



Robotic Education Cell 2.0

ADVANCING THE MANUFACTURING SKILLS
OF THE NEXT GENERATION

Manufacturing and fabrication have changed dramatically. Competitive pressure has expanded and businesses of all sizes are now competing on a global level. With that fact, the skills and the capabilities of manufacturing companies have been challenged to increase productivity, improve quality all while reducing costs. Coupled with the critical shortage of skilled labor, the manufacturing industry needs to implement automated fabrication processes and solutions to remain competitive. Robotics will play a major role in manufacturing and fabrication today and in the future. Robotic education is a key initiative for many employers and, therefore plays a major part in training and education programs.

To help welding instructors achieve these new skills and enhance training in the classroom and welding lab, Lincoln Electric has delivered a training system to demonstrate and teach real-life industrial robotic concepts, capabilities, programming and robotic welding.



BENEFITS OF WELDING TRAINING ENHANCED WITH ROBOTICS

- Provide students with advanced manufacturing skills
- Increase student participation and engagement with a hands-on training solution
- Teach robotics using the equipment implemented in manufacturing and fabrication facilities
- Accelerate student skills and capabilities for high graduation employment rates
- Peek interest and enrollment with this exciting recruitment tool

APPLY THE ROBOTIC EDUCATION CELL INTO MULTIPLE PROGRAMS

- Industrial, Mechanical and Advanced Manufacturing Welding
- Engineering or Technology
- Production Processes
- Lean Manufacturing and Manufacturing Management
- 3D / CAD / Virtual Prototyping Programming Classes
- Manufacturing Operations, Mechatronics, Quality Control and Inspection



**Automation
Solutions**

The Lincoln Electric Robotic Welding Education Cell is ideal for:

- » Training and demonstration purposes in a welding lab, classroom or even at a recruitment event
- » Technical training at universities
- » Trade schools
- » Workforce development programs

The cell includes access to the Train-the-Trainer Program, welding education and welding safety materials backed by the Lincoln Electric knowledge and support system. Our goal is to help instructors and students develop the skills necessary to thrive in an advanced manufacturing environment.



Lincoln Electric Delivers the Most Comprehensive Welding Training Solution on the Market

THE ROBOTIC WELDING EDUCATION CELL 2.0 BASIC AD2437-1:

- » Robotic Welding Package with a 230V Input Power Option
- » Robotic Welding Project Based Lessons (K3976-1 & K3976-2)
 - Lincoln Electric project based lessons offer instructors with projects to encourage active inquiry and higher-level thinking
 - Instructions offer learning activities, step-by-step instructions and discussion questions to easily integrate into manufacturing education programs
- » **Welding Fixture (K4110-1):**
 - The patent pending 3-in-1 adjustable welding fixture is designed for use on a robotic welding education training system. The welding fixture is flexible and compact, enabling the welding instructor to teach common and industry supported joints and positions in welding, all in one simple device.
- » **Miniflex® Welding Fume Extractor (AD1312-16):**
 - Portable weld fume extractor system
 - Integrates easily in the bracket on the Education Cell
 - Ideal for welding “on the go”
- » **EN 20 Extraction Nozzle (K2389-5):**
 - With its funnel extraction opening and magnetic mounting stand, it gives the welder a great amount of versatility.
- » Custom Lettering Program, preprogrammed with easy to use high quality lettering

FEATURES OF THE ROBOTIC WELDING CELL 2.0

- » Expandable work surface provides the instructor room to teach robotic programming and welding skills.
- » Small system footprint easily incorporates into a classroom or welding lab.
- » Designed to fit through a standard doorway, the Education Cell can be moved from classroom to classroom to welding lab and positioned for best viewing during demonstrations, training and programming.
- » Provides everything you need right at your fingertips to present a manufacturing ready robotic welding system. Includes Lincoln Electric robotic welding equipment and welding wire, integrated safety measures in the work cell design, and FANUC® Robotics robot and software.
- » Integrated safety measures incorporated into the work cell design and robotic software. Welding hand shields are provided with the robotic system.



EN 20 Extraction Nozzle,
Welding Fixture, and Project Based Lessons



CLASSROOM READY ROBOTIC WELDING AND PROGRAMMING TRAINING PACKAGE AD2437-2:

- » Robotic welding and classroom package offers 230V input power for welding and a 115V connection for offline programming in the classroom
- » Includes Robotics CERT Program

FANUC ROBOTICS CERT PROGRAM

The CERT program is an Authorized Provider of Continuing Education Units (CEU) by the International Association for Continuing Education and Training (IACET). All CERT training meets eligibility requirements for IACET CEU's according to the national ANSI / IACET 1-2007 standard.

Free Instructor ArcTool™ CERT Training Program and Software Package:

- » ArcTool Certification & ArcTool CERT Training Program
- » ROBOGUIDE Simulation Software (Laptop not included)
- » ArcTool eLearn Web Courses
 - One seat for Basic Robotic training at Lincoln Electric
 - One on-line seat to take robot operations web course through Fanuc
 - One on-line seat to take WeldPRO web course through Fanuc.
- » Student ArcTool Software Package: (12 Month subscription per student, laptop not included):
 - Qty (25) ROBOGUIDE Simulation Software Licenses
 - Qty (25) ArcTool eLearn Web Courses

Additional CERT Program (Instructor Only):
Includes qty (1) one each of the following:

- » ROBOGUIDE Simulation Software
- » ArcTool eLearn Web Courses
- » Seat in ArcTool Ops & Programming class at FANUC Robotics

CLASSROOM READY AND VISION ENABLED ROBOTIC WELDING AND PROGRAMMING TRAINING PACKAGE AD2437-3:

- » Robotic welding and classroom package offers
 - 230V input power for welding
 - 115V connection for offline programming in the classroom
 - 2D vision camera and functionality
 - Includes Robotics CERT Program



System with Vision Camera integrated



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TECHNICAL SPECIFICATIONS

» ROBOTIC SYSTEM

- Dimensions:
 - Height: 81.23 inches
 - Length: 64.82 inches
 - Width: 66 inches (sides expanded), 32 inches (sides folded)
- Weight: 870 lbs
- Work surface area: 2,000 in²
- Robotic system input voltage: 230V Standard/welding voltage, 120V Optional/ Robot operation and programming

» POWER SOURCE & FEEDER

Power Wave® R350 and AutoDrive® 4R100

- Input Voltage: 208/230/380-415/460/575/1/3/50/60
- Input Current @ Rated Output:
 - 3 Ph/40% Duty Cycle: 39/35/19/17/14 A
 - 1 Ph/40% Duty Cycle: 60/67/NA/NA/NA A
- Output Range: 5 - 350 Amps
- Rated Output:
 - GMAW: 350A/31.5V/40%
 - GMAW: 300A/29V/100%

» ROBOT

- FANUC ARC Mate® 50iD/7L
 - Six Axis Mechanical Unit
 - 7 kg Maximum Payload
 - 0.892m Reach
- FANUC Robotics ARC Mate controller
 - 8-Axis Control Board
 - 6 Channel Servo Amplifier
 - Dual Check Safety
 - RIA compliant Operator Panel with T1-Auto Mode Switch, Cycle Start, E-Stop Buttons and ON-OFF switch
 - Memory Card PCMCIA Slot on Operator Panel
 - Fixed Digital I/O Port with 28 digital inputs, (source type), 24V and ground

» ROBOT (cont.)

- FANUC Robotics LR ARCTool® Software – Compliant with RIA R15.06 Safety Requirements

» SAFETY/WELD CELL CONTROLS

- CSA/UL certification ready system.
- PLEASE NOTE: Obtaining CSA/UL certification is the responsibility of the customer
- Fully integrated ANSI/RIA 15.06-2012 compliant operator safety devices including a door safety switch
- RIA compliant robotic controller operator panel, robotic software and pendant
- Quantity 2, hand shields (personal protection equipment) supplied with robotic system

» COMPLETE SYSTEM DOCUMENTATION

- Hard Copy binder
- Electronic manuals and tools include: operations manuals, maintenance guides, spare parts lists, calibration numbers and serial numbers, print, and supplier references and specifications.

» TRAIN-THE-TRAINER PROGRAM

- The 3-5 day (depending on options purchased) Lincoln Electric Train-the-Trainer program provides three instructors from your school or educational institution with knowledge to program and operate the cell, as well as access to the Lincoln Electric staff of welding experts and robotic welding expertise.

WORLD-CLASS WELDING AND AUTOMATION EXPERTISE

Lincoln Electric's strategic alliance with FANUC® Robotics translates into an unparalleled combination of welding and robotics expertise, plus single-source efficiency. Whether you're considering your first automated cell, or you're ready to upgrade or enhance your existing robotic systems, there's no better partner than Lincoln Electric and FANUC® Robotics.



EXCEPTIONAL CUSTOMER SERVICE

Lincoln Electric and FANUC® Robotics have a global network of facilities and people to provide quick response and personalized attention. No matter where your welding operations are located today, no matter where they will be tomorrow, Lincoln Electric welding experts can provide local support, ready to create and implement solutions that fit your needs.

VALUABLE CUSTOM SOLUTIONS

While Lincoln Electric offers a wide spectrum of pre-engineered systems, we also offer the ability to modify or completely customize the creation of your weld cell to meet your precise needs.

Contact us today!



Automation Solutions

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CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.