Operator's Manual

RealWeld ® Trainer

For use with machines having Code Numbers:

12591

Visit: www.lincolnelectric.com/realweld for initial setup videos and training information.

Patent(s): "http://www.lincolnelectric.com/patents"

GENUINE ™
LINCOLN PARTS

Register your machine:
www.lincolnelectric.com/register

Authorized Service and Distributor Locator:
www.lincolnelectric.com/locator

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

⚠ WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.

⚠ CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**

SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.

SECTION A: WARNINGS

CALIFORNIA PROPOSITION 65 WARNINGS

WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65 warnings.ca.gov/diesel

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code § 25249.5 *et seq.*)

WARNING: Cancer and Reproductive Harm www.P65warnings.ca.gov

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE POWERED EQUIPMENT.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

ELECTRIC SHOCK CAN KILL.

3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

• Semiautomatic DC Constant Voltage (Wire) Welder.

• DC Manual (Stick) Welder.

• AC Welder with Reduced Voltage Control.

3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".

3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode in water for cooling.

3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

ARC RAYS CAN BURN.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. I standards.

4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES CAN BE DANGEROUS.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**

5. b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer's safety practices. SDS forms are available from your welding distributor or from the manufacturer.

5.f. Also see item 1.b.

WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.
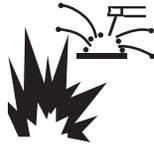
6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.

6.I. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.

6.j. Do not use a welding power source for pipe thawing.

CYLINDER MAY EXPLODE IF DAMAGED.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-I, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.

FOR ELECTRICALLY POWERED EQUIPMENT.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Refer to http://www.lincolnelectric.com/safety for additional safety information.

SAFETY PRECAUTIONS

⚠ WARNING

If moved improperly, unit can tip over and cause injury.

• Do not allow children under 16 to move unit.

• Move unit slowly and only with all four wheels in contact with ground.

• Do not move unit over uneven ground or curbs.

• Only transport unit in completely lowered position.

• When in use, place unit in stable, flat area and lock casters.

• Only move the machine in a slow and controlled manner.

• Transporting with the column in an elevated position can cause the machine to hit doorways and damage property or cause a tipping hazard.

⚠ CAUTION

Property damage and/or risk of injury may be caused if unit is raised in area with low overhead clearance.

• Be sure there is enough overhead clearance before raising/lowering the unit

• If there is not enough clearance, do not raise the unit by forklift.

• Raising the machine in an area of low clearance can cause the machine to intersect with equipment on the ceiling. Equipment such as: light fixtures, doorways, electrical equipment, etc.

⚠ WARNING

Unit can tip over causing injury to user if improperly moved.

• Lock Casters when unit is not being transported.

• If Lift Truck is used, be sure there is clearance for fork lift.

• Only lift unit with lift truck at marked locations to avoid uneven lifting surface.

• When lifting with a lift truck be sure the machine is in the "lowered" position.

• Attach the machine to a lift truck with straps to avoid a tipping hazard

• Always use safety conscious judgment when moving large equipment

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⚠ CAUTION

Welding Spatter may cause injury or property damage.

• Wear proper personal protective equipment when welding.

• Move monitor out of viewing area before welding.

⚠ CAUTION

When replacing monitor, be sure to use insulating bushings and washers on all screws to prevent damage to the machine.

• The monitor is mounted to the pivoting arm with a series of insulating washers. This is to prevent the monitor chassis electric ground from becoming continuous to the welding ground plane. When replacing the monitor it is imperative that the insulating washers are reused to maintain this discontinuity.

⚠ AVERTISSMENT

Si l'unité n'est pas déplacée correctement, elle peut basculer et entraîner des blessures.

• Ne pas laisser des enfants de moins de 16 ans déplacer l'unité.

• Déplacer lentement l'unité et uniquement lorsque les quatre roulettes sont en contact avec le sol.

• Ne pas déplacer l'unité sur un sol dont la surface est inégale ou sur une bordure.

• Ne transporter l'unité qu'en position complètement abaissée.

• Pendant l'utilisation, placer l'unité sur une surface plane et stable, et verrouiller les roulettes.

⚠ ATTENTION

Des dégâts matériels et/ou des risques de blessures peuvent survenir si l'unité est mise à la verticale dans un endroit bas de plafond.

• S'assurer de disposer d'un dégagement suffisant entre l'unité et le plafond avant de la mettre à la verticale ou de l'abaisser.

• Si le dégagement est insuffisant, ne pas mettre l'unité à la verticale.

⚠ AVERTISSMENT

L'unité peut basculer et blesser l'utilisateur si elle n'est pas déplacée correctement.

• Verrouiller les roulettes lorsque l'unité n'est pas transportée.

• Si un chariot élévateur est utilisé, s'assurer qu'il existe un espace suffisant pour l'élévateur à fourche.

• Ne soulever l'unité avec le chariot élévateur qu'aux endroits désignés pour éviter que la surface de levage ne soit inégale.

⚠ ATTENTION

Les projections de soudure peuvent causer des blessures ou des dégâts matériels.

• Porter un équipement de protection individuelle lors du soudage.

• Déplacer l'écran hors de la zone d'observation avant le soudage.

⚠ AVERTISSMENT

Lors du remplacement du moniteur, assurez-vous d'utiliser des douilles et rondelles isolantes sur toutes les vis pour éviter d'endommager la machine.

Page

TECHNICAL SPECIFICATIONS			
INPUT			
MODEL	DESCRIPTION	INPUT VOLTAGE ± 10%	INPUT CURRENT (MAX.)
K4344-1	REALWELD TRAINER	115/230 VAC (50/60 HZ)	3 / 1.5A

⚠ **WARNING**
THIS PRODUCT INCORPORATES A PROTECTIVE EARTH CIRCUIT IN THE AC POWER CORD. THE AC PLUG SHOULD ONLY BE INSERTED INTO A SOCKET OUTLET PROVIDED WITH A PROTECTIVE EARTH CONTACT. NOTE: INSTALLATION CATEGORY II EQUIPMENT.

PHYSICAL DIMENSIONS (MACHINE WITH MONITOR)			
HEIGHT	WIDTH	DEPTH	WEIGHT
77.75" (ADJUSTABLE MINIMUM) 95.5" (ADJUSTABLE MAXIMUM)	25" 635 mm **Base Plate :** 34.5" (877 mm)	25" 635 mm **Base Plate :** 29" (737 mm)	400 LBS. 181.4 KGS.

MAX WELDING TABLE WEIGHT	100 LBS. (45 KGS.)

PHYSICAL DIMENSIONS (CRATE WITH MACHINE)			
HEIGHT	WIDTH	DEPTH	WEIGHT
86" 2185 mm	40" 1016 mm	40" 1016 mm	500 LBS. 226.8 KGS.

TEMPERATURE RANGES	
OPERATING TEMPERATURE RANGE	STORAGE TEMPERATURE RANGE
50º - 95º F (15º - 35º C)	32º - 149º F (0º - 65º C)

RELATIVE HUMIDITY*	OPERATING ALTITUDE
80% FOR TEMPERATURES UP TO 88º F / 31º C 50% @ 104º F / 40º C	6562 FEET (2000 METERS)

ENVIRONMENT
THIS PRODUCT IS FOR USE IN POLLUTION DEGREE 2 ENVIRONMENT. FOR INDOOR USE ONLY.

CPU SPECIFICATIONS			
MONITOR	PROCESSOR	HARD DRIVE	PORTS (QTY) - USB 2.0/ ETHERNET
17" TOUCH SCREEN MONITOR (MOUNTED ON A SWIVEL ARM)	INTEL® CORE® I5	256GB SSD	2X USB, 2X ETHERNET, 1X HDMI, 1X 3.5mm AUDIO JACK

* Condensation on camera lenses may appear in high humidity environment.

SELECT SUITABLE LOCATION

Position the RealWeld Trainer in a dry location where there is free circulation of clean air. Dirt, dust or any foreign material that can be drawn into the machine should be kept at a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance trips.

ENVIRONMENTAL AREA

Keep the machine inside and dry at all times. Do not place it on wet ground or in puddles. Never place liquids on top of the machine.

STACKING

The RealWeld Trainer cannot be stacked.

TILTING

Place the RealWeld Trainer directly on a secure, level surface.

LIFTING

If lifting the RealWeld Trainer is required, use two straps; each rated for 420 pounds (190.5 kg) or more. Do not attempt to lift the RealWeld Trainer with accessories attached to it.

TRANSPORT

The RealWeld Trainer has four swivel, locking casters for easy transport. When the RealWeld is not being transported be sure the machine is on level ground and lock the casters to prevent unwanted movement.

• Only transport the machine on level ground.

• Move the machine slowly and only when all four wheels are in contact with the ground.

• Do not move over uneven ground or curbs.

• The RealWeld Trainer can also be transported by forklift. The forks should only be inserted in the area marked on the decal near the base of the machine. If the forks are improperly seated the machine can cause a tipping hazard. When the RealWeld Trainer is transported by forklift be sure to use supplemental ratcheting straps to hold the machine against the fork lift to prevent tipping.

• The RealWeld Trainer should never be lifted with an overhead crane.

UNCRATING PROCEDURE

1. Remove the six carriage bolts and washers securing the front panel to the crate. See Figure A.1. Set front panel aside.

Figure A.1 – Front panel removal

2. Carefully remove the rubber strap securing the fixture platform, Mig gun box and SMAW torch box in the left side of the crate. See Figure A.2. Set items aside in a safe location for later installation.

Figure A.2 – Rubber strap removal

RUBBER STRAP

3. Carefully remove the rubber strap securing 18" fixture box and the ramp in the right side of the crate. See Figure A.3. Remove box and set aside in a safe location for later installation.

Figure A.3 – Box removal
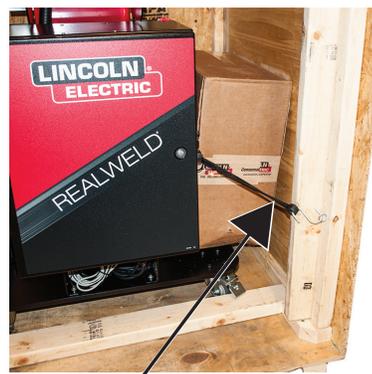
RUBBER STRAP

4. Carefully reach behind the machine and remove the fixture box and set aside in a safe location for later installation.

5. Carefully remove the ramp from the right side of the crate. See Figure A.4.

Figure A.4 – Ramp removal
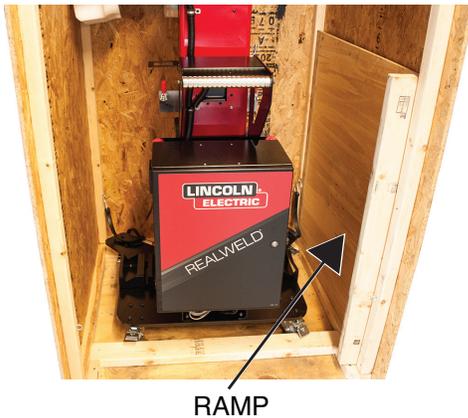
RAMP

6. Place the ramp into position, at the crate opening, to allow for the safe removal of the machine from the crate. See Figure A.5.

Figure A.5 – Ramp placement

RAMP

7. Remove the wood bracing from the bottom of the crate and set aside in a safe location. See Figure A.6. Do not discard bracing, return it too crate when uncrating procedure is complete.

Figure A.6 – Bracing removal

BRACING

8. Carefully remove the nylon strap securing the top portion of the machine in the crate. See Figure A.7.

Figure A.7 – Nylon strap removal

NYLON STRAP
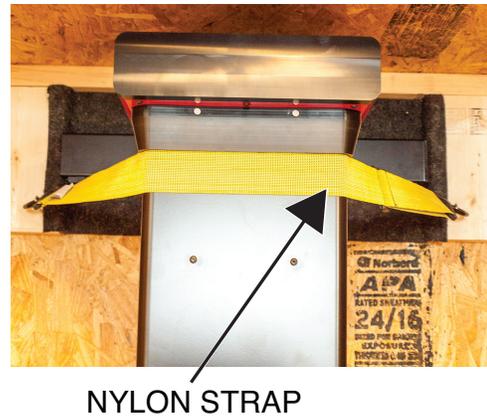
9. With the help of an assistant, carefully maneuver the RealWeld Trainer machine out of the crate and position in a suitable location setup and operation.

10. Once the machine is in position, lock the wheels to prevent unwanted moving of the machine during setup and operation. See Figure A.8.

Figure A.8 – Lock wheels

UNLOCKED POSITION   LOCKED POSITION
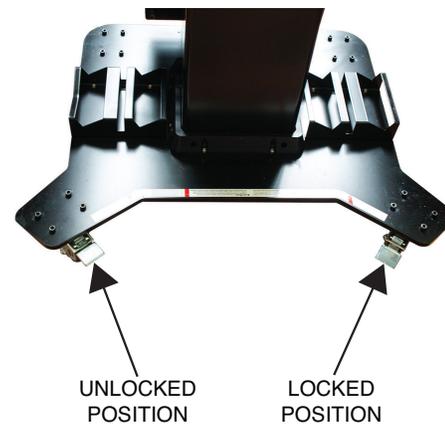
11. Remove the two protective foam pieces from around the monitor. See Figure A.9. Do not discard, place in shipping crate.

Figure A.9 – Monitor foam removal

PROTECTIVE FOAM PIECES

SETUP PROCEDURE

1. Open the SMAW torch box and remove all of the cables (except the SMAW torch).

2. Attach the power cable to the CPU. See Figure A.10. Do not connect power cable to outlet at this point.

Figure A.10 – Power cable connection

CPU POWER
CABLE CONNECTION

3. Connect the height adjustment pendant cable to the CPU and place it in the bracket on the side of the machine. See Figure A.11.

Figure A.11 – Height adjustment pendant connection

HEIGHT ADJUSTMENT
PENDANT CONNECTION

4. Place both fixture clamps into the unlocked position. See Figure A.12.

Figure A.12 – Unlocked position

UNLOCKED
POSITION

5. Carefully position the fixture platform onto the stand. See Figure A.13.

Figure A.13 – Fixture platform
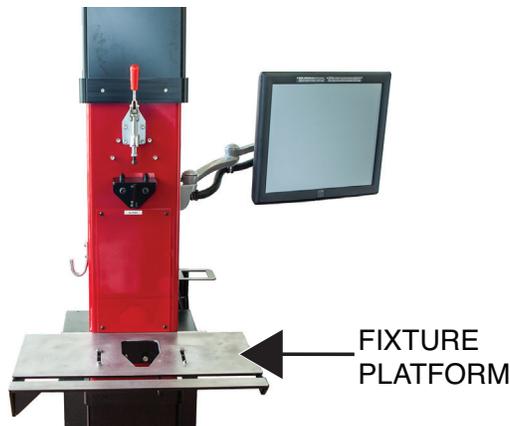
FIXTURE
PLATFORM

6. Place both fixture clamps into the locked position to secure the fixture platform to the machine. See Figure A.14.

NOTE: It may be necessary to adjust tension screws in order to safely secure platform. If platform is loose after clamp is placed in the locked position, use a 7/16" nutdriver to tighten the tension screws. If clamp will not go into the locked position use a 7/16" nutdriver loosen the tension screws.

Figure A.14 – Locked position

LOCKED
POSITION

7. Attach the current transducer to the ground cable. If welding polarity is DCEP, the positive (+) side of the current transducer faces the fixture platform. If welding polarity is DCEN*, the positive (+) side of the current transducer faces the welder. See Figure A.15.

* When welding in DCEN, make certain the ground cable is connected to the positive output stud on the power source.

Figure A.15 – Current transducer
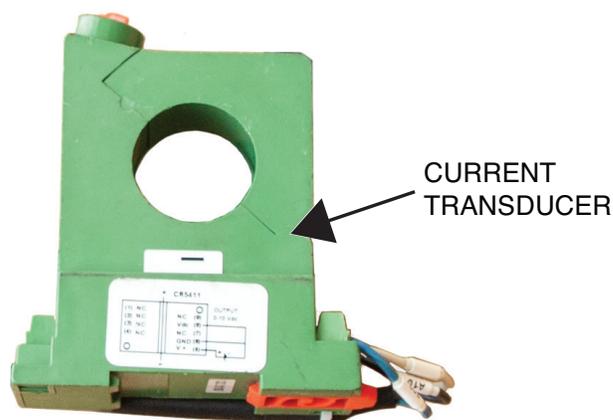
CURRENT
TRANSDUCER

8. Connect the current transducer cable to the CPU. See Figure A.16.

Figure A.16 – Current transducer connection

CURRENT TRANSDUCER
CABLE CONNECTION
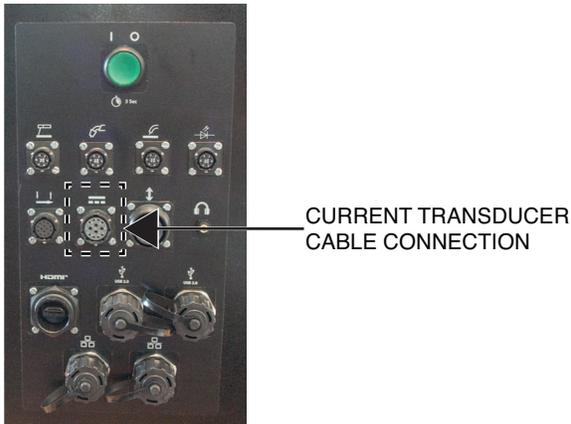
9. Open the MIG gun box and remove the MIG gun.

10. Connect the female y-splitter cable connector to the gun trigger pigtail. See Figure A.17.

11. Connect the male y-splitter cable connector to the 4-pin receptacle on the welder. See Figure A.17.

12. Connect the y-splitter cable to the CPU. See Figures A.17 and A.18.

Figure A.17 – Y-splitter cable connection diagram

MALE   FEMALE

WELDER /
WIRE FEEDER

GUN TRIGGER
PIGTAIL

MIG GUN

Y-SPLITTER
CABLE

REAL
WELD
CPU
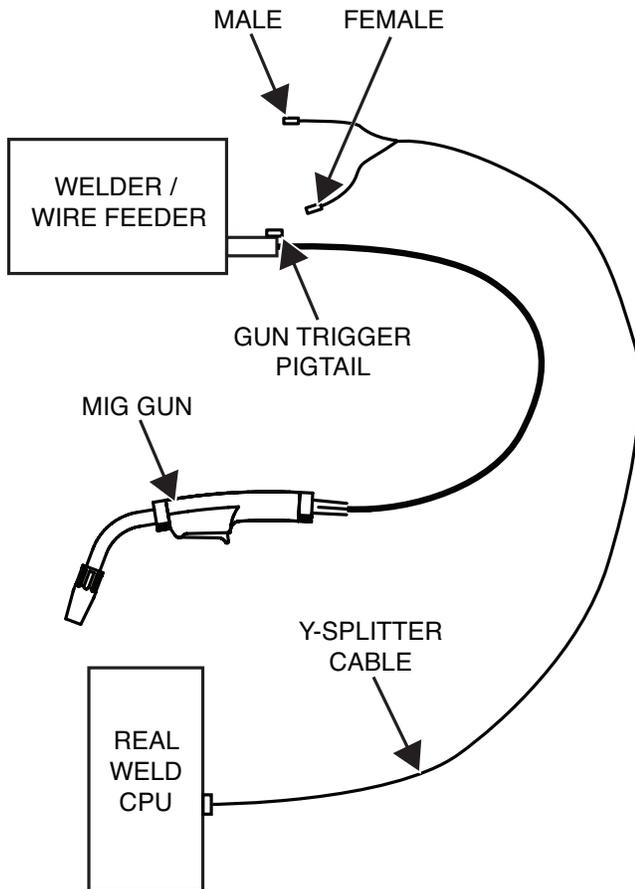
Figure A.18 – Y-splitter cable CPU connection

Y-SPLITTER
CABLE CONNECTION
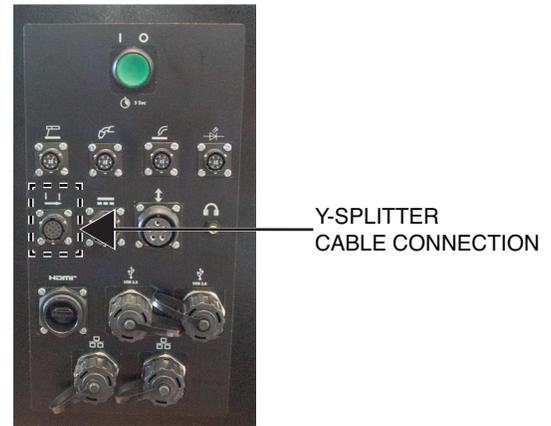
13. While pulling outward on the spring-loaded pin, slide the target onto the target mounting plate of the MIG gun. Be sure the target is secure. See Figure A.19.

14. Connect the target cable to the target. See Figure A.19.

Figure A.19 – Target mounting

TARGET CABLE   TARGET
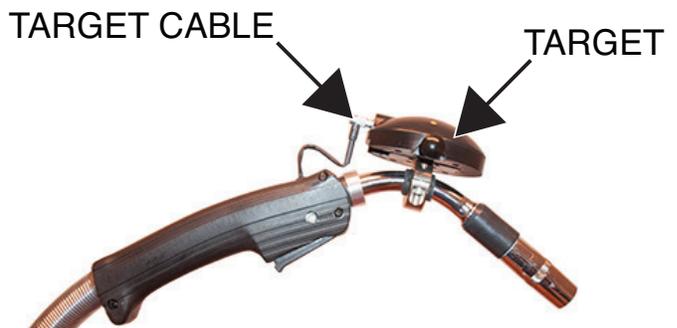
15. Connect the target cable to the appropriate gun connector on the CPU. See Figure A.20.

Figure A.20 – Target cable cpu connection

TARGET
CABLE CONNECTIONS
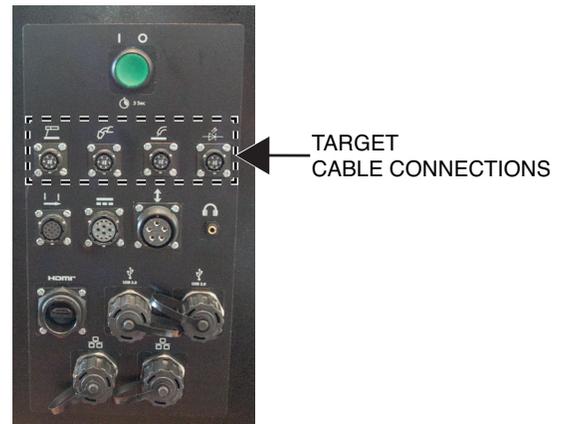
16. Connect the CPU power cable to a standard outlet.

17. Pair welder to the RealWeld by connecting work lead to weld table and also connecting the gun to the wire feeder. See welder/wire feeder manual for setup of these components.

SMAW TORCH SETUP

1. Connect the SMAW torch connection to the power source. See welder/wire feeder manual for setup.

2. Connect the ground cable to the power source.

3. Attach the current transducer to the ground cable. If welding polarity is DCEP, the positive (+) side of the current transducer faces the Fixture platform. If welding polarity is DCEN*, the positive (+) side of the current transducer faces the welder. See Figure A.21.

* When welding in DCEN, make certain the ground cable is connected to the positive output stud on the power source.

Figure A.21 – Current transducer

CURRENT TRANSDUCER
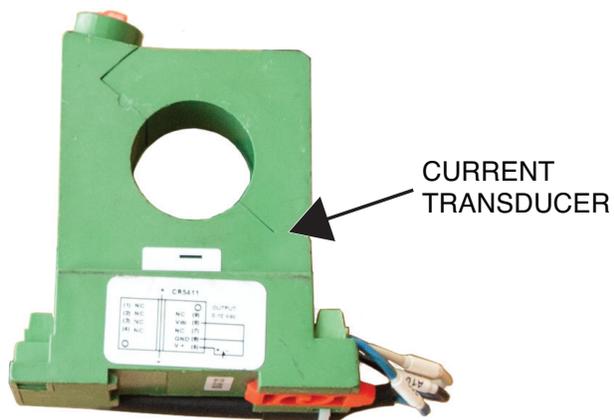
4. Connect the current transducer cable to the CPU. See Figure A.22.

Figure A.22 – Current transducer cpu connection

CURRENT TRANSDUCER CABLE CONNECTION
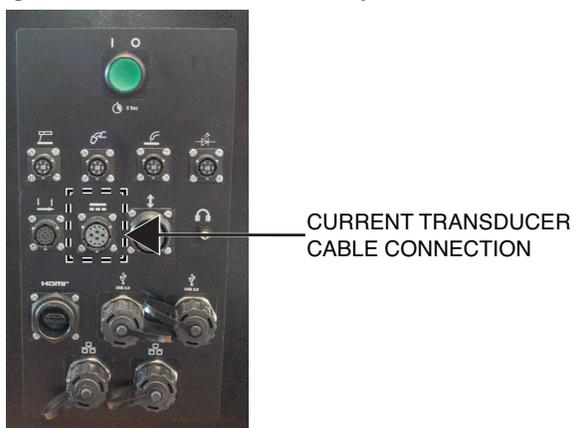
5. Connect the target cable to the CPU. See Figure A.23.

Figure A.23 – Target cable cpu connection

TARGET CABLE CONNECTIONS
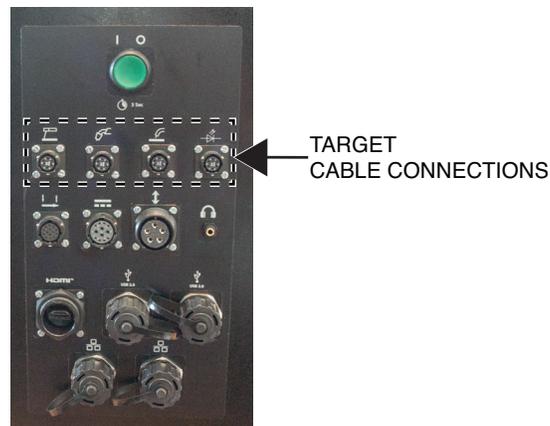
6. While pulling outward on the spring-loaded pin, slide the target onto the target mounting plate on the SMAW torch. Be sure the target is secure. See Figure A.24.

7. Connect the target cable to the target. See Figure A.24.

Figure A.24 – SMAW target mounting

TARGET   TARGET CABLE
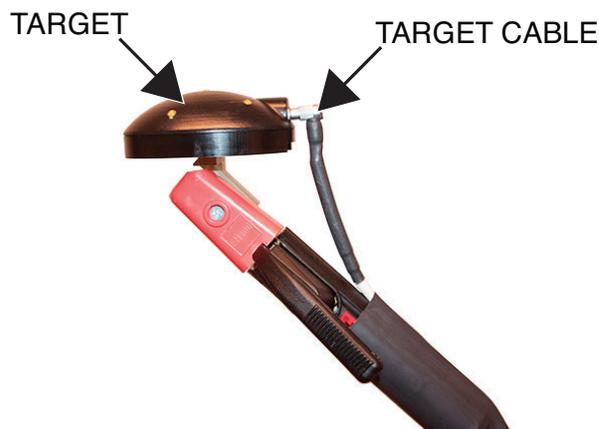
8. Connect the CPU power cable to a standard power outlet.

9. Pair welder to the RealWeld by connecting work lead to weld table. See welder/wire feeder manual for setup of these components.

PRODUCT DESCRIPTION

The RealWeld Trainer is a welding training solution designed to capture and score proper welding technique while making actual arc-on and/or practice arc-off welds.

The RealWeld Trainer uses a software-based system to manage the entire training process. The software operates with two types of users – the Instructor mode is for instructors to enroll new trainees, establish teaching curricula, assign curricula to each trainee, sign-off on a trainee's progress, calibration of the system and extract data to analyze trainee progress over time. The Trainee mode is for students to monitor their improvement over time while learning from defined curricula as assigned by the instructor. Instructors and trainees are uniquely identified by their username and must supply a password to gain access to the system.

A curriculum is an ordered list of Welding Procedure Specifications (WPSs). As many WPSs can be defined as required and are uniquely identified by their name. If there are well established curricula and WPSs in the training environment, the instructor can quickly configure those in the software. If there are not established curricula and WPSs, having a RealWeld Trainer will move you in that direction.

The student is assigned a curriculum and the result of every welding trial with either the arc-on or arc-off is saved for future reference and is uniquely identified by the trainee, WPS and date/time of that trail. Once a trainee has mastered a WPS, the instructor signs off on their skill level and the trainee will then be presented with the next WPS to learn in that curriculum. Several screens in the system allow either the trainee or instructor to evaluate progress.

The core of the technology is a robust vision system that allows the computer to track the motion of the welding torch or welding electrode holder. A target device is attached to a standard welding gun, so the motion capture cameras can track the gun as the student welds. A patent-pending technology filters out the arc light so the vision system is unaffected by the welding process. The system can automatically measure important welder motion parameters, such as travel speed, work angle, travel angle, contact tip to work distance (CTWD) and alignment with the joint (proximity). These measurements are made more than ten times per second and compared with the desired training procedure to automatically score the students performance. A report is instantly produced and graphically displayed so the student can learn what was done properly and where improvements are needed.

The RealWeld Trainer supports the welding of 6 inch coupons of up to three-eighths inch thickness (optionally supports 18 inch coupons for an additional feature cost) using SMAW (Stick), GMAW (Mig), FCAW (Flux Cored) welding processes. The system includes a work table and fixtures that support fillet, lap and groove (butt) welds in the flat, horizontal and vertical positions. Fillet and lap also support overhead position.

POWER UP / DOWN

1. Turn on the welder. See the Instruction Manual for the welder being used.

2. Press the ON/OFF button on the CPU. The button will illuminate to indicate that the power has been turned ON. See Figure B.1.

Figure B.1 – ON/OFF BUTTON

ON / OFF BUTTON

3. The computer will launch directly to the RealWeld Trainer software when booting. The computer will also automatically shut down when the Realweld software is exited. Desktop access is available only when logged in as instructor. See Figure B.2.

Figure B.2 – Desktop
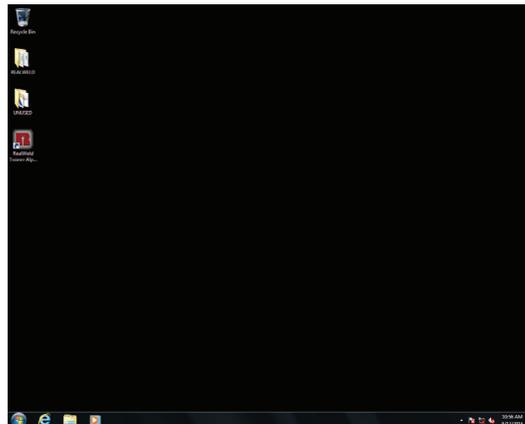
4. To power down the unit (while in the desktop environment), quit all programs by tapping the red 'X' icon in the upper right corner of each window.

5. Select the 'Start' icon and select 'Shutdown' to power down the machine.

LOADING REALWELD TRAINER SOFTWARE

1. Using the touchscreen monitor, Select the desired language from the drop down menu and select the green checkmark icon to continue. See Figure B.3.

Figure B.3 – Select language
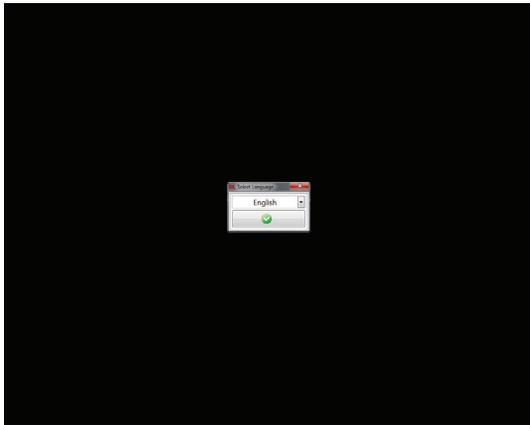
2. The software may take 15-30 seconds to load and will display a Lincoln Electric splash screen during this process. See Figure B.4.

Figure B.4 – Splash Screen

3. The login window will appear once the software has been opened. See Figure B.5.

Figure B.5 – Login

INSTRUCTOR MODE

To access the features of the instructor mode, the instructor must login with the appropriate username and password.

Default instructor login credentials:

Username: 1234

Password: 1234

1. Using the touchscreen monitor, select the 'Username' text box and enter the assigned username with the on-screen keyboard. Select the red 'X' icon to apply the username. See Figure B.6.

NOTE: The keyboard will automatically pop up when the text box is selected. The on-screen keyboard can be resized by dragging the corner of the keyboard box.

Figure B.6 – Username

2. Using the touchscreen monitor, select the 'Password' text box and enter the assigned password with the on-screen keyboard. Single tap the red 'X' icon once the password has been entered, this will remove the on-screen keyboard from the screen. See Figure B.7.

Figure B.7 – Password

3. Using the touchscreen monitor, select the 'OK' icon on the login window. Once selected, the user will be logged in and a set of menu options, specifically for an instructor, will be displayed on the left side of the screen. See Figure B.8.

Figure B.8 – Instructor menu
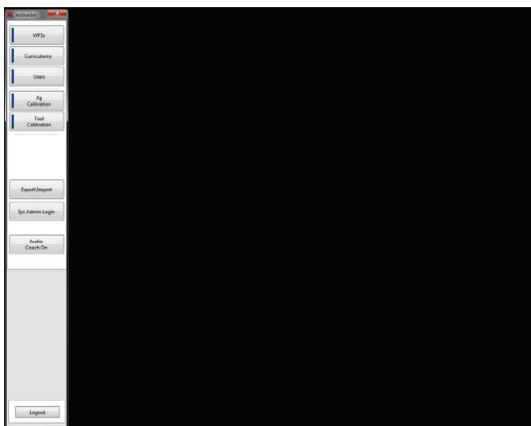
WELDING PROCEDURE SPECIFICATIONS (WPS)

Selecting the 'WPSs' icon will bring up a list of all WPSs currently in the system. There are pre-loaded curricula (SMAW 101, GMAW 101 and FCAW 101) that contain various WPSs that match up with the U/LINC™ curriculum. See Figure B.9.

Figure B.9 – Welding procedure specifications (WPS)
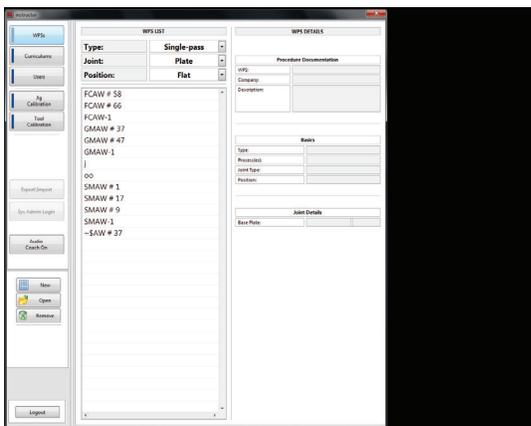
Selecting the 'Type', 'Joint' and 'Position' drop down menus will display the various options. Each combination of type, joint and position will display the WPSs that are associated with that selection.

In the 'Type' drop down menu, single-pass or multi-pass can be selected. See Figure B.10.

Figure B.10 – Type
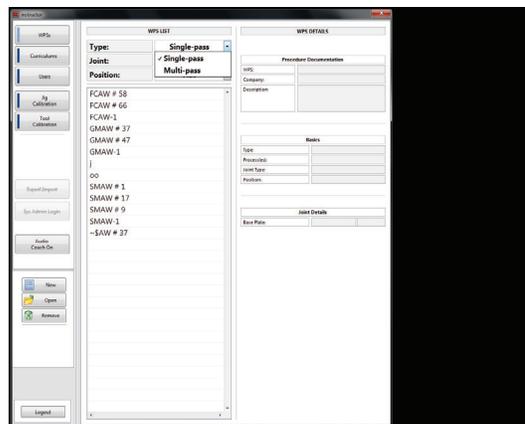
In the 'Joint' drop down menu, either plate, fillet, lap, butt and groove can be selected. See Figure B.11.

Figure B.11 – Joint
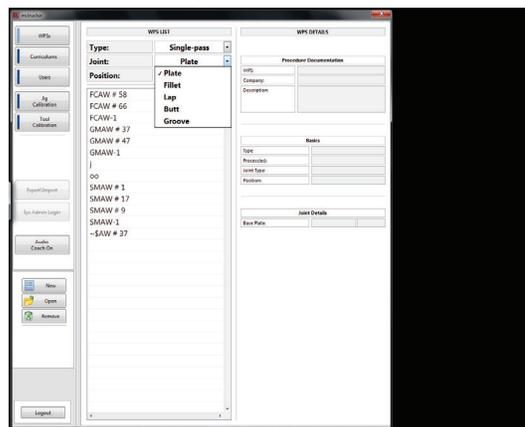
In the 'Position' drop down menu, flat, horizontal, vertical or overhead positions can be selected. See Figure B.12.

Figure B.12 – Position
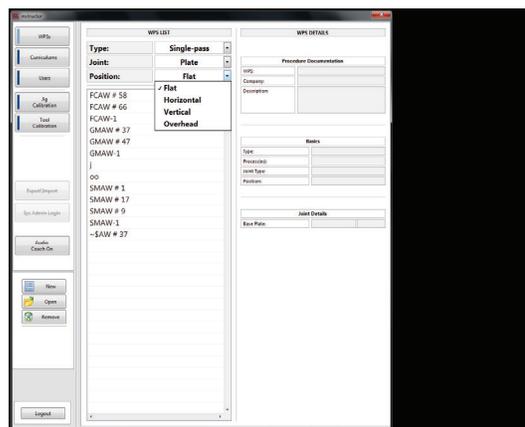
Selecting the desired WPS, the procedure documentation, basics and joint type will be displayed in the WPS details column on the right side of the monitor. See *Figure B.13*.

Selecting the desired WPS, the procedure documentation, basics and joint type will be displayed in the WPS details column on the right side of the monitor. See Figure B.13.

Figure B.13 – WPS details


CREATE A NEW WPS

1. Using the touchscreen monitor, select the 'New' icon on the left side of the monitor. See Figure B.14.

Figure B.14 – Create a new WPS

2. Enter the title for the new WPS into appropriate text box and select the 'OK' icon. The WPS editor will now be displayed. In this window, the instructor can set a variety of parameters. See Figure B.15.

Figure B.15 – WPS editor

When setting up a WPS, any item that has an orange highlight is required for creating a WPS. In regards to the variables section on the right hand side of the screen, there are five critical torch motion variables that need to be set that will be used to accurately measure each students results. The five critical torch motion variables are Work Angle, Travel Angle (Push or Drag), CTWD (Contact Tip to Work Distance), Travel Speed and Proximity (aim to the root of the joint).

The best approach to determining these values, if not already known, is to have an experienced welder run several welds with this system until an acceptable weld is created. The data collected from these welds can be used to create the baseline for the five critical torch motion variables as well as current, voltage and wire feed speed.

At the top of the screen, under 'Procedure Documentation', the company name and description can be typed in, as well as the option to select the appropriate units (standard/metric, decimal/fractional).

The first few items to program are listed under 'Basics'. This includes things like joint type, process, position and progression angle. Various other process variables can be programmed as well including transfer mode, shielding gas type flow rate and even specific heat treatment temperatures.

Enter the base plate material type and thickness in the 'Joint Details' section.

On the right hand side of the screen, under 'Pass Specifics', the process, polarity and the filler metal type and size can be programmed.

In the "Variables" section, enter the work angle, travel angle, CTWD, travel speed, proximity, current, voltage wire feed speed and weld. These values need to be entered in order to create the new WPS.
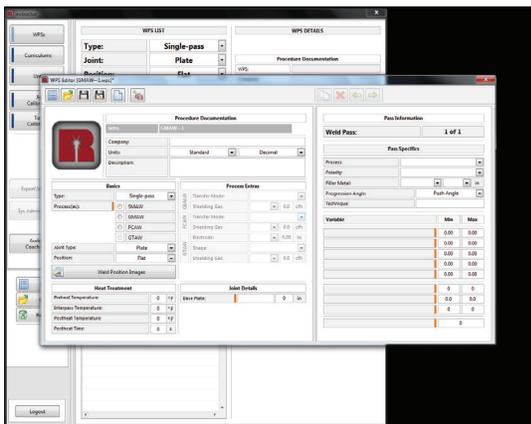
SUPPORT MATERIAL

Support material in a WPS can be any document (pdf), image (bmp, jpg, png), video (avi, mp4, mov, wmv) or URL that helps to supplement the selected WPS. Examples could be material that helps demonstrate proper weldment setup, proper welding torch setup, common weldment errors, etc.

To add, edit or remove support material select the 'Add support material' icon. This will display the support material editor. See Figures B.16 and B.17.
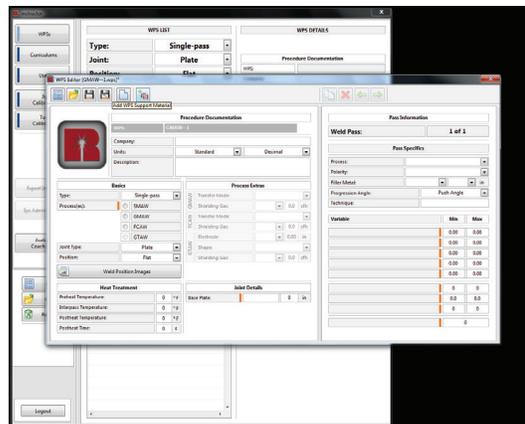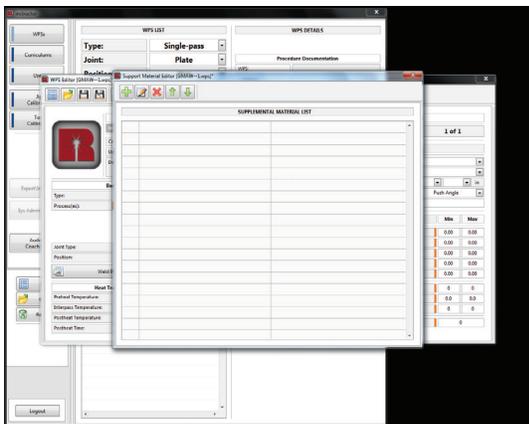
Figure B.16 – Add support material

Figure B.17 – Support material editor

Select the 'Plus' icon to add new support material, the 'Edit' icon will add an existing support material, the 'Delete' icon will delete existing support material and the 'Up Arrow' and 'Down Arrow' will re-sequence the order of support materials.

Selecting the 'Plus' icon or the 'Edit' icon will generate a support material secondary editor. See Figure B.18.

Figure B.18 – Support material secondary editor
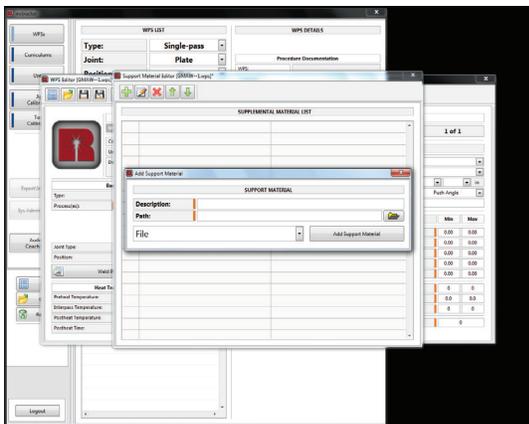
The secondary editor requires a description for the support material (this is the visible description to the student when reviewing the WPS) and a Path or URL of the support material being added.

To change between a file (document, image or video) or a URL, select the drop down box to change values.

When a description and path\URL have been entered, select the 'Add Support Material' icon to add the defined object to the WPS. The secondary editor closes and the support material editor is now updated.

After all support material has been added, select the red "X" in the upper right corner of the support material editor to apply your changes to the WPS. See Figure B.19.

Figure B.19 – Apply changes
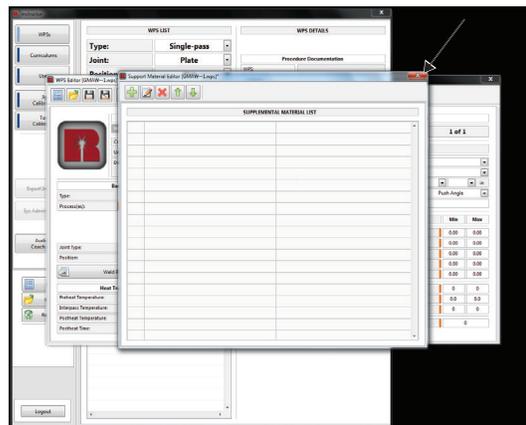
Once the support material editor closes the WPS editor will be updated with an icon to indicate that the WPS has support material attached. See Figure B.20.

Figure B.20 – Support material attached
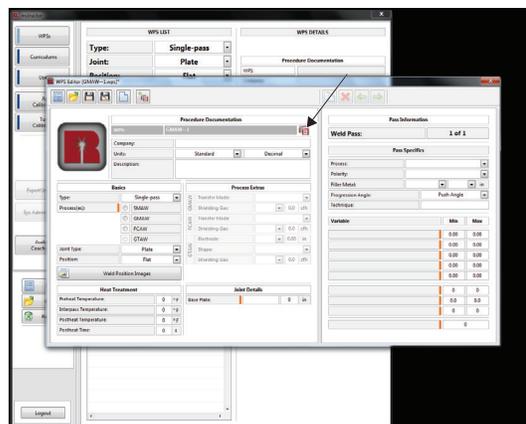
When the WPS parameters have been entered, select the 'Save' icon from the toolbar.

CURRICULUM

Select the 'Curriculum' icon on the left side of the screen to enter the curriculum section.

The 'Curriculum List' will display all the curriculum's that the instructor has entered. Select any of the curriculum's to show the corresponding curriculum sequence. The curriculum sequence displays the learning objectives that have been assigned to a particular curriculum. See Figure B.21.

Figure B.21 – Curriculum
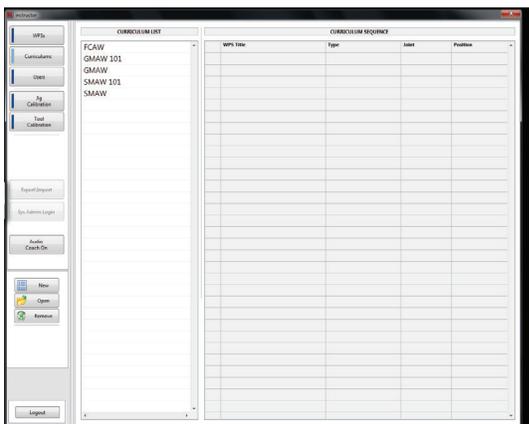
In the curriculum menu the instructor can add, edit or remove curriculum's from the list.

ADD A CURRICULUM

1. Using the touchscreen monitor, select the 'New' icon on the left side of the screen.

2. In the pop up window, select the text box area and enter a name for the curriculum using the on-screen keyboard. Select the 'OK' icon to continue. See Figure B.22.

Figure B.22 – New curriculum
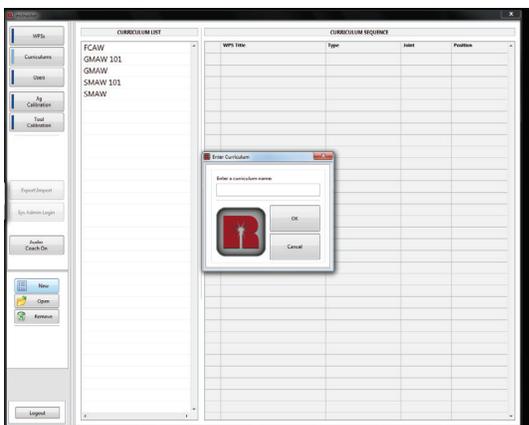
3. The 'Curriculum Editor' window will appear. In this window, the instructor can add, remove and rearrange the order of learning objectives associated with this curriculum. See Figure B.23.

Figure B.23 – Curriculum editor
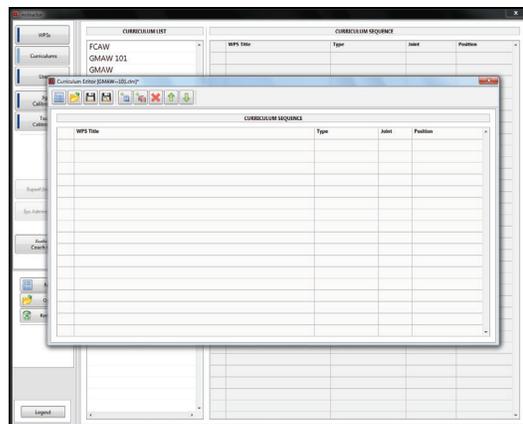
4. To add a WPS, select the 'Add WPS' icon in the toolbar. This will bring up a list of saved WPSs to choose from. Select the WPSs that are to be associated with the selected curriculum. Once all WPSs are added, select the 'save' icon in the toolbar. The curriculum will be added to the curriculum list. See Figure B.24.

Figure B.24 – Add curriculum
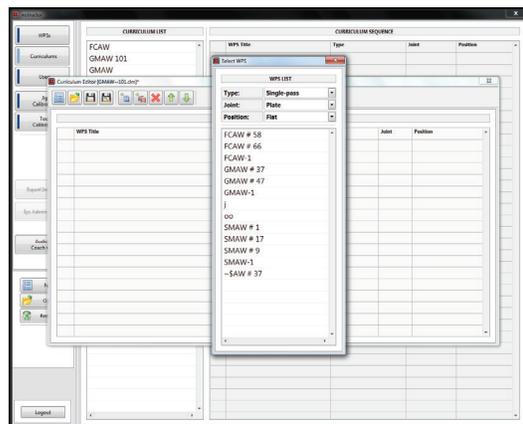
5. Select the WPSs that are to be associated with the selected curriculum. In this example, the curriculum is named "FCAW # 58". To select 'FCAW # 58', select the WPS and it will automatically be added to the curriculum. See Figure B.25.

Figure B.25 – Save Curriculum
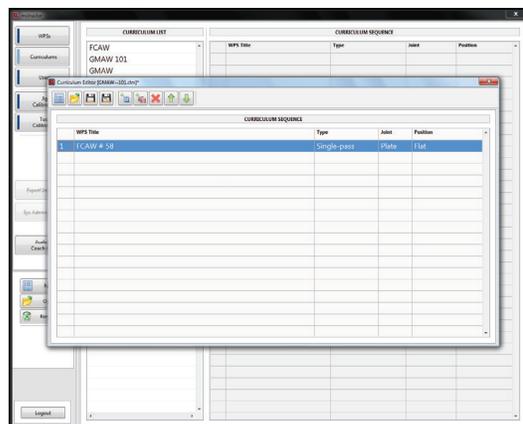
6. Once the WPSs are added to the curriculum, select the 'Save' icon in the Curriculum Editor and the new curriculum will appear in the curriculum list. Existing curriculum's can also be edited by selecting a curriculum and selecting the 'Edit' icon.

USERS

Selecting the 'Users' icon will allow the instructor to add, edit or remove users. See Figure B.26.
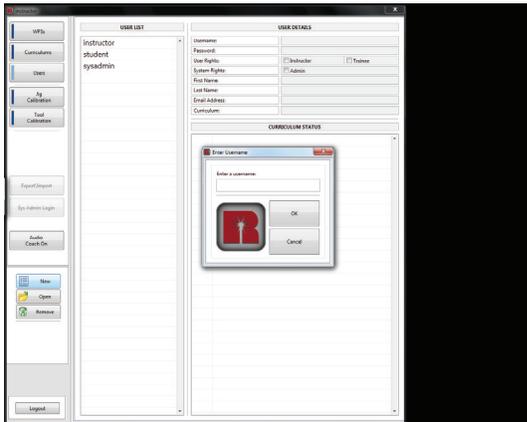
Figure B.26 – Users
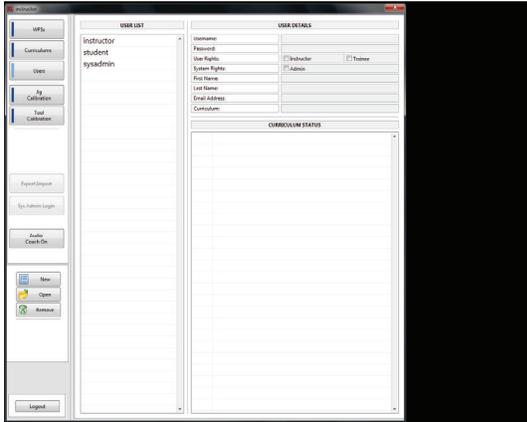
ADD A USER

1. Using the touchscreen monitor, select the 'New' icon on the left side of the screen. A pop up box will appear on the screen. See Figure B.27.

2. Enter a username for the new user and select the 'OK' icon to continue. See Figure B.27.

Figure B.27 – Username

3. The 'User Editor' window will be displayed. In this window, the instructor can set the password, user rights, name and curriculum for this particular user. See Figure B.28.

Figure B.28 – User editor
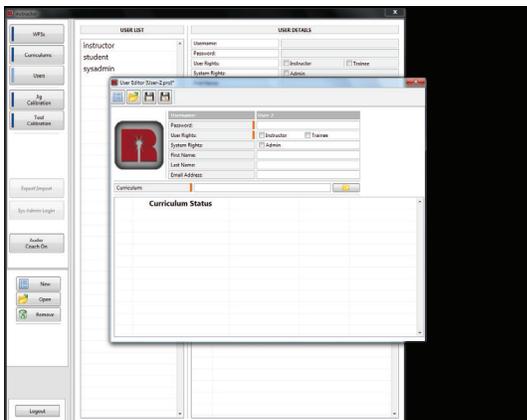
4. Select the password text box and using the on-screen keyboard enter a password and select the red 'X' to exit the keyboard. For security, passwords are stored in an encoded format.

5. In the User Rights section, select either 'Instructor' or 'Trainee'.

6. In the System Rights section, select 'Admin' if the new user should be allowed to modify key settings of the trainer application.

7. Select the 'First Name' and 'Last Name' text boxes and using the on-screen keyboard enter the new users first and last names. Select the red 'X' to exit the keyboard.

8. Select the 'Email Address' text box and using the on-screen keyboard enter the users email address. Select the red 'X' to exit the keyboard.

9. A curriculum must be assigned in order to save the user. Select the yellow 'Folder' icon next to the curriculum text box. This will bring up a list of various curriculum's to choose from.

10. Select the curriculum that should be assigned to this user. A pop up window may appear that reads "Changing the curriculum will reset WPS stats." Select 'OK' icon to assign the selected curriculum to the user. The curriculum should now be displayed underneath the curriculum status. See Figure B.29 and B.30.
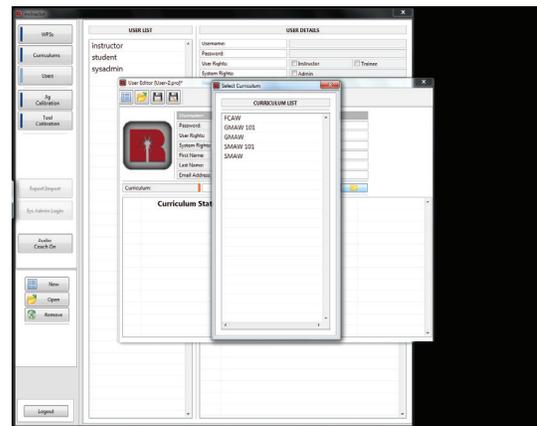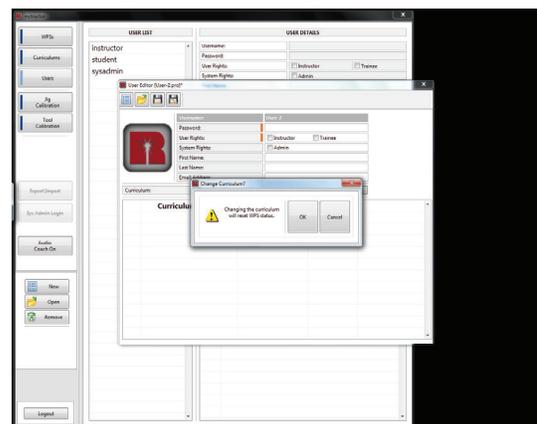
Figure B.29 – Assign curriculum


Figure B.30 – Change curriculum

11. Select the 'Save' icon in the toolbar to save the user. If the username needs to be changed, select the 'Save As' icon in the toolbar and change the username.

12. If the instructor wants to change the status of any particular WPS, see the Status section for detailed instructions. The three status conditions are Not Started, In Process and Complete.
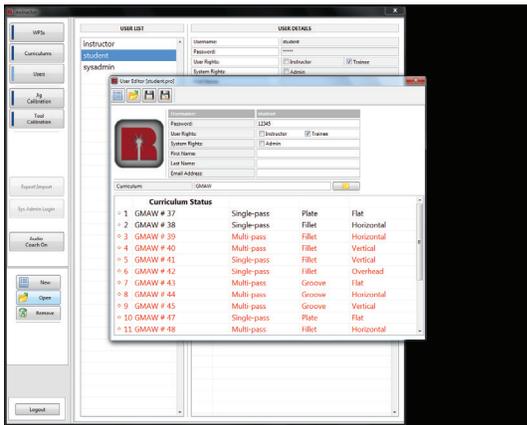
EDIT A USER

1. Select the desired user under the user list. See Figure B.31.

Figure B.31 – User list
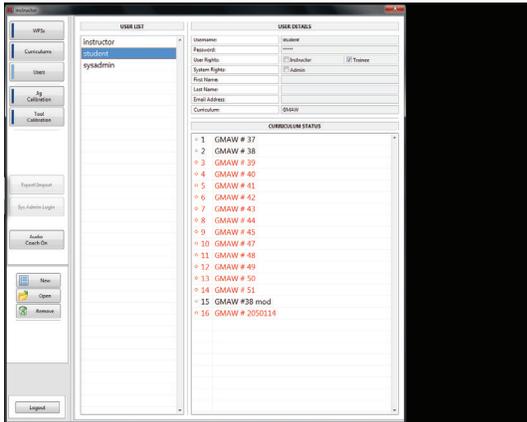
2. Select the 'Open' icon on the left side of the screen. This will bring up the 'User Editor' window. See Figure B.32.

Figure B.32 – User editor

3. In the user editor window, the instructor can modify First and Last Name, User Rights, Password and Curriculum, if necessary.

4. Select the 'Save' icon in the toolbar to save any changes.

REMOVE A USER

1. Select the desired user form the user list.

2. Select the 'Remove' icon on the left side of the screen. A pop up window will appear allowing the instructor to confirm deleting the user.

3. Select the 'OK' icon to delete the user. See Figure B.33.

Figure B.33 – Remove a user
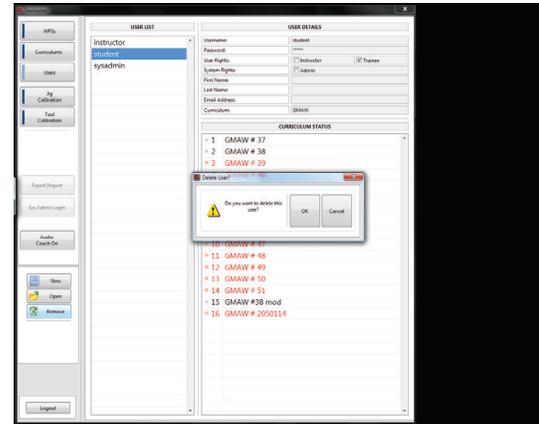
FIXTURE PLATFORM SETUP

The fixture platform can be setup in three different positions.

Position 1 - Flat orientation (position 1). See Figure B.34.

Figure B.34 – Position 1

Position 2 - Horizontal and Overhead orientation (position 2). See Figure B.35.

Figure B.35 – Position 2

Position 3 - Vertical orientation (position 3). See Figure B.36.

Figure B.36 – Position 3

CALIBRATION PROCEDURES

FIXTURE CALIBRATION

NOTE: Must be logged in as instructor to perform calibration.

The fixture calibration procedure helps ensure that the cameras are always reading the exact location of the fixture platform. It is necessary to go through the fixture calibration procedure in three different situations.

Situation 1 - When the system is first installed.

Situation 2 - If the user is seeing consistent erroneous data that relates to position such as proximity. If the output values seem to be incorrect, the fixture may need to be re-calibrated.

Situation 3 - Every 30 days.

1. Before beginning the calibration procedure, remove the fixture and any clamps (including the ground clamp) from the fixture platform.
2. **Open all camera lenses**.
3. Select the 'Fixture Calibration' icon on the left of the screen to begin the calibration procedure. See Figure B.37.
4. Select the 'Position 1' icon on the left side of the screen. See Figure B.37.

Figure B.37 – Tool calibration
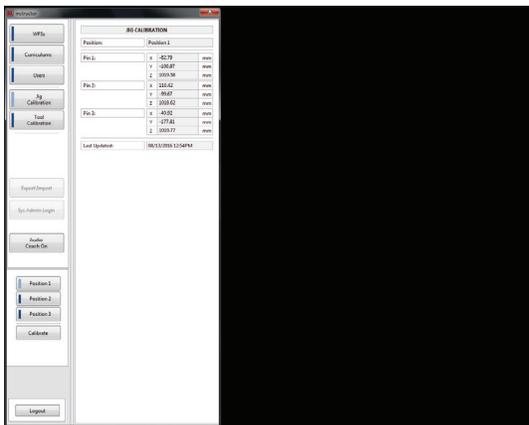
5. Select the 'Calibrate' icon on the left side of the screen. This will bring up the 'Calibrate Fixture' window. See Figure B.38.

Figure B.38 – Calibrate fixture
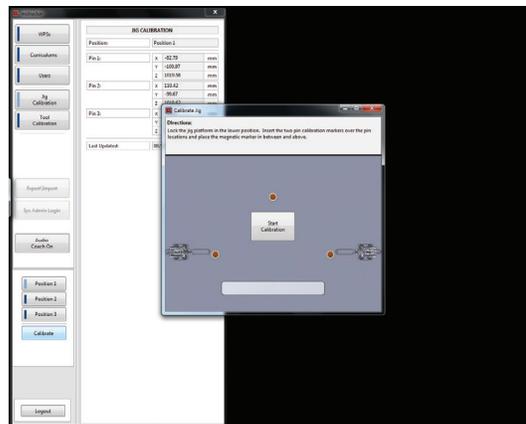
6. The calibrate fixture window has directions that show where to place the LED markers. Two of the LED markers need to be placed over the 2 pin locations on the platform and the 3rd marker is magnetic and should be placed in between and above the other two markers (towards the back of the fixture platform but no more than halfway back). See Figures B.39.

Figure B.39 – Fixture platform calibration markers
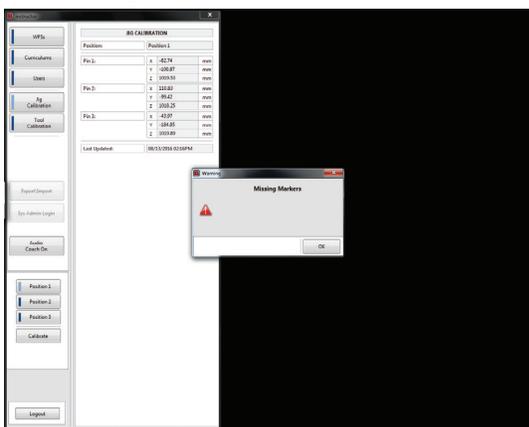

CALIBRATION MARKERS

7. With the LED markers in place, select the 'Start Calibration' icon on the screen. The LED markers on the screen will start to blink while various numbers appear above them. During this time, the equipment is determining the position of the fixture platform. See Figure B.40.

Figure B.40 – Start calibration
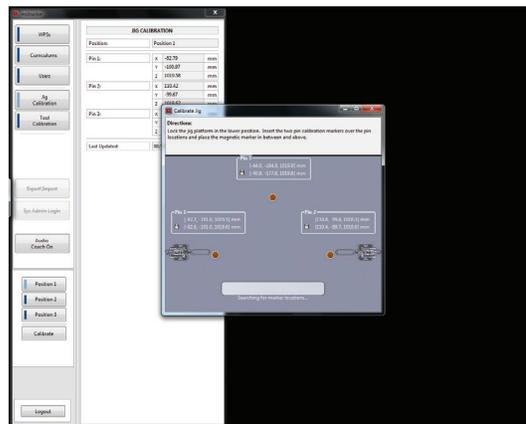
8. In some cases, there might be an error with the calibration due to the markers not being within the field of view or if there is a bright light in the area. Also, in some instances the ambient lighting can cause an error stating 'too many markers recognized'. If this happens, select the 'OK' icon, verify that the markers are placed correctly and that there aren't any sources of bright light in the area and repeat the calibration steps. See Figure B.41.

Figure B.41 – Calibration error

9. When the calibration is complete, the calibrate fixture window will automatically close. The fixture calibration menu will still be displayed and the numerical values for pins 1-3 will be updated. The date and time of the calibration will also be updated and displayed. See Figure B.42.

Figure B.42 – Calibration complete
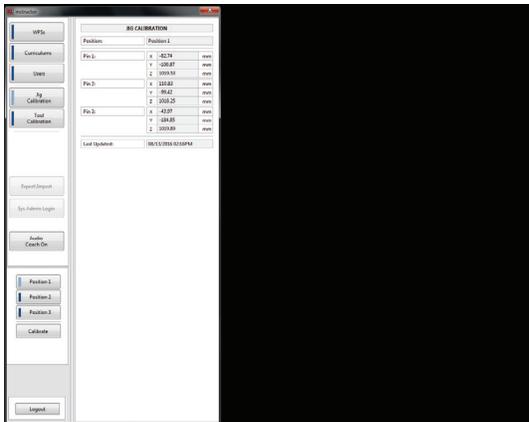
10. Repeat this calibration for each of the three fixture platform positions, by adjusting the fixture platform to the corresponding position and selecting the position from the menu on the left side of the screen.

11. When calibration is complete, remove the LED markers from the fixture platform and store them properly.

12. **Close the camera lenses**.

TOOL CALIBRATION

NOTE: Must be logged in as instructor to perform calibration.

The tool calibration procedure ensures that the cameras know the exact configuration of the welding torch or tool that's being used. It's necessary to go through the tool calibration procedure in three different situations.

Situation 1 - When the equipment is first installed.

Situation 2 - If the user is seeing consistent erroneous data that relates to position such as proximity. If the output values seem to be incorrect, the fixture may need to be re-calibrated.

Situation 3 - Every 30 days.

GMAW GUN CALIBRATION

1. Before beginning the tool calibration procedure, place the fixture and work piece onto the fixture platform and **open camera lenses**.

2. Carefully attach the calibration markers to the GMAW gun. See Figure B.43.

Figure B.43 – Calibration markers
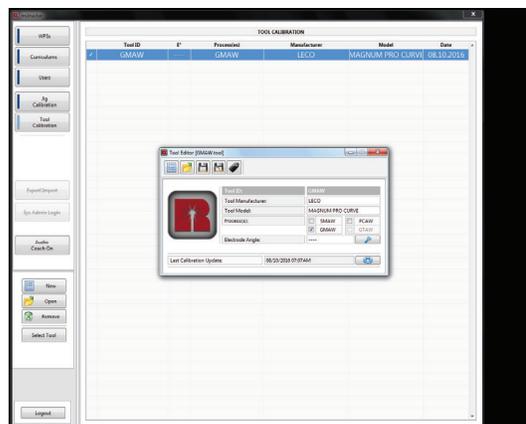

CALIBRATION MARKERS

3. Select the 'Tool Calibration' icon. This will bring up a list of tools that has been saved to the system. See Figure B.44.

Figure B.44 – Tool calibration
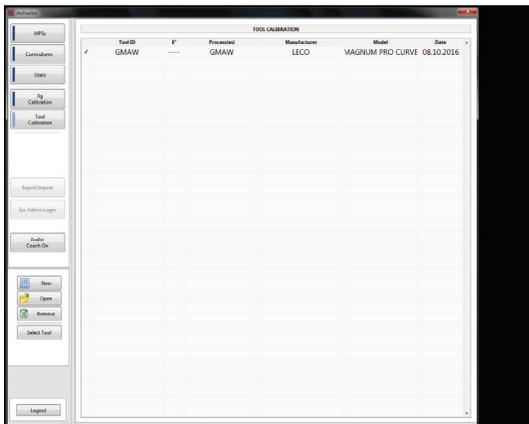
4. Select the tool to be calibrated which should highlight the tool.

5. Select the 'Edit' icon on the left side of the screen. This will bring up the 'Tool Editor' window. See Figure B.45.

**Figure B.45 – Tool editor**

6. Select the 'Gear' icon next to the Last Calibration Update field. This will bring up a Calibrate Tool window that has instructions on how to prepare the tool for calibration. This includes removing the nozzle and contact tip from the weld tool. See Figure B.46.

Figure B.46 – Start calibration
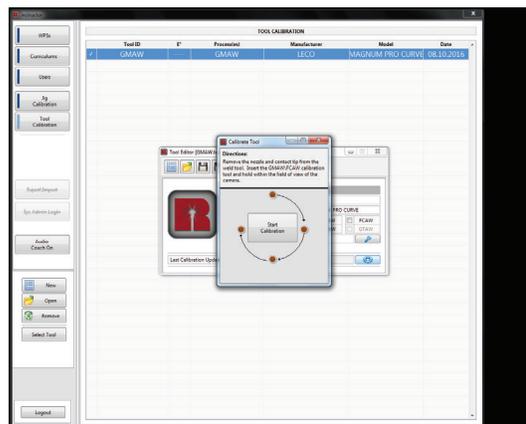
7. During calibration be sure to hold the tool steady and be sure at least three of the five tool markers and all tip markers are visible to the cameras.

8. Select the 'Start Calibration' icon on the Calibrate Tool window. The LEDS on the screen will start to blink. See Figure B.47.

Figure B.47 – Blinking LEDs
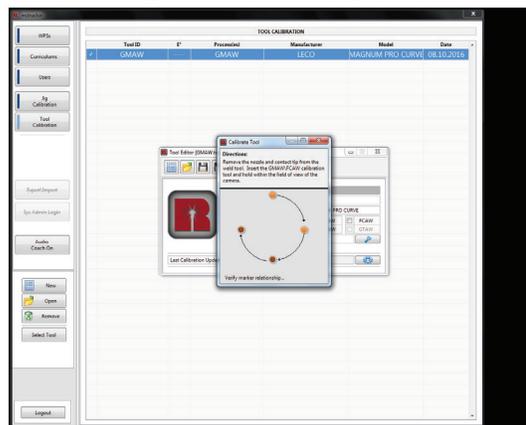
9. When the calibration has been completed, the Calibrate Tool window will display a checkmark and will say 'Calibration Complete'. This window will automatically close. After the Calibrate Tool window automatically closes, the tool editor window will remain open. See Figure B.48.
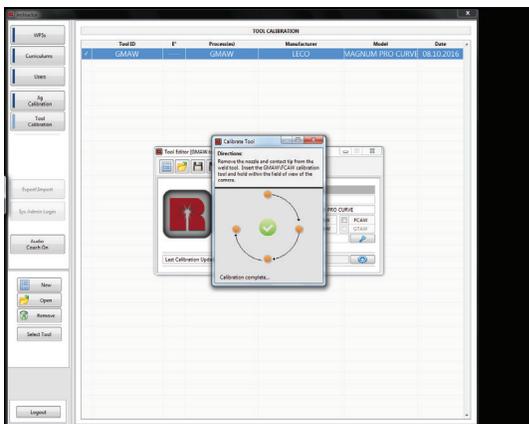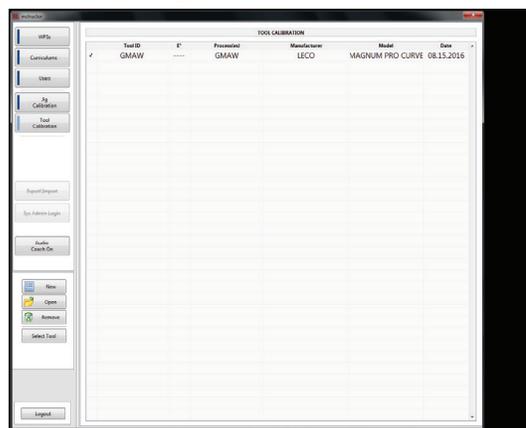
Figure B.48 – Calibration complete

10. The calibration needs to be saved and this is done by selecting the 'Save' icon in the tool editor window. This will automatically update the 'Last Calibration Update' field with the current calibration date. See Figure B.49.

Figure B.49 – Last calibration update

11. Close the tool editor window by selecting the red "X" icon in the top right corner of the tool editor window.

12. Remove the calibration markers from the GMAW gun.

13. Place the nozzle and contact tip onto the weld tool.

14. **Close the camera lenses**.

SMAW TORCH CALIBRATION

1. Before beginning the tool calibration procedure, place the fixture and work piece onto the fixture platform.

2. Carefully attach the calibration markers to the SMAW torch. See Figure B.50.

3. **Open the camera lenses**.

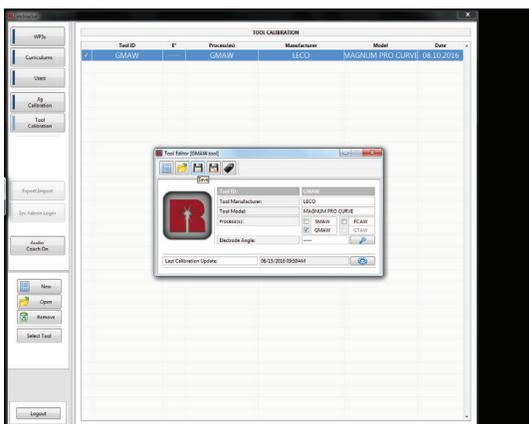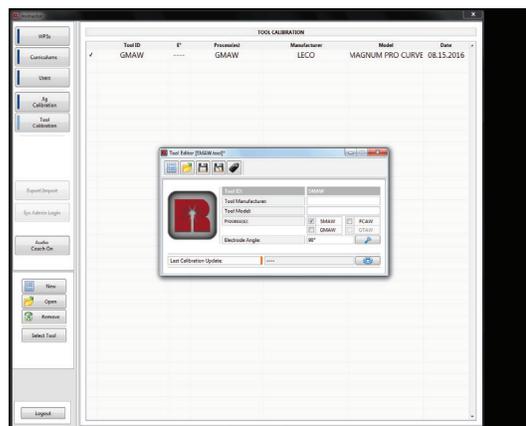**Figure B.50 – SMAW torch calibration markers**

CALIBRATION MARKERS

4. Select the 'Tool Calibration' icon. This will bring up a list of tools that has been saved to the system. See Figure B.51.

Figure B.51 – Tool list

5. Select 'SMAW' from the list of tools.

6. Select the 'Edit' icon on the left side of the screen. This will bring up the 'Tool Editor' window. See Figure B.52.

Figure B.52 – Tool editor

7. Select the electrode angle (90º, 45º, 135º).

8. Carefully position the calibration markers for the desired angle. See Figure B.53.

Figure B.53 – Electrode angle
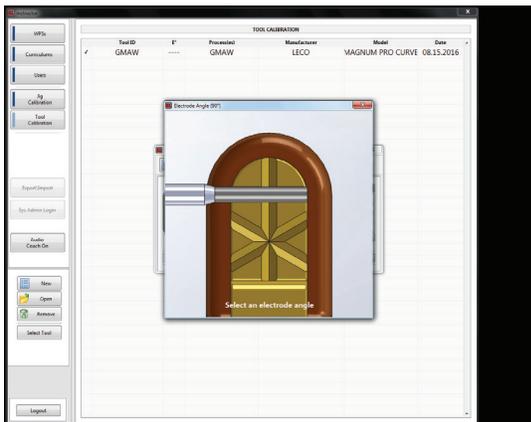
9. Select the 'Gear' icon next to the Last Calibration Update field. This will bring up a Calibrate Tool window that has instructions on how to prepare the tool for calibration. See Figure B.54.
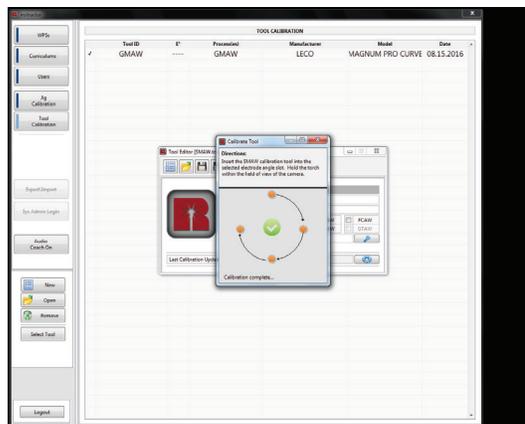
Figure B.54 – Calibrate tool
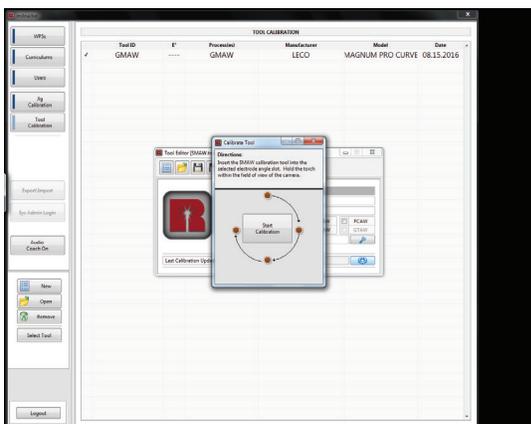
10. During calibration be sure to hold the tool steady and be sure at least three of the five tool markers and all tip markers are visible to the cameras.

11. Select the 'Start Calibration' icon on the Calibrate Tool window. The LEDS on the screen will start to blink. See Figure B.55.

Figure B.55 – Blinking LEDs
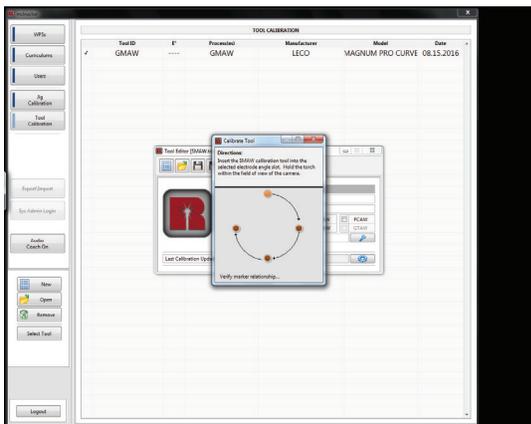
12. When the calibration has been completed, the Calibrate Tool window will display a checkmark and will say 'Calibration Complete'. This window will automatically close. After the Calibrate Tool window automatically closes, the tool editor window will remain open. See Figure B.56.

Figure B.56 – Calibration complete

13. The calibration needs to be saved and this is done by selecting the 'Save' icon in the tool editor window. This will automatically update the 'Last Calibration Update' field with the current calibration date. See Figure B.57.

Figure B.57 – Last calibration update
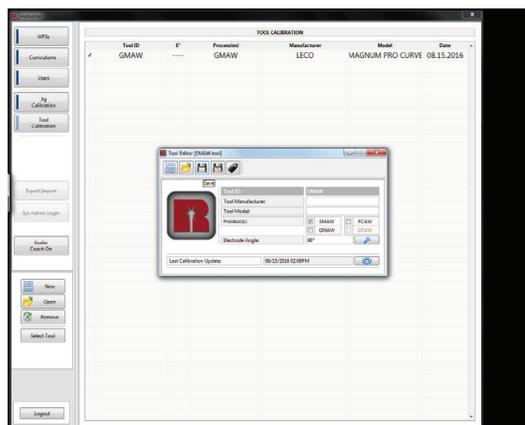
14. Repeat the SMAW device calibration for each angle (90º, 45º and 135º).

15. Close the tool editor window by selecting the red "X" icon in the top right corner of the tool editor window.

16. Remove the calibration markers from the SMAW torch.

17. **Close the camera lenses**.

EXPORT AND IMPORT

This feature allows the import/restore or export/backup of the data associated with the trainer application. This data [WPSs, Curriculum's and Users] can be transferred to a laptop (running the RealWeld Instructor Application) and can be modified offline. These modifications can then be imported back into the trainer to update them with changes made from the instructor admin application. Through the entire process of backup and restore, the trainer is the foundation of data used for the instructor admin application. This means that the exports from the trainer are used to import into the instructor admin application are then modified and returned to the respective trainer system. If more changes are required the changes can be performed locally on the trainer or must be exported again to the instructor admin application.

EXPORT

Exporting allows data to be systematically transferred from the RealWeld trainer to a RealWeld defined sync folder, USB drive or to a network drive (requires network access).

1. From the instructor main menu select the 'Export\Import' icon. The Export\Import menu will display, select the 'Export' icon to export all user and system configuration files associated with the respective trainer. See Figure B.58.

Figure B.58 – Export
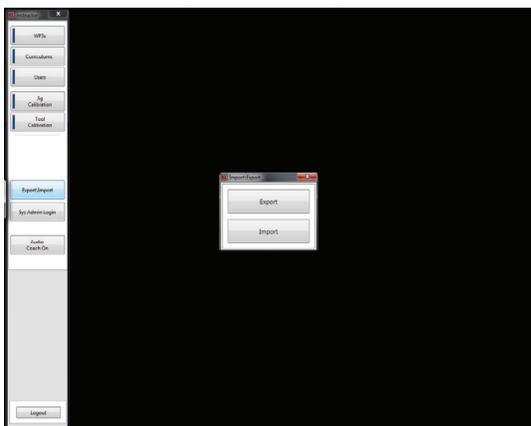
2. Selecting export will generate a dialog window requiring a path and filename to save the exported data. RealWeld designates a default sync folder that resides in the Documents folder under RealWeld and then Exports (C:\Users\<username of computer>\ Documents\RealWeld\Exports). RealWeld also defines a default filename titled Exported Data <Date\Time Stamp>. This directory can be changed to a USB drive or network drive if preferred. See Figure B.59.

Figure B.59 – Exported data
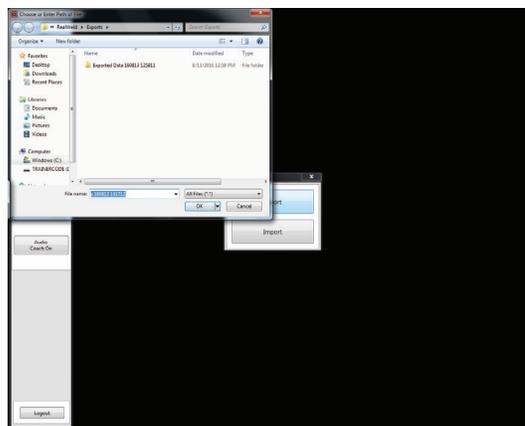
3. While the data is being exported the system will display a status window describing the file being exported, the directory to which the data is being exported to and a total progress bar displaying the progress of the entire export process. See Figure B.60.

Figure B.60 – Export progress
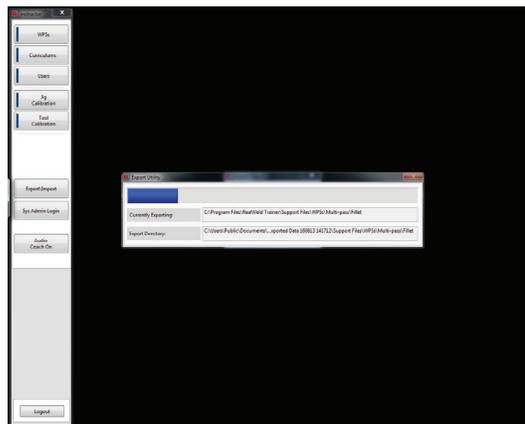
4. Upon completion of the export, a dialog will be displayed confirming the completion with a status of data exported. See Figure B.61.

Figure B.61 – Export complete
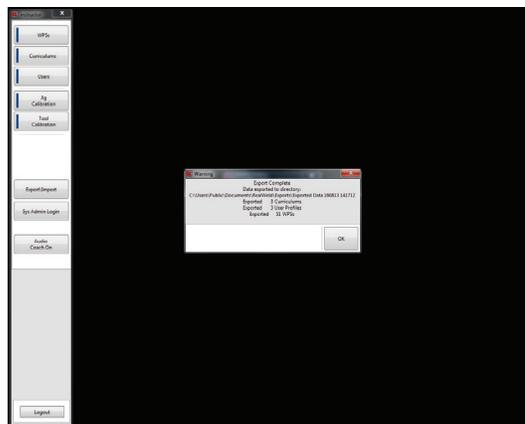
IMPORT

Importing allows exported trainer data to be correctly populated into an instructor admin or trainer application. See Figure B.62. This data can fall into three categories defined during the import process. Selecting the import icon will bring up the Import Mode Selection window. See Figure B.63. Choose the appropriate import process (Update Data, Restore Data, Restore All Data) and select the "OK" icon.
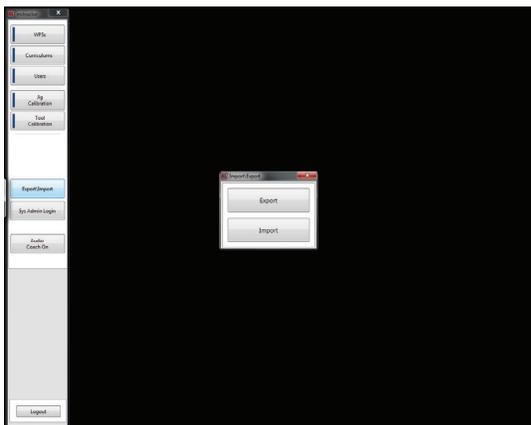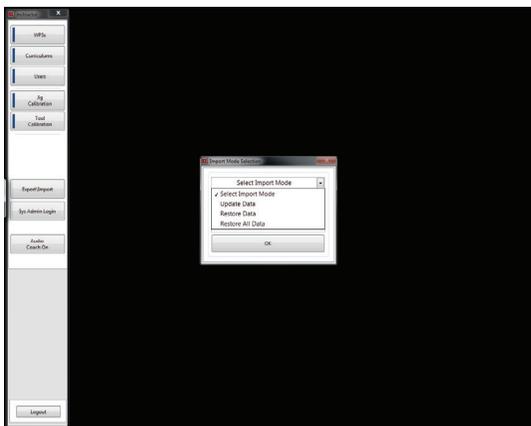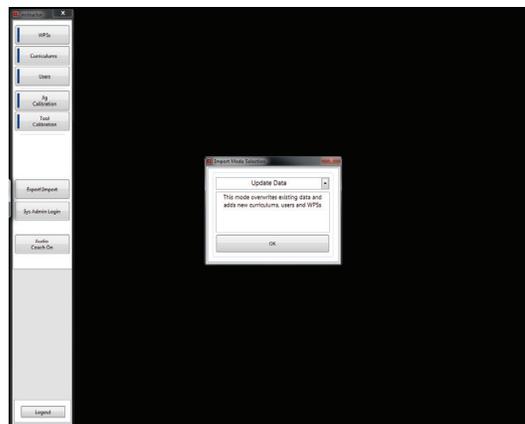
Figure B.62 – Import

Figure B.63 – Import

UPDATE DATA

This import mode **will overwrite** any existing WPSs, curriculum's and users data that already exist on the respective system and add any new WPSs, curriculum's and users existing in the export directory that do not currently exist on the system the import is being performed on. All other files are left unchanged (deleted users will not be deleted on the trainer). See Figure B.64.

Figure B.64 – Update data

RESTORE DATA

This import mode will remove any existing WPSs, curriculum's and users that already exist on the respective system and add all WPSs, curriculum's and users existing in the export sync folder. This mode allows WPSs, curriculum's or users to be deleted from the instructor admin application and not remain on the trainer. See Figure B.65.

Figure B.65 – Restore data
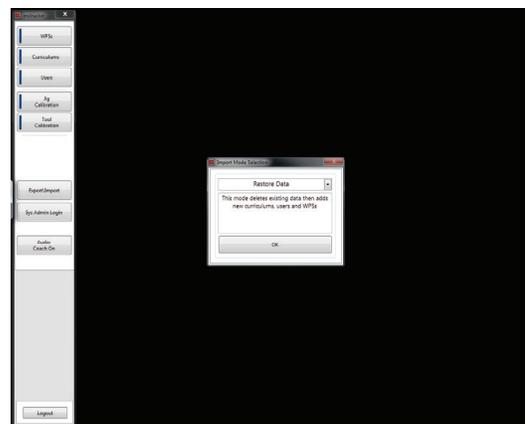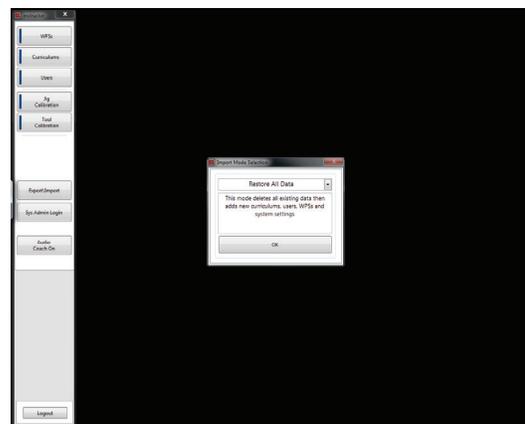

RESTORE ALL DATA

Like the restore data mode, this import mode will remove ALL user generated data that already exists on the respective system as well as ALL system configuration files. All files will then be restored from the sync folder used for this import mode. This is the same as performing a restore of backup data. See Figure B.66.

Figure B.66 – Restore all data

NOTE: If this export data is not that of the trainer this import mode is being performed on, there could be some additional steps needed to correct Camera and calibration differences.

Selecting the import mode will generate a dialog window requiring a path and filename to the exported data to import from. RealWeld designates a default sync folder that locally on the trainer system. The directory is as follows: C:\Users\<username of computer>\ Documents\RealWeld\Exports. See Figure B.67.

Figure B.67 – Import data
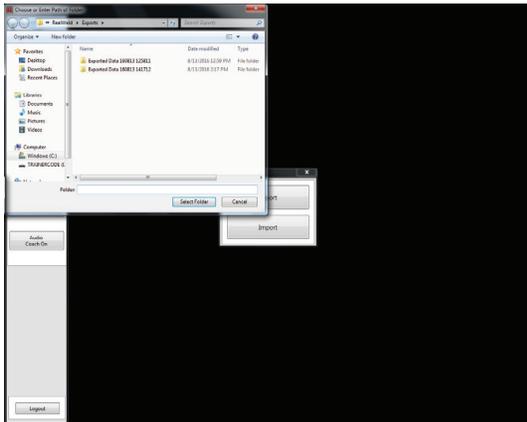
When the data is being imported the system will display a status window describing the file being imported, the directory to which the data is being imported to and a total progress bar displaying the progress of the entire import process. See Figure B.68.

Figure B.68 – Import progress
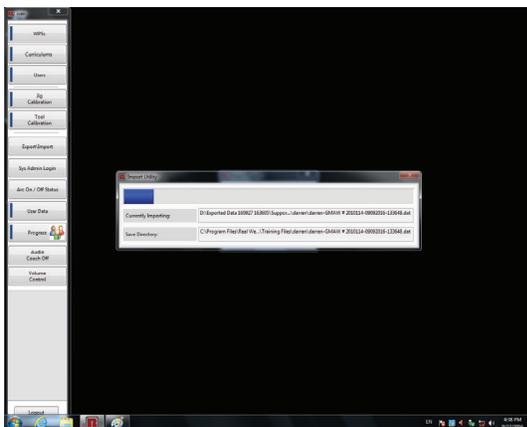
Upon completion of the import, a dialog will be displayed confirming the completion with a status of data imported. See Figure B.69.

Figure B.69 – Import complete
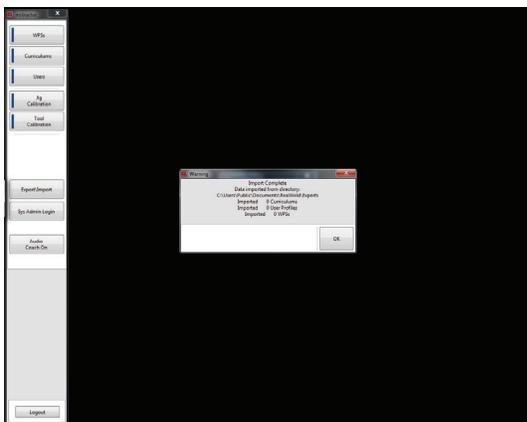
TRAINEE MODE

PRODUCT DESCRIPTION

The RealWeld Trainer, is a welding training solution designed to capture and score proper welding technique while making actual arc-on and/or practice arc-off welds.

The RealWeld Trainer uses a software-based system to manage the entire training process. The software operates with two types of users – the Instructor mode is for instructors to enroll new trainees, establish teaching curricula, assign curricula to each trainee, sign-off on a trainee's progress, calibration of the system and extract data to analyze trainee progress over time. The Trainee mode is for students to monitor their improvement over time while learning from defined curricula as assigned by the instructor. Instructors and trainees are uniquely identified by their username and must supply a password to gain access to the system.

A curriculum is an ordered list of Welding Procedure Specifications (WPSs). As many WPSs can be defined as required and are uniquely identified by their name. If there are well established curricula and WPSs in the training environment, the instructor can quickly configure those in the software. If there are not established curricula and WPSs, having a RealWeld Trainer will move you in that direction.

The student is assigned a curriculum and the result of every welding trial with either the arc-on or arc-off is saved for future reference and is uniquely identified by the trainee, WPS and date/time of that trail. Once a trainee has mastered a WPS, the instructor signs off on their skill level and the trainee will then be presented with the next WPS to learn in that curriculum. Several screens in the system allow either the trainee or instructor to evaluate progress.

The core of the technology is a robust vision system that allows the computer to track the motion of the welding torch or welding electrode holder. A target device is attached to a standard welding gun, so the motion capture cameras can track the gun as the student welds. A patent-pending technology filters out the arc light so the vision system is unaffected by the welding process. The system can automatically measure important welder motion parameters, such as travel speed, work angle, travel angle, contact tip to work distance (CTWD) and alignment with the joint (proximity). These measurements are made more than ten times per second and compared with the desired training procedure to automatically score the students performance. A report is instantly produced and graphically displayed so the student can learn what was done properly and where improvements are needed.

The RealWeld Trainer supports the welding of 6 inch coupons of up to three-eighths inch thickness (optionally supports 18 inch coupons for an additional feature cost) using SMAW (Stick), GMAW (Mig), FCAW (Flux Cored) welding processes. The system includes a work table and fixtures that support fillet, lap and groove (butt) welds in the flat, horizontal and vertical positions. Fillet and lap also support overhead position.

POWER UP / DOWN

1. Turn on the welder. See the Instruction Manual for the welder being used.

2. Press the ON/OFF button on the CPU. The button will illuminate to indicate that the power has been turned ON. See Figure B.70.

**Figure B.70 – ON/OFF BUTTON**

ON / OFF BUTTON
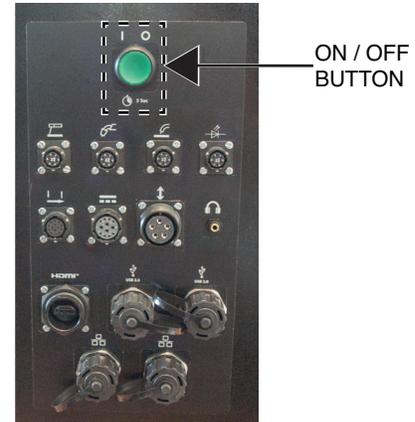
3. When the computer starts up it will automatically launch into the RealWeld software.

4. The unit will automatically shut down when the RealWeld Trainer software is exited.

LOADING REALWELD TRAINER SOFTWARE

1. Using the touchscreen monitor, select the desired language from the drop down menu and select the green checkmark icon to continue. See Figure B.71.

Figure B.71 – Select language
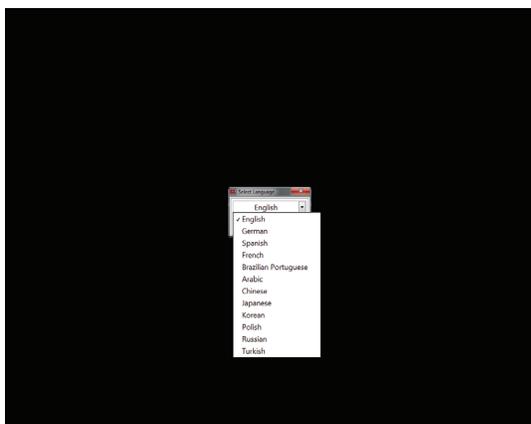
2. The software may take 15-30 seconds to load and will display a Lincoln Electric splash screen during this process. See Figure B.72.

Figure B.72 – Splash screen

3. The login window will appear once the software has been opened. See Figure B.73.

To login and access the features of Trainee Mode, the student must login with the appropriate username and password. The username and password are assigned in 'Instructor Mode' by the instructor.

4. Using the touchscreen monitor, select the 'Username' text box and enter the assigned username with the on-screen keyboard. Select the red 'X' icon to apply the username. See Figure B.73.

NOTE: The keyboard will automatically pop up when the text box is selected. The on-screen keyboard can be resized by dragging the corner of the keyboard box.

Figure B.73 – Login

5. Using the touchscreen monitor, select the 'Password' text box and enter the assigned password with the on-screen keyboard. Select the red "X" icon to exit the keyboard. See Figure B.74.

Figure B.74 – Password

6. Using the touchscreen monitor, select the 'OK' icon on the login window. Once selected, the trainee will be logged in and a set of menu options, specifically for a trainee, will be displayed on the left side of the screen. See Figure B.75.

Figure B.75 – Trainee menu
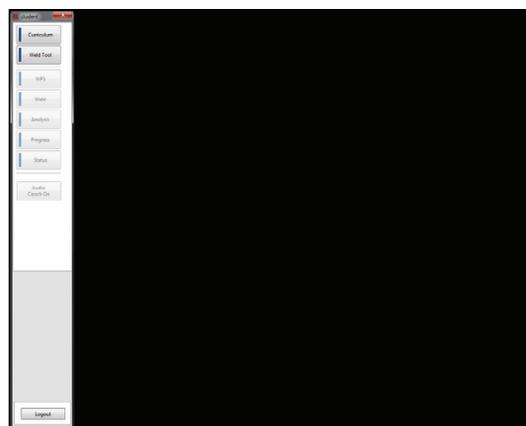
CURRICULUM

Select the 'Curriculum' icon on the left side of the screen to bring up the curriculum assigned to the trainee. See Figure B.76.

Figure B.76 – Curriculum list

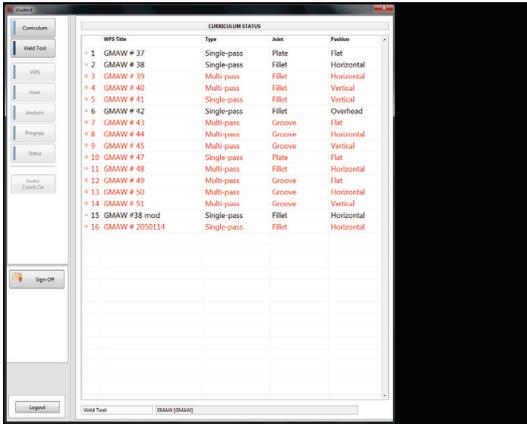The curriculum status contains a list of various learning objectives that are assigned to the selected trainee. There are three modes to each of the learning objectives in the assigned curriculum:

COMPLETED

If the learning objective has been completed, the text will be highlighted in **orange** and there will be an orange circle placed in front of the WPS number

IN PROCESS

If the learning objective is currently in process, the text will have a **grey colored** background and there will be a half shaded circle placed in front of the WPS number.

NOT STARTED

If the learning objective has not been started, the text will be **black** and there will be an open circle in front of the WPS number.

The trainee can only select the WPSs that are marked as Complete or In-Process. The trainee will not be able to view any WPS that has not been started.

Select the desired WPS from curriculum status list to view a Completed or In-Process WPS. This will bring up a compatibility check window that will list the selected WPS, weld tool and a few variables associated with that WPS. If the WPS requires a different weld tool, proceed to the Weld Tool menu and select the correct weld tool. See Figure B.77.

Figure B.77 – Compatibility check
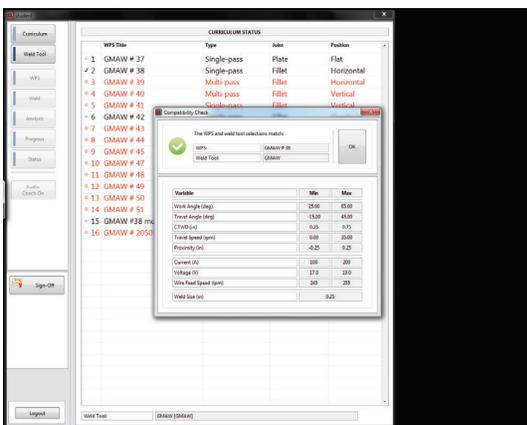
SIGN OFF

In this mode, the instructor can also approve the trainee's test results on the current WPS. If the results meet the requirements, the instructor can sign off on the WPS and mark it complete (Sign off can also be performed in instructor mode).

1. Select the instructor 'Sign-Off' icon on the curriculum screen. See Figure B.78. A pop-up window will appear that shows the Curriculum Status for the trainee.

Figure B.78 – Curriculum status
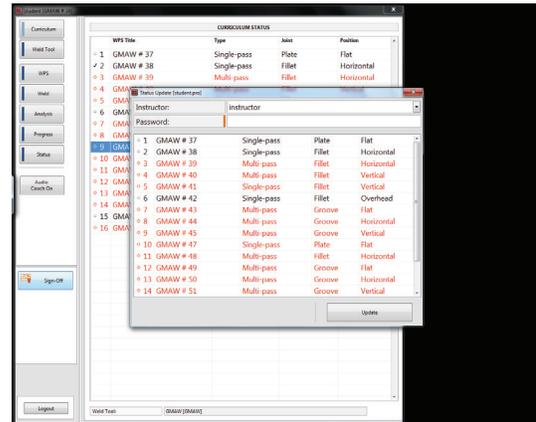
2. The instructor can select the appropriate learning objective. This will bring up another window showing three options – Not Started, In Process and Complete. See Figure B.79.

Figure B.79 – Status options
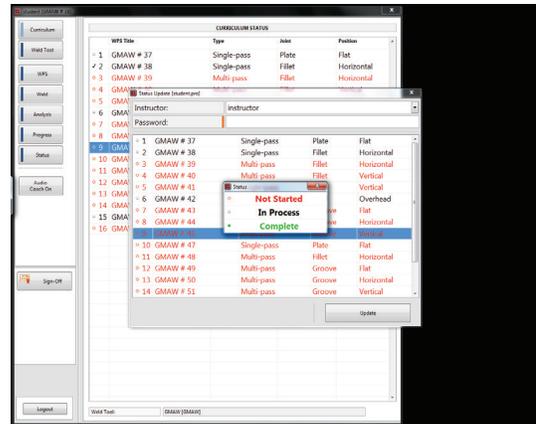
3. To sign off on the learning objective, the instructor can select complete. However, in order to properly sign off on the learning objective, the instructor has to enter their username and password. If the instructor tries to sign off the learning objective without entering their password, an error window will pop up. See *Figure B.80*.

Figure B.80 – Error message
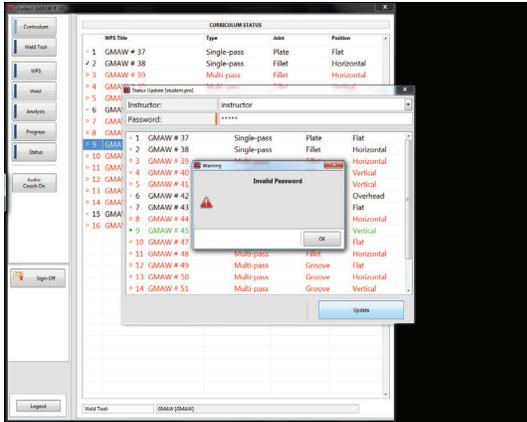
4. Once the instructor name and password are entered, select the 'Update' icon. See Figure B.81.

Figure B.81 – Update icon

5. The sign-off operation can also be performed while in instructor mode. While in the Users menus, the instructor can select the appropriate user and select the 'Edit' icon. See Figure B.82.

Figure B.82 – Edit user status

6. Select the appropriate learning objective. Upon doing so the status window will pop up allowing the instructor to change the status of the selected learning objective. In the following example, WPS FCAW-4 is selected. See Figure B.83.
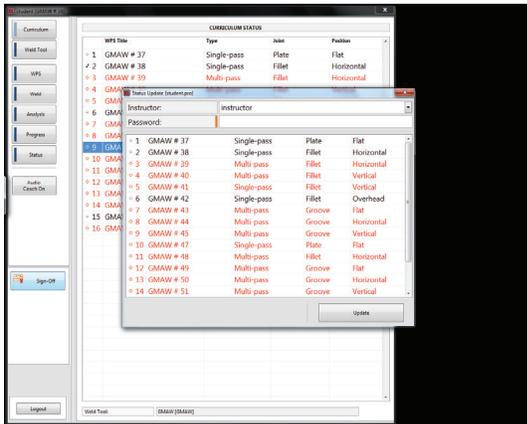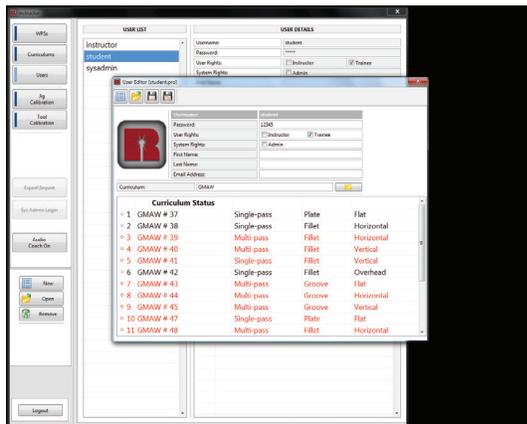
Figure B.83 – Change user status
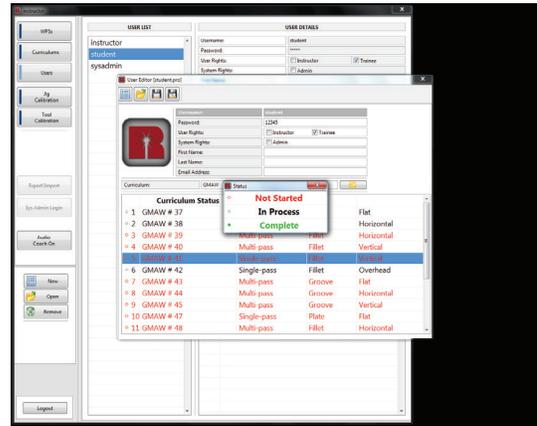
7. The instructor can change the status of this learning objective simply by tapping the appropriate status. Once the status condition has been selected, select the 'Save' icon in the tool bar. This finalizes the status update. The instructor can also select which learning objective they want the trainee to work on next, using the same procedure. While updating the status, the instructor can select a learning objective and then select In Process to indicate that they want the trainee to work on the selected learning objective. The next time the trainee logs in, they will see this learning objective labeled as In Process, evidenced by the grey colored text and the half shaded circle in front of the learning objective number.

WELDING PROCEDURE SPECIFICATIONS (WPS)

When the compatibility check window shows that the WPS and the weld tool are a match, select the 'OK' icon and then select the 'WPS' icon on the left side of the screen. This will bring up the selected WPS and all of its details. It is important for the trainee to note the five critical torch motion variables listed as Pass Details. These include Work Angle, Travel Angle, CTWD, Travel Speed and Proximity. The trainee's ability to stay within the acceptable range for each of these variables during Arc Off and Arc On mode will determine their score. See Figure B.84.

Figure B.84 – WPS details
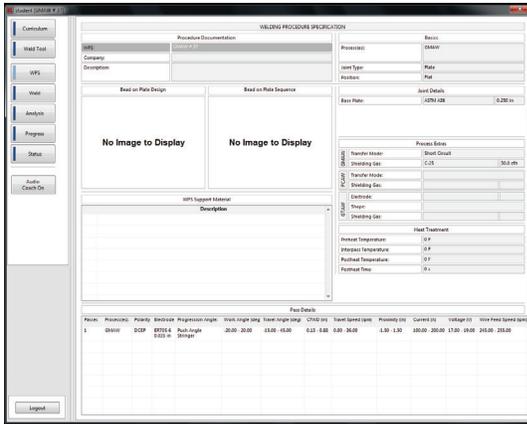
NOTE: Make certain the welder is set according to the proper parameters for the selected WPS to avoid injury or damage.

WELD MODE

When the trainee has selected a WPS, select the 'Weld' icon to enter weld mode. Once the 'Weld' icon is selected, five motion gages will be displayed. If the torch is not within the field of view of the cameras, the gages will be red in color. The system will not record any data if the gages are red. Move the torch until the gages turn white. This indicates that the torch is within the camera's field of view. See Figure B.85.

Figure B.85 – Weld mode
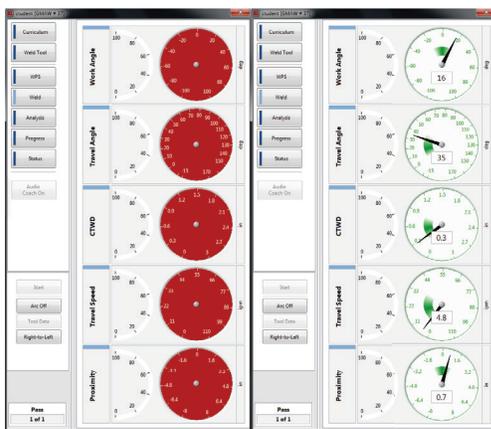
There are two different modes of operation – 'Arc On' and 'Arc Off'. When in Arc Off mode, the trainee can practice moving the torch along the weld joint without actually creating a weld. The program will record their movements and display them on the screen. In Arc On mode, the trainee can create an actual weld and the program will record their movements and display them on the screen.

ARC OFF MODE

When in the weld screen, select the 'Arc On/Off' icon until it displays "Arc Off". This will indicate that the arc is off. At this point, the trainee should put on the appropriate welding gear and safety equipment. In Arc Off mode the trainee will not be making an actual weld, but should be wearing all the typical gear so they can simulate the actual welding conditions. See Figure B.86.

Figure B.86 – Arc off

When ready, simply pull the trigger. The program will start recording data. The trainee can now start moving along the joint. Make sure the gages are not red prior to or during Arc Off welding. If the trainee is leaning over the torch and happens to cover the target, the gages will turn red and data will not be saved.

The trainee can just let go of the trigger of their torch to stop recording their weld just like they would when they are welding with arc on.

When welding in Arc OFF mode with SMAW, the 'Start' icon must be selected for the system to begin collecting data.

ARC ON MODE

When in the weld screen, select the 'Arc On/Off' icon until it displays "Arc On". This indicates that the arc is on. At this point, the trainee should put on the appropriate welding gear and safety equipment. In Arc On mode, the trainee will be making an actual weld, so all standard welding safety procedures must be followed. See Figure B.87.

Figure B.87 – Arc on

In Arc On mode, 'Start' and 'Stop' icons are disabled. When the trainee is ready to weld, they can just start welding. The program will automatically start recording data once an arc is struck and it will save that data once stopped. Make sure the gages are not red prior to or during Arc On welding. If the trainee is leaning over the torch and happens to cover the target, the gages will turn red and data will not be saved.

Once the trainee has stopped welding, results will be shown in Analysis mode.

ANALYSIS

When the 'Stop' icon is selected in Arc Off mode or welding is stopped in Arc On mode, the program will enter Analysis Mode, as indicated by the light blue color next to the 'Analysis' icon. The gages will freeze and will display a variety of numerical values.

Directly next to the white gages, there are several percentage value gages for each torch motion. The percentage value displayed after the test is the amount of time that the trainee kept that motion in the sweet spot. For example, if the travel speed gauge says 25%, that means that for 25% of the time during the test, the trainee was able to maintain a Travel Speed that was within the sweet spot. See Figure B.88.

Figure B.88 – Analysis
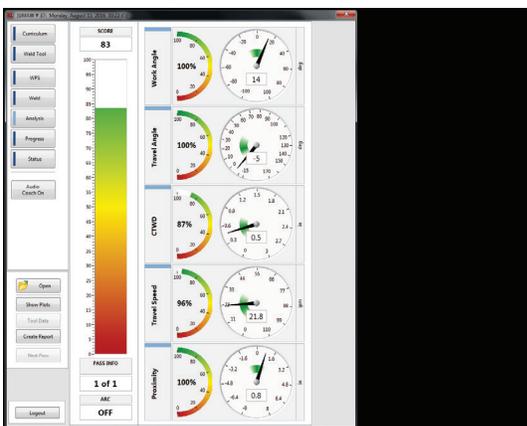
The score, which is displayed as a number and a bar graph, is a calculated value based on the amount of time that all five torch motions are within the sweet spot at the same time.

For example, let's assume the following:

Work Angle, Travel Angle, CTWD are all within the sweet spot for the entire weld (100%). Travel Speed was in the sweet spot during the 1st half of the weld, but not the second half (50%). The Proximity was not in the sweet spot during the 1st half of the weld, but was in the second half (50%). In this scenario, the resulting score would be 0 (zero). All five torch motions were not in the sweet spot at the same time.

For another example, let's assume the following:

Work Angle, Travel Angle, CTWD and Travel Speed are in the sweet spot 100% of the time. However, Proximity is within the sweet spot 12% of the time. In this scenario, the resulting score would be 12% since all five torch motions were operating within the sweet spot at the same time for only 12% of the time.

To view a graphical representation of the trainee's results, select the 'Show Plots' icon on the left side of the screen. This will display five different plots corresponding to each torch motion. The green shaded area on the plot represents the sweet spot and the goal for the trainee is to produce results that stay within this area for the entire weld. The black line represents the values that the trainee actually produced. In the following example, the trainee was within the sweet spot for Proximity for most of the weld, but had some areas where the Travel Speed was not within the sweet spot. These plots help the trainee understand what areas they need to focus on. See Figure B.89.

Figure B.89 – Analysis graph
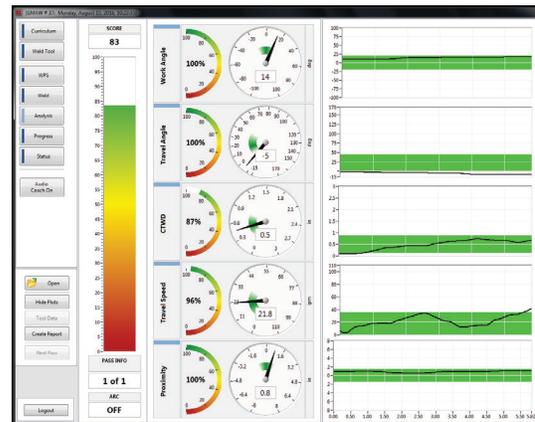
Each torch motion can also be displayed independently. This is a helpful feature if the trainee only wants to work on one torch motion. Select the torch motions the trainee does not want to see and they will no longer be displayed on the screen. See Figure B.90.

Figure B.90 – Independent torch motion graph
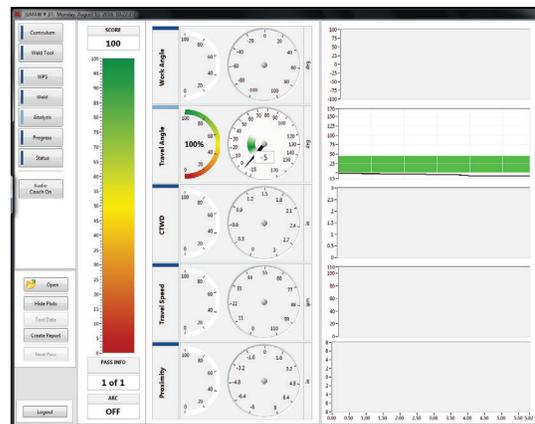
PROGRESS

In trainee mode, Progress can be viewed by selecting the 'Progress' icon on the left side of the screen. This mode can display three different formats of progress – Compliance, Average and Consistency.
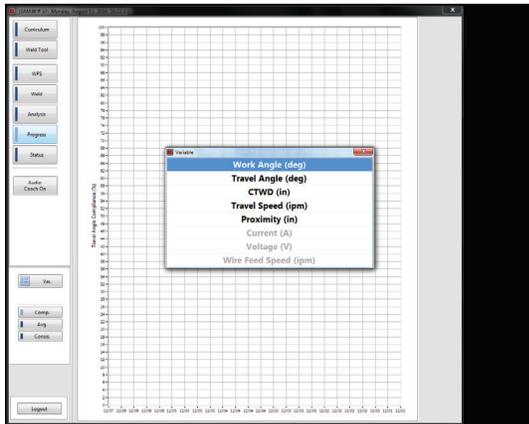
Select the desired variable to view the corresponding progress. See Figure B.91.

Figure B.91 – Progress

When a variable is chosen, the program will create a plot of that variable versus date. The green shaded area on the plot represents the sweet spot for that particular variable. This feature gives the trainee a visual representation of their progress. The trainee can see on which days they were operating in the sweet spot. Ideally, as time goes on, there should be more data points within the sweet spot indicating that the trainee is becoming better at maintaining that torch motion. Examples for work angle consistency, average and compliance are shown below. See Figures B.92, B.93 and B.94.

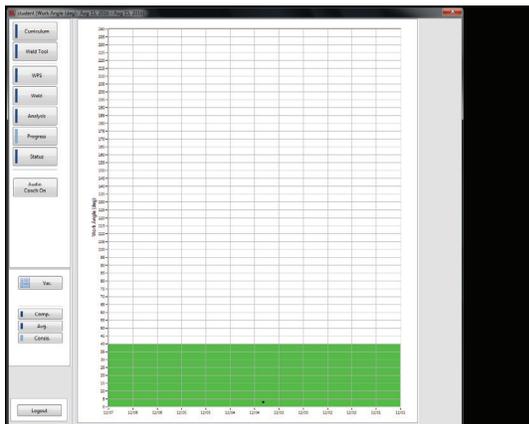**Figure B.92 – Consistency**

Figure B.93 – Average
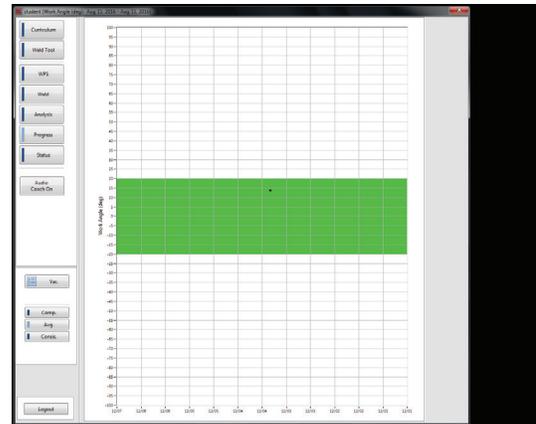
Figure B.94 – Compliance
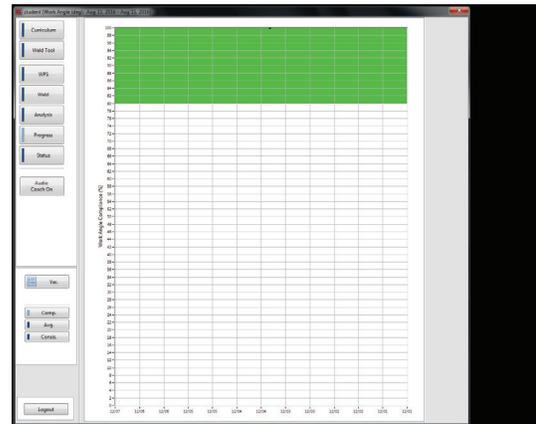
STATUS

In status mode, the trainee's current and overall compliance is displayed. The compliance is based on the five torch motions. Compliance is shown as a percentage value, with 100% being the best. See Figure B.95.

Figure B.95 – Status
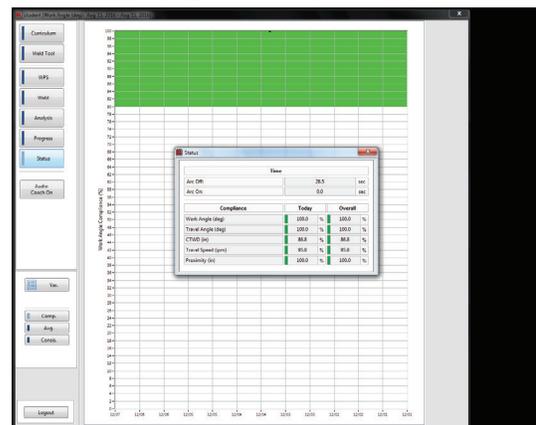
AUDIO COACHING

Audio Coaching is a teaching tool for trainees to receive coaching on proper torch setup and welding techniques. The Coach ("Allie") will state positive commands, based on a priority listing, while the trainee is setting up to weld and welding in arc off or arc on modes. Instructors also have the possibility to record their own voice and not use the default coach of Allie. The priorities are checked every three and a half seconds during setup and two seconds while welding, so that the trainee is not overwhelmed.

SETUP PRIORITIES

These are the setup priorities. This is the default ordering.

• Proximity

• CTWD (Contact Tip to Work Distance)/Deposition

• Work Angle

• Travel Angle

WELDING PRIORITIES

These are the welding priorities. This is the default ordering.

• Camera Blocked

• Proximity

• CTWD (Contact Tip to Work Distance)/Deposition

• Work Angle

• Travel Angle

• Travel Speed

COMMANDS

PRIORITY	SPOKEN COMMANDS	POSITION	ACTION
CAMERA BLOCKED	CAMERA BLOCKED	ANY	MOVE HELMET OUT OF CAMERA VIEW
PROXIMITY	AIM BACK	FLAT / HORIZONTAL / OVERHEAD	AIM BACK INTO ROOT OF JOINT
	AIM DOWN	FLAT / HORIZONTAL / OVERHEAD	AIM DOWN INTO ROOT OF JOINT
	AIM UP	OVERHEAD	AIM UP INTO ROOT OF JOINT
	AIM LEFT	VERTICAL	AIM LEFT INTO ROOT OF JOINT
	AIM RIGHT	VERTICAL	AIM RIGHT INTO ROOT OF JOINT
CTWD	TIP IN	ANY	MOVE TIP INTO ROOT OF JOINT
	TIP OUT	ANY	MOVE TIP OUT ROOT OF JOINT
DEPOSITION	STICK IN	ANY	MOVE STICK INTO ROOT OF JOINT
	STICK OUT	ANY	MOVE STICK OUT OF ROOT OF JOINT
WORK ANGLE	ANGLE DOWN	FLAT / HORIZONTAL / OVERHEAD	MOVE TORCH ANGLE DOWN
	ANGLE UP	FLAT / HORIZONTAL / OVERHEAD	MOVE TORCH ANGLE UP
	ANGLE LEFT	VERTICAL	MOVE TORCH ANGLE LEFT
	ANGLE RIGHT	VERTICAL	MOVE TORCH ANGLE RIGHT
TRAVEL ANGLE	ANGLE DOWN	VERTICAL	MOVE TORCH ANGLE DOWN
	ANGLE UP	VERTICAL	MOVE TORCH ANGLE UP
	ANGLE LEFT	FLAT / HORIZONTAL	MOVE TORCH ANGLE LEFT
	ANGLE RIGHT	FLAT / HORIZONTAL	MOVE TORCH ANGLE RIGHT
TRAVEL SPEED	GO FASTER	ANY	WELD FASTER
	GO SLOWER	ANY	WELD SLOWER

MISCELLANEOUS COACHING

COACHING TYPE	SPOKEN COMMAND	WHEN PLAYED
SCORE 100	CONGRATULATIONS YOU SCORED A 100. TAKE A PICTURE AND SEND IT TO REALWELD.	WHEN A TRAINEE SCORES A 100.
SCORE 0	WAH-WAH-WAH-WAHHHHH	WHEN A TRAINEE SCORES A 0
SHORT WELD	SHORT WELD	WHEN A TRAINEE MAKES TOO SHORT OF A WELD.
TORCH SETUP START	I SEE YOU	WHEN TRAINEE PLACES TORCH CLOSE TO ROOT OF JOINT DURING TORCH SETUP.
TORCH SETUP ALL IN	BURN TO LEARN™	WHEN TRAINEE HAS SETUP TORCH WITHIN ALL FOUR PARAMETERS CHECKED DURING TORCH SETUP. THIS IS CONFIRMING THE TRAINEE IS READY TO BEGIN WELDING.

COMMAND FILENAMES

All command files are located in directory: C:\Program Files\RealWeld Trainer\Support Files\Audio\<Coach Name>.

<Coach Name> - must be name of coach.

PRIORITY	FILENAME
CAMERA BLOCKED	Camera Blocked.wav
PROXIMITY	Proximity Aim Back.wav
	Proximity Aim Down.wav
	Proximity Aim Left.wav
	Proximity Aim Right.wav
	Proximity Aim Up.wav
CTWD	CTWD Tip In.wav
	CTWD Tip Out.wav
DEPOSITION	Deposition Stick In.wav
	Deposition Stick Out.wav
WORK ANGLE	Work Angle Angle Down.wav
	Work Angle Angle Up.wav
	Work Angle Angle Left.wav
	Work Angle Angle Right.wav
TRAVEL ANGLE	Travel Angle Angle Down.wav
	Travel Angle Angle Up.wav
	Travel Angle Angle Left.wav
	Travel Angle Angle Right.wav
TRAVEL SPEED	Travel Speed Go Faster.wav
	Travel Speed Go Slower.wav
SCORE 100	Congrats100.wav
SCORE 0	Zero.wav
TORCH SETUP START	Setup Inside Torch Envelope.wav
TORCH SETUP ALL IN	Setup Sweet Spots.wav

These commands can be overwritten by custom commands recorded by the instructor.

Creating Custom Commands

1. Backup all current command audio files by copying them to a folder on the desktop.

2. Record the desired command in ".wav" format.

3. Replace current audio file in directory C:\Program Files\RealWeld Trainer\Support Files\Audio\<Coach Name> with the new file.

4. Rename the command exactly as you see it in the above 'Filename' table.

ENABLE/DISABLE AUDIO COACHING

To enable or disable audio coaching follow these instructions.

When logged in under an instructor or trainee mode, the main menu will show "Audio Coach On" or "Audio Coach Off" button. See Figure B.96.

Figure B.96 – Audio coaching

INSTRUCTOR MODE   TRAINEE MODE

The audio coaching state is defined by the button title. If the button reads "Audio Coach On" then audio coaching is enabled. If the button reads "Audio Coach Off" then audio is disabled.

If the instructor has disabled audio coaching, the trainees must have the instructors override the default off setting set by the instructor. This means that if the instructor has turned off audio coaching, the trainees must have the instructor enable it by using their (instructor) password. See Figure B.97.

Figure B.97 – Audio coach override
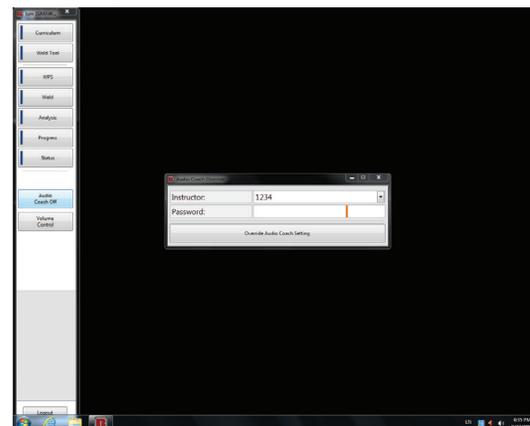
ACCESSORIES

18" FIXTURES

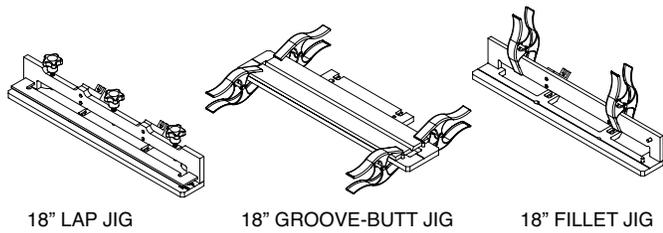The 18" fixtures allows for practicing of longer welding procedures. Three 18" fixtures are included in the upgrade kit (fillet, lap and butt/groove).

An upgrade kit can be purchased to allow longer coupon lengths to be accepted by the RealWeld system. Contact Lincoln Electric Automation for more information.

Figure C.1 – 18" Fixtures

18" LAP JIG   18" GROOVE-BUTT JIG   18" FILLET JIG

ROUTINE MAINTENANCE

Routine maintenance on the RealWeld Trainer should be performed on an as needed basis dependent on machine usage and environment. The screen protector on the monitor should be replaced as it becomes damaged or shows signs of wear. The target should be cleaned with a soft cloth if it becomes dusty or dirty. The lenses (in the pull out trays) for the cameras should be cleaned if they become dirty or interfere with the performance of the cameras. Remove any slag or spatter from the weld area (fixture, platform, etc.) as needed. Inspect cables for burns, cracks or other welding and heat related issues, replace as necessary.

PERIODIC MAINTENANCE

Confirm the tightness of the fixture platform hold downs before use and after changing the platform position. The fan filters on the CPU should be cleaned/changed every six months.

REALWELD TRAINER CLEANING

The RealWeld Trainer is a live welding trainer and susceptible to sparks and slag. The machine can be wiped down with light soap and water. Special care needs to be taken when cleaning the touch screen and camera lenses. Use a microfiber cloth to clean both of these items.

TOUCHSCREEN MONITOR

> ⚠ **CAUTION**

The monitor is a touch screen and can be damaged by poking it with any object other than the pad of your finger. Use care when cleaning screen. Use only a soft dry cloth (cotton or flannel). Avoid chemicals and solvents (alcohol, benzine, acidic or alkaline solvent cleaners). Avoid granular or abrasive cleaning agents.

COMPUTER

The computer runs the clock of a Complementary metal-oxide-semi-conductor (CMOS) battery (CR2032). It is recommended that the CMOS battery be replaced every 24 months.

NOTE:

• In case of a drained battery, an additional step might be necessary to power up the unit. See Troubleshooting Section.

• Time and date will be reset on the student report.

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and repair should be performed by only Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).

Look under the column labeled "PROBLEM (SYMPTOMS)." This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.

The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION

This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

**Observe Safety Guidelines
detailed in the beginning of this manual.**

TROUBLESHOOTING GUIDE

| SYMPTOMS	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Low or NO audio from the speaker. Machine functions normally.	1. Possible faulty speaker, bad connection.	1. Check audio cable and power cable connections to speaker. 2. Check power button and volume dial located on speaker.
RealWeld Trainer has problem recognizing the 18" fixture.	1. Be certain the 18" fixture option is licensed for the machine.	1. Check the Extended Length License in the System Admin Software.
Fixture platform will not calibrate.	1. Debris or tools on the fixture platform. Clear tools from fixture platform. 2. Ground clamp connected to fixture platform. 3. Lens covers are not open.	1. Recalibrate with lens covers open and fixture platform clean.
Consistently low or NO scoring, regardless of quality of weld.	1. Improper fixture and/or tool calibration. 2. Improper fixture platform position. 3. Improper machine setup.	1. Recalibrate fixture and/or tool. 2. Place the fixture platform in the correct position. 3. Verify that the machine is setup properly, according to WPS in RealWeld software.
Target not found.	1. Check all plugs and connections. 2. Possible light interference. 3. Check target LEDs for faint red illumination.	1. Open lens covers. 2. Position unit to reduce the effects of overhead lighting.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely,
contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 1-888-935-3877.

TABLE OF CONTENTS
- DIAGRAMS SECTION -

79.95

37.46

34.92
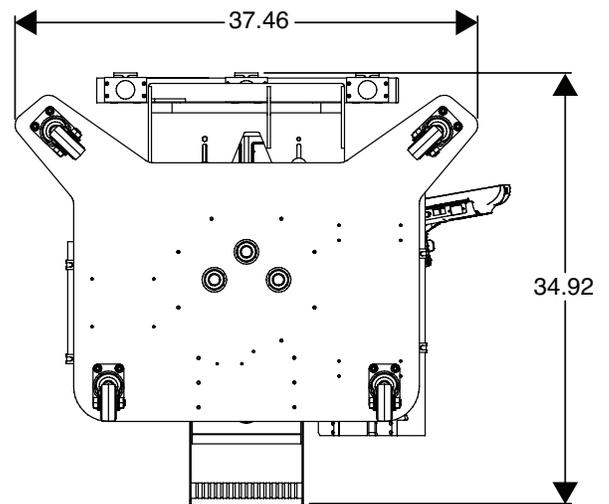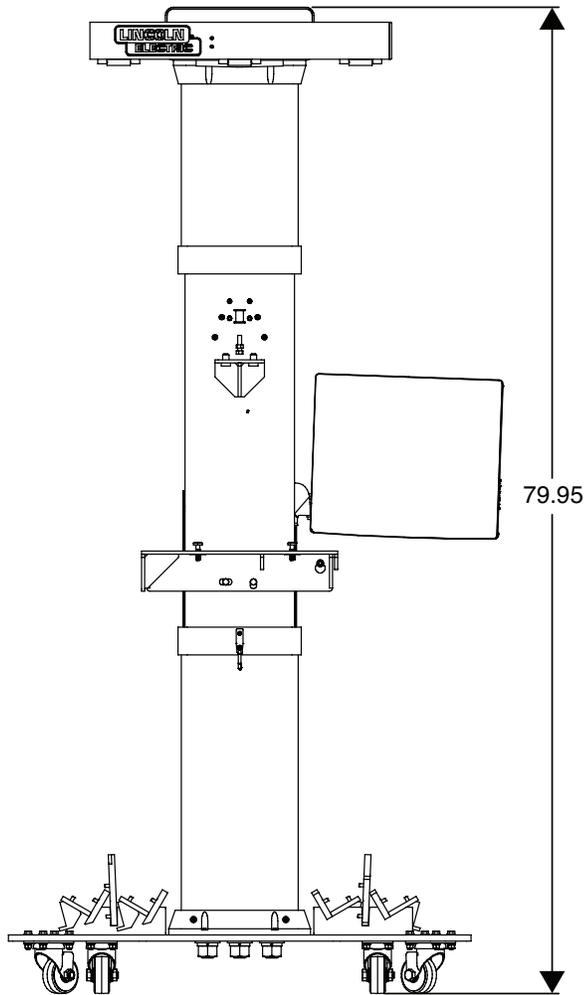
CUSTOMER ASSISTANCE POLICY

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 advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

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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