

VRTEX™ 360

For more information, go to:

www.VRTEX360.com

- Register for VRTEX™ 360 newsletter.
- See the demonstration event calendar.
- Find out who's using VR Welding Training and how they benefit.

Hard Drive
60 GB

RAM
4 GB

Graphics
High powered graphics

Input Power
115-230/1/50/60

Input Current
4-2 A

Weight/Dimensions
Machine: 360 lbs. (163 kg)
Stand: 102 lbs. (46 kg)

Machine with Monitor:
71 x 30 x 50 in. (1803 x 762 x 1270 mm)
Stand:
78 x 39 x 47 in. (1981 x 990 x 1194 mm)

The Revolution in Welding Training is Here...

The VRTEX™ 360 is a virtual reality arc welding trainer. This computer based training system is an educational tool designed to allow students to practice their welding technique in a simulated environment. It promotes the efficient transfer of welding skills to the welding booth while reducing material waste associated with traditional welding training. The combination of realistic puddle simulation and arc welding sound tied to the welder's movement provides a realistic and exciting, hands-on training experience.

FEATURES

► Flexibility

- Multiple welding processes.
- Variety of joint configurations.
- Multiple welding positions.

► Innovation

- High tech welding training tool.
- Magnatron™ technology.
- ProFlo™ technology creates realistic puddle modeling.

► Classroom Performance - Train Welders Faster

- Visual cues give real-time technique feedback.
- Advanced scoring system for student evaluation.
- Instructor cam allows virtual weld inspection.

► Eco Friendly

- Turn your welding program green.
- Track cost savings with the Weldometer™

► Service and Support

- Annual upgrade package (optional).
- 24/7 phone support.



**VRTEX™
360**

Powered By

VRsim™

THE LINCOLN ELECTRIC COMPANY

Automation Division

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**LINCOLN®
ELECTRIC**
THE WELDING EXPERTS™

SYSTEM OVERVIEW

VR Stand

Allows the VR Welding coupon to be placed in multiple positions with or without the adjustable table to simulate real welding applications.

VR Helmet

Immerses the student in a virtual welding world through a specially designed welding helmet with 3D stereo eye pieces and sound.

VR Gun

Allows the student to practice their GMAW and FCAW welding technique.

VR Stinger

Retracts at the rate a real stick electrode would melt off to simulate the melting of a real electrode.

VR Machine

The interface between the student and software.



INNOVATION

VRAW
SOLUTIONS

The VRTEX™ 360 is a VRAW™ (Virtual Reality Arc Welding) training solution. VRAW™ Solutions change the way welding training is accomplished. These solutions represent the most advanced simulation technologies to train skilled welders. The goals of VRAW™ Solutions are to:

- Recruit and retain the next generation of skilled welders.
- Train welders faster.
- Improve the image of welding.
- Reduce material cost.
- Make welding education fun.
- Create green welding programs.

VRSIM

The VRTEX™ 360 represents the next generation in Virtual Reality Welding Training. This product was developed in a partnership between Lincoln Electric and VRSim, experts in the field of Virtual Simulations. The VRTEX™ 360 is based on the VRSim SimWelder and has replaced it in the market with new capabilities and advanced features to position it as the premiere virtual welding training tool. Lincoln Electric and VRSim will continue to work together to provide new and exciting features for the VRTEX™ 360.

In a virtual reality environment, a user experiences *immersion*, or the feeling of being inside and a part of that world. He is also able to interact with his environment in meaningful ways. A VR simulation immerses the student in a virtual environment and allows them to focus exclusively on the task at hand. Skilled welders draw on information gathered through sight, sound and feel in order to make a good weld. The VRTEX™ 360 replicates these cues accurately so the student can learn their importance and easily and efficiently transfer these welding skills to the real welding booth.

WELDING IMMERSION

Sense	Skill	VR Advantage
Touch	<ul style="list-style-type: none"> - Striking an arc. - Understanding body position. - Learning specialized welding techniques. 	<ul style="list-style-type: none"> - Student strikes virtual arc on VR coupons. - VR welding stand can be positioned many different ways to simulate various welding situations. - Different welding techniques can be used and scored including whip and weaving techniques.
Sight	<ul style="list-style-type: none"> - Reading the puddle. - Following the joint. 	<ul style="list-style-type: none"> - Realistic puddle simulation closely represents the puddle movement. - Bad welding technique results in visual discontinuities including porosity and undercut.
Sound	<ul style="list-style-type: none"> - Using the sound of the arc to help the welder determine if good welding technique is being used. 	<ul style="list-style-type: none"> - VR Welding sound is tied to the student's movements. - Good technique results in a crisp arc sound where a long arc length pops and sputters.

Simulation technology appeals to the next generation of welders and allows for welding career exploration in a classroom environment without the need for a dedicated welding area. The VRTEX™ 360 can be used by instructors to aid first time welding students in the development of proper welding skills and can help experienced students learn more about their welding technique and to expand their skill set.

Magnatron™ Technology

- Allows student to weld on real 3D coupons
 - The haptic feedback adds realism to the simulation and allows for simulation of processes that require touching the electrode to the base metal such as when using stick electrodes that require a drag technique and when making the root pass in pipe.
- Accurate positional data results in scores that help students improve their technique and translates to real welding lab success.

ProFlo™ Puddle Modeling

- Technology allows student to learn to "read the puddle". Puddle simulation reacts to student movement.
- Advanced computational system creates life-like puddle.
- Simulates sparks, slag, grinding (on pipe) and weld cooling.
- Virtual weld discontinuities appear in the weld when improper welding technique is used.



Weld Discontinuities

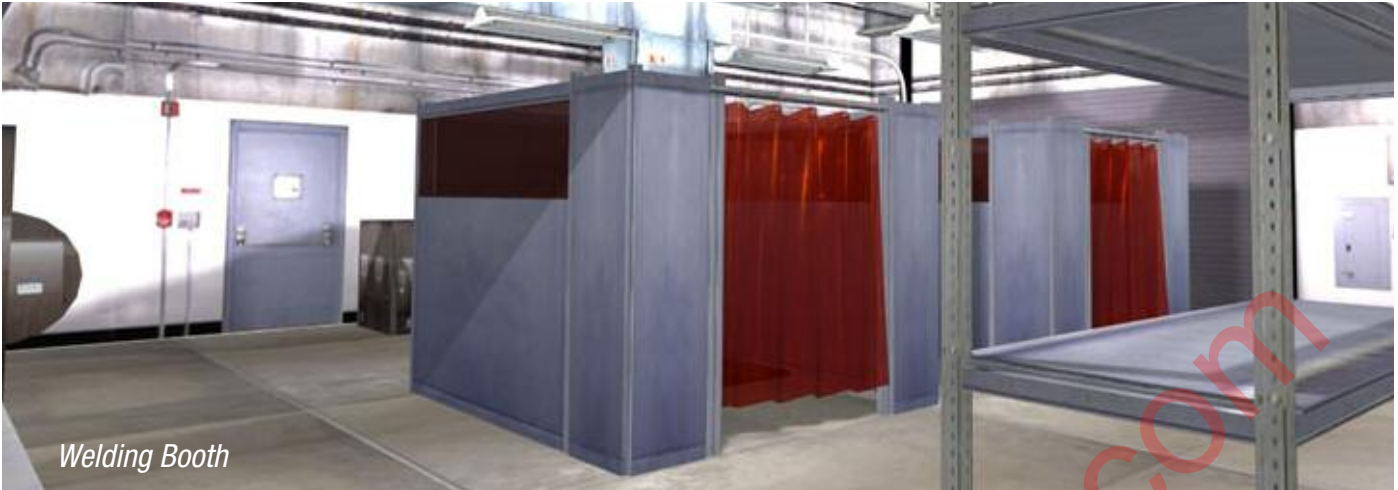


Virtual welding puddle GMAW



Virtual welding puddle SMAW

Simulate real field welding experiences with Virtual Environments



Welding Booth



Construction Site



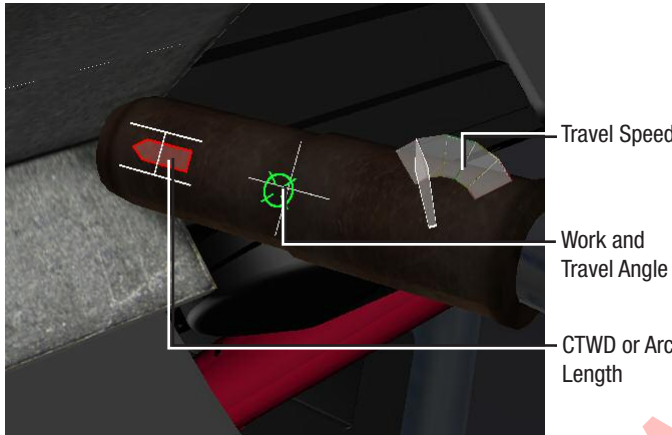
Desert Base

Becoming a skilled welder takes practice. Welding skills cannot be taught solely through the use of simulation; however, VR can be used as part of a welding training program to enhance and expedite the training process.

Virtual Welding Training can increase throughput by helping instructors teach more effectively and students learn quicker. This allows more time to teach additional topics.

Student Tools

- Visual Cues: Optional graphic overlays give students real time welding technique feedback.
 - Work Area/ Welding Booth Preparation.
 - Welding Machine Set Up
 - Process Selection, Wire Feed Speed/ Amperage, Voltage, Polarity, Gas Selection and Flow Rate.
 - Welding Actions – Trim Wire, Get a new Electrode, Quench Metal, and remove slag.

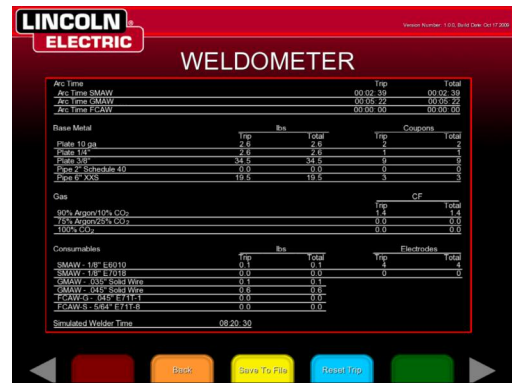


Visual Cues



Instructor Tools

- Instructor Mode – A key is required to enter the instructor preference mode.
 - Either use Lincoln Electric Welding School defaults – Train your students the way Lincoln does in their welding school.
 - Or customize your system – Fine tune student experience through modification of preferred welding technique, weld procedures and tolerances. Modify these parameters to match how you teach welding.
 - Access the Weldometer™
 - Track material usage
 - Verify cost savings
 - Track student arc time
- Instructor Cam – The Instructor Cam can be used while the student is welding or used for visual inspection after the weld has been completed. Use this feature to visually inspect welds made on the VRTEX™ 360 for porosity, undercut and proper bead placement.
- First Pass™ Welding Curriculum – Helps instructors integrate VR Welding into traditional welding training. Recommendations on amount of time spent in the VR welding lab versus traditional booth time, welding lessons and supporting resources and curriculum.
- Student Reports
 - Save student reports to USB memory to track student progress.
 - Identify areas of technique improvement.



Weldometer™



Instructor Cam

Scoring System

- Record and verify student work.
- Scores each weld based on how accurately the student performs the welding technique set by the instructor.
- Identifies areas of potential discontinuities and visual indications can be seen in virtual weld.

The screenshot displays the LINCOLN ELECTRIC VRTEX 360 software interface. At the top, the name 'Erin' is shown in a dark red box. Below this, three tabs are visible: 'Horizontal Tee 10 ga', 'GMAW Short Arc', and 'Stringer/Push'. On the left side, there are several control panels. The top panel has buttons for 'Position', 'CTWD', 'Work Angle', 'Travel Angle', and 'Travel Speed'. Below that is a 'Pass 1' indicator with left and right arrows. The bottom panel lists various weld defects: 'Inc. Fusion/Pen.', 'Slag Inclusion', 'Porosity', 'Undercut', 'Poor Bead Pl.', 'Wrong Weld Size', 'Convex/Ex. Reinf.', 'Concave/Underfill', 'Excess Spatter', and 'Melt Through'. The center of the screen features three stacked panels: a line graph with multiple colored lines (yellow, blue, green, purple) representing different parameters; a grayscale image of a weld bead; and a dark panel with horizontal lines indicating discontinuities. On the right side, a 'Score' panel shows the following data: Position: 64, CTWD: 41, Work Angle: 58, Travel Angle: 58, Travel Speed: 59, and Score: 56. Below the score is a 'Travel Direction' indicator with a red arrow pointing left. At the bottom of the interface are navigation buttons: 'Prev', 'Menu', 'Actions', 'Visual Cues', 'New Coupon', and 'Next'. A large, semi-transparent watermark 'www.lincolnelectric.com' is overlaid diagonally across the center of the interface.

The VRTEX™ 360 graphs the students' welding technique and color codes results. Parameters include:

- Position in the joint
- Contact Tip to Work Distance (CTWD) / Arc Length
- Work Angle
- Travel Angle
- Travel Speed

Student results are compared to correct welding technique selected by the instructor.

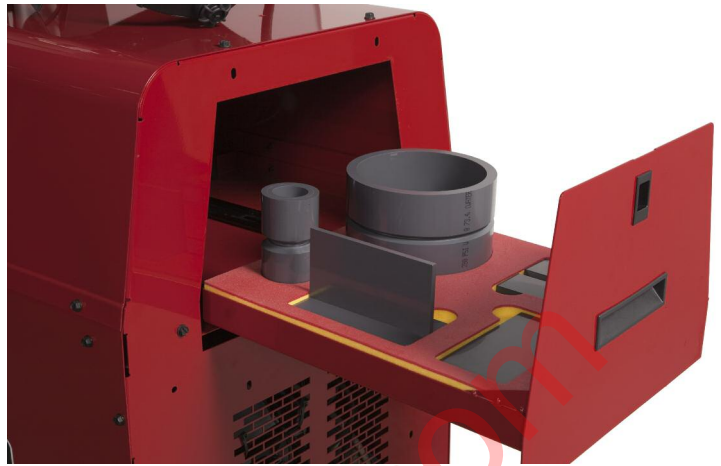
The student receives an overall score and individual weld technique score for each technique parameter tracked.

The weld discontinuity graph indicates where potential discontinuities may have resulted due to improper welding technique.

Records the percentage of weld having discontinuities allowing for pass/fail correlation to code.

Simulates multiple welding processes including:

- SMAW
 - E6010 (Fleetweld® 5P+)
 - E7018 (Excalibur® 7018)
- GMAW
 - Short Arc [.035 in. (0.9 mm) SuperArc® L-56]
 - Axial Spray [.045 in. (1.1 mm) SuperArc® L-56]
 - Pulse [.045 in. (1.1 mm) SuperArc® L-56]
 - STT® [.045 in. (1.1 mm) SuperArc® L-56]
- FCAW
 - Gas-shielded [.045 in. (1.1 mm) UltraCore® 71A85]
 - Self-Shielded [5/64 in. (2.0 mm) Innershield® NR-232]



Convenient storage drawer for welding coupons.

Multi Position

- Independent table and arm height adjustment



Left, right and center Weld Arm positions.



Weld Table can be moved to away position to simulate real life welding applications.



90, 45 and 0 degree arm positions allows for 2G, 5G and 6G pipe welding.

Joint Configurations

- Flat Plate
- Tee Joint
- Groove Joint
- 6 inch Diameter Schedule 40 Pipe
- 2 inch Diameter XXS Pipe

<p>Horizontal Tee</p> <p>2F</p>	<p>Vertical Tee</p> <p>3F</p>	<p>Overhead Tee</p> <p>4F</p>	<p>Flat Groove</p> <p>1G</p>	<p>Overhead Groove</p> <p>4G</p>
<p>Horizontal Groove</p> <p>2G</p>	<p>Vertical Groove</p> <p>3G</p>	<p>6" Schedule 40</p> <p>2G</p>	<p>6" Schedule 40</p> <p>5G</p>	<p>6" Schedule 40</p> <p>6G</p>
<p>For all possible joint configurations offered go to: www.vrtex360.com</p>	<p>Practice Plate</p>	<p>2" XXS</p> <p>2G</p>	<p>2" XXS</p> <p>5G</p>	<p>2" XXS</p> <p>6G</p>

PRODUCT SPECIFICATIONS

Product Name	Product Number	Input Power	Input Current	H x W x D inches (mm)	Net Weight lbs.(kg)
VRTEX™ 360 Std.	AD1332-1	115-230/1/50/60	4-2A	Machine: 71 x 30 x 50 (1803 x 762 x 1270) Stand: 78 x 39 x 47 (1981 x 990 x 1194)	Machine: 360 (163) Stand: 102 (46)
VRTEX™ 360 Alt.	AD1332-2				
Annual Upgrade Pkg. (optional)	AD1332-3	-	-	-	-

Space recommended to operate system: 8 x 8 x 8 ft.
Std. and Alt. models needed in multiple system installations.

ECO-FRIENDLY

Turn your welding program GREEN:

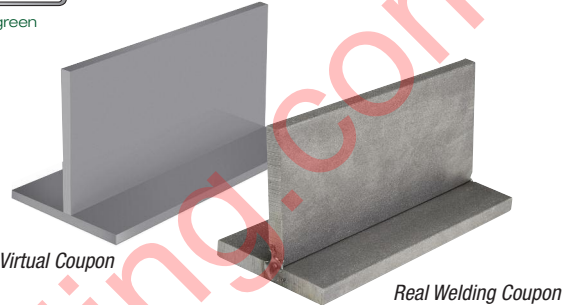


VR Welding Technology:

- Reduces material waste
- Saves energy
- Tracks material and cost savings using the Weldometer™

Potential Cost Savings in:

- Base Material
- Electrodes
- Shielding Gas
- Consumable Parts
- Energy Consumption



SERVICE AND SUPPORT

Service and Support That You Can Count On

24/7 Phone Support 1-888-935-3878 • Online Support FAQ's • Warranty and Replacement Programs

Protect and leverage your investment and take advantage of future developments with the purchase of an optional upgrade package:

- Software patches, upgrades and support.
- Annual upgrade package that includes new product features and other enhancements.
- First Pass™ Welding Curriculum Upgrades.
- Advanced notification of new Lincoln Electric educational materials, seminars and classes.

Service and support that you can count on.

- 24/7 Phone Support.
- Online Support FAQ's.
- Warranty and Replacement Programs.



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.

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