, and Kahle served as the overall integrator on the project. Prior to starting the project, each equipment supplier gave a presentation on their machine that explained what it did and how it would integrate into the total process of the line. Kahle had to stay in close contact with all involved to ensure a smooth working relationship. "To mastermind a big project like this, there needs to be somebody who's willing to stand up



System integrators can offer single-source capability that ensures control over every aspect of system development and cost. (Photo courtesy Automation Tooling Systems)

and take responsibility for it," says Kahle's Logothetis.

Integrators bring a lot to any project. Many have their own automation platforms to start from, and all draw upon the expertise of a huge range of other suppliers. They are up to date on things that a normal manufacturer simply does not have time to keep in touch with. "We find others with the expertise we need and we integrate their products into our systems," says Paul Beduze, Business Development Manager, Mikron Assembly Technology (Aurora, CO). "We know what we're starting with for customer solutions. It's not a blank sheet of paper."

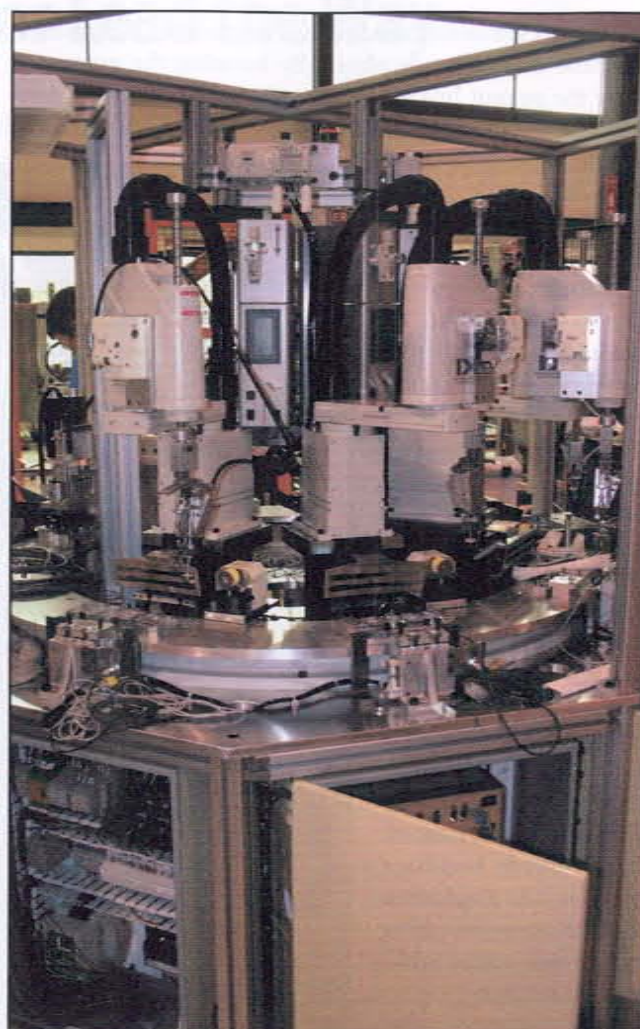
### Finding the Right Match

The best place to start looking for a system integrator is often with one of the major suppliers of equipment that you will be specifying. They all have preferred integrators to recommend that will likely know your specific area of manufacturing. It does not bode well, for example, if you are in medical product assembly and a supplier recommends an integrator that has no medical experience. A mistake such as this would never happen going through a major equipment supplier because it gives the supplier a black eye. Suppliers want you to use their equipment in the most effective way possible. They will only recommend integrators that will make them look good, and in turn, make your project run smoother.

"We look at the user's application and recommend integrators that know that niche," says Brian Jones, section manager at Denso Robotics (Carson, CA). He adds that to become a Denso-certified systems integrator, candidates must pass the company's training program.



In this assembly application, one-, two- and three-axis solutions combine linear motion systems with motors, cables, and servo drives, as well as interfaces to all commonly used fieldbus systems. (Photo courtesy Bosch Rexroth Corp.)



A robotic soldering-ring dial for electronic assembly. This solution allows for high transfer speeds and accurate placement. (Photo courtesy Edgewater Automation)

Similarly, says Kevin Kozuszek, director of marketing for Kuka Robotics, "We pride ourselves on how we identify the right integrators as partners. We don't work with everybody. We have an integrator network that allows us to pick the partners that have the most experience and stability. We train them to be an extension of Kuka Robotics."

Motoman (West Carrollton, OH) is another leading robot manufacturer that works all areas of the market. "We sell products to end-users, we work with outside system integrators, and we have our Advanced Systems Group, which is our in-house integration organization," says Tom Sipple, handling technology leader. According to Sipple, the company uses a wide range of supporting products from a variety of top companies.



Six-axis robots with multihead end-of-arm tooling (EOAT) assemble automotive parts. (Photo courtesy Denso Robotics)

### Bringing It All to the Table

An integrator wants the customer to come to them with either a process in place or, at minimum, enough design work on a new product to have an idea of how they intend to build it. An important factor for success in any automation project is early involvement of the integrator, and clear communication up front. Everything should be spelled out regarding what each party is responsible for. Every iteration of a design plan means project delays and potentially higher costs.

A good example of how clear communication kept a complicated integration project on time and on budget involves an optical lens manufacturer that came to FlexLink (Allentown, PA) for help setting up an entire manufacturing area for new products. Paul Jarossy, FlexLink director of marketing, says it became a project of continual communication because it fell into separate sections, each requiring special attention by both the customer and the integrator.

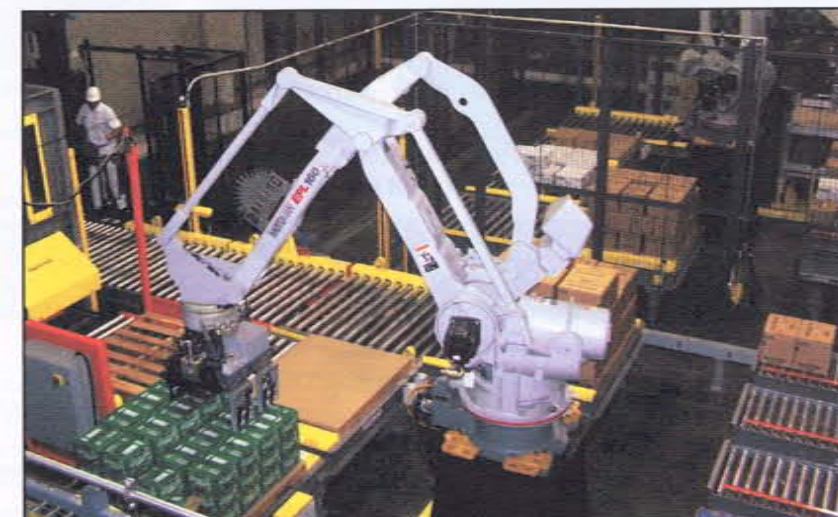
First, the full conveyorized system was simulated at FlexLink. After the simulation was approved by the customer, FlexLink built the complete conveyor system, shipped it to the customer, and installed it before any manufacturing equipment was ever in place. Once all final-assembly and test equipment was selected and shipped, FlexLink worked with each original manufacturer and adjusted every machine and the conveyor line to ensure everything was perfectly timed and working together properly. By having each stage of the proj-

ect preplanned and well documented, each player knew what to do, and the whole system was up and running with no glitches between stages.

In this case and many others like it, system simulation proved invaluable. All the best integrators provide this service to their customers. "We developed our own simulation system, and that ties right into the return on investment (ROI)," says Dave Galloway, FlexLink's director of engineering. "The customer can see a 3-D model of their proposed production facility with their products running on our conveyors. We can pinpoint throughput to any specific area of that plan and identify potential bottlenecks in simulation before anything

is ever built. The customer can play with the layout and experiment to see how different configurations affect product flow."

Bosch's Gingerich says, "The CAD aspect of this can't be emphasized enough. Our CMS product has an on-line configurator that anyone can use to essentially create the system they are looking for; it also has a CAD generator that e-mails a 3-D CAD drawing to the person who has put in the specifications. So it's like outsourcing the design work for a customized system. Regardless of how the integrator works," he adds, "they can get good CAD support for any of our products."



Two four-axis palletizing robots equipped with multifunction grippers palletize cases of butter from eight infeed accumulation conveyors. The robot maker served as the systems integrator for this project. (Photo courtesy Motoman Inc.)



A six-axis robot with vision guidance works with a flexible parts feeder. The parts being processed are for an oral healthcare product. (Photo courtesy Epson Robots)

Regardless of how ROI is calculated, it's important to consider the total cost of ownership of an integration project over a period of time for a true ROI, not just upfront costs. For example, what will the cost be to run and maintain the equipment compared with the profit it will produce for the company?

In most cases, the cost of using an outside integrator will be less in the long run, compared with using in-house resources, if all factors are compared apples-to-apples. Faster time to completion without technical snags results in more high-quality product produced faster, which pays for the investment more quickly.

### Tips, Whispers, and Warnings

Probably the most important factor to determine about a potential integrator for your project is if the integrator is technically proficient in your application area. To know for sure, ask for references. It also doesn't hurt to ask for certifications from OEMs, suppliers, and partners. If the

integrator is dedicated enough to get thoroughly trained on different products, it shows a level of professionalism.

Financial stability is also critical. If the integrator can't easily weather financial setbacks, the end-user is the one who will suffer.

Finally there is the issue of older equipment. When a system has seen 30 years of use, it's often wiser to go with a new line that will be up for another 30 years, rather than try to add new equipment. Also, control systems today are not what they were even 10 years ago, let alone 20 or 30. Getting older machines to work with new ones can be a real issue.

When working with any integrator, you are paying for experience. A reputable integrator will guide you in the proper direction. He can tell you, for example, if what you want will be too difficult or expensive, and will offer alternative solutions. He'll also turn down jobs he deems too risky. If you did the right research to get the best integrator for your project, trust his decisions. You will reap the benefits. ■

Joyce Laird is a freelance writer in Arleta, CA.

### Companies Interviewed for This Article

Booth number indicates Automation Technology Expo  
East exhibitor, New York, June 12-14

#### Adept Technology Inc.

310-572-4657  
www.adept.com  
Booth 2813

#### ATS Automation Tooling Systems

519-653-4483  
www.atsautomation.com  
Booth 2919

#### Beckhoff Automation

952-890-0000  
www.beckhoffautomation.com  
Booth 2901

#### Bosch Rexroth Corp.

Linear Motion and Assembly  
Technologies  
269-697-5295  
www.boschrexroth-us.com  
Booth 2805

#### Denso Robotics

310-513-8500  
www.densorobotics.com  
Booth 3019

#### Edgewater Automation

269-983-1300  
www.edgewaterautomation.com

#### Epson Robots

972-964-8890  
www.robots.epson.com  
Booth 2905

#### Fanuc Robotics America

248-377-7000  
www.fanucrobotics.com

#### FlexLink Systems Inc.

610-937-8232  
www.flexlink.com  
Booth 3009

#### Kahle Automation

908-598-1140  
www.kahleautomation.com  
Booth 2605

#### KUKA Robotics

248-819-0230  
www.kukarobotics.com

#### Meikle Automation Inc.

519-896-0800  
www.meikleautomation.com  
Booth 3137

#### Mikron Assembly Technology

303-364-5222  
www.mikron.com  
Booth 3125

#### Motoman Inc.

937-847-6277  
www.motoman.com