Miller

Miller Welding Education and Training Systems

AugmentedArc™
Augmented reality welding system

LiveArc™
Welding performance management system

Efficient, Economical and Engaging

Our industry needs qualified weld operators, but it faces multiple challenges. Educators with full classrooms struggle to personally observe and evaluate each student. On the job, managers must not only train and qualify existing employees, but also screen job candidates. And in a world of ever-expanding career options, talented young people must see welding as an attractive choice.

Together, we can meet these challenges. Miller welding education systems assess users' weld techniques, delivering immediate feedback that also can be evaluated by instructors and managers.

Using the Miller® AugmentedArc™ augmented reality welding system, beginner and intermediate-level students can experience the most realistic multiprocess welding simulation available — and then seamlessly transition to the industry's most complete live arc experience in the Miller® LiveArc™ welding performance management system.

In classrooms, labs and industrial hiring and training applications, **Miller and you can help build weld operators' skills.**

Delivering Unbeatable Advantages

Optimize instructor efficiency

Instructors can program a wide variety of customizable weld exercises into either system, so students can work at their own pace — and instructors can have more time to assist students one-on-one.

Deliver real-time feedback

By providing immediate feedback on users' techniques, Miller systems quickly help correct errors, reinforce proper welding practices and accelerate skill advancement.

Reduce overall training time

Compared to traditional methods, Miller welding education and training systems significantly reduce the amount of time needed to teach students.

Assess weld operator skills and performance

Miller systems make it easy to periodically monitor employee abilities. Weld operators needing more training can receive it; those with advanced skills can be given critical tasks. Quality issues can be improved, operator certification costs can be reduced and qualification records can be generated.

Minimize material cost

By helping students refine their welding skills in a simulation environment before beginning live arc welding, Miller systems deliver a green training solution: There's less waste of wire, gas and coupons.

Enhance job candidate recruiting and screening

It's faster and easier to evaluate prospective weld operators by using Miller weld training systems to objectively assess their skills.

Build a larger, more-skilled welding workforce

Miller welding education and training systems are attractive to computer-savvy young people, drawing them to welding education programs and increasing their success — key to building the larger, more-skilled welding workforce the world depends on.

AugmentedArc™

## The industry's most realistic welding simulation system

The AugmentedArc system improves the efficiency and economy of classroom education with augmented reality technology that's ideal for beginner and intermediate-level students. Users wear a specially designed helmet that shows them images of the real world, augmented with computer-generated images of metal workpieces, weld arcs and weld beads. The result is a simulation that closely resembles live-arc welding — without using an actual arc or consuming wire, shielding gas or coupons.

AugmentedArc provides a simulation that closely resembles live arc welding — without using an actual arc or consumables.

Here's how it works:

▶ Instructors use the system's software to develop a curriculum of exercises, monitor student performance and create progress reports.
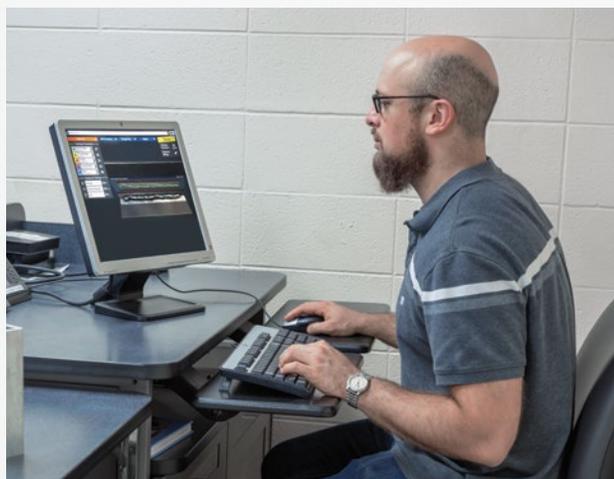
▶ To complete an assignment, students wear a specially designed welding helmet that contains an external optical sensor, which captures images of coded devices and coupons and sends them to the AugmentedArc system's computer.

▶ The system's computer generates three-dimensional images of metal workpieces, weld arcs and weld beads, augmenting them into a real-world environment.


▶ Inside the helmet, the augmented reality environment appears on a specially designed heads-up display panel, precisely showing the user's proximity to and interaction with the workpieces and welding gun/torch. The same images also appear on a second display panel in the system's computer case. Additionally, realistic arc sounds feed through speakers located in the helmet.

▶ The AugmentedArc system continuously monitors the user's adherence to predetermined or custom welding parameters — including travel speed, gun/torch angles, distance, aim, contact-tip-to-work (GMAW/FCAW only) and arc length, rod work angle and rod travel angle (GMAW/SMAW).

▶ The helmet's heads-up display delivers immediate visual feedback on the user's performance, providing confirmation when parameters are being maintained and alerts when they are exceeded. The same images also appear on the second display panel in the system's computer case.
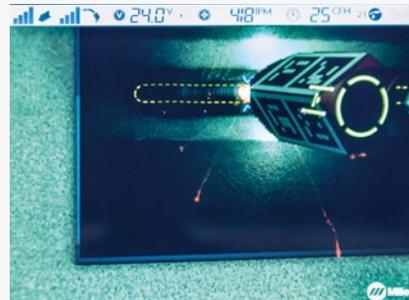
▶ When the welding exercise is complete, an analysis screen provides feedback on the user's performance in the form of scores and graphs. Video of the welding exercise is also recorded and made available for later playback, allowing instructors to evaluate students' performance.

LiveArc™

The industry's most complete live arc welding training system

Ideal for lab training, the Miller LiveArc welding performance management system provides both a simulation/pre-weld setup mode as well as a live-arc training mode, allowing the user to gain experience and build techniques in pre-weld exercises before seamlessly transitioning into real welding on GMAW, FCAW and SMAW processes.

LiveArc provides both a simulation/pre-weld setup mode as well as a live-arc training mode.

Here's how it works:

▶ An easy-to-understand touch-screen interface lets users work independently. They can select from a library of preloaded or instructor-customized welding exercises, then view all of the proper equipment settings, weld parameters and the instructor's targeted assignment score.

▶ Students use either a 400-amp GMAW SmartGun or a 250-amp SMAW SmartStinger for weld exercises. The SmartGun includes an OLED display that provides initial visual feedback to guide the user in proper positioning before welding exercises begin, while the SmartStinger offers pre-weld setup for travel and work angles via the display panel in the system's computer case.

▶ Once the welding exercise begins, embedded LEDs in the SmartGun and SmartStinger are detected by the system's motion-tracking cameras, delivering exact positioning feedback to the system's computer for scoring.

▶ The SmartGun and SmartStinger vibrate whenever predetermined weld parameters are exceeded. This haptic feedback prompts the user to make performance-enhancing adjustments and helps to reinforce optimal gun/stinger positioning and movement.

▶ After the exercise is completed, the touch screen displays feedback on the user's performance, including work angle, travel angle, travel speed, contact-tip-to-work distance and aim. The user's performance history can be stored, then retrieved and reviewed at any time to monitor ongoing development.
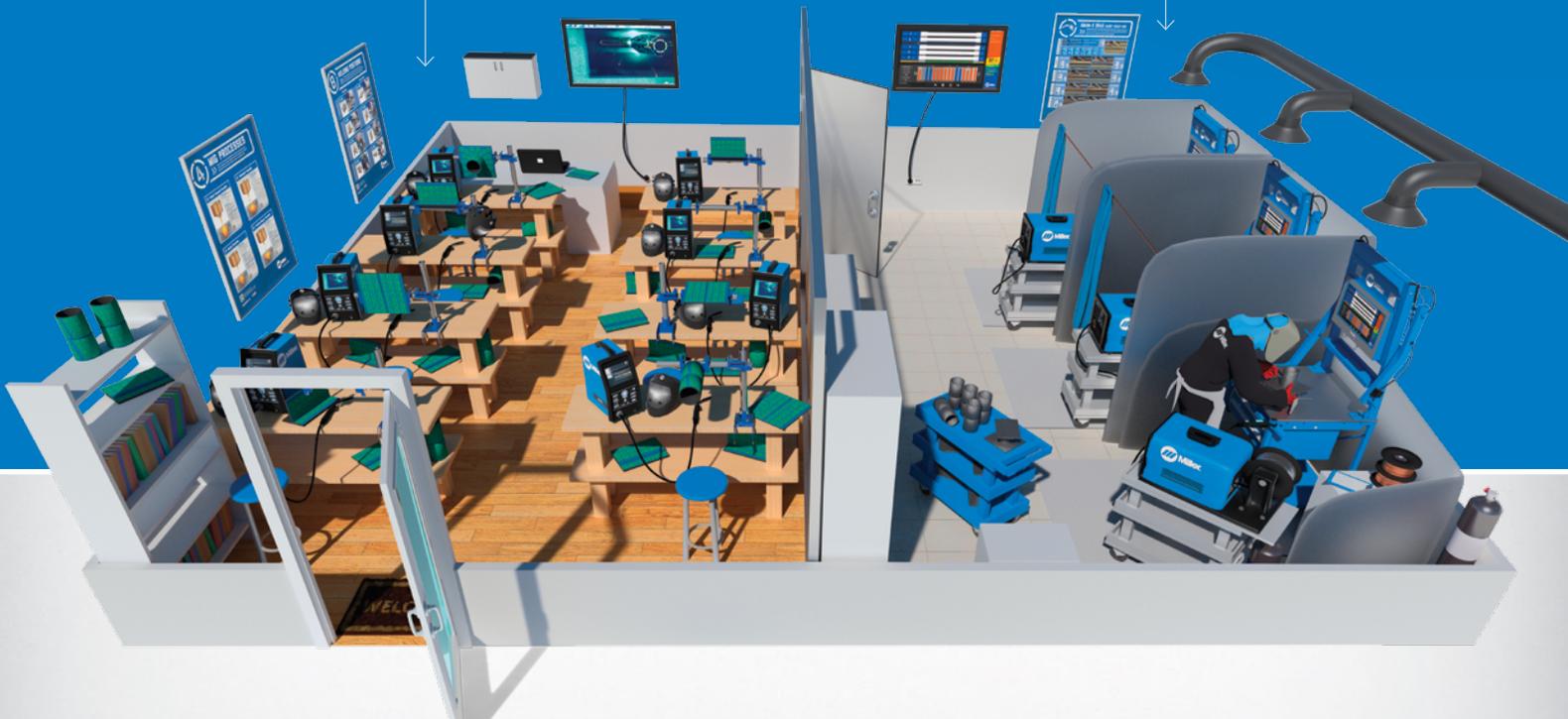
A Seamless Transition From Classroom to Laboratory

When AugmentedArc and LiveArc systems are used together, students follow an efficient, natural progression from classroom welding simulation to laboratory live arc welding — gaining both the knowledge and the experience they need to become skilled and productive weld operators.

LiveArc™
Welding performance management system

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