orion®

Orion® x-Series

Users Guide

With Tru-Fire Technology®, Smart Energy Release, and WeldIQ™

20251027 • ITEM #1760

sunstone®

The Micro Welder Experts

ATTENTION: Read the Safety Guide before operating this welder!

Operator assumes all liability.

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orion 200x
ARC
SINGLE
100
STOP
AUTO / PEDAL
orion 200x
TACK
GROUNDING CLIP
STYLUS

Chapter 1: Welder Setup & Assembly

The Orion x-Series pulse arc welder provides unmatched weld strength and reliability. Designed to meet the rigorous demands of professionals across jewelry, dental, aerospace, and manufacturing markets, the new Orion x-Series offers stronger welds, a price point for faster return on investment, and exceptional customer service that has defined Sunstone for nearly 20 years.

Key Features

- Broad Power Range from 1 to 150 J (150x) or from 0.15 to 200 J (200x)
- Extensive Spot Size Range (~ 0.1-4.5mm) for Any Work Piece
- Versatile Rail System for Mounting Accessories
- Adjustable Articulating Microscope Arm
- Brilliant 8" HMI Touchscreen Control
- Easy-to-Reach, Tactile Stylus Mounted Energy Buttons
- Tru-Fire Technology® for Fewer Misfires
- Smart Energy Release for More Efficient Energy Use
- WeldIQ™ for Absolute Digital Energy Control

What is in the Box

BOX 1 CONTENTS:

(1) Orion x-Series Power Supply

(1) Orion x-Series Microscope Arm Assembly

(1) Orion x-Series Case (attached to Arm Assembly

(1) Safety Manual & Quick Start/Quick Settings Guide

ACCESSORIES BOX (1)

(1) Welder Power Cord

(1) Welding Stylus Hand Piece

(1) Comm. Cable (Display Port Ends)

(2) Alligator Clip Cables

(1) Foot Pedal

(1) Shielding Gas Hose

(1) Electrode Vial (3 1.0 mm Electrodes)

(1) Fiberglass Brush

(1) Cross Lock Tweezers

(1) Jump Ring Pliers

(1) Optional Microscope Arm Mounting Hardware

(2) Microscope Eye Piece Shields

(1) Set of Allen Wrenches

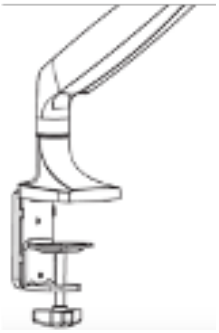


Figure 2.1. The Orion x-Series ships with the mounting assembly already attached to the microscope arm, as shown above.

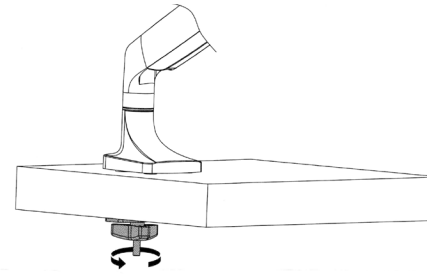


Figure 2.2. Lift Arm Assembly up and slide onto the table.

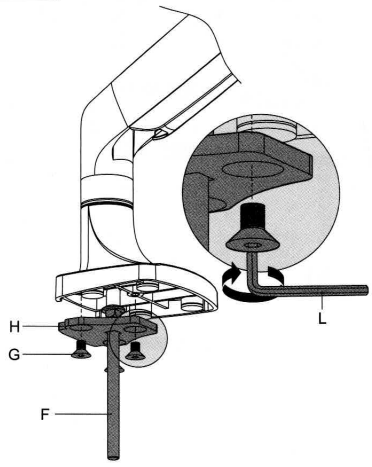


Figure 2.3. Using a 4mm (5/32) Allen wrench, unscrew the flat head screws (G) holding the clamp to the arm.

Microscope Arm Assembly Setup

- Remove the microscope arm assembly from the box and lay it gently 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.

MOUNTING OPTIONS

Mounting Option 1 - Clamp to Table

Mounting the clamp to a table is the most popular mounting option and is pre-installed on your microscope arm assembly, as shown in figure 2.1. The Clamp to Table option is best used on tables with accessible edges and avoids the need to drill holes in the table.

Note: If your table is thicker than 3-1/2" (9cm), or you do not have access to tighten the clamp, follow mounting options 2 or 3

Attaching the microscope arm with mounting option 1:

- Lay the arm assembly down on the tabletop.
- Adjust the knob on the clamp mechanism at the bottom of the arm until the gap is sufficient for the thickness of your tabletop.
- Lift the arm assembly up and slide the arm onto the table.
- Lock it into place by turning the knob on the clamp mechanism until the clamp is pressing firmly against the bottom of the table. See Figure 2.2.

Mounting Option 2 - Bolt through Table

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

(1x) Flat Mounting Plate (letter H)

(3x) Flat head screws (letter G)

(1x) Long Carriage Bolt (letter F)

(1x) Flat Pressure Plate (letter I)

(1x) Adjustment Knob (letter J)

- Using a 4mm (5/32) Allen wrench, unscrew the flat head screws (G) holding the clamp to the arm. See Figure 2.3.
- Run the included 8mm (5/16) carriage bolt (F) through the included plate (H).
- Attach plate (H) to the bottom of the arm using (3x) flat head screws
- Drill a 3/8' (9 .5mm) hole through the tabletop.
- Lower the arm so the bolt goes through the hole in the table top.
- Slide the tightening plate (I) onto the bolt (see Figure 3.1) and then tighten the twist knob (J) onto the bolt until it is very snug, as shown in Figure. 3.2.

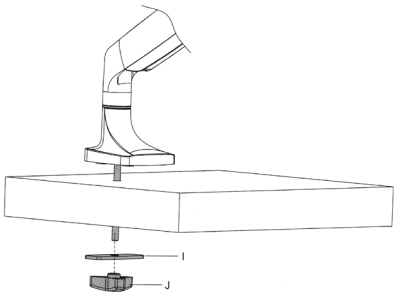


Figure3.1. Remove the plate from the arm, run the carriage bolt through the plate, then re-attach the plate to the arm.

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.

Mounting Option 3 - Screw to Table (vertical surface)

Required hardware from Box 2:

(1) Angled Mount Bracket (A)

(3) Flat Head Screws

(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 as shown in Figure 2.3
- 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. Figure 3.3

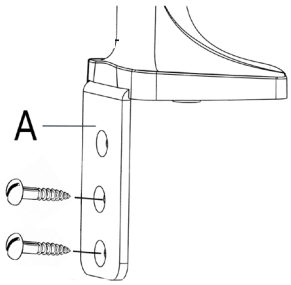


Figure 3.3. Use wood screws (not included) to attach the angled bracket (A) to the table.

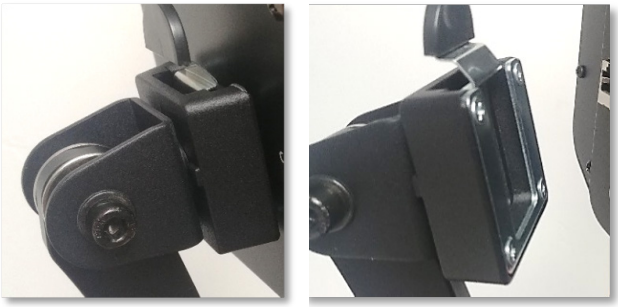


Figure 4.1 Though the screen case comes pre-attached, it can be removed by pulling the tab away from the screen.

Figure 4.2. Adjust the tension of the Arm Assembly for more loose or more tight movement.

Figure 4.3. Push the two rubber eypiece covers over the top of the microscope lenses.

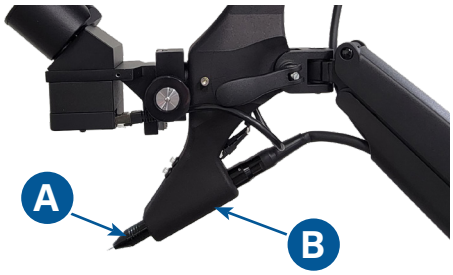


Figure 4.4. Slide the Stylus (A) into the Stylus Holder (B) until it bottoms out. Some pressure may be necessary to slide the stylus into place.

Screen Case

The screen case comes pre-attached to the microscope arm assembly. For screen case removal, pull the tab on the mount bracket away from the screen case and lift the screen case up and out of the pocket on the bracket. See Figure 4.1.

Be sure to remove the screen protector film from the front of the screen.

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 4.2. Use the included 6 mm 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 as shown in Figure 4.3.

Welding Stylus Setup

- Remove the Welding Stylus from the accessories box.
- Insert the Welding Stylus (A) into the Stylus Holder (B) at the bottom of the arm assembly. See Figure 4.4. Until it bottoms out. Some pressure may be necessary to slide the stylus into place.
- The stylus tubing can be routed up and through the removable cable guide portion of the arm if desired.

- Tighten the thumb screw on the bottom of the stylus holder to hold it in place.

Adjust the Microscope Focus

- Twist the knob on the microscope forward and backward to lower and raise the head. See Figure 5.1. This will allow you to focus the microscope on the welding stylus
- 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.

Figure 5.1. To adjust focus, turn the knob to move the optics up or down.

POWER SUPPLY SETUP

Power Supply Mounting

The Orion X power supply is designed to have stability to rest on a tabletop without the need to attach it to anything. This is great for mobility in changing positions.

Four holes have been placed in the base of the power supply if more secure positioning is required.

Mounting to a Tabletop:

- Place the power supply onto a level, stable, tabletop.
- Locate the desired position on the tabletop for the power supply.
- Use four screws (not supplied) to attach the power supply to the table. See Figure 5.2.
- Make sure there is sufficient space around the power supply base to attach cables and to allow for air flow.

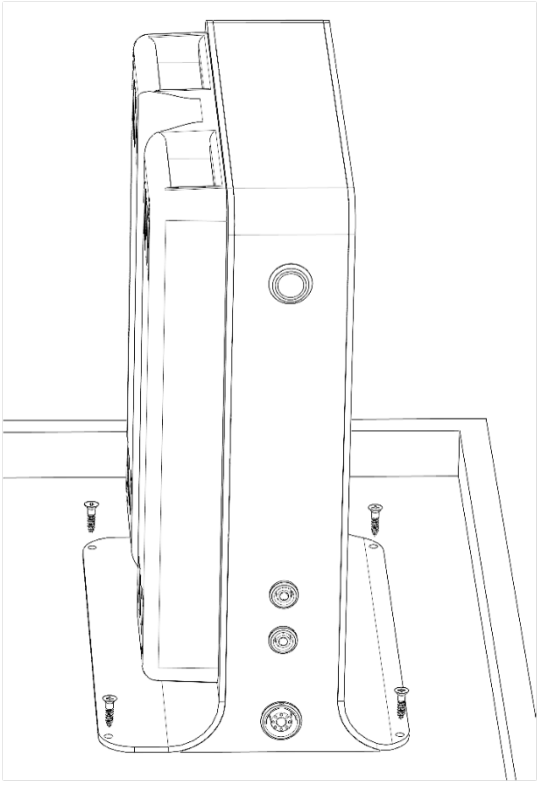


Figure 5.2. After positioning the power supply in the desired location, you may wish to use screws to secure the power supply to the tabletop for added stability.

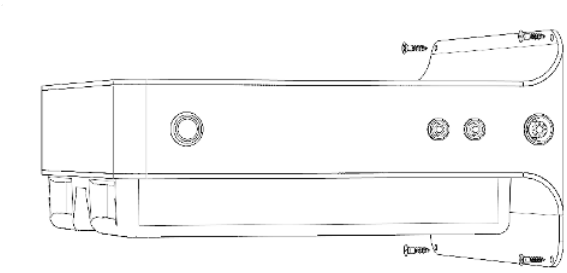


Figure 6.1. The Orion x-Series power supply can be mounted to a vertical surface. Use four screws to secure the power supply to the vertical surface as shown here.

Mounting to a Vertical Surface:

The Orion X can be mounted on a vertical surface using the four holes in the base.

- Locate the desired position to mount the power supply. It is recommended to attach the base to a stud in the wall or other structurally sound vertical supports.
- Use four screws (not included) to attach the power supply securely to the vertical surface. See Figure 6.1.

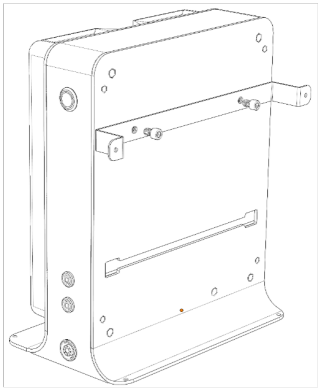


Figure 6.2. To mount the power supply vertically to a vertical surface, first attach the optional mounting bracket to the power supply as shown above.

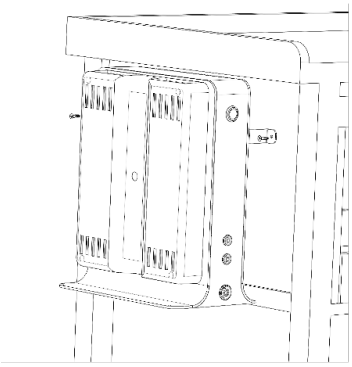


Figure 6.3. Use two screws to attach the mounting bracket and power supply to the vertical surface. The bottom of the power supply will rest against the vertical surface.

Optional Mounting Bracket for Mounting Vertically to Vertical Surface:

Using an optional mounting bracket allows you to attach the power supply vertically to a vertical surface such as the side of a desk or the wall.

- Attach the optional bracket to the power supply. See Figure 6.2.
  - Insert two ¼-20 T-Nuts (not included) into the upper slot on the right panel of the power supply.
  - Use two ¼-20 x 3/8" (not included) socket cap screws to attach the bracket to the T-nuts.
- Locate the desired position to mount the power supply. It is recommended to attach the base to a stud in the wall or other structurally sound vertical supports.
- Use two screws (not included) to attach the power supply securely to the desired vertical surface – the bottom of the base will rest against the vertical surface. See Figure 6.3.

Power Supply Set Up – Back

The cables mentioned below can be found in the accessories box. See Figures 7.1 and 7.2.

Comm Cable

- Plug the included Comm Cable (long display port cable) into the Display port (A).
- Plug the other end of the Comm Cable into the Display Port (E) on the back of the Screen Case (the cable can be routed through the removable cable guides on the arm system if desired). See Figure 7.2.

Shield Gas Tube

- Insert the included 1/4" gas tube firmly into the Shield Gas Port (B).

Note: The gas tube may wiggle when connected but should not come out if pulled on.

Power Cable

- Plug the female end of the included power cable into the "90-250 VAC" Power port (C).
- Connect the male end of the power cable into AC power (wall outlet). The Orion X can accept voltages ranging from 90VAC to 250VAC.

Warning: Connecting other display port compatible devices to the Display Port may damage the welder and/or the other devices.

Foot Pedal

- Plug the foot pedal into the "Foot Pedal" port (D).

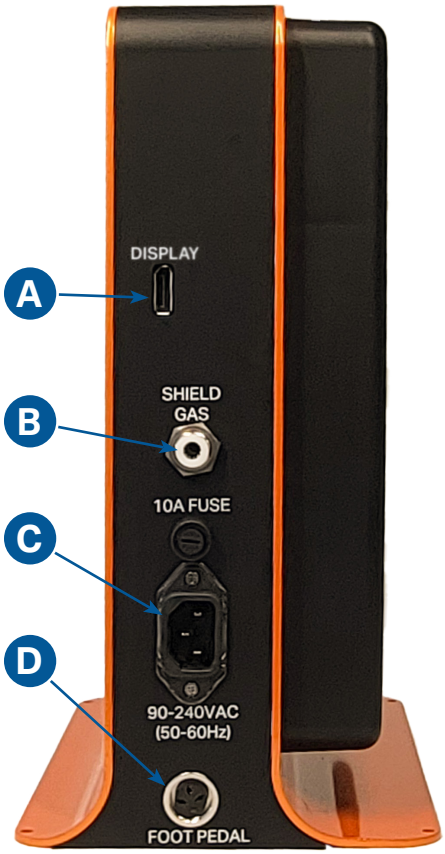


Figure 7.1. Connect the Comm Cable to the Display Port (A). Insert 1/4" gas tube into the Shield Gas Port (B). Plug the female end of the power cable into the 90-250VAC Port (C). Plug the foot pedal cable into the Foot Pedal Port (D).

Figure 7.2. Connect the loose end of the Comm Cable into the Display Port (E) found on the back of the Screen Case.

Figure 8.1. Connect the Stylus cord to the Stylus Port (I). Insert the alligator clip ground to the Grounding Clip Port (H). For the Orion 200x model, connect an additional ground to the Tack Port (G). Turn the welder on by pushing the Power Button (F).

Figure 8.2. The multi-purpose mounting system on the right side of the power supply can accommodate all types of accessories.

Power Supply Set Up – Front

- Insert the stylus connector into the Stylus Port (I) on the bottom of the front panel. See Figure 8.1. Ensure that the RED circular indicator on the stylus lines up with the RED indicator on the stylus port. The connector will snap into place.
- Plug an alligator clip cable into the red Grounding Clip Port (H) on the front panel.
- **Orion 200x Only:** When Tack welding, plug one alligator clip cable into the Tack Port (H) and one into the Grounding Port (G).
- Push in the Power Button (F) to turn the welder on.
- The LED on the power button should light up. The touch screen and the microscope light should power on as well.

Multi-purpose Mounting System

The Orion X is equipped with a multipurpose mounting system on the right-side panel, as shown in Figure 8.2. Sunstone offers a variety of optional accessories that can be purchased separately for these slots.

- Use a ¼ -20 T-SLOT NUT with ¼-20 bolts to attach your accessories.
- Some accessories simply insert into the side pocket and slide into position along the slot.
- Attach any accessories in the desired locations and make sure they are firmly attached.

Electrode Set Up

The Orion welder comes standard with a 1.0 mm electrode collet and (3) 1.0 mm electrodes. The 1.0 mm electrodes are a good multipurpose electrode. The 0.5 mm electrode can be purchased and are more suited for very small applications (less than 5ws of energy).

Stylus Components

Figure 9.1

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

Install the Tungsten Electrode Into the Welding Stylus

See Figure 9.1 and follow these steps to properly install the tungsten electrode.

- Remove the stylus hull (E) by pulling it away from the stylus shaft (A). See Figure 9.2.
- Loosen the collet cap (C) by twisting it counter-clockwise.
- Insert a 1.0 mm electrode into the collet (B). The welder accepts 2 electrode collets. One fits 0.5 mm electrodes (D) and one fits 1.0 mm electrodes (D). The electrode stylus will be shipped with the 1.0 mm electrode collet installed. 0.5 mm collets can be purchased separately.

Helpful Tip: There is a groove cut around the stylus hull that will help measure the electrode length. Place the end of the stylus hull up against the collet cap, then make sure the electrode tip falls between grooves. See Figure 9.3.

- There should be between 0.6 - 0.7 in (1.5 – 2 cm) of the electrode protruding from the stylus shaft (A). This will allow the electrode enough room to stick out from the stylus once the stylus hull is placed back on the stylus.
- Lock the electrode into place by hand tightening the collet cap (C) in a clockwise direction.
- Replace the stylus hull by pushing it in until you feel it snap back into place (the electrode should stick out between 1/8 – 3/8 inch (3.175 – 6.35 mm) after the stylus hull is snapped back into place). See Figure 9.4.

Figure 9.2. To install the electrode, first remove the stylus shaft (A) from the stylus hull (E) by pulling them apart.

Figure 9.3. Use the guide engraved on the side of the stylus hull (E) for proper electrode (D) positioning.

Figure 9.4. The electrode should protrude past the stylus hull (E) 1/8 to 1/4 inch (3.175 to 6.35 mm).

Work-Piece to Electrode 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 in turn cause the electrode to be contaminated (work-piece material on the electrode). We recommend cleaning or changing the electrode any time it gets stuck to the work-piece.

When to Sharpen the Electrode

Refer to Chapter 3 for more information on electrodes.

Most applications are best welded using a sharpened electrode tip. A sharp tip improves arc initiation and helps to focus the arc properly. It is recommended that the user 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 flex shaft tool or you may wish to purchase the Pilot Electrode Sharpener as seen on page 11.

See Figure 10.1 and follow these steps for sharpening the electrode:

- Completely 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.
- Power on the Dremel or flex shaft then hold it with the opposite hand.
- Place the electrode tip on the diamond disc in such a way that the grit of the disk is moving parallel with the electrode shaft and moving towards the tip. View image on the right for help with placement.
- This will affect the quality of the weld if not

Figure 10.1. A sharp electrode tip improves arc initiation and results in a better overall weld.

Figure 10.2. Use a rotary tool to sharpen the electrode.

done as explained above.

- Set the electrode on the diamond disk at a 15-degree angle and begin to spin the electrode with the thumb and middle finger. See Figure 10.2. 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.
- Once the electrode is sharp and clean, turn the Dremel off and insert the electrode back into the stylus as explained above.

Note: As a general rule of thumb we recommend a freshly 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 instead of sharpening it, as shown in Figure 11.1.

PILOT™

ELECTRODE SHARPENER

Need that perfect angle on your electrode? Get our new Pilot: an attachable guide to make sure your electrodes are sharp and ready for welding. Call Sunstone for immediate delivery: +1 801-658-0015 or scan the QR code below.

SHOP

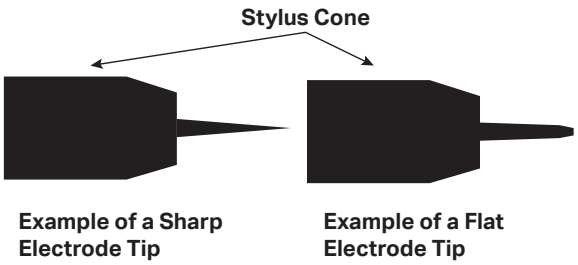


Figure 11.1. When working with silver, copper, and other highly conductive metals, a flat or blunt electrode provides better results.

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. Shielding gas is necessary to produce clean and repeatable pulse-arc welds. We recommend the use of pure argon, and not a mixture. This can be purchased at your local welding supply shop, or from Sunstone directly.

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

Refer to Figures 13.1 and 13.2 and carefully follow these instructions:

GET GAS!

Need argon gas? Sunstone will ship a right-sized tank to your doorstep. No more adventurous trips to the gas store! Call Sunstone for immediate delivery: +1 801-658-0015 or scan the QR code above.

- 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.
- 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 13.2. You should have already connected the other end of the gas tubing (E) to the Shield Gas Port (B), as shown in Figure 7.1.
- Open the gas tank at the main valve (F) slowly as shown in Figure 13.3. 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 6-10 psi. Some regulators will measure in liters per minute. Using the built in psi measurement on the User Interface, adjust to achieve the proper psi. See Figure. 13.1.

Figure 13.1. 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 13.2. Connect the OD gas tube (E) from the power supply to the gas regulator port (D).

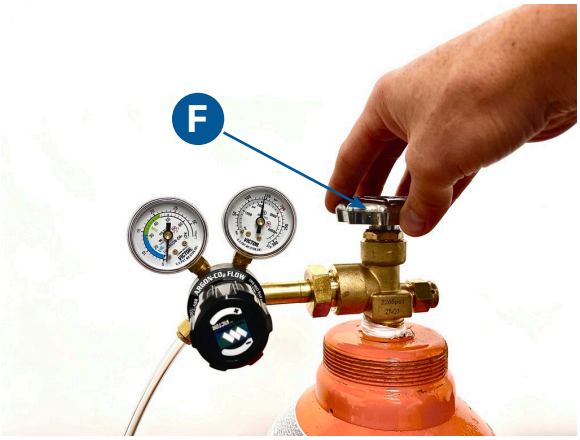


Figure 13.3. Open the shielding gas tank main valve (F) slowly clockwise until the left dial on the regulator port indicates gas pressure of 7-10 liters per minute.

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 X's internal computer verifies the Microscope LCD Filter Shutter System has been closed be-

fore 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.

Figure 14.1. Rest your hands on the table and position the workpiece close to, but not touching the electrode,, Then look through the microscope.

BECOME FAMILIAR WITH THE MICROSCOPE

The Orion 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 these steps while the touch screen is on the "Start" screen (the welds are disabled while this screen is being displayed).

- 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 14.1.
- 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 performing real welds.

POWERTAP™ ENERGY ADJUSTMENT BUTTONS

The stylus holder assembly is equipped with two buttons near the base of the assembly. The PowerTap buttons, as they are called, can be used to raise or lower the weld energy on the fly, without looking away from the microscope eyepiece. Press the upper PowerTap button (A) to increase the weld energy, press the lower PowerTap button (B) to decrease the weld energy.

Increments of energy vary depending on the current energy level. See Page 17 for details.

Figure 15.1. Tactile energy adjustment buttons, or PowerTap buttons, can be found on the upper side of the stylus holder. Press the upper button (A) to increase weld energy; press the lower button (B) to decrease weld energy.

Chapter 2: The Touch Screen Interface

The Orion x-Series user interface can be customized to fit your preferences. Specifically, you can customize the Home Screen to contain only those functions most pertinent to your needs.

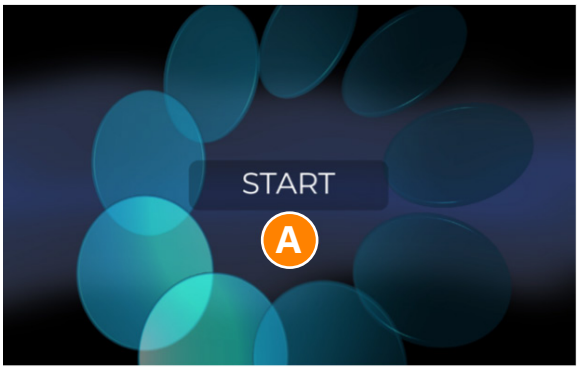


Figure 16.1. Press the "Start" button to begin.

Start Screen

The Start Screen, as shown in Figure 16.1, appears when the welder is powered up and ready to begin.

Press the Start Button (A) to enter the application and be taken to the Home Screen.

Note: The Welder will enter a sleep mode and the Start Screen will appear after 10 minutes of inactivity. Simply press the Start Button to return to the Home Screen.

Figure 16.2. The Home Screen is divided into five sections: Widgets (B), Energy Adjustment (C), Stop Button (D), Trigger Selection (E), and the Menu (F)

Home Screen

The Home Screen is designed to be the main screen from which weld parameters will be adjusted and viewed.

- Widget Section (B)
- Energy Adjustment Section (C)
- Stop Button (D)
- Trigger Select Button (E)
- Menu button (F)

WIDGET SECTION

The Widget Section displays buttons, or widgets, that allow you to quickly access specific features, like Agitation, Ignition, or Brightness. You can choose which widget you wish to display based on your specific needs. The number of widgets that can be displayed depends upon your welder model. The Orion 150X can display up to 3 widgets. The Orion 200X can display up to 6 widgets.

Figure 16.3. The Widget section will display up to 3 widgets with the Orion 150x or 6 widgets with the Orion 200x.

For more information on how to select and customize your widgets, please refer to the Customize Screen section on page 25.

ENERGY ADJUSTMENT SECTION

The Energy Adjustment section displays the current weld energy. The weld energy can be adjusted up or down in four different ways (see Figure 17.1): Energy Slider (G), Left Button (H) or Right Button (I), Keypad (e) or the PowerTap buttons as shown in Figure 15.1.

The Energy Value (a) displays the current weld energy setting. The amount of power displayed here is what the welder will release to the electrode with the next weld. The Energy Value can be as little as 0.15 joules or as much as 200 joules depending upon your model.

Energy Slider (G). This slider adjusts the amount of energy that is being applied in the weld to achieve the desired results for your application. Using your finger, slide left to decrease power; slide right to increase power.

Left Button (H). Tap this button to decrease the welder's current energy. Holding down the left button will decrease the welder's current energy more quickly

Right Button (I). Tap this button to increase the welder's current energy. Holding down the right button will increase the welder's current energy more quickly.

The left and right buttons increment level will scale with the energy level (the higher the energy level, the higher the increment level) according to the table below.

Current Energy Level	Increment per Press
0.15 Joule to 1 Joule	0.05 Joules
1 Joule to 3 Joules	0.2 Joules
3 Joules to 10 Joules	0.5 Joules
10 Joules to 50 Joules	1 Joule
50 Joules to 200 Joules	3 Joules

Keypad (J). To enter your desired weld energy value directly, press the Keypad Icon to open the keypad mode.

PowerTap Buttons. Press the top PowerTap button to increase power; press the bottom PowerTap button to decrease power. See Figure 15.1.

Figure 17.1. The current weld energy (a), i.e., the amount of energy to be released by the welder to the electrode, is displayed in the Energy Adjustment section. You can adjust energy in four different ways: Energy Slider (G); Left Button (H) and Right Button (I), Keypad (J), or the PowerNudge buttons shown in Figure 15.1.

Figure 18.1. Location of the Menu, Stop, and Triggers Buttons.

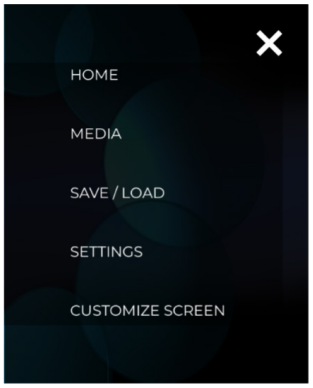


Figure 18.2. When you press the Menu Button (C) you'll open a menu and will be able to navigate to other screens.

STOP BUTTON

When you press the Stop Button (A) the welder will discontinue to function and display the Start Screen. Press the Stop Button to avoid inadvertent changes or weld energy release. See Figure 18.1.

TRIGGER SELECT BUTTON

Energy can be released using two different triggers (B):

Auto Mode. Whenever you touch your grounded work-piece to the electrode the weld sequence automatically initiates.

Pedal Mode. Use the included foot pedal, the weld sequence begins when the foot pedal is depressed.

MENU BUTTON

Press the Menu Button (C) (See Figure 18.1) to open a menu and navigate to the various Orion X screens as shown in Figure 18.2.

Pressing the Menu button opens a navigation popup for access to different sections that control various functions.

Press the Home Button or the 'X" to return to the Home Screen.

The other screens are discussed in detail in the following sections.

Media Screen

The Orion x-Series has been preloaded with various forms of media to assist in achieving great welds. Use the Media Screen (see Figure 19.1) to access the available materials. The included media can be updated via WiFi by pressing "Download Latest Videos". Call Sunstone Customer Service department for assistance.

MANUALS DROP DOWN

Press the Manuals Drop Down (C) to view the user manual. Click on the PDF to show the user manual on the right side of the media screen. Double tapping on

the manual will cause the application to zoom in. If the application is zoomed in all the way, double clicking the user manual once more will set the user manual back to its default size. When zoomed in, the user can scroll the user manual horizontally as well as vertically.

TECHNIQUE DROP DOWN

Press the Technique Drop Down (D) to view a list of instructional videos.

WATCH A VIDEO

Play/Pause Button (E)

Press the Play Button (E) to play the selected video. While playing a video the Play Button will change to a Pause Button. Press the Pause Button to pause video playback.

Rewind Button (F)

Press the Rewind Button (F) to rewind the video by 10 second increments.

Fast Forward Button (G)

Press the Fast Forward Button (F) to advance the video by 10 second increments.

Volume Button (H)

Press the Volume Button (H) to toggle between mute, average volume, and maximum volume.

Video Slider (I)

Use the Video Slider (I) to navigate to the desired time-stamp in the selected video. Using your finger, slide left to rewind; slide right to advance.

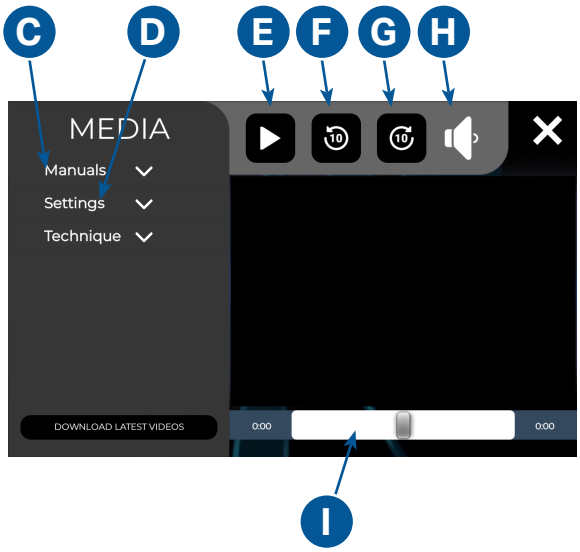


Figure 19.1. With the Media Screen you can access the Users Guide and instructional videos.

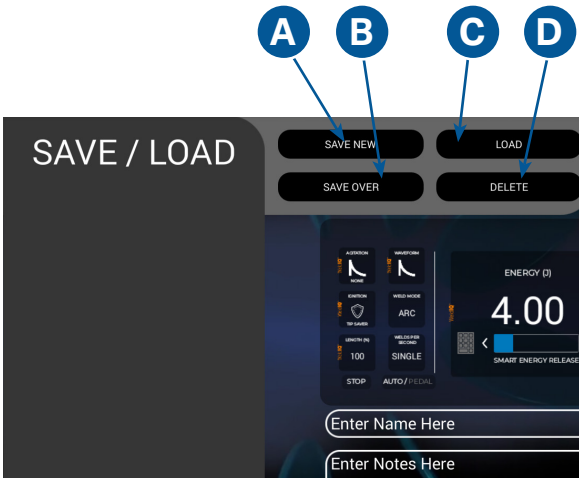


Figure 20.1. Use the Save/Load Screen to save favorite weld settings for future use. Saved welds can accessed or deleted here.

Save/Load Screen

The Orion x-Series can save and load your weld settings for future use. Previously saved welds will be shown on the left side of the Save/Load screen. See Figure 20.1.

Save New Button (A)

Press this button to save the welder's current weld settings as a new weld.

Load Button (C)

Press this button to load a previously saved weld to the welder's current settings. To load a previous weld, first tap on the desired weld on the left side of the screen, then press the Load button. When you load a weld you'll be redirected to the Home screen with the saved weld settings.

Save Over Button (B)

Press the Save Over Button to save the welder's current settings over another previously saved weld. To save over a weld, first select a previously saved weld, then press the Save Over button. The previously saved weld will be overwritten with the welder's current settings.

Delete Button (D)

Press the Delete Button to delete a previously saved weld. To delete a weld, tap a previously saved weld, then press the Delete Button. The deleted weld will be removed from the welder.

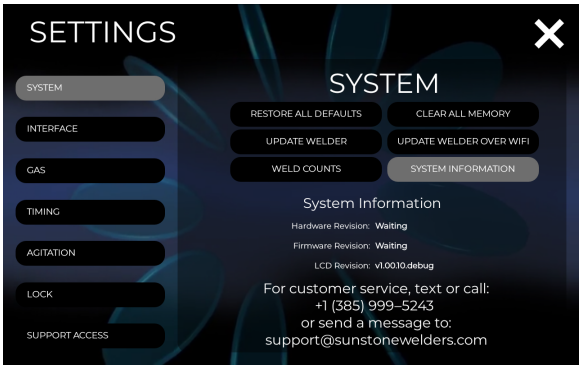


Figure 20.2. Systems Screen.

Settings Screen

The Settings Screen, as seen in Figure 20.2, has navigation tabs that provide access to various system settings and weld parameter settings, specifically:

- System
- Interface

- Gas
- Timing
- Agitation
- Lock
- Support Access

SYSTEM TAB

Press "System" to make changes to the welder's software system, such as restoring defaults, clearing memory, or making software updates.

Additionally, the welder's current software and firmware information will be displayed here. Should you ever contact Sunstone for technical service, you may be asked for this information.

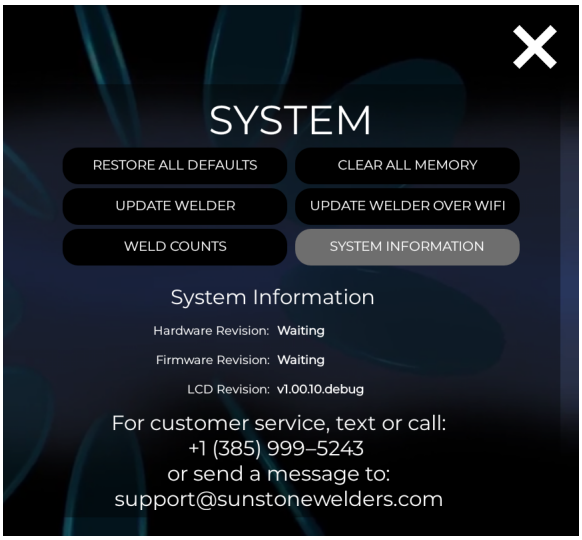


Figure 21.1. System Tab.

Restore All Defaults

Press the Restore All Defaults button to restore the weld settings to the initial default state. Once the system is restored, it can not be undone; make certain you wish to restore defaults before using this function.

Clear All Memory

Press the Clear All Memory button to restore all weld settings to their default state and clear memory of any saved welds, weld counts, and download media.

Update Welder

With assistance from Sunstone, you can update your system using a file stored on a USB drive.

Insert the USB drive into the back of the Screen Case and then press the "Update Welder" button to initiate the process.

Do not take the USB drive out of the screen case until the Update Welder process is completed.

Update Welder Over WiFi

Update your system from the Sunstone Server via WiFi. For further details, please read the Update Welder section shown later in this user manual.

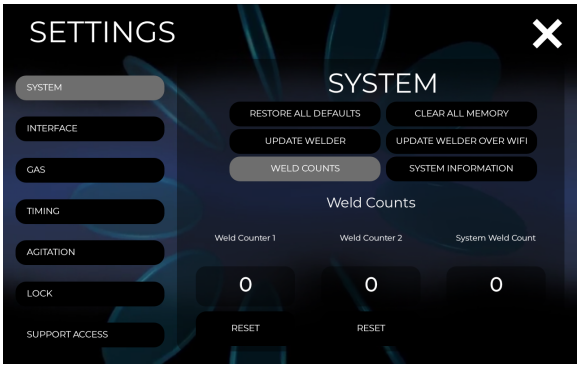


Figure 22.1. The welder will track three different weld counts: Weld Counter 1, Weld Counter 2, and System Weld Count.

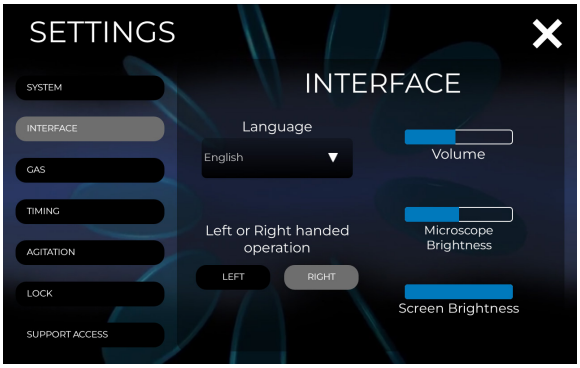


Figure 22.2. Use the Interface Screen to make adjustments to volume, microscope brightness, language selection, and left- or right-hand formatting.

Weld Counts

The Weld Counts screen displays three separate weld counters that increment by 1 each time the system completes a weld. See Figure 22.1. Weld Counter 1 and Weld Counter 2 can be reset to zero by pressing the "RESET" button at any time. The System Weld Count tracks all welds for the duration of the welder's lifetime.

System information

Displays the system information of the welder, including the current hardware, firmware, and LCD versions. Press the X button to exit and return to the Home Screen.

INTERFACE TAB

Volume Slider

The Volume Slider adjusts the volume of the system. Using your finger, slide left to decrease the volume, or right to increase the volume. Press the X button to exit and return to the Home Screen.

Microscope Brightness

Increase or decrease the brightness of the microscope LED light by sliding your finger left or right. Press the X button to exit and return to the Home Screen.

Screen Brightness

Increase or decrease the overall brightness of the screen as desired by sliding your finger left or right. Press the X button to exit and return to the Home Screen.

Language Drop Down

With the Orion x-Series you can choose to operate the welder in many different languages. Select your language from the drop down box. Press the X button to exit and return to the Home Screen.

Left/Right Hand Operation

The Left/Right Hand Operation swaps the Energy Display and the Widget Section. If you are right-handed, having the Energy Display on the right hand side of the screen makes operation easier. If you are left-handed, use this feature to move the Energy Display to the left side of the screen for easier operation. Press the X button to exit and return to the Home Screen.

GAS TAB

The Gas Tab's main feature is a digital gauge showing the current pressure between the welder and the gas regulator attached to the gas tank. To be clear, this gauge does NOT display the pressure in the gas tank, only in the line to the welder.

From this screen you can calibrate the digital gauge, purge the line of any existing gas, or make changes to when gas flows during a weld.

When making a change to the timing sliders, press and hold and a + and - button will appear. These sliders will appear for 5 seconds after the slider has been adjusted.

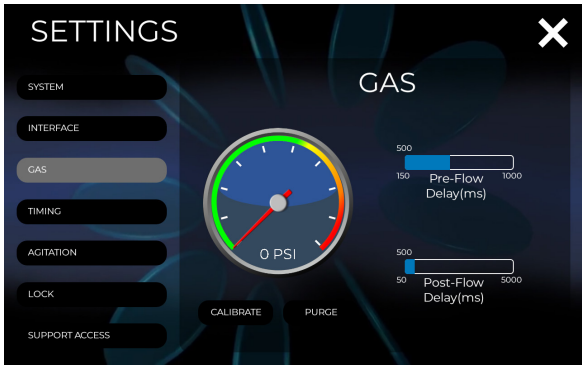


Figure 23.1. The Gas Tab displays the current pressure between the welder and the argon gas regulator.

Pre-flow Delay Slider

The Pre-flow Delay sets how long the gas will be on before the weld initiates, measured in milliseconds. The welder will automatically increase this time if a weld hasn't occurred for a given time in order to purge the line and decrease oxygen at the weld location.

Press and hold the slider to make changes. Press the + button to increase the amount of time wherein gas is flowing BEFORE the weld. Conversely, press the - button to decrease the time.

Post-flow delay slider

Sets how long the gas will remain on after a weld has taken place. Longer delays are useful for metals that oxidize quickly, such as titanium, where oxygen will cause cracks while the molten metal is cooling.

Pre-flow delay impacts the weld speed; the more delay you add more time is required to complete the weld, thus adding more time between welds.

Press and hold the slider to make changes. Press the + button to increase the amount of time wherein gas is flowing AFTER the weld. Conversely, press the - button to decrease the time.

Calibrate Gas Button

Press the Calibrate Gas Button to recalibrate the digital pressure gauge. To calibrate, turn off the gas tank, disconnect the gas from the back of the system and press the button. Be sure to reconnect the gas to the welder when finished.

Purge Gas Button

Purges the line of air and or gas, useful for depressurization and to check gas flow.

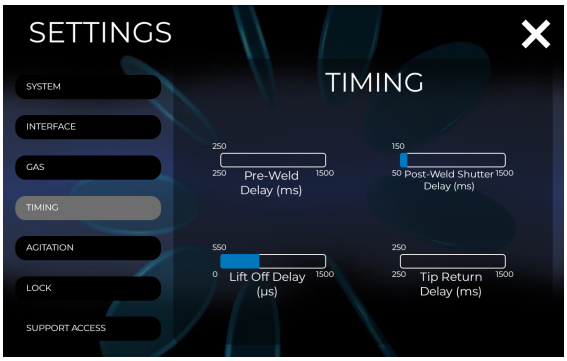


Figure 24.1. The Timing Tab allows you to adjust the amount of time required for each phase of a weld.

TIMING TAB

The Timing Tab allows you to adjust the amount of time required for each phase of a weld. To make a change, tap the slide bar for the delay you wish to edit. When you tap, + and - buttons will appear. Tap the + button to increase the time; tap the - button to decrease the time. The + and - buttons will disappear five seconds after the last touch. Making changes in this tab can affect the welding of your machine. These are advanced settings, and should only be adjusted for specific reasons.

Pre-weld Delay Slider

The Pre-weld Delay Modifies the delay time between weld initiation (touch detect or foot pedal press and the actual arc formation). Increasing the delay can provide extra time to ensure the correct position of the electrode.

Lift-off Delay Slider

The Lift-off Delay adjusts the timing of the weld discharge (arc formation) in relation to the position of the

electrode as it retracts. The longer the delay, the further away from the work-piece the electrode will be when the arc forms. Longer delay times can help improve electrode life; but may lead to increased difficulty in starting or maintaining the arc (aborted welds). Longer delay times can also increase weld spot size inconsistencies.

Post-weld Shutter Delay Slider

The Post-weld Shutter Delay adjusts how long the shutter stays darkened after a weld.

Minimum Time Between Welds

The Minimum Time Between Welds delay adjusts the time the welder will need to wait before it can weld again.

AGITATION TAB

The Orion x-Series allows you to make adjustments to the welder's energy agitation feature. To make a change, tap the slide bar for the delay you wish to edit. When you tap, + and - buttons will appear. Tap the + button to increase the time; tap the - button to decrease the time. The + and - buttons will disappear five seconds after the last touch.

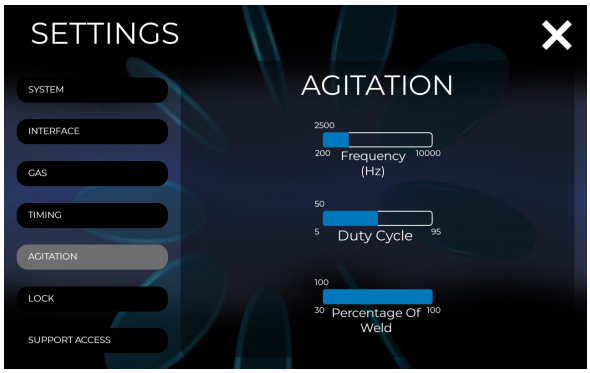


Figure 25.1. Use the Agitation Tab to make adjustments to the welder's energy agitation feature.

Frequency Slider

The Frequency Slider adjusts the frequency (Hz) of the agitation spikes. Typically, values of around 2500Hz are ideal for good weld results, but different metals may require different values. Higher frequencies will help break up crystalline structures during cooling.

Duty Cycle Slider

A higher duty cycle means more spikes will occur during the weld and also means less time between spikes. Higher duty cycles will add more energy to the weld in comparison to lower duty cycles. Use this slider to make any necessary adjustments.

Percentage of Weld Slider

The Percentage of Weld allows the user to set the duration of the agitation spikes in relation to the length of the weld. 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.

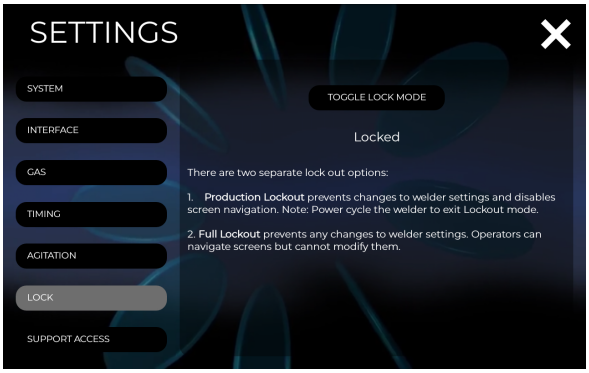


Figure 26.1. The Orion x-Series can be locked in two different modes. Press the Toggle Lock Mode button to cycle between the modes.

LOCK TAB

Toggle Lock Mode

The Orion x-Series can be locked in two different modes: Production Lock Out and Full Lock Out. Press the Toggle Lock Mode button and press the Production Mode Button or Full Lock Out Mode Button.

Production Lock Out Mode

The Production Lock Out Mode allows the welder to be used but no changes can be made to the current weld settings; however, previously saved welds can still be loaded.

To select the Production Lock Out Mode, press the Toggle Lock Mode button then press the Production Lock Out Mode. Enter a 4-digit PIN and then press OK.

To exit the Production Lock Out Mode, press the main menu button in the upper right corner. Then select Settings then select Lock. Then press the Toggle Lock Mode button and select Unlock. Enter the 4-digit PIN.

Full Lock Out Mode

The Full Lock Out Mode allows the welder to be used but no changes can be made to the current weld settings; no changes are allowed to any settings.

To select the Full Lock Out Mode, press the Toggle Lock Mode button then press the Full Lock Out Mode. Enter a 4-digit PIN and then press OK.

To exit the Full Lock Out Mode, press the main menu button in the upper right corner. Then select Settings

then select Lock. Then press the Toggle Lock Mode button and select Unlock. Enter the 4-digit PIN.

SUPPORT ACCESS TAB

The Support Access tab provides advanced, technical access and is reserved for Sunstone's customer service team. The advanced diagnostics available here require a password to access.

Customize Screen

The Customize Screen is where you can choose the widgets you want to appear on the Home Screen. You will want to choose only those widgets that you use often.

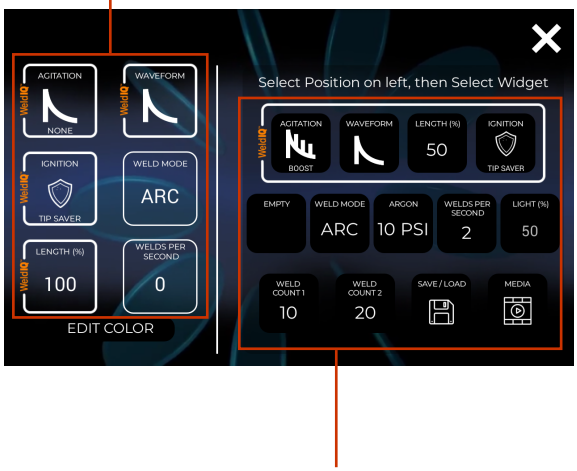
To customize which widgets appear on the Home Screen, follow these steps:

- Select one of the available positions on the left side of the Customize Screen by tapping the desired position. See Figure 27.2.
- Next, select one of the widgets on the right side of the screen to occupy the position that you just selected by tapping on the desired widget. See Figure 27.2.
- The desired widget will then fill the spot you selected on the right.
- As needed, continue to select a widget position first on the left, and then choose the widget you wish to fill that position from available widgets on the right.
- When finished, tap the X button to return to the Home Screen. At the Home Screen you'll see your selected widgets displayed on the left side of the Home Screen.

The Orion 150x only displays three widgets on the home screen. The Orion 200x displays six widgets on the Home Screen. Some widgets are only available on the Orion 200X.

Figure 27.1. The Customize Screen allows you to change which widget you wish to appear on the Home Screen. You can also change the background color here.

Figure 27.2. To customize the Home Screen, first select widget position you wish to assign on the left side of the Customize Screen.



Second, select widget you wish to assign to the spot that you selected on the left side.

Widget List

AGITATION WIDGET

The ability to digitally control agitation is part of Sunstone's WeldIQ technology. Agitation is a high frequency energy variable that can increase weld depth and spot size in certain applications.

None

Select "None" for no agitation added to the weld. This is the standard weld discharge curve with a smooth slope.

Soft (available only with the Orion 200x)

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

Boost

Offers low levels of agitation. It has a minimal impact on spot size formation but yields additional penetration and enhanced weld strength.

Max (available only with the Orion 200x)

Max agitation offers high levels of agitation for improved weld spot strength in some metals. The high levels of agitation energy will affect the spot size due to the extra energy used in this option.

WAVEFORM WIDGET

Use the Waveform Widget to toggle between the pulse arc waveforms (available only with the Orion 200x). The waveforms help control the way the energy is discharged to help weld difficult metals and are part of Sunstone's WeldIQ technology.

Classic

The Classic waveform is the default waveform. It has a high initial peak current, followed by a capacitive discharge slope. One key advantage of the classic waveform is its ability to create large weld spots with shallow surface penetration, which helps keep the overall work-piece cooler. The capacitive discharge slope allows the weld spots to cool with less internal stress, and without surface ripples. Classic welds will typically have a smoother surface than other waveforms.

Triangle

The Triangle waveform (only available on the Orion 200x model) is similar to the classic waveform's ability to make smooth and uniform weld results. One key advantage of the triangle waveform is the ability to set the peak current lower and still be able to discharge the full amount of energy over a long period of time. Welds performed in Triangle mode will typically get deeper into the weld surface than with Classic. Triangle also gives users more control over the total energy being discharged that is possible with Classic.

Square

A Square waveform (only available on the Orion 200x model) allows you to utilize all energy over a longer time period. The difference between Square to Classic and Triangle is the abruptness

Figure 29.1. The Waveform Adjustment widget, only available with the Orion 200x, lets you control how energy is discharged, particularly helpful when working with difficult metals.

of power at the start and end of each weld. The square waveform closely mimics the weld output of a typical laser welder.

WAVEFORM ADJUSTMENT

Use this widget to toggle between the pulse arc waveforms (available only with the Orion 200x). The waveforms help control the way the energy is discharged to help weld difficult metals.

Power

Adjust the power of the weld using the slider, left and right buttons, or keypad.

Length slider

Adjust the length of the weld using the slider, left and right buttons, or keypad. Keep in mind that the higher the length of the weld, the more energy will be discharged (hotter welds).

IGNITION WIDGET

Use the Ignition Widget to toggle between the ignition options. Ignition options affect how the weld arc is initiated are part of Sunstone's WeldIQ tehnology. You can choose between two ignition options: Precision and Tip Saver.

Precision

In the Precision ignition option, the energy discharge occurs at approximately the same time as the tip lifts off the work-piece surface. This 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. Precision 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. Also when welding in a channel of groove, to prevent the arc from jumping to the sides.

Tip Saver

In Tip Saver ignition mode, the energy discharge occurs well after the electrode tip lifts off the work-piece surface. While similar to the Precision option, Tip Saver includes a "pre-heat" function known 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. This additional energy helps preheat the weld area and helps establish an arc when the electrode is further away from the surface. The Tip Saver ignition helps provide better weld consistency by allowing more variation in contact pressure before the weld takes place. The majority of welds should be completed in Tip Saver. Clicking either of these options will direct the user back to the HOME screen.

WELD MODE WIDGET

This widget is used to toggle between Pulse Arc mode and Resistive Tack Mode (only available with the Orion 200x).

Arc Mode

In Arc Mode, the user can customize their weld through agitation, waveform and ignition.

Tack Mode

If you select Tack Mode, the ENERGY ADJUSTMENT section on the HOME screen will change to display the TACK ENERGY in Joules and includes pre-weld delay buttons. Any agitation, waveform, and ignition widgets will be removed from the home screen while Tack Mode is active.

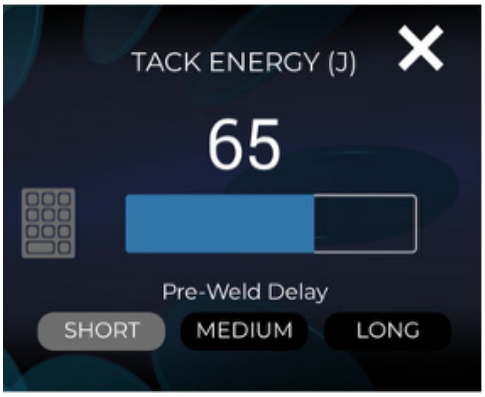


Figure 30.1. Tack Energy Slider.

TACK ENERGY SLIDER

Use the Tack Energy slider to adjust the amount of tack weld energy that will be discharged. See Figure 30.1.

PRE-WELD BUTTONS

Trigger a weld and wait the specified delay time (Short, Medium, or Long) before the weld energy will discharge.

Figure 30.2. Welds per Second Widget.

WELDS PER SECOND WIDGET

The Welds per Second widget (see Figure 30.2) opens the Welds per Second Slider (see Figure 30.3) and allows you to quickly adjust how many welds will be attempted per second.

Figure 30.3. Welds per Second Slider.

WELDS PER SECOND SLIDER

The default setting for this slider is zero. This puts the welder in Single Fire mode – meaning that one weld cycle is attempted per trigger attempt (touch detect or foot-pedal press).

A value higher than zero means that the welder will attempt multiple weld cycles per trigger attempt, up to 4 attempted weld cycles per second.

Figure 30.4. Length Widget.

LENGTH WIDGET

Click the Length Widget (see Figure 30.4) to access the Length Slider (see Figure 31.1). This widget adjusts the amount of discharge time for the weld.

The length of the weld discharge is a large part of how much energy is released into the weld site. The longer the length, the more ener-

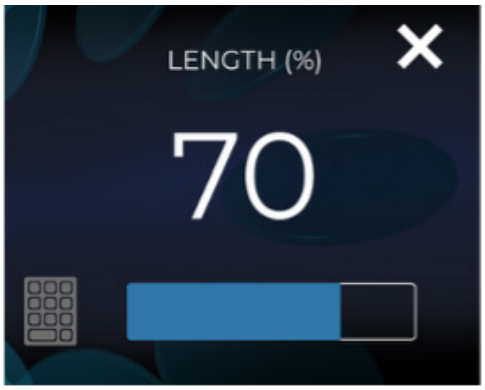


Figure 31.1. The Length Slider allows you to adjust the amount of discharge time for the weld.

gy/heat goes into the weld site - especially in Triangle and Square modes. In Classic Mode, the long length gives weld puddles time to cool properly for smooth results because there is less energy being added to the weld spot the longer the weld lasts.

Length Slider

The Length Slider (see Figure 31.1) allows the user to change the length of the weld. The higher the length setting, the more heat will be generated at the weld site. Press the keypad icon on the left to enter your desired value manually.

SAVE/LOAD WIDGET

Clicking on this widget will redirect the user to the Save/Load Screen See page 20 to learn more about saving welds for later use.

MEDIA WIDGET

Clicking on this widget will redirect the user to the Media Screen. See page 18 to learn how to access this users guide digitally and to watch instructional videos.

GAS WIDGET

Clicking on this widget will redirect the user to the Gas Screen. See page 23 to learn more about managing the shielding gas supply.

LIGHT WIDGET

Clicking on the Light Widget will open the Light Slider (see Figure 31.2).

Figure 31.2. Use the Light Slider to control the brightness of the microscope lights.

Light slider

The Light Slider (see Figure 31.2) allows the user to adjust the brightness level of the microscope lights. Use your finger to adjust the brightness level. Sliding left will decrease the brightness; sliding right will increase the brightness. Alternatively, tap the keypad icon and then manually enter the desired brightness number.

Figure 32.1. Weld Count 1 Screen.

Figure 32.2. Weld Count 2 Screen.

Figure 32.3. Use the Empty Widget should you wish to keep a widget space empty.

WELD COUNT 1 WIDGET

The Orion x-Series allows you to track the number of completed welds using two counters, 1 and 2. Click this widget to access the Weld Count 1 Screen. See page 22 to learn more about weld counts and how to reset weld counts.

WELD COUNT 2 WIDGET

Click this widget to access the Weld Count 2 Screen. See page 22 to learn more about weld counts and how to reset weld counts.

Weld Count reset button

Clicking this button on the Weld Count 1 screen or the Weld Count 2 screen will reset the count for that counter back to 0.

EMPTY WIDGET

Select this widget into any available widget spaces you do not wish to be occupied by a widget (see Figure 32.3). The space will appear blank on the Home screen.

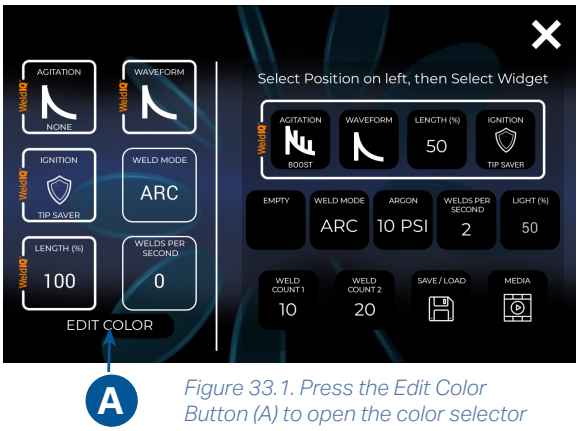


Figure 33.1. Press the Edit Color Button (A) to open the color selector (see Figure 33.2) and change the background color.

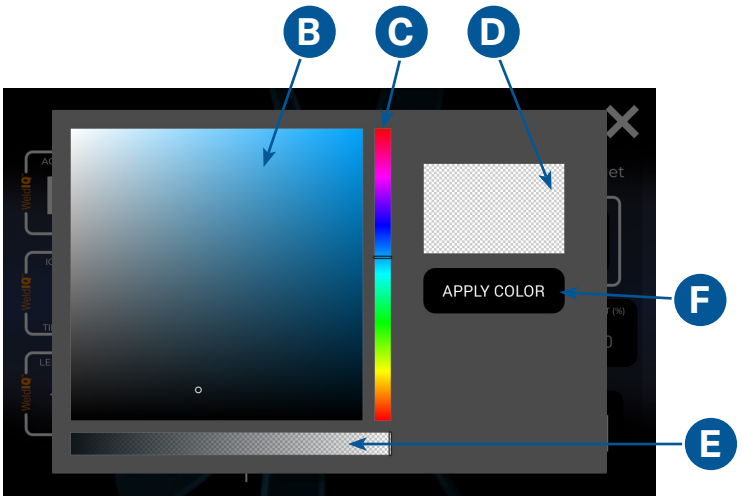


Figure 33.2. Use this color selector screen to change the background color.

How to Edit the Background Color

The Edit Color Button (A) in the Customize Screen (see Figure 33.1) lets you edit the color of all sliders shown on the Home Screen as well as the background color. When you click on the Edit Color Button a color sector screen will appear (see figure 33.2).

COLOR SLIDER (C)

To pick a color, first use the Color Slider on the right to select the general color or hue that you like. Slide your finger up and down to change the color that appears on the left. Once you remove your finger, the color you selected then appear in the Selected Color Square (D). If you like this color, tap the Apply Color Button (F). You'll be redirected to the Home Screen and the color you chose will be represented in the background.

COLOR PICKER (B)

If you're not satisfied with the general color or hue, you can use the Color Picker (B) to find a more specific color that fits your needs. User your finger to tap on the color you like. The color you selected will appear in the Selected Color Square (D). If you like this color, tap the Apply Color Button (F). You'll be redirected to the Home Screen and the color you chose will be represented in the background.

TRANSPARENCY SLIDER (B)

You can make further adjustment to your preferred color by changing the transparency. The Transparency Slider (E) at the bottom of the Color Picker (B) allows you to change the background color's transparency. Selecting a transparency level in the middle of the slider will satisfactory compliment the Orion x-Series software. Should you maximize transparency by sliding all the way to the left, the "circle of circles" design you see in the software background will be covered by the color you chose and will not appear. Should you minimize transparency by sliding all the way to the right, the color you chose will not appear at all. The color you selected will appear in the Selected Color Square (D). If you like this color, tap the Apply Color Button (F). You'll be redirected to the Home Screen and the color you chose will be represented in the background.

Tru-Fire Technology®

Inconsistent weld ignition can lead to misfires, particularly at low energy settings, resulting in wasted time and compromised weld quality.

Sunstone's Tru-Fire Technology is designed to ensure reliable arc initiation. The system automatically detects electrode contact with the workpiece and delivers a controlled ignition pulse, reducing misfires and promoting stable arc formation. Your Orion x-series welder utilizes Tru-Fire Technology with every weld.

For the operator, this translates to improved workflow efficiency, fewer errors, and welds that initiate correctly on the first attempt. Tru-Fire provides consistent performance across a range of applications, from delicate jewelry joints to high-precision industrial welds, maintaining repeatable quality that standard pulse arc welders cannot consistently achieve.

Smart Energy Release

Other welder brands release the entire energy reservoir with each weld, regardless of the actual energy required. For example, if a weld requires 10 joules, other welders discharge all stored energy, directing excess into internal components or dissipating it as heat. This inefficiency increases thermal load, accelerates component wear, and reduces overall machine lifespan.

Sunstone's Smart Energy Release, a feature built into every Orion pulse arc welder, addresses these issues by storing energy in a reservoir and delivering only the precise amount needed for each weld. If 10 joules are required, exactly 10 joules are released, after which the reservoir is automatically replenished for the next operation.

The controlled energy delivery reduces heat generation, minimizes stress on internal components, and extends welder durability. For operators in pulse arc welding or precision TIG applications, this results in cleaner, cooler, and more consistent welds. Smart Energy Release is supported by Orion's 3-year warranty, ensuring long-term reliability and performance.

WeldIQ™

Only available with the Orion 200x, WeldIQ provides comprehensive digital control over the welding process, enabling operators to fine-tune energy delivery for optimal results. This system allows precise adjustment of three critical parameters:

Agitation (Penetration Control)

- Soft (90%): For delicate materials
- Standard (100%): General-purpose welding
- Fine (120%): Increased penetration for added strength
- Max (150%): Maximum penetration for heavy-duty applications

Wave Form (Energy Delivery Style)

- Classic, Square, Triangle: Defines how energy is released during the weld
- Previously available only on larger TIG or laser welders, now integrated into a pulse arc system

Ignition Modes (Start Control)

- Precision Mode: Electrode contacts the workpiece for maximum control; suitable for high-accuracy applications but accelerates electrode wear.
- Tip Saver Mode: Electrode is slightly lifted to reduce wear and extend lifespan; recommended when precision is not critical.

By combining control over penetration, energy waveform, and ignition, WeldIQ enables operators to achieve repeatable, high-quality welds across a variety of materials and applications. Unlike conventional pulse arc welders with fixed settings, WeldIQ allows full customization, giving the operator complete control over each weld.

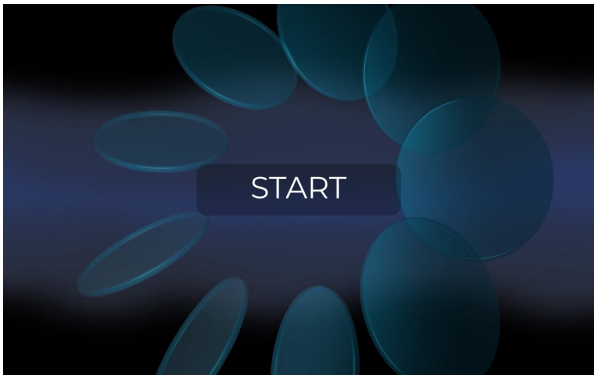


Figure 36.1. When you turn on the Orion x-Series and the Start Button appears, you're ready to start welding. Press the Start Button to begin.

Figure 36.2. The Home Screen is where you will set welding parameters, such as energy, agitation, length, etc.

Figure 36.3. Attach the grounding alligator clip to the stainless steel welding plate.

Chapter 3: Make a Weld

Start Screen

- Upon power up, the Start Screen is displayed, as shown in Figure 36.1.
- Press the "Start" button to open the Home Screen (see Figure 36.2) and to begin welding.
- To return the unit to the Start Screen and deactivate welds, press the STOP button

Make an Arc Weld

Note: For more information on techniques and specifics, refer to Chapter 4 of the Orion Welding Workbook

- Attach the alligator clip firmly to the corner of the provided stainless steel weld plate (or other practice material). See Figure 36.3.
- On the Home Screen, click the Waveform widget (Orion 200x only) and select Classic. If you're using the Orion 150x, Classic is the only available waveform option.
- Next, click the Agitation widget and select None for no agitation.
- Then, click the Length widget and bring the slider up to 100%.
- Slide the Energy bar to the desired value (between 10 and 20 is a good place to start).
- Press the "Auto/Pedal" button to select Auto Detect.

Remember to verify the gas pressure and microscope connection. Purging gas is recommended after the initial setup. See page 24.

- Adjust the arm to a comfortable height. Ideally your hands will be able to rest on the table while making welds for greatest stability.
- Look through the microscope and raise the work-piece toward the stylus until it contacts the electrode as shown in Figure 36.3.

- Once contact is made between the electrode and grounded work-piece; the weld will automatically initiate. The electrode will retract and energy will be discharged to form an arc. Once the energy has discharged, the electrode will return to its original position.

Note: For those who are welding for the first time, the initial tendency is for people to continue pushing upward as the electrode retracts; but it is important to hold the workpiece still during the weld process. Once contact is made, just maintain part position until the weld is over. Pushing up can cause sticking of the electrode. Pulling away can cancel the formation of the arc.

- Use the provided stainless steel weld plate (as shown in Figure 36.3) as a guide to try different settings and practice weld placement. Make several welds on the weld plate to get comfortable with the stylus and the effects of different weld parameters.

Make a Tack Weld (Only Available on 200x)

Note: For more information, visit Chapter 2 of the Orion Welding Workbook.

Tack Weld mode requires the use of two al ligator clips or other cables connected to the black "Tack" terminal and the red "Grounding Clip" terminal on the front of the power supply. See Figure 37.1.

- From the Home Screen, press the Weld Mode Widget and select Tack mode. The Tack Controls will appear. See Figure 37.2.
- Select Short for the Pre-weld Delay. Use the Slider to select desired energy (between 40 and 80 is a good place to start) Press the Auto/Pedal **B**utton to toggle Pedal.
- Attach the negative alligator clip to one work-piece and the positive alligator clip to the other work-piece.
- Lightly touch the two work-pieces together where you want to tack them together. Too much pressure can weaken the tack strength,

Figure 37.1. In Tack Mode, connect one ground to the Tack Port and another ground to the Grounding Clip Port on the front of the welder.

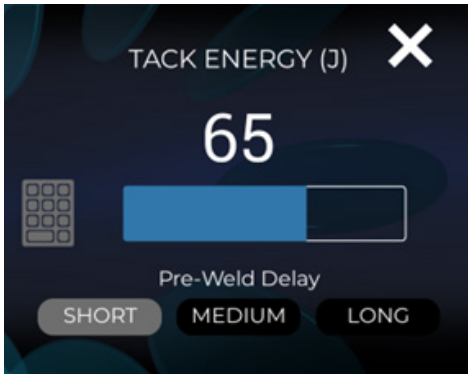


Figure 37.2. The Tack Controls appear when you press the Weld Mode Widget button and select Tack.

Figure 38.1. In Tack Mode, when two work pieces are positioned as desired, using your foot depress the foot pedal to initiate the weld.

too little pressure can cause arcing between the two surfaces and lead to sparks or poor tack quality.

- Step on the foot pedal as shown in Figure 38.1. After a short weld delay, energy will discharge and the weld will take place. Try to maintain even pressure throughout the weld process. Having a lack of pressure will result in a hotter weld and could cause a spark. Having too much pressure will result in a colder weld and could result in an unsuccessful tack weld.
- If the work-pieces stay together, proceed to the Arc screen to perform a permanent weld using the Pulse Arc Welding Stylus. If the pieces do not stay together, move the Total Energy up and repeat steps 2-4.

Finding the Right Settings

Several different factors can affect the way the welder will behave for any given combination of settings (i.e. types of metal being used, thickness of metal, geometry of the work-pieces, gaps between mating surfaces, electrode size and shape, gauge of ground wire, argon coverage, etc.). For this reason, it can be important to experiment and get to know the proper settings for your specific applications.

The Basic Control Layout on the HOME screen can give new users an idea of where to start and helps get the ball rolling initially; but to fine tune the results and maximize weld quality, it can be extremely helpful to make use of the many configurations the Orion X has to offer. Although it can be intimidating to experiment with new technology, "playing" with weld parameters on the Orion X can be a fun, educational experience and lead to a better understanding of welding varied applications.

Welding Tips

- Try the Classic Waveform first. It is usually the easiest to adjust for ideal results. Some metals

will weld better using Triangle Waveform or Square Waveform (Orion 200X only), however. Try all three to see the differences!

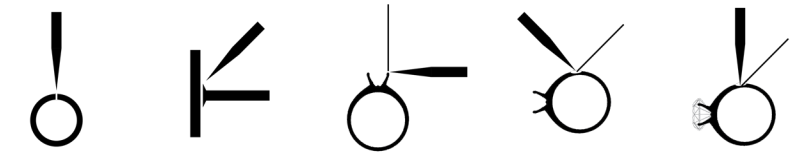
- Always start low in energy and work your way up until the welds are strong enough and look good.
- In Triangle and Square modes, try setting the Length shorter or longer while keeping the Power the same. Compare the results.
- Start with no agitation at first, then add it to see the changes in the results. Compare spot sizes and weld quality for each agitation setting.
- Start with the Standard + ignition profile but try out the Standard as well to find out which one suits your techniques and application best.

"Aiming" the Electrode

Electrode placement in relation to the work-piece prior to the weld can have a large influence on weld quality and behavior. Knowing the correct angle of approach and the correct place to touch the electrode can lead to more consistent weld results and weld quality. Review Figure 39.1 and try these tips:

- Aiming the electrode perpendicular to the surface will deliver the most uniform weld spots and the best smoothing.
- The molten metal can sometimes be "pushed" by aiming the electrode at a steeper angle (other than perpendicular). Some metals (like Silver) flow better than other metals when being welded and care must be taken not to "dig holes".
- When adding fill material, the heat of the weld can actually kind of "pull" the metal toward the electrode. Holding the fill wire too close to the electrode can cause it to stick.
- The weld arc typically originates at the tip of the electrode, but if the shaft of the electrode is close to an edge of the work-piece, arcing can occur and cause the electrode to stick.

Figure 39.1. Electrode Placement Examples



Jump Ring *Earing Post* *Prong Retipping* *Filling Porosity* *Adding Metal*

General Settings:

26 AWG wire/chain/jump ring			
	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			
	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

0.5mm Thick Ring			
	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

1mm Thick Ring			
	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

2mm Thick Ring			
	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)			
	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

Add Material (24 AWG Laser Wire)			
	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

Re tip Prong (26 AWG Wire)			
	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

Orion x-Series Pulse Arc and Resistance Welder		
WELDER		
	150X	**200X**
Languages	20+ (Ask a representative if we have your language)	20+ (Ask a representative if we have your language)
Display	8″ Capacitive Touch Screen	8″ Capacitive Touch Screen
Energy (Ws)	1-150 Ws	1-200 Ws
Switching Power Supply	110/240VAC (Auto Detected)	110/240VAC (Auto Detected)
Resistive Tack	NA	100WS
Estimated Weld Spot Diameter Range	0.25-2.5 mm	0.25-3.0 mm
Footprint (L x W x H)	10″ x 6.25″ x 12″	10″ x 6.25″ 12″
Weight (Power Supply Case)	11lbs (5kg)	11lbs (5kg)
MICROSCOPE		
Stereo Microscope Magnification	5x	5x
Stereo Microscope Eye Protection	>UV 16 and >IR 16	>UV 16 and >IR 16

We're Gonna Treat You Like Royalty!

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

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PROTECTION PLAN

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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

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