



Cobots have enabled Advanta Southeast LLC, Manning, S.C., to take on more work.

# SOLVING THE WELDER SHORTAGE WITH COBOTS

*How two companies overcame skepticism and embraced the benefits of automation*

**A**lthough compounded by the global COVID-19 pandemic, the current welder shortage is nothing new. The aging welder workforce, the lack of a substantial new generation of welders, and career advancements/transitions along with an unprecedented surge in the demand for metallics across all industries caused a headache for welding shops long before the pandemic. But that brewing storm strengthened to a hurricane once the pandemic hit.

“COVID has hurt us pretty bad,” explained Mark Moye, plant manager at Advanta Southeast LLC, Manning, S.C., a company that offers turnkey industrial metal fabrication services. “The labor shortage is still very tight at the moment due to stiff local competition for welders.”

The company is far from alone in grappling with the skilled welder shortage — Fig. 1. After seeing production capacity and quality levels compromised, many manufacturers have

turned to automation and robotics to bridge the gap between the number of welders needed in their respective industries and the number of available qualified welders.

Another such company is Industrial Mfg. Services (IMS), Lancaster, S.C., a manufacturer of fabricated metal components for OEMs in the heavy-machinery industry. The company decided to embark on the route to automation as contracts continued to pour in while finding skilled welders remained a challenge.

“We always knew automation was going to be the way forward,” said Warren Earl, vice president of IMS.

Although automation offers companies many benefits, the transition can pose some challenges. Keep reading to find out how Advanta Southeast and IMS adopted collaborative robots (cobots) to overcome the skilled welder shortage.



**Fig. 1 – Like many manufacturers, Advanta Southeast has turned to automation to overcome the shortage of skilled welders.**

## Challenges on the Road to Automation

Both companies experienced some of the following obstacles as they moved toward automation. For manufacturers, these challenges are often based on the welding teams' initial experiences with traditional robots. The common concerns expressed are understandable.

**Fear of being replaced by robots.** Many companies hedge on robotics due to employees' resistance to change and questions about whether or not their jobs will be replaced. When Advanta Southeast started looking into investing in robot technologies, the company's workers were initially hesitant and skeptical.

"Employees were afraid of losing their jobs," Moye said.

**Extensive training to learn complex systems.** Companies that are already time-strapped are worried about the complex level of robotic technologies, especially when some welders may not be tech-savvy enough to operate complex solutions. For that reason, extended training and onboarding along with extensive support are often cited as concerns. It stands to reason that the more a welder tries to get a handle on a robot, the less time they spend on profitable jobs and contributing to throughput.

"Some managers questioned just how efficient welding robots could really be as far as learning to program them and set them up," Moye said.

This can ring true for high-mix, low-volume projects. Many may ask, "Does the programming time trump efficiency?"

**High equipment and training costs.** On top of concerns dealing with technological complexity, equipment performance, and staff pushback, a lot of welding shops do the math and realize that the capital investments for traditional robots, exacerbated by the costs of extended setup times and prolonged support services by robot integrators, are high. This can make manufacturers perceive target return on investments (ROIs) as unattainable in the short term. A 2019 study by McKinsey & Co. confirmed these concerns (Ref. 1). The study reported that 53% of respondents said their top challenge in implementing industrial robots was the costs.

## Technological Innovations Overcome Challenges in Robotics Integration

Despite the hurdles companies may face when considering robotics systems to automate their production processes, there are innovative solutions available that aim to democratize robotics use and make automation investments more affordable. Developed with proven technologies from renowned brands, new welding cobots and their surrounding equipment are becoming easier to use. Many also eliminate the complexities of traditional industrial robot setups.

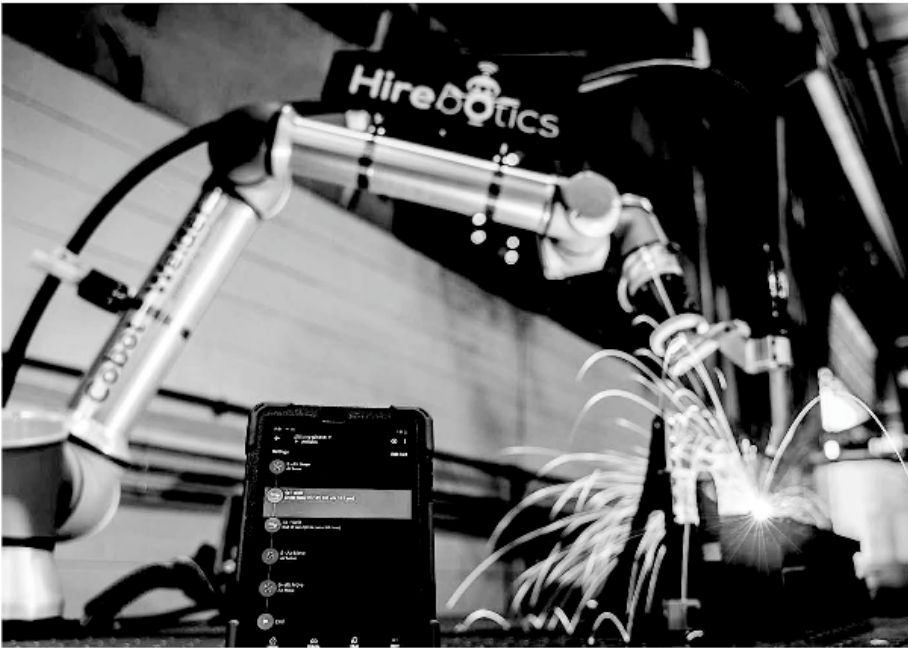
When researching welding automation systems, apart from considering inherent functionalities, manufacturers should ask themselves the following questions:

- How are the welding automation systems installed?
- What is required to program the welding automation systems?
- How easy is it to configure the welding automation systems for different applications?

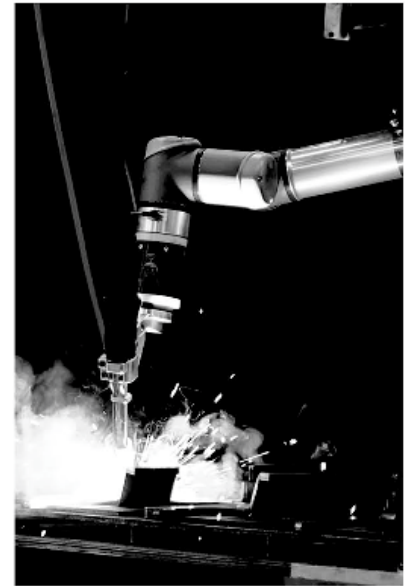
To make welders more receptive to cobots, during vendor demos, many fabrication shops are now asking welders to test-drive the systems to see how comfortable they are with the setup and how the systems work.

Programming ease will inevitably affect the welder's adaptability. The harder the system is to learn, the less likely it will be adopted by welding teams, so selecting a cobot that is easy to program is key. An important factor that can affect the ease of programming is whether the robotic welding system needs to be programmed on a robot interface or on a commonly used device, like a phone or tablet. Cloud capabilities and an intuitive interface are additional factors that can help users fix issues quickly and in real time.

Helping them avoid some of the challenges associated with robotics integration, Advanta Southeast and IMS both opted for an automated cobot welding solution that could be programmed with a simple app on a mobile device — Fig. 2. This meant that the teams did not need to learn robotics programming.



**Fig. 2 — The cobot welding solutions adopted by Advanta Southeast and IMS can be easily programmed using a mobile device app.**



**Fig. 3 — The cobots at IMS help the company achieve consistent and repeatable quality welds.**

At first, the welders at IMS were skeptical about how easy the cobot would be to use because the company had tried other cobots and noticed few distinct advantages regarding simplicity and programming times. However, after the onboarding process, the welders were able to start using the cobot in about half an hour.

“Programming a traditional robot takes at least an hour,” explained Justin Payne, manufacturing engineer at IMS. “It took me four minutes and 19 seconds at one welding cobot station.”

Advanta Southeast pointed out that thanks to the limited programming needs of its selected system, welders started to enjoy working with cobots. At the company, the cobots were dedicated to mundane and repetitive tasks, while welders were assigned more value-added jobs, thus improving employee efficiency and job satisfaction.

Both companies also experienced accelerated throughput, which allowed them to take on more work despite the skilled welder shortage.

Advanta Southeast was able to expand its offerings and take on new types of projects in different locations. For example, the company was recently awarded a large new mandate of towers for Rivian, Irvine, Calif., a provider of electric vehicles. These projects would have been impossible for the company to take on prior to adopting its welding automation systems.

“We increased our output to 400% compared with manual welding,” added Moye.

IMS has also seen an uptick in diversified work. To date, the company has not experienced any problems with part consistency, repeatability, and quality — Fig. 3.

## Welding Automation Is the Way Forward

Offering ultra-short programming times and intuitive interfaces that guide welders to configure jobs in as little as ten minutes, welding cobots are a game-changer. With cobots overcoming the apprehensions of welding shops, both Advanta Southeast and IMS consider welding cobots to be the wave of the future.

As IMS Manufacturing Engineer Matt Blowers affirmed, “I would tell anybody if they’re on the fence or questioning it, go for it. They won’t regret it.” **WJ**

### Reference

1. Teulieres, M., Tilley, J., Bolz, L., Ludwig-Dehm, P. M., and Wägner, S. 2019. *Industrial Robotics: Insights into the Sector’s Future Growth Dynamics*. McKinsey & Co., New York.

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