orion

Orion™ 150s

Pulse Arc Welder Users Guide

20230407 • ITEM #1260

sunstone™
The Micro Welder Experts

ATTENTION: Read the Safety Guide before operating this welder!

Operator assumes all liability.

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REVISION	DATE	VERSION NO.	DESCRIPTION OF CHANGES
1	07/2021		New Formatting
2	01/2022	20220111	Minor Revisions and Updates
3	07/2022	20220725	Sheilding Gas Corrections
4	04/2023	20230407	Minor Revisions and Updates

Contents

Orion™ 150s Series Users Guide

Chapter 1: Welder Setup & Assembly

What is in the Box

BOX 1 CONTENTS:

(1) Sunstone 150s Series Power Supply   (1) Foot Pedal

BOX 2 CONTENTS

(1) Sunstone Microscope Arm Assembly   (1) Sunstone Safety Guide

ACCESSORIES BOX (Located in Box 2)

(1) Microscope Arm Mounting Hardware   (1) Pair Microscope Eye Piece Shields

(1) Welder Power Cord   (1) Loop Closing Pliers

(1) Welding Stylus Hand Piece   (1) Set Allen Wrenches

(1) Shutter Cable (RJ45 ends)   (2) Alligator Grounding Clips

(1) Cross Lock Tweezers   (1) Shielding Gas Hose

(1) Fiberglass Brush

(1) Electrode Vial (5 1.0 mm Electrodes and 1 Diamond Sharpening Disk)

Microscope Arm Assembly Setup

- Remove the Microscope Arm Assembly from the box and place it on your table.
- There are three available options for mounting the Arm Assembly to your table. Select one of the following methods and use the required mounting hardware from the accessories box as outlined.

Figure 2.1. Attach angled bracket C to A
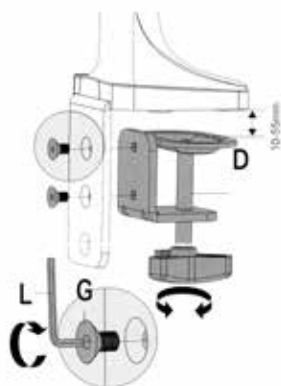
Figure 2.2. Attach clamp mechanism D to angled bracket C.

Figure 2.3. Lift Arm Assembly up and slide onto the table.
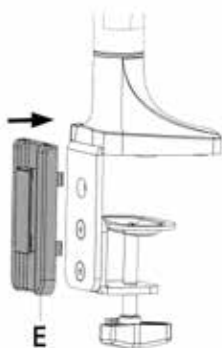
Figure 2.4. Cover the clamp mechanism D with the plastic cable guide cover E.

MOUNTING OPTIONS

Mounting Option 1 - Clamp to Table

This option is best for tables with accessible edges and for mounting without drilling holes in the table.

Note: If your table is thicker than 3-1/2" (9cm), follow the instructions for mounting options 2 or 3 on the next page.

Hardware required from Box 2:

- (1) Angled Bracket (C)
- (1) Sunstone Microscope Arm Assembly (A)
- (1) Clamp Mechanism (D)
- (5) Flat Head Hex Screws (G)

- Lay the arm assembly down on the tabletop.
- As shown in Figure 2.1, attach the angled bracket (C) to the bottom of the arm using three (3) of the included flat head hex screws (G) using a 4mm (5/16") Allen wrench (L).
- Attach the clamp mechanism (D) to the angled bracket using two (2) of the included flat head hex screws (G). See Figure 2.2. For thicker tables, attach the clamp mechanism D to the two lower holes in the angled bracket C.
- Adjust the knob on the clamp mechanism (D) until the gap is sufficient for the thickness of your tabletop.
- Lock the arm into place by turning the knob on the clamp mechanism until the clamp is pressing firmly against the bottom of the table.
- Lift the Arm Assembly up and slide the arm onto the table as shown in Figure 2.3.
- A plastic cable guide cover (E) can be clipped on over the angled bracket if desired. See Figure 2.4
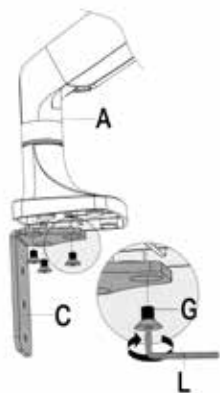
Mounting Option 2 - Bolt through Table

Mounting Option 2 is best for tables without accessible edges. Hardware required from Box 2:

(1) Flat Mounting Plate (H)

(3) Flat Head Hex Screws (G)

(1) Long Carriage Bolt (F)

(1) Flat Pressure Plate (I)

(1) Adjustment Knob (J)

- As shown in Figure 3.1, using a 4mm (5/32") Allen wrench, unscrew the flat head hex screws (G) holding the mounting plate (H) to the arm.

- Run the included 8mm (5/16") carriage bolt (F) through the included mounting plate (H).

- Attach mounting plate (H) to the bottom of the arm using (3) flat head hex screws (G).

- Drill a 3/8" (9.5mm) hole through the tabletop.

- Lower the arm so the bolt goes through the hole in the tabletop. See Figure 3.2.

- Slide the flat pressure plate (I) onto the bolt. Turn the adjustment knob (J) clockwise to tighten the plate to the underside of the table.

Mounting Option 3 - Screw to Table (vertical surface)

Required hardware from Box 2:

(1) Angled Mount Bracket (A)

(3) Flat Head Screws (G)

(2) Wood Screws **(not included)**

- Attach the angled bracket (A) to the bottom of the arm assembly using three (3) of the included flat head hex screws (G) as shown in Figure 2.1.

- Lift and position the arm assembly onto the table in the desired location.

- Run wood screws through the bracket (A) and into vertical surface of the table, as shown in Figure 3.3.
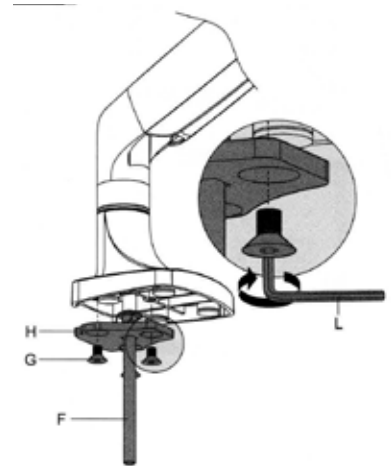

Figure 3.1. Remove the plate from the arm, run the carriage bolt through the plate, then re-attach the plate to the arm.
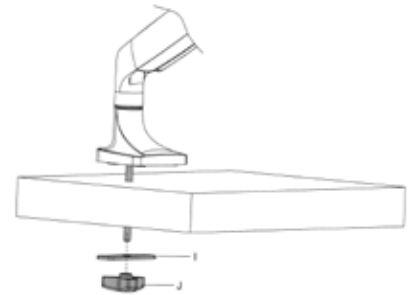

Figure 3.2. Lower the arm so the bolt goes through the hole in the table. Turn the twist knob clockwise to tighten the plate to the table.
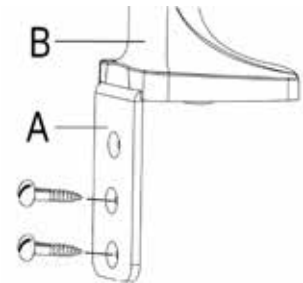
Figure 3.3. Use wood screws (not included) to attach the angled bracket (A) to the table.

Figure 4.1. Adjust the tension of the Arm Assembly for more loose or more tight movement.

Figure 4.3 After installing the rubber eyepiece covers, use the Shutter Cable to connect the power supply to the bottom of the microscope head.

Arm Tension Adjustment

The spring tension is factory pre-set, but should changes be desired, the tension can be adjusted by turning a hex screw located on the arm joint, as shown in Figure 4.1. Use the included 6mm Allen wrench to make adjustments.

- Turn the hex screw counterclockwise (in the direction of the "+" symbol on the arm) if the arm does not hold the microscope up.

- Turn the hex screw clockwise (in the direction of the "-" symbol) if the arm does not allow the microscope to be lowered easily.

Microscope Setup

- Install the rubber eyepiece covers onto the microscope lenses.

- Plug the included Shutter Cable into the RJ45 port on the back of the microscope (the bottom of the microscope head). See Figure 4.2.

- Plug the other end of the Shutter Cable into the shutter port on the welder's back panel.

Note: Connecting other RJ45 compatible devices to the Sunstone shutter RJ45 port may damage the welder and/or the other devices.

Welding Stylus Setup

- Remove the Welding Stylus from the accessories box.

- Insert the Welding Stylus into the holder at the bottom of the arm assembly. See Figure 4.3.

- The tubing can be routed up and through the removable cable guide portion of the arm if desired. See Figure 5.1.

- For now, position the Welding Stylus such that only the smaller diameter portion protrudes from the holder. Then, tighten the thumb screw on the bottom of the stylus holder to hold it in

place.

- Rotate the stylus holder to approximately a 45-degree angle as shown in Figure 4.3 (the stylus should be angled down).

- Fine tune the position of the Welding Stylus while looking through the microscope: Loosen the thumb screw on the bottom side of the stylus holder and slide the Welding Stylus forward and backward until the tip of the Welding Stylus is in the center of your focus. See the example in Figure 5.2.

- Now securely tighten the Welding Stylus in place by tightening the thumb screw on the bottom of the stylus holder, which you can see in Figure 4.3.

Electrode Setup

The Orion i Series pulse arc welder comes standard with a 1.0mm electrode collet and ten (10) 1.0mm electrodes. The 1.0mm electrodes are a good multipurpose electrode for most welding applications. Available separately, Sunstone offers 0.5mm electrodes, which are more suited for very small applications (less than 5 Ws of energy).

HOW TO PLACE THE ELECTRODE INTO THE WELDING STYLUS

See the Stylus Components Chart (Figure 5.4) to install the tungsten electrode (D) and then carefully follow these instructions:

Figure 5.1. Mount the Welding Stylus to the holder below the microscope.

Figure 5.2. Tubing and other cables can be routed up and through the removable cable guide portion of the arm.

Figure 5.3. When looking through the microscope, the stylus should appear in the center of your focus, as shown here.

Stylus Components

Figure 5.4

| *Stylus Shaft (A)* | *Collet (B)* | *Collet Cap (C)* | *Electrode (D)* | *Stylus Hull (E)* |

Figure 6.1. To install the electrode, first remove the stylus shaft (A) from the stylus hull (E) by pulling them apart.

Figure 6.2. Use the guide engraved on the side of the stylus hull (E) for proper electrode (D) positioning.

Figure 6.3. The electrode should protrude past the stylus hull (E) 1/8 to 1/4 inch (3.175 to 6.35mm).

Figure 6.4. Turn this knob to adjust microscope focus. You'll find one knob on each side of the microscope arm.

- Remove the stylus hull (E) by pulling it away from the stylus shaft (A). See Figure 6.1.

- Loosen the collet cap (C) by twisting it counter-clockwise.

- The welder accommodates 0.5mm and 1.0mm electrodes. The electrode stylus will be shipped with the 1.0mm electrode collet (B) installed.

- Insert a 1.0mm electrode (D) into the collet. **Helpful Tip: There is a groove on the side of the stylus hull (E) that helps measure the electrode length. Place the end of the stylus hull (E) against the collet cap, then make sure the electrode extends to the groove as indicated. See Figure 6.2.**

- There should be between 0.6 - 0.7 inch (1.5 – 2cm) of the electrode (D) protruding from the stylus shaft (A). This will allow the electrode enough room to stick out from the stylus once the stylus hull (E) is placed back on the stylus.

- Lock the electrode (D) into place by hand tightening the collet cap (C) in a clockwise direction.

- Replace the stylus hull (E) by pushing it in until you feel it snap back into place. The electrode (D) should stick out between 1/8 – 1/4 inch (3.175 – 6.35mm after the stylus hull is snapped back into place). See Figure 6.3.

Adjusting The Microscope Focus

- Twist the knob on the microscope forward and backward to lower and raise the head. This will allow you to focus the microscope on the welding stylus. See Figure 6.4.

- Place your finger under the welding electrode to help judge the correct focus location. Focus the microscope until the texture on the skin of your finger is clearly visible.

Power Supply Setup - Back Panel

Reference Figure 7.1 and follow these instructions (all required cables are found in the accessories box).

- Plug the female end of the included power cable into the 90-250 VAC Power Port (F).

- Connect the male end of the power cable into AC power (wall outlet). The Orion s series can accept voltages ranging from 90VAC to 250VAC. (When plugged in for the first time the Power Button LED will blink a couple of times and then turn off.)

- Insert the included 1/4" gas tube firmly into the Shield Gas Port (C). The tube may feel loose when connected but should not come out if pulled.

- Plug the foot pedal cable into the Foot Pedal Port (D).

- Insert the stylus connector into the Weld Stylus Port (H) on the back panel of the power supply. Ensure that the white circular indicator on the stylus is lined up with the white indicator on the Weld Stylus Port. The connector will snap into place.

- When making welds using the stylus, an alligator clip cable can be connected to the Pulse Arc+ Port (G) on the back of the power supply for grounding the work piece during the weld.

- When tack welding, plug one alligator clip cable into the Tack+ Port (A) and one into the Tack- Port (B). Be sure to attach each alligator clip to each work piece before tacking the two pieces together.

- As instructed previously on page 4, connect the Shutter Cable to the Shutter Port (E).

Note: Connecting other display port compatible devices to the Orion 150s's Shutter Port may damage the welder and/or the other devices.

Figure 7.1. Back panel of the Orion 150s.

Electrode Care and Pressure

Touch the work piece to the electrode with very light pressure. Too much pressure will cause the work piece to stick to the electrode and cause the electrode to become contaminated (work piece material on the electrode). Sunstone recommends cleaning or changing the electrode when it sticks to the work piece.

When to Sharpen the Electrode

Refer to Chapter 3 for more information on electrodes.

The majority of applications are best accomplished using a sharp electrode tip. A sharp tip improves arc initiation and helps focus the arc properly. It is recommended that you pay close attention to the electrode condition. An electrode that appears to be dark colored or covered with material from previous welds can lead to inconsistent welding and poor ignition of the weld arc. When this occurs, simply sharpen the electrode with the included diamond disk. The diamond disk can be attached to a rotary tool. Follow these steps for sharpening the electrode:

Figure 8.1. A sharp electrode tip improves arc initiation and results in a better overall weld.

Figure 8.2. Use a rotary tool to sharpen the electrode.

- Remove the electrode from the stylus.

- Pinch the electrode between the thumb and index and/or middle finger with the shaft going perpendicular to the fingers. See Figure 8.1.

- Power on the rotary tool then hold it with the opposite hand.

- Place the electrode tip on the diamond disc so the grit of the disk is moving parallel with the electrode shaft and moving towards the tip. See Figure 8.2. Sharpening the electrode in a way other than explained here will affect the quality of the weld.

- Set the electrode on the diamond disk at a 10-degree angle and begin to spin the electrode with the thumb and middle finger. **Tip: A helpful way to get a sharp electrode is to push down on the electrode with your index finger while twisting the electrode with the thumb and middle finger. See Figure 8.2**

- Once the electrode is sharp and clean, turn off the rotary tool and insert the electrode back into the stylus as explained above.

Note: As a rule of thumb, Sunstone recommends a sharpened electrode anytime a new work piece is being welded.

WHEN TO FLATTEN/ BLUNT THE ELECTRODE

- When working with silver, copper, and other highly conductive metals in energy levels above 20 Ws, it can be helpful to blunt the electrode, as shown in Figure 9.1.

- Follow the "When to Sharpen the Electrode" instructions on the previous page.

- Once the electrode is sharp and clean, turn the electrode to a 90-degree angle and push it against the diamond disk in order to place a flat/blunt tip on the electrode. Cleaning the edge of a blunt tip electrode assists in preventing the electrode from sticking to the weld surface.

- Once the electrode has a flat/blunt tip, turn off the rotary tool and insert the electrode back into the stylus as explained earlier.

Stylus Cone

Example of a Sharp Electrode Tip   **Example of a Flat Electrode Tip**
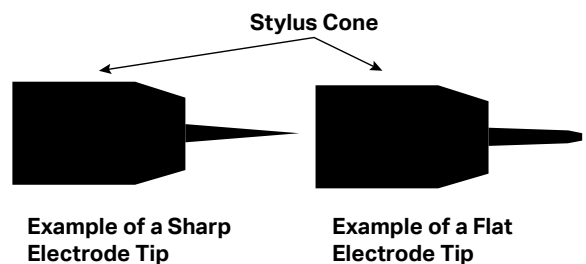
Figure 9.1. When working with silver, copper, and other highly conductive metals, a flat or blunt electrode provides better results.

Shield Gas Setup

During the pulse-arc welding process high temperature plasma quickly melts metal into a molten pool. As the weld is performed, a small amount of shielding gas is released through the weld stylus to prevent oxygen from entering the molten pool. After the weld has occurred the protective gas turns off.

If oxygen from the air enters this molten pool, the result is a metal oxide that is brittle, porous, and burnt-looking. Protective shielding gas is used, such as 99.996% pure argon (Argon 4.6), to prevent these effects.

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Figure 10.1. First, turn the regulator dial (C) counterclockwise to close the regulator valve. Screw the gas regulator (A) to the top of the shielding gas tank (B).

Figure 10.2. Connect the OD gas tube (E) from the power supply to the gas regulator port (D).

Figure 10.3. Open the shielding gas tank main valve (F) slowly clockwise until the left dial on the regulator port indicates gas pressure of 7-10 liters per minute.

PRESSURIZED GAS SAFETY

There are several important rules that should be followed when using a compressed shielding gas such as argon:

Always secure the pressurized gas tank to a fixed location (such as a sturdy table leg). If the pressurized gas cylinder were to tip and become damaged there is possibility that the tank could become a projectile, expelling the high-pressure shielding gas as propellant.

Always turn off the shielding gas at the main valve when finished. This will help your shielding gas supply last longer in case there is a small leak in the tubing. This is also a good safety practice. If the tube becomes dislodged shielding gas could fill the room and displace oxygen, which can lead to suffocation. Argon is heavier than air and will fill the room from the bottom upward. If you experience a large shielding gas leak, open all of the doors and windows in the room.

SHIELDING GAS TANK AND REGULATOR SETUP

- Ensure that your shielding gas tank is securely fastened to a stationary point near the welding area.

- Turn the regulator dial (C) COUNTERCLOCKWISE (closed) until it is fully backed out, meaning the dial becomes loose, to prevent over-pressurization of the line. See Figure 10.1.

- Screw the gas regulator (A) onto the shielding gas tank (B) and tighten fully using a wrench.

- If not already done, insert one end of the included ¼" OD gas tubing (E) into the gas port on the back of the power supply. Tug gently on the tube to verify a tight fit. See Figure 10.2.

- Connect the other end of the gas tubing (E) to the gas regulator port (D), as shown in Figure 10.2.

- Open the gas tank at the main valve (F) slowly as shown in Figure 10.3. The dials attached to the regulator should respond as the valve

is opened. The right dial should measure and show pressure inside the tank; the dial on the left, which measures pressure in the hose, should remain at zero (when the regulator dial is fully backed out).

- Slowly turn the regulator dial (C) CLOCKWISE until the dial on the left shows gas pressure between 7-10 liters per minute. See Figure. 10.1.

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Microscope LCD Filter Shutter System

The Microscope LCD Filter Shutter System provides an unobstructed working view before welding and completely protects your eyes during the welding process. The Orion 150s's internal computer verifies the Microscope LCD Filter Shutter System has been closed before allowing the weld to take place. Should the shutter not close, the microscope lens is equipped with >UV 16 and >IR 16 for maximum eye protection.

BECOME FAMILIAR WITH THE MICROSCOPE

The Sunstone microscope has been designed to provide maximum visual clarity, eye protection, and ease of use. One challenge using the microscope is getting used to bringing the work piece to the welding electrode while looking through the microscope. This is an easy challenge to overcome. To begin, follow the suggested practices below while the welder is in Weld

Figure 12.1. Rest your hands on the table and position the workpiece close to, but not touching the electrode., Then look through the microscope.

Off Mode. While the welder is in Weld Off Mode, it will not be able to make a weld when the work piece touches the electrode.

- Rest your hands on the table and position the work piece close to the welding electrode before looking into the microscope.

- Make sure your focus is at the tip of the electrode.

- Use slow, controlled movements.

- It is helpful to have your hands resting on the table and to only use your fingers to move the work piece up to the electrode. See Figure 12.1.

- Place the work piece surface perpendicular to the point of the electrode. **As discussed in later chapters, the angle of the electrode tip relative to the work piece surface is very important and will take practice.**

- Now practice making soft contact with the work piece to the electrode.

- Once you feel comfortable, attach the alligator clip to the work piece and enable welds (switching the unit to Weld On Mode) to begin welding. **Be mindful of your energy setting: Too much power may damage the work piece.**

Chapter 2: How to Weld

At the front of the Orion 150s pulse arc welder is a digital touchscreen display. You'll use the software interface that appears on the display to control how much power the 150s delivers, how the power is delivered, make adjustments to agitation, make system changes, view instructional videos, or save welds.

Before you begin welding, make sure you have carefully reviewed Chapter 1 and all installation steps have been completed. Also carefully review the Safety Guide that accompanied this users guide.

Follow these instructions to weld:

Power On the Welder

On the front of the welder, in the lower left corner, press the Power Button (A) as shown in Figure. 13.1. Wait for the welder's software to load.

When the Power Button (A) is pressed and the welder is turned on, the Power Button illuminates with a blue light. Wait for the welder's software to fully load before continuing.

Attach the Alligator Clip

Insert the alligator clip ground (B) to the front of the welder as shown in Figure 13.1.

Choose a Welding Mode: Arc vs Tack

With the welder on and the software loaded you should see the Arc Mode screen, as shown in Figure 13.1. With the 150s you can use the welder in two ways:

Arc Mode. The normal welding mode is the Arc Mode. In this mode you'll manually set the energy level, agitation, and ignition. When in Arc Mode, the words "Arc" will appear below the main row of blue buttons at the top.

Figure 13.1. To get started, press the Power Button (A); wait for the software to load; insert the alligator clip ground (B).
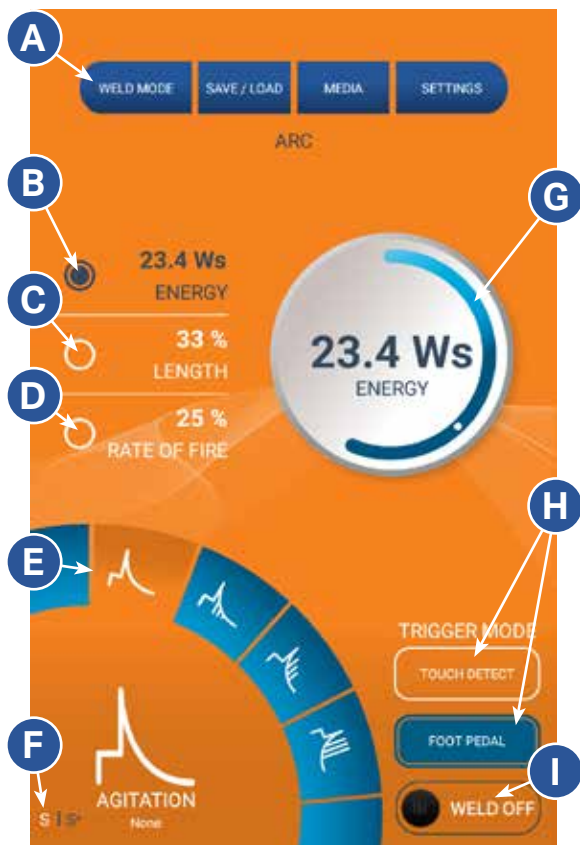
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Figure 14.1. To weld in the Arc Mode, select the power (B); select the length (C); select the rate of fire (D); select the desired agitation (E); select the desired ignition (F); select the desired Trigger Mode (H); press the Weld Off Button (I) to toggle to the Weld On Mode; attach the alligator clip to the workpiece and then trigger the weld accordingly.

Move your finger counter-clockwise to decrease.

Move your finger clockwise to increase.

Figure 14.2. The white wheel is used for adjusting energy, length, and rate of fire.

Basic Mode. Basic Mode is variation of the Arc Mode. The 150s can automatically determine the amount of energy and the type of agitation required for a successful weld based on the type of metal and application you select. As a result, you need but *basic* understanding of power, agitation, and ignition. Use the Basic Mode to take advantage of this automation. When in Basic Mode, the words "Basic" will appear below the main row of blue buttons at the top of the screen.

Tack Mode. In Tack Mode, you won't use the stylus; instead, you'll connect an additional ground (whether as an alligator clip, plier, or other type of ground) to the back of the welder. With two pieces of the work piece grounded, a weld will occur where the pieces contact. When in Tack Mode, the words "Tack" will appear below the main row of blue buttons at the top of the screen.

Welding in Arc Mode

Choose **Arc Mode** by pressing the Weld Mode Button (A) and select Arc in the drop down menu. The Arc Mode is the default weld mode.

1. Enter Energy Level

The amount of energy you wish to use in any weld is measured in Joules (or watt seconds). Enter the energy level by pressing the Energy radio button (B), as seen in Figure 14.1, and the place your finger against the white energy wheel (G) and moving your finger down to increase energy, or up to decrease energy. See Figure 14.2. When you reach the desired energy level, remove your finger. The energy level increases or decreases by two-tenths of a Joule at a time.

2. Select Length

Select the length of time the energy will run through the electrode by pressing the Length radio button (C) and then using the white wheel (G) to decrease or increase time length. The default is 100%. and recommended for most welds. Length is measured as a percentage. A 100% time length means that energy was dispersed throughout the entire weld. A 50% time length means energy was dispersed through 50% of the entire weld.

3. Rate of Fire

Select the rate of fire by pressing the Rate of Fire radio button (D) and then using the white wheel (G) to decrease or increase the rate of fire. The maximum rate of fire is 3; the minimum is Single Fire.

Rate of Fire is the number of times the welder will release energy in one second. If you are seam welding, a faster rate of fire may make more efficient use of time. If you are tacking, a single fire rate may be applicable.

4. Select Agitation

Select the desired agitation by pressing the icon (E) of the type of agitation you wish to use. You can choose from one of four different types of agitation:

- **None.** With no agitation, the energy dissipates evenly, leaving a smooth weld nugget.

- **Negative.** Negative agitation decreases the overall energy of the weld and has the same peak voltage of the weld without agitation. Negative agitation can be useful to minimize porosity of the weld.

- **Sloped.** The Sloped agitation option offers low levels of agitation. It has minimal impact on spot size formation, but yields additional penetration and enhanced weld strength. This agitation is available up to 233 Ws of energy.

- **Sustained.** The Sustained option offers high levels of agitation for improved weld spot strength in some metals. The high levels of agitation energy will affect the spot size because of the extra energy used in this option. To compensate for this addition of agitation energy, users may need to slightly lower the overall weld energy when using this option. This agitation is available up to 133 Ws of energy.

5. Select Ignition

Select the type of ignition you wish to use by pressing the Ignition icon (F). By pressing the Ignition icon you'll toggle between two types of ignition:

- **Standard.** In the Standard ignition option, the energy discharge occurs at approximately the same time as the tip lifts off the work-piece surface. Standard ignition mode is perfect for metal types that do not require a pre-heat phase during the weld. Because the electrode is closer to the work-piece, the electrode may dull more quickly. Standard ignition mode is typically used for welding very fine applications that would be damaged by high energy levels since there is no pre-ignition arc. Standard may also be suitable when welding a tight joint.

- **Standard Plus.** In Standard+ ignition mode, the energy discharge occurs well after the electrode tip lifts off the work-piece surface. While similar to the Standard option, Standard+ includes a "pre-heat" function know as a Focus Arc before the main weld. As the electrode begins to pull away from the surface, a small amount of energy is discharged prior to the main weld discharge. The additional energy helps preheat the weld area and helps establish an arc when the electrode is further away from the surface. The Standard+ ignition helps provide better weld consistency by allowing more variation in contact pressure before the weld takes place. You may also see this ignition mode preserve the electrode tip and accumulate less contamination.

6. Select Trigger Mode

Select how you want the weld to be triggered by pressing the Touch Detect Button or Foot Pedal Button. See (H) in Figure 14.1. Choose one of the following trigger types:

Figure 16.1. Attach the alligator clip ground to the workpiece at a spot that ensure the best contact between ground and workpiece.
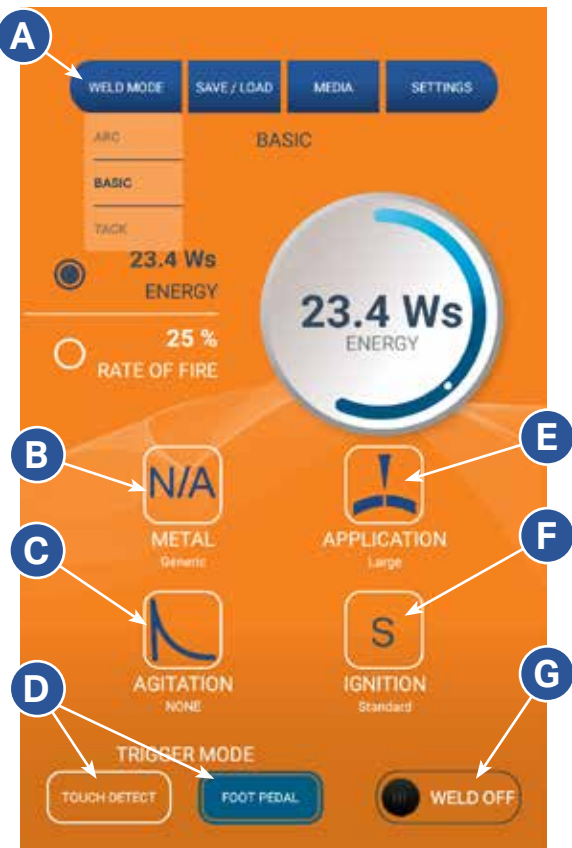

Figure 16.2. To weld in Basic Mode, press the Weld Mode Button (A) and choose Basic; press the Metal Button (B) to select a metal; press the Application Button (E) to select an application type; press the Agitation Button (C) to select the desired type of agitation; press the Ignition Button (F) to select the desired type of ignition; select a Trigger Mode (D); press the Weld Off Button (G) to toggle to the Weld On Mode.

- **Touch Detect.** The Touch Detect mode is the default mode. The welder will initiate a weld when the electrode touches the work piece.

- **Foot Pedal.** If you attach a foot pedal to the back of the welder, a weld will only occur when you depress the pedal. Place the pedal on a floor that is flat, devoid of debris, and away from traffic areas. In this mode, you place the electrode against the work piece in the desired location and then depress the foot pedal to initiate the weld.

7. Select Weld On Mode

At this point, touch the Weld On ratio button (I) as shown in Figure 14.1.

As an additional safety measure, the welder incorporates a digital switch that must be in the on position before energy will be released. When the welder is not being used, you should toggle this button to the Weld Off mode to avoid an unintentional discharge of energy.

8. Attach Alligator Clip to Work piece

Attach the alligator clip ground to the work piece as close to the intended weld spot. See Figure 16.1.

Welding in Basic Mode

The 150s can automatically determine the amount of energy and the type of agitation required for a successful weld based on the type of metal and application you select.

After you choose the metal and application type, the 150s will set the energy level, the best agitation type, and the best ignition type.

To begin, choose **Basic Mode** by pressing the Weld Mode Button (A) and select Basic in the drop down menu, as shown in Figure 16.2.

1. Select Metal Type

Press the Metal Button (B) as shown in Figure 16.2 and choose the type of metal you're working with. If the metal you see is not listed, for now, choose the most similar or choose Generic. Metal types are listed by name and the element symbol, such as Ag for silver.

Once you select the metal type, the 150s will automatically adjust all welding parameters to optimum levels for that particular metal. You can always manually adjust these settings later.

2. Select Application Type

Select the Application Button (E) as shown in Figure 14.1 and choose the application the best fits the type of weld you wish to accomplish.

You can choose from the following:

- **Large.** Select this Application Type if you have a large gap to fill or working with a thick material.
- **Small.** Select this Application Type for smaller gaps or for thinner materials.
- **Joint.** Select this application Type when joining two pieces together in a 90º or less angle.
- **Wire.** Select this Application Type when adding filler wire to a workpiece.
- **Prong.** Select this Application Type when extending or repairing a prong.

If you don't see an applicable Application Type, choose the one most similar to your needs. You can always make adjustments to all weld settings later.

3. Select Agitation

Note: The welder will automatically adjust the Agitation based on the metal and application types selected. You can choose to accept the welder's recommendations for agitation or make manual adjustments.

Agitation defines how the weld pool is allowed to cool. By agitating the power as it is delivered to the weld, you can affect how the weld may appear.

You can select from four different agitation types:

- **None.** With no agitation, the energy dissipates evenly, leaving a smooth weld nugget.
- **Negative.** Negative agitation decreases the overall energy of the weld and has the same peak voltage of the weld without agitation. Negative agitation can be useful to minimize porosity of the weld.
- **Sloped.** The Sloped agitation option offers low levels of agitation. It has minimal impact on spot size formation but yields additional penetration and enhanced weld strength. This agitation is available up to 233 Ws of energy.
- **Sustained.** The Sustained option offers high levels of agitation for improved weld spot strength in some metals. The high levels of agitation energy will affect the spot size because of the extra energy used in this option. To compensate for this addition of agitation energy, users may need to slightly lower the overall weld energy when using this option. This agitation is available up to 133 Ws of energy.

As noted, the welder will automatically adjust the agitation based on the type of metal and application chosen. You can choose to accept the recommendations or make manual adjustments. To adjust the agitation, press the Agitation Button (C) shown in Figure 16.2 and choose the desired agitation type.

4. Select Ignition

Note: The welder will automatically adjust the Ignition based on the metal and application types selected. You can choose to accept the welder's recommendations for ignition or make manual adjustments.

Ignition defines how the weld is started. You can select two different types of ignition types:

- **Standard.** In the Standard ignition option, the energy discharge occurs at approximately the same time as the tip lifts off the work-piece surface. Standard ignition mode is perfect for metal types that do not require a pre-heat phase during the weld. Because the electrode is closer to the work-piece, the electrode may dull more quickly. Standard ignition mode is typically used for welding very fine applications that would be damaged by high energy levels since there is no pre-ignition arc. Standard may also be suitable when welding a tight joint.

- **Standard Plus.** In Standard+ ignition mode, the energy discharge occurs well after the electrode tip lifts off the work-piece surface. While similar to the Standard option, Standard+ includes a "pre-heat" function know as a Focus Arc before the main weld. As the electrode begins to pull away from the surface, a small amount of energy is discharged prior to the main weld discharge. The additional energy helps preheat the weld area and helps establish an arc when the electrode is further away from the surface. The Standard+ ignition helps provide better weld consistency by allowing more variation in contact pressure before the weld takes place. You may also see this ignition mode preserve the electrode tip and accumulate less contamination.

As noted, the welder will automatically adjust the ignition based on the type of metal and application chosen. You can choose to accept the recommendations or make manual adjustments.

To adjust the ignition, press the Ignition Button (F) as shown in Figure 16.2 and choose the desired ignition type.

5. Select Foot Pedal or Touch Detect

You can choose to initiate the weld in two ways:

- **Touch Detect.** The Touch Detect mode is the default mode. The welder will initiate a weld when the electrode touches the work piece.

- **Foot Pedal.** If you attach a foot pedal to the back of the welder, a weld will only occur when you depress the pedal. Place the pedal on a floor that is flat, devoid of debris, and away from traffic areas. In this mode, you place the electrode against the work piece in the desired location and then depress the foot pedal to initiate the weld.

To choose one mode over the other, press the Touch Detect Button or Foot Pedal Button in the Trigger Mode area (D) in Figure 16.2.

6. Adjust Energy as Needed

The amount of energy to be delivered is displayed in the center of the white Energy Wheel as shown in Figure 19.1. You can adjust the energy amount as needed.

As noted earlier, the welder will automatically adjust the energy for optimum results given the metal and application already selected. However, you can make manual adjustments.

To manually adjust the energy level, touch the small white circle in the curved slider bar and move your finger counter-clockwise to reduce or clockwise to increase energy. As you move your finger, the amount of energy will change in two-tenths of a watt second (Ws).

Once you remove your finger, the energy level displayed in the Energy Wheel is the amount of energy to be delivered.

7. Press Weld On Radio Button.

At this point, touch the Weld On ratio button (G) as shown in Figure 16.2.

As an additional safety measure, the welder incorporates a digital switch that must be in the on position before energy will be released. When the welder is not being used, you should press the Weld Off radio button to avoid an unintentional discharge of energy.

8. Attach the Alligator Ground to the Work piece

Attach the alligator clip ground to the work piece at spot that ensures the best contact between ground and work piece. See Figure 19.2.

9. Touch the Electrode to the Work piece

Looking through the provided microscope, slowly touch the work piece to the tip of the electrode. When contact is made energy is released and a weld is created.

Tip: Don't pull the work piece away from the electrode when the weld initiates. The welder will automatically retract the electrode tip away from the work piece when they come into contact, resulting in a better weld.

10. Inspect. Adjust. Repeat.

After the weld, inspect the results. If you need to make adjustments to power, agitation, or ignition, do those now. Then, complete another weld to see how your adjustments affected the weld.

Using the Tack Mode to Weld

To weld using the Tack Mode, follow these instructions:

Choose Tack Mode

To choose **Tack Mode**, press the Weld Mode icon (C) as shown in Figure 20.1 and select Tack in the drop down menu. The Tack Mode Screen will appear with different options than those that appear in the Arc Mode Screen.

Attach Grounds to Back Panel

Tack Mode requires two grounds to be attached to the back panel of the welder, one attached to the Pulse Arc

Move your finger counter-clockwise to decrease.

Move your finger clockwise to increase.

Figure 19.1. The white wheel is used for adjusting energy, length, and rate of fire.

Figure 19.2. Attach the alligator clip ground to the workpiece at a spot that ensure the best contact between ground and workpiece.

Figure 20.1. To weld in Tack Mode, first attach grounds to the back panel as shown in Figure 20.2; select the desired Quick Power (D); select the desired Pre-Weld Delay (E); select the desired Trigger Mode (F); press the Weld Off Button (H) to toggle to Weld On Mode.
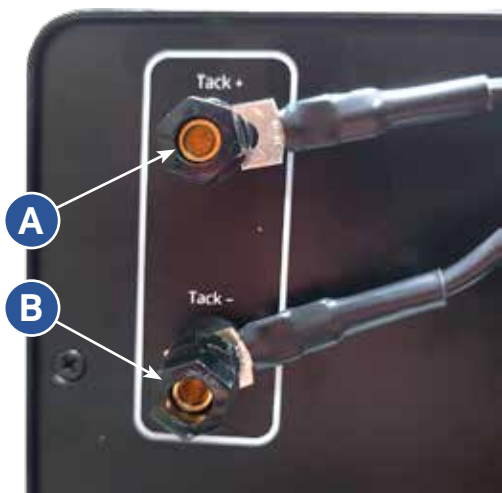

Figure 20.2. To weld in Tack Mode, attach two grounds to Tack + (A) and Tack - (B) on the welder's back panel.

Tack + (positive) terminal (A) and the other attached to the Tack - (negative) terminal (B) as shown in Figure 20.2. In Tack Mode, the front ground is not operational. Call Sunstone if you need to purchase alligator clip grounds specifically designed for Tack Mode.

Select Power Setting

For convenience, the welder allows you to choose a Low, Medium, or High power setting. Select the desired energy level (start with a lower energy level and work up) by pressing the Low, Medium, or High Quick Power Setting buttons (D) as shown in Figure 20.1.

To manually adjust the energy level, touch the small white circle in the curved slider bar (G) and move your finger counter-clockwise to reduce energy or clockwise to increase energy. As you move your finger, the amount of energy selected will change in two-tenths of a watt-second (Ws).

Once you remove your finger, the energy level displayed is the amount to be delivered.

Select Pre-Weld Delay

One of the benefits of tack welding is being able to hold a work piece in one hand and another work piece in another hand, position them as desired, and then have them welded together. A pre-weld delay provides you with the opportunity to make sure you've positioned the pieces correctly before the weld occurs.

For convenience, the welder allows you to choose a Short, Medium, and Long pre-weld delay (E) as shown in Figure 20.1 You may wish to experiment with each setting to find one that works for you.

Press one the of Pre-Weld Delay Buttons to continue.

Select Foot Pedal or Touch Detect

If you're using a foot pedal to initiate the weld, press the Foot Pedal Button (F). Make sure you have a foot pedal connect to the rear of the welder. If you want the weld to initiate the weld automatically when the work pieces touch, press the Touch Detect Button (F).

Press Weld On Radio Button.

At this point, touch the Weld Off Button (H).

As an additional safety measure, the welder incorporates a digital switch that must be in the on position before energy will be released. When the welder is not being used, you should press the Weld Off Button to avoid an unintentional discharge of energy.

Attach the Grounds to the Work pieces

Attach the grounds to the work pieces at a spot that ensures the best contact between ground and work piece. See Figure 21.2.

Touch the Two Work pieces Together

Looking through the provided microscope or ADL (auto darkening lens), slowly bring the two work pieces together (one in each hand as shown in Figure 21.2). In Touch Detect Mode, the welder will imitate a weld when the two pieces make contact with each other (and in accordance with the selected Pre-Weld Delay setting). In Foot Pedal Mode, you'll want to connect the two pieces together and then depress the foot pedal and then release.

Figure 21.2. To weld in Tack Mode, grounds are attached to two different workpieces. Position the workpieces as desired and then initiate a weld by touch or foot pedal.

Inspect. Adjust. Repeat.

After the weld, inspect the results. If you need to make adjustments to power, do that now. Then, complete another weld to see how your adjustments affected the weld.

Tip: If your first weld joined the two pieces to any degree, a second weld will not strengthen the first weld. The weld energy will pass through the first weld's connection point(s).

Chapter 3: Systems Settings

To adjust the Orion 150s's interface, gas, timing, and other systems, press the Systems Settings Button (A) in the top row of blue menu buttons, as shown in Figure. 23.1. A drop down menu will appear with the following options:

- **Interface.** Choose the Interface option to make adjustments to Volume, Microscope Brightness, Screen Brightness, or Language preferences.

- **Gas.** Choose the Gas option to make adjustments to the flow of shield gas.

- **Timing.** Choose the Timing option to make adjustments to pre-weld delays, post-weld shutter delays, and lift-off delays.

- **System.** Choose the System option to restore factory defaults to the software, clear all memory, update the welder's software, enter a test suite (for diagnostic purposes only), or to access software version information.

Interface Options

LANGUAGE PREFERENCES
To change language preferences, follow these steps:

- Press the Systems Settings Button (A) in the top row of blue menu buttons, as shown in Figure. 23.1.

- From the sub-menu, press the Interface option.

- In the Settings-Interface Screen as shown in Figure 23.1, press the blue Language Button (B) and then select the desired language.

- Press the Exit Button (G) to return to the previous screen.

LOCK/UNLOCK
You can lock the welder, which will prevent unauthorized use of the welder. When the welder is unlocked, the Lock/Unlock Button (C) will display "Unlocked" or "Locked" if the welder is locked.

To lock the welder, follow these steps:

- Press the Systems Settings Button (A) in the top row of blue menu buttons, as shown in Figure. 23.1.

- From the sub-menu, press the Interface option.

- In the Settings-Interface Screen as shown in Figure 23.1, press the Unlocked Button (C).

- A blue window will open with three options. You can Lock the welder, change the PIN (Personal Identification Number), or cancel.

- Press the Full Lock Out Button to lock the welder. Press the Change the Pin Button to change the security PIN. Press the Cancel Button to exit this feature. To change the PIN, you must enter the existing PIN.

- When you press the Full Lock Out Button, you'll be prompted to enter a 4-digit PIN. Enter the 4-digit PIN and then press OK. Press Cancel to exit this feature. You'll be prompted to re-enter the PIN number.

- The message "The Welder is Locked" will appear. If you attempt to access any feature in the software, this same message will appear. Press the Go To Unlock Button to unlock the welder. Press the Dismiss Button to exit the message window.

- Enter the 4-digit PIN to unlock the welder. If you forgot the 4-digit PIN, call Sunstone Customer Service at +1 801-658-0015.
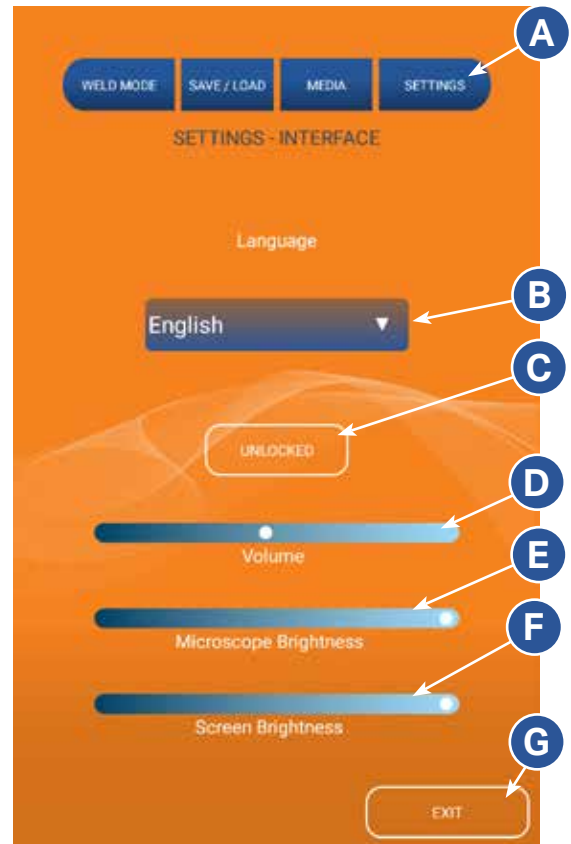
To unlock the welder, follow these steps:

- Press the Systems Settings Button (A) in the top row of blue menu buttons, as shown in Figure. 23.1.

- From the sub-menu, press the Interface option.

- In the Settings-Interface Screen as shown in Figure 23.1, press the Locked Button (C).

- A blue window will open with three options. You can unlock the welder, create a PIN, or cancel.

- Enter the PIN to unlock the welder. If you forgot the PIN, call Sunstone Customer Service at +1 801-658-0015.

- After you enter the PIN, the welder will unlock.

Figure 23.1.Press the Settings Button in the top row blue menu buttons and choose the Interface option to make changes to Language (B), Lock/Unlock the welder (C), adjust the Volume (D), adjust the Microscope Brightness (E); or adjust the Screen Brightness (F).

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VOLUME

To adjust the volume, follow these steps:

- Press the Systems Settings Button (A) in the top row of blue menu buttons, as shown in Figure. 23.1.
- From the sub-menu, press the Interface option.
- In the Settings-Interface Screen as shown in Figure 23.1, press your finger to the Volume slider bar (D) and move to the right to increase the volume; move to the left to decrease the volume.
- Press the Exit Button (G) to return to the previous screen.

MICROSCOPE BRIGHTNESS

To adjust microscope brightness, follow these steps:

- Press the Systems Settings Button (A) in the top row of blue menu buttons, as shown in Figure. 23.1.
- From the sub-menu, press the Interface option.
- In the Settings-Interface Screen as shown in Figure 23.1, press your finger to the Microscope Brightness slider bar (E) and move to the right to increase the brightness; move to the left to decrease the brightness.
- Press the Exit Button (G) to return to the previous screen.

SCREEN BRIGHTNESS

To adjust screen brightness, follow these steps:

- Press the Systems Settings Button (A) in the top row of blue menu buttons, as shown in Figure. 23.1.
- From the sub-menu, press the Interface option.
- In the Settings-Interface Screen as shown in Figure 23.1, press your finger to the Screen Brightness slider bar (F) and move to the right to increase the brightness; move to the left to decrease the brightness.
- Press the Exit Button (G) to return to the previous screen.

Gas Options

As explained on page 8, a shield gas is released during a weld to shield to prevent oxidation. Usually, argon is a suitable choice as a shield gas, which you can purchase directly from Sunstone at www.sunstonewelders.com/gas. See page 10 to set the gas pressure.

You can control two key settings in the Setting-Gas Screen: pre-flow delay and post-flow delay in milliseconds. Pre-flow delay is the amount of time the gas flows before the weld is initiated. The longer the time, the more opportunity for shielding gas to cover the work piece and prevent oxidation. Post-flow delay is the amount of time the gas flows after the weld is initiated, providing additional coverage as the weld pool cools. Keep in mind that longer pre- and post-flow delays require more shielding gas, subsequently drawing more often on your supply.

HOW TO ADJUST PRE-FLOW DELAY

- Press the System Setting icon (A) as shown in Figure 25.1.

- From the sub-menu, press the Gas Screen option.

- In the Settings-Gas Screen as shown in Figure 25.2, press your finger to the Pre-Flow Delay slider bar (E). Move your finger to the right to increase the amount of time gas flows before the weld; move your finger to the left to decrease the amount of time gas flows before the weld.

- Press the Exit Button (G) to exit.

HOW TO ADJUST POST-FLOW DELAY

- Press the System Setting icon (A) as shown in Figure 25.1.

- From the sub-menu, press the Gas Screen option.

- In the Settings-Gas Screen as shown in Figure 25.1, press your finger to the Post-Flow Delay slider bar (F). Move your finger to the right to increase the amount of time gas flows after the weld; move your finger to the left to decrease the amount of time gas flows after the weld.

- Press the Exit Button (G) to exit.

HOW TO PURGE GAS

If you adjust gas pressure on the regulator (see page 10), either increase or decrease, that adjustment in gas is not immediately registered at the electrode tip. Purging the gas line (or allowing the gas to flow unrestricted for a short amount of time) will set the flow of gas to whatever changes you made to the regulator.

To purge the gas line, follow these steps:

- Press the System Setting icon (A) as shown in Figure 25.1.

- From the sub-menu, press the Gas Screen option

Figure 25.1. Press the Settings Button in the top row blue menu buttons and choose the Gas Screen option to view the current gas pressure (B); to calibrate the gas pressure (C); to purge the gas line (D); to make changes to the pre-flow delay (E); or to make changes to the post-flow delay (F).

- In the Settings-Gas Screen as shown in Figure 25.1, press the Purge Gas Button (D). You'll briefly hear gas exit the gas line. Subsequently, the line has been purged.

- Press the Exit Button (G) to exit.

HOW TO CALIBRATE GAS

If the regulator valve and the digital gas dial (G) indicate different pressure readings, you'll want to calibrate the digital gas dial.

To calibrate the digital gas dial, follow these steps:

- Press the System Setting icon (A) as shown in Figure 25.1.

- From the sub-menu, press the Gas Screen option.

- Ensure there is no gas pressure, then disconnect the line from either the welder or the regulator.

- In the Settings-Gas Screen as shown in Figure 25.1, press the Calibrate Gas Button (C). You'll briefly hear the welder calibrate Now, the digital gas dial (B) and the regulator should indicate the same pressure readings.

- Reconnect the gas line and then press the Exit Button (G) to exit.

Timing Options

To make adjustments to weld timings (pre-weld delays, shutter delays, and lift-off delays), choose Timing from the Systems Settings (A) sub-menu as shown in Figure 27.1.

In the Settings-Timing Screen (see Figure27.1), you make adjustments to the following:

- **Pre-Weld Delay.** The Pre-Weld Delay is the time that elapses between the weld trigger and the weld ignition, measured in milliseconds. When welding in Touch Detect Mode, the Pre-Weld Delay is the time that elapses from when the electrode touches the work piece to when the weld ignition starts.

- **Lift-Off Delay.** In Arc Mode, when the electrode contacts the work piece (or when the foot pedal is depressed), the welder will retract the electrode slightly and then release energy through the electrode when the electrode reaches the apex of the retraction, a motion that improves weld strength. The Lift-Off Delay is the amount of time that elapses between when the weld is initiated and when the electrode begins to retract. Lengthening the delay means the electrode will stay in contact with the work piece longer. Shortening the delay means the electrode will stay in contact with the work piece for a shorter period of time. The Lift-Off Delay is a user preference setting; weld quality is not necessarily affected by the Lift-Off Delay. You may prefer a longer delay, which may provide you with a bit more time to make sure the electrode is placed exactly where you want it. Or, you may prefer a shorter delay.

- **Post-Weld Shutter Delay.** The microscope optics utilize a physical shutter that closes during the weld, to protect the eyes. The Post-Weld Shutter Delay is the amount of time that elapses after the weld ends and before the shutter opens, measured in milliseconds. The delay provides an additional layer of safety in blocking residual, harmful light from reaching your eyes.

- **Minimum Time Between Welds.** You can adjust the amount of time between each weld, measured in milliseconds. By decreasing the minimum time between welds you'll be able to complete more welds

within a given time period. However, adjusting the time downward may result in the electrode sticking to the weld because not enough time has elapsed for the previous weld to cool.

Advanced Agitation Options

- **Duty Cycle.** Agitation spikes energy during a weld, either by adding energy in an positive spike or removing energy in a negative spike. Duty cycle controls determine how long the spikes are on. A higher duty cycle means the spikes are on longer.

- **Percentage of Weld.** You can control the length of time agitation occurs during a weld, as a percentage. At 100%, the agitation spikes will last for the entire discharge of weld energy. At anything less than 100%, the percentage is measured from the end of the weld.

HOW TO ADJUST PRE-WELD DELAY

- Press the System Setting icon (A) as shown in Figure 27.1.

- From the sub-menu, press the Timing option.

- In the Settings-Timing Screen as shown in Figure 27.1, press your finger to the Pre-Weld Delay slider bar (B). Move your finger to the right to increase the delay that elapses between the weld trigger and the weld ignition, measured in milliseconds; move your finger to the left to decrease the delay.

- Press the Exit Button (H) to exit.

HOW TO ADJUST LIFT OFF DELAY

- Press the System Setting icon (A) as shown in Figure 27.1.

- From the sub-menu, press the Timing option.

- In the Settings-Timing Screen as shown in Figure 27.1, press your finger to the Lift-off Delay slider bar (C). Move your finger to the
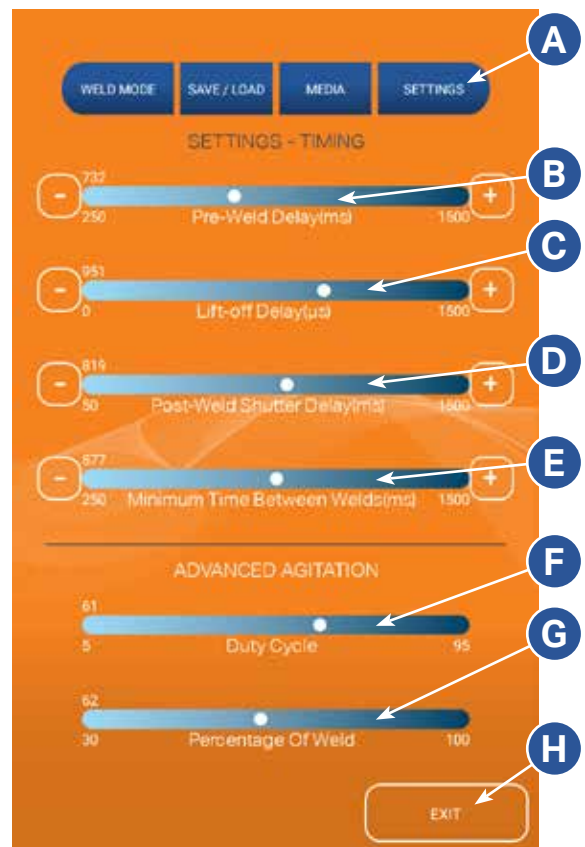

Figure 27.1. To make changes to weld timings, choose the Timing option form the Settings menu (A).

right to increase the delay that elapses between the weld trigger and the weld ignition, measured in milliseconds; move your finger to the left to decrease the delay.

- Press the Exit Button (H) to exit.

HOW TO ADJUST POST-WELD SHUTTER DELAY

- Press the System Setting icon (A) as shown in Figure 24.1.

- From the sub-menu, press the Timing option.

- In the Settings-Timing Screen as shown in Figure 27.1, press your finger to the Post-Weld Shutter Delay slider bar (D). Move your finger to the right to increase the amount of time that elapses after the weld and when the shutter opens, measured in milliseconds; move your finger to the left to decrease the delay.

- Press the Exit Button (H) to exit.

HOW TO ADJUST THE MINIMUM TIME BETWEEN WELDS

- Press the System Setting icon (A) as shown in Figure 27.1.

- From the sub-menu, press the Timing option.

- In the Settings-Timing Screen as shown in Figure 27.1, press your finger to the Minimum Time Between Welds slider bar (E). Move your finger to the right to increase the minimum time between welds measured in milliseconds; move your finger to the left to decrease the minimum time between welds.

- Press the Exit Button (H) to exit.

HOW TO ADJUST THE AGITATION DUTY CYCLE

- Press the System Setting icon (A) as shown in Figure 27.1.

- From the sub-menu, press the Timing option.

- In the Settings-Timing Screen as shown in Figure 27.1, press your finger to the Duty Cycle slider bar (F). Move your finger to the right to increase the duty cycle, measure in hertz; move your finger to the left to decrease the duty cycle.

- Press the Exit Button (H) to exit.

HOW TO ADJUST THE AGITATION AS A PERCENTAGE OF THE WELD

- Press the System Setting icon (A) as shown in Figure 27.1.

- From the sub-menu, press the Timing option.

- In the Settings-Timing Screen as shown in Figure 27.1, press your finger to the Percentage of Weld slider bar (G). Move your finger to the right to increase the percentage; move your finger to the left to decrease the percentage.

- Press the Exit Button (H) to exit.

System Settings

In the Settings-System Screen, see Figure 29.1, you can access the following system-wide controls:

- **Restore All Defaults.** This feature will restore all welder settings to factory defaults. When you use this feature all current settings are lost.

- **Clear All Memory.** The welder can store certain welding schedules. This feature will clear the on-board memory. All existing saved welds will be lost when you utilize the feature.

- **Update Welder Over WiFi.** From time to time, Sunstone will make improvements and changes to the welder's software. This feature allows you to upgrade the software using a WiFi connection.

- **Connect to WiFi.** You can connect the welder to a WiFi connection to update the welder's software.

- **Enter Test Suite.** While working with Sunstone's customer service team, you may be asked to place the welder in a test suite. Use this button to begin that process.

Note: Sunstone strongly recommends you only utilize these features when working closely with the Sunstone customer service team. Call or text +1 801-658-0015 to contact us.

HOW TO RESTORE ALL DEFAULTS

- Press the System Setting icon (J) as shown in Figure 29.1.

- From the sub-menu, press the System option.

- In the Settings-System Screen as shown in Figure 29.1, press the Restore All Defaults Button (K).

- A blue warning screen will appear asking you to confirm. Press the Yes button to continue; press the No button to cancel and go back.

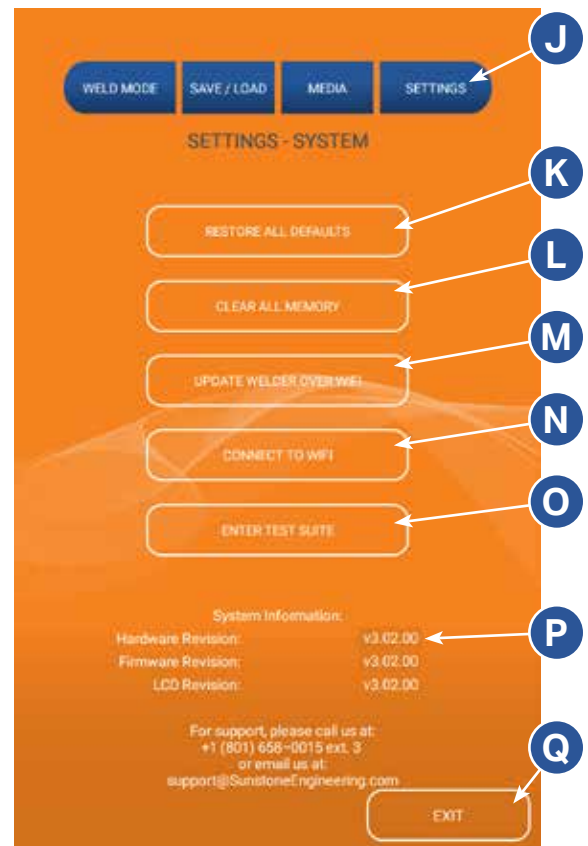*Warning: Restoring defaults cannot be undone.*

Figure 29.1. Use the Settings-System screen to restore the welder to factory defaults (K), clear all welder memory (L), update the welder's software (M), connect the welder to a WiFi connection (N), or view welder system information (P).

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- After all defaults are restored, the Arc screen will appear.

HOW TO CLEAR ALL MEMORY
- Press the System Setting icon (J) as shown in Figure 29.1.

- From the sub-menu, press the System option.

- In the Settings-System Screen as shown in Figure 29.1, press the Clear All Memory Button (L).

- A blue warning screen will appear asking you to confirm. Press the Yes button to continue; press the No button to cancel and go back.

Warning: This action will permanently erase all current weld settings, saved user welds, and any user preferences.

- After the welder's memory is cleared the Arc screen will appear.

HOW TO UPDATE THE SOFTWARE
- Press the System Setting icon (J) as shown in Figure 29.1.

- From the sub-menu, press the System option.

- In the Settings-System Screen as shown in Figure 29.1, press the Update Welder Over WiFi Button (M).

- Carefully follow the on-screen instructions to complete the update procedure.

- Once the update is completed, the welder will display the Arc Screen.

HOW TO CONNECT THE WELDER TO A WIFI CONNECTION
- Press the System Setting icon (J) as shown in Figure 29.1.

- From the sub-menu, press the System option.

- In the Settings-System Screen as shown in Figure 29.1, press the Connect to WiFi Button (N).

- After you press the Connect to WiFi Button (N), a list of available WiFi networks will appear. Touch the WiFi network to which you wish to connect.

- Enter the selected WiFi network's password. If you wish to show the password as you type or after you've entered it, press the Show Password check box. If you want the welder to remember the password for you, and automatically enter the password the next time you connect, press the Remember Password check box.

- If you entered the correct password and are able to connect to the selected WiFi network, the welder will display a success message. Now that you're connected to a WiFi network you can update the welder's software. See How to Update the Software on page 30.

HOW ENTER THE TEST SUITE
- Press the System Setting icon (J) as shown in Figure 29.1.

- From the sub-menu, press the System option.

- In the Settings-System Screen as shown in Figure 29.1, press the Enter Test Suite Button (O).

- A blue warning screen will appear asking you to enter a custom password only available from Sunstone. To receive your custom password, call Sunstone's customer service team at +1 801-658-0015 and provide them with the password displayed on the welder.

- Follow the instructions provided by Sunstone's customer service team to complete this process.

HOW TO VIEW SYSTEM INFORMATION

- Press the System Setting icon (J) as shown in Figure 29.1.

- From the sub-menu, press the System option.

- In the Settings-System Screen as shown in Figure 29.1, you'll see all system information in bottom third of the screen (P).

- Press the Exit Button (Q) to exit.

Chapter 4: How to Save, Load and Delete Weld Schedules

The welder has the ability to save weld schedules, which you can then access and load later, saving you the time it may otherwise require to enter the desired weld parameters manually.

A weld schedule is a set of weld parameters. In other words, if you have discovered that for a particular job, 43 Ws of energy, using the Tight Angles application, with negative agitation, and S+ ignition produces the best results, you can save those parameters as a weld schedule. Then you can load that weld schedule for the next time you encounter that particular type of job.
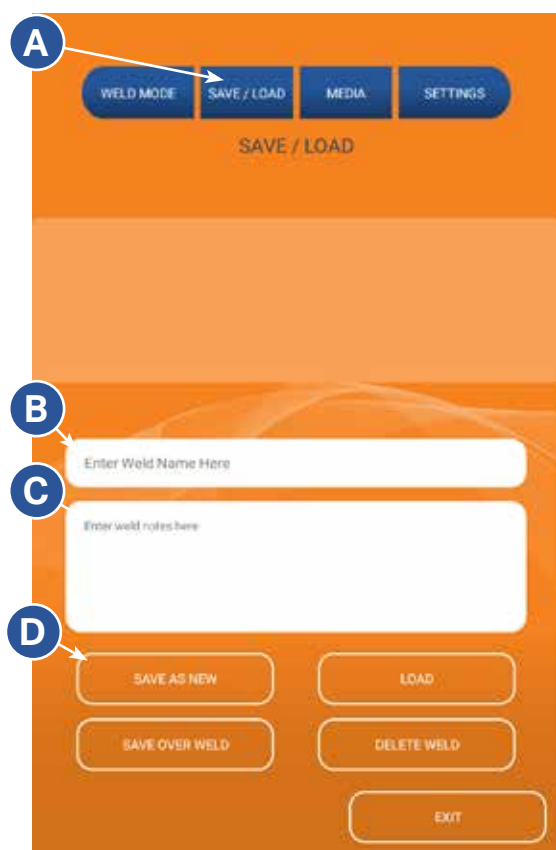

Figure 32.1. To save a new weld schedule, enter a name (B); enter a description or other notes (C); press the Save As New Button (D).

How to Save a Weld Schedule

- Make sure all weld parameters (energy, application, agitation, and ignition) are in the desired configuration.

- Press the Save/Load Button (A) as shown in Figure 32.1. The Save/Load Screen will appear.

- In the Save/Load Screen, enter a name for the schedule you wish to save in the box labeled "Enter Weld Name Here" (B) by touching the empty box and then entering a name.

- Next, touch the empty box labeled "Enter weld notes here" (C) and enter whatever notes will help you identify this particular weld schedule.

- Press the Save As New Button (D) if this schedule is new. A blue box will appear warning you to wait 10 seconds for the welder to save or delete a weld. You can wait for the welder to automatically close the box or you can press the Dismiss Button.

- The welder will save the new weld schedule and display in a list of available schedules.

How to Load a Weld Schedule

- Press the Save/Load Button (E) as shown in Figure 33.1. The Save/Load Screen will appear.

- In the list of saved schedules (F), touch to select the schedule you wish to load. When you select the schedule, the name and description will appear in the schedule name box (G) and schedule note box (H).

- With the desired schedule selected, press the Load Button (J)

- The welder will load the parameters and return to the Arc screen.

How to Save Over an Existing Weld Schedule

- Make sure all current well parameters (energy, application, agitation, and ignition) are in the desired configuration.

- Press the Save/Load Button (E) as shown in Figure 33.1. The Save/Load Screen will appear.

- In the list of saved schedules (F), touch to select the schedule you wish to save over. When you select the schedule, the name and description will appear in the schedule name box (G) and schedule note box (H).

- Press the Save Over Weld Button (I) to save the weld schedule over the previous weld schedule. You can cancel this operation by pressing the Exit Button (L) PRIOR to pressing the Save Button. A blue box will appear warning you to wait 10 seconds for the welder to save or delete a weld. You can wait for the welder to automatically close the box or you can press the Dismiss Button.
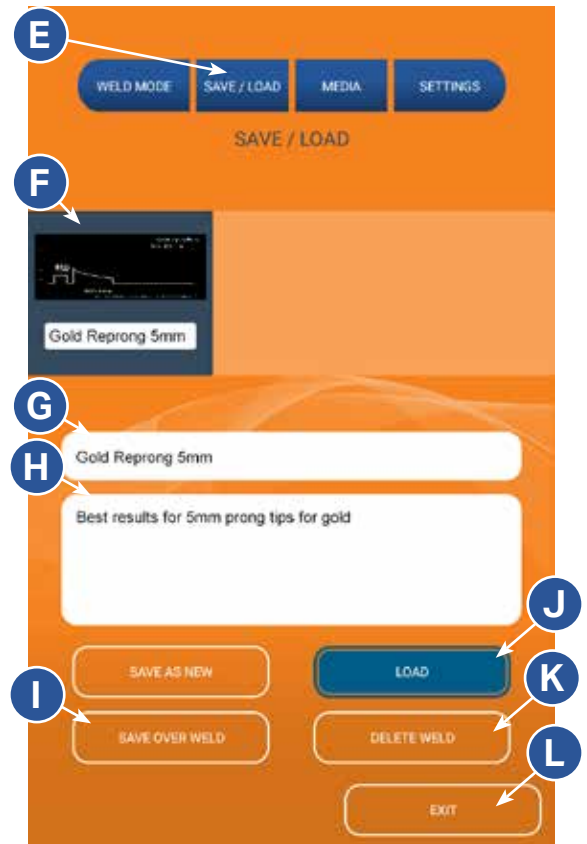
- The welder will then display the Arc screen.

Figure 33.1. To load a weld schedule, select the weld from the list of available welds (F) and then press the Load Button (J).

How to Delete an Existing Weld Schedule

- Press the Save/Load Button (E) as shown in Figure 33.1. The Save/Load Screen will appear.

- In the list of saved schedules (F), touch to select the schedule you wish to delete.

- Press the Delete Weld Button (K). The welder will then delete the schedule. A blue box will appear warning you to wait 10 seconds for the welder to save or delete a weld. You can wait for the welder to automatically close the box or you can press the Dismiss Button.

Chapter 5: How to View Media

The Orion 150s carries an on-board library of documents and videos in a number of different categories. Sunstone periodically updates the library which you can access using a WiFi connection.

To view the library follow these instructions:

- Press the Media Button (A) found in the top row of blue navigation buttons. See Figure 35.1. The Media Screen will appear.

- The library is organized into three different categories: Manuals, Settings, Technique. To open and view the contents of a category, touch the white down arrow button (B) next to the category name. A list of available documents or videos will appear, as shown in Figure 36.1. Touch the white arrow button (B) again to close the category list.

- To Close the list of categories, press the white X (C) in the top right corner of the library list.

- Touch the document or video you wish to view, as shown in Figure 36.1. The document or video will appear in the lower half of the screen.

- To navigate documents, simply touch the document page and move your finger down to advance to the next page in the document.

- To play videos, touch the Play Button (H). See Figure 36.2.

- To rewind a video by 30 seconds, touch the Back 30 Button (F).

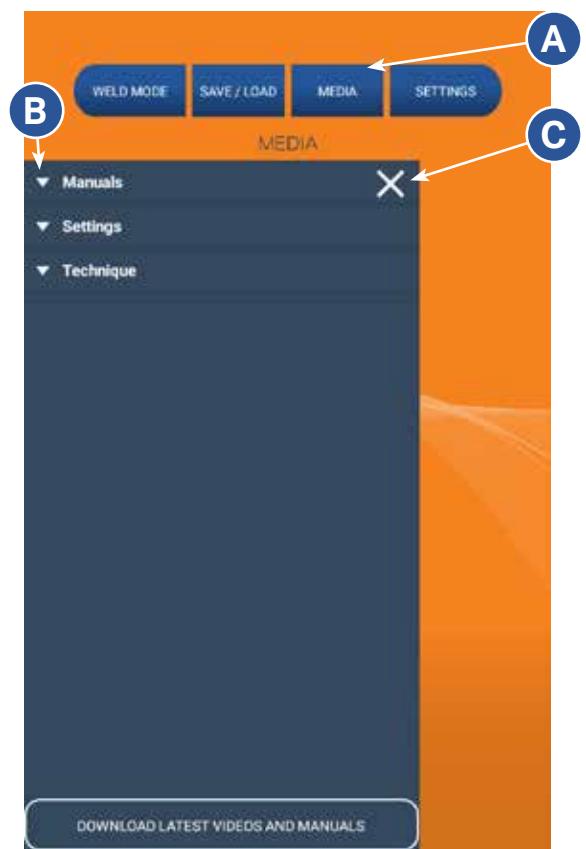- To fast forward by 10 seconds, touch the Forward 10 Button (I).

Figure 35.1.To access the on-board library, press the Media Button (A). Press the white down arrow button (B) to open and view the contents of each library category.
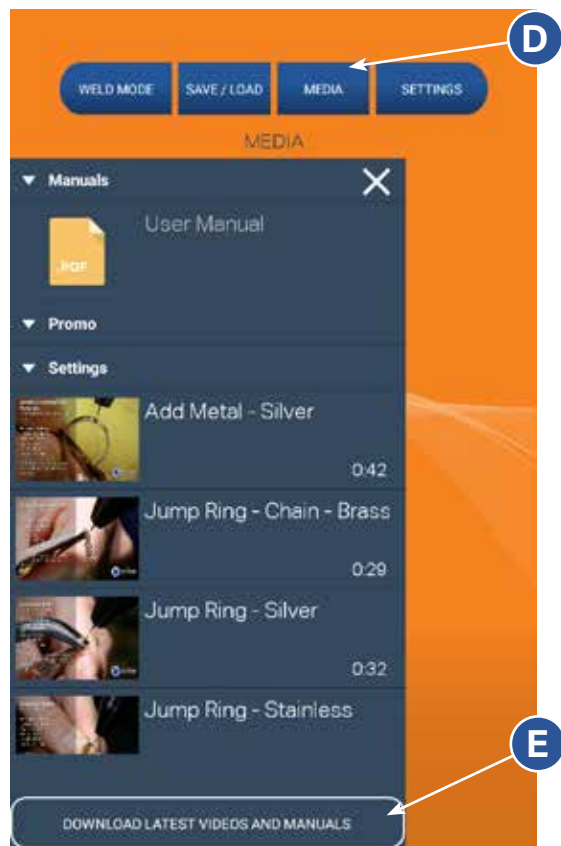
Figure 36.1.When you open a category, a list of available documents and/or videos will appear with an accompanying thumbnail image. Touch the document or video you wish to view.

Figure 36.2.To play a video, press the Play Button (H). To rewind by 30 seconds, press the Rewind 30 Button (F). To fast forward by 10 seconds, press the Forward 10 Button (I). Use the slider bar (G) to find any point in the video.

- To rewind or advance to any point in the video, touch and hold your finger over the slider bar (G); move your finger left to rewind; move your finger right to fast forward.

- Press Media >> at the top of the screen to close the document or video.

How to Download the Latest Library

To download the latest library, follow these instructions:

- Press the Media Button (D) found in the top row of blue navigation buttons. See Figure 36.1. The Media Screen will appear.

- Press the Download Latest Library Button (E) found at the bottom of the screen.

- A list of available WiFi networks will appear. Select the desired WiFi network.

- Enter the WiFi network password.

- After the welder connects to the WiFi network the library will be updated.

Appendix 1: Product Specifications

Pre-Programmed Metal Settings	11
Customizable Save Settings	1,000
Languages	20 + (Ask us if we have your language)
Display	8" Capacitive 10 point Touch Screen
Energy (Ws)	1-150 Ws
Switching Power Supply	110/240VAC (Auto Detected)
Estimated Weld Spot Diameter Range	0.5 - 3.5 mm
Footprint (L x W x H)	12" x 6" x 10" (30.5 x 15.2 x 25.4 cm)
Weight	20 lbs (9 kg)
Stereo Microscope Magnification	5x
Stereo Microscope Eye Protection	>UV 16 and >IR 16

Appendix 2: General Weld Parameters

The following charts are intended to help you determine appropriate energy settings for various applications and metal. Remember to start at a lower power and work up.

26 AWG wire/chain/jump ring

Metal	Tip Shape	Energy	Agitation
14k Gold	Sharp	9 ws	None
24k Gold	Sharp	8 ws	None
Silver	Sharp	10 ws	None
Platinum	Sharp	10 ws	None
Stainless	Sharp	8 ws	Sloped
Palladium	Sharp	7 ws	Sustained
Titanium	Sharp	10 ws	None
Brass	Sharp	9 ws	None

Earring Post

Metal	Tip Shape	Energy	Agitation
14k Gold	Sharp	11 ws	None
24k Gold	Sharp	10 ws	None
Silver	Sharp	12 ws	None
Platinum	Sharp	12 ws	None
Stainless	Sharp	9 ws	Sloped
Palladium	Sharp	8 ws	Sustained
Titanium	Sharp	12 ws	None
Brass	Sharp	11 ws	None

0.5 mm thick Ring

Metal	Tip Shape	Energy	Agitation
14k Gold	Sharp	12 ws	None
24k Gold	Sharp	11 ws	None
Silver	Sharp	17 ws	None
Platinum	Sharp	15 ws	None
Stainless	Sharp	14 ws	Sloped
Palladium	Sharp	13 ws	Sustained
Titanium	Sharp	15 ws	None
Brass	Sharp	15 ws	None

1 mm thick Ring

Metal	Tip Shape	Energy	Agitation
14k Gold	Sharp	22 ws	None
24k Gold	Sharp	20 ws	None
Silver	Semi Blunt	45 ws	None
Platinum	Sharp	24 ws	None
Stainless	Sharp	22 ws	Sloped
Palladium	Sharp	19 ws	Sustained
Titanium	Sharp	26 ws	None
Brass	Sharp	26 ws	None

2 mm thick Ring

Metal	Tip Shape	Energy	Agitation
14k Gold	Semi Blunt	50 ws	None
24k Gold	Semi Blunt	45 ws	None
Silver	Blunt	80 ws	None
Platinum	Sharp	60 ws	None
Stainless	Sharp	45 ws	Sloped
Palladium	Sharp	40 ws	Sustained
Titanium	Sharp	55 ws	None
Brass	Blunt	55 ws	None

Add Material (30 AWG laser wire)

Metal	Tip Shape	Energy	Agitation
14k Gold	Sharp	13 ws	None
24k Gold	Sharp	12 ws	None
Silver	Sharp	14 ws	None
Platinum	Sharp	14 ws	None
Stainless	Sharp	10 ws	Sloped
Palladium	Sharp	9 ws	Sustained
Titanium	Sharp	14 ws	None
Brass	Sharp	13 ws	None

Retip Prong (26 AWG wire)

Metal	Tip Shape	Energy	Agitation
14k Gold	Sharp	9 ws	None
24k Gold	Sharp	8 ws	None
Silver	Sharp	10 ws	None
Platinum	Sharp	10 ws	None
Stainless	Sharp	8 ws	Sloped
Palladium	Sharp	7 ws	Sustained
Titanium	Sharp	10 ws	Sloped
Brass	Sharp	9 ws	None

Add Material (24 AWG wire)

Metal	Tip Shape	Energy	Agitation
14k Gold	Sharp	17 ws	None
24k Gold	Sharp	16 ws	None
Silver	Sharp	18 ws	None
Platinum	Sharp	18 ws	None
Stainless	Sharp	14 ws	Sloped
Palladium	Sharp	13 ws	Sustained
Titanium	Sharp	18 ws	None
Brass	Sharp	17 ws	None

We're Gonna Treat You Like Royalty!

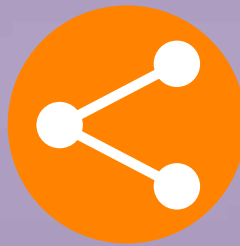*Enjoy a "forever" warranty starting as low as $15/month!*

sunstone circle
PROTECTION PLAN

"Forever Warranty"

For as long as your welder is covered by the Sunstone Circle your warranty never expires. You'll never deal with lifeless warranty extensions, but rather enjoy a forever warranty. And that's a big circle of protection!

Complimentary Loaner

If you need a loaner unit while your welder is being repaired, we'll send one. We're going to do all we can to keep your production levels up. If you're in the circle, we'll take care of you!
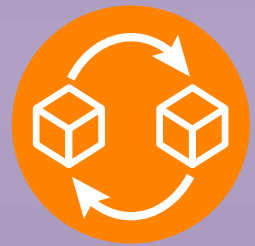
Free Replacement

Sometimes it makes more sense to replace a broken welder with a current or refurbished model, or offer a discount on the latest model rather than make a repair. At our discretion, we'll do what we can to keep your shop productive!

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PROTECTION PLAN

You Purchased an Extra Special Welder.
Get Extra Special Treatment!
Here's how a small monthly subscription delivers royal treatment:

Free Software Upgrades

When your welder is powered by the latest software improvements your shop becomes more productive and capable. You'll have access to all software upgrades when you join the Sunstone Circle!

Complimentary Shipping

Should your Sunstone welder ever need repair, we'll cover the shipping costs for ground service within the United States. If you need it faster, simply pay the difference. Need it shipped internationally? Give us a call!

Expedited Customer Service

At Sunstone every customer is a VIP, but when you're part of the circle your request for customer service gets moved to the front of the line. You get extra attention! Just another perk when you subscribe today.

More Valuable Member Benefits!

You'll receive snazzy Sunstone swag, a subscription to *Micro Welding Today* magazine, invitations to VIP events, *Inside the Circle* e-newsletter, and new product trial opportunities. Call now to join the circle!

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