

IM2062
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REV01

MAXsa™ 10 CONTROLLER

OPERATOR'S MANUAL



ENGLISH



THE LINCOLN ELECTRIC COMPANY
22801 St. Clair Ave., Cleveland Ohio 44117-1199 USA
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THE LINCOLN ELECTRIC COMPANY

EC DECLARATION OF CONFORMITY



Manufacturer and technical documentation holder:

The Lincoln Electric Company

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EC Company:

Lincoln Electric Europe S.L.

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c/o Balmes, 89 - 8^o 2^a
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SPAIN

Hereby declare that equipment:

K2803, Power Wave AC/DC 1000 SD
K2444, CE Filter
K2814, MAXsa 10 Controller
K2626, MAXsa 19 Controller
K2370, MAXsa 22 Feed Head
K2312, MAXsa 29 Feed Head
(Sales codes may contain suffixes and prefixes.)

Is in conformity with Council Directives and amendments:

Electromagnetic Compatibility (EMC) Directive 2014/30/EU

Low Voltage Directive (LVD) 2014/35/EU

Standards:

EN 60974-1: 2012, Arc Welding Equipment – Part 1: Welding Power Sources;

EN 60974-5: 2013, Arc Welding Equipment-Part 5: Wire Feeders;

EN 60974-10: 2014, Arc Welding Equipment-Part 10: Electromagnetic compatibility (EMC) requirements;

CE marking affixed in 09

Handwritten signature of Samir Farah in black ink, written over a horizontal line.

Samir Farah, Manufacturer
Compliance Engineering Manager

19 January 2017

Handwritten signature of Dario Gatti in black ink, written over a horizontal line.

Dario Gatti, European Community Representative
European Engineering Manager

20 January 2017

MCD240f



12/05

THANKS! For having chosen the QUALITY of the Lincoln Electric products.

- Please Examine Package and Equipment for Damage. Claims for material damaged in shipment must be notified immediately to the dealer.
- For future reference record in the table below your equipment identification information. Model Name, Code & Serial Number can be found on the machine rating plate.

Model Name:	
.....	
Code & Serial number:	
.....
Date & Where Purchased:	
.....

ENGLISH INDEX

Technical Specifications.....	1
Electromagnetic Compatibility (EMC).....	2
Safety	3
Installation Instructions.....	4
Operation Instruction.....	12
WEEE	25
Spare Parts	25
Authorized Service Shops Location.....	25
Electrical Schematic.....	26
Suggested Accessories.....	27

Technical Specifications

MAXsa™ 10 CONTROLLER

INPUT VOLTAGE AND CURRENT			
MODEL	VOLTAGE*	INPUT AMPS*	
K2814-3	40VDC	1.0	
PHYSICAL DIMENSIONS			
HEIGHT (mm)	WIDTH (mm)	DEPTH (mm)	WEIGHT (kg)
381	259	102	11,3
TEMPERATURE RANGES			
OPERATING TEMPERATURE RANGE (°C)		STORAGE TEMPERATURE RANGE (°C)	
-10 to +40		-40 to +85	

IP23 Insulation Class

*When not driving a motor

Electromagnetic Compatibility (EMC)

11/04

This machine has been designed in accordance with all relevant directives and standards. However, it may still generate electromagnetic disturbances that can affect other systems like telecommunications (telephone, radio, and television) or other safety systems. These disturbances can cause safety problems in the affected systems. Read and understand this section to eliminate or reduce the amount of electromagnetic disturbance generated by this machine.



This machine has been designed to operate in an industrial area. To operate in a domestic area it is necessary to observe particular precautions to eliminate possible electromagnetic disturbances. The operator must install and operate this equipment as described in this manual. If any electromagnetic disturbances are detected the operator must put in place corrective actions to eliminate these disturbances with, if necessary, assistance from Lincoln Electric.

Before installing the machine, the operator must check the work area for any devices that may malfunction because of electromagnetic disturbances. Consider the following.

- Input and output cables, control cables, and telephone cables that are in or adjacent to the work area and the machine.
- Radio and/or television transmitters and receivers. Computers or computer controlled equipment.
- Safety and control equipment for industrial processes. Equipment for calibration and measurement.
- Personal medical devices like pacemakers and hearing aids.
- Check the electromagnetic immunity for equipment operating in or near the work area. The operator must be sure that all equipment in the area is compatible. This may require additional protection measures.
- The dimensions of the work area to consider will depend on the construction of the area and other activities that are taking place.

Consider the following guidelines to reduce electromagnetic emissions from the machine.

- Connect the machine to the input supply according to this manual. If disturbances occur it may be necessary to take additional precautions such as filtering the input supply.
- The output cables should be kept as short as possible and should be positioned together. If possible connect the work piece to ground in order to reduce the electromagnetic emissions. The operator must check that connecting the work piece to ground does not cause problems or unsafe operating conditions for personnel and equipment.
- Shielding of cables in the work area can reduce electromagnetic emissions. This may be necessary for special applications.

WARNING

EMC classification of this product is class A in accordance with electromagnetic compatibility standard EN 60974-10 and therefore the product is designed to be used in an industrial environment only.

WARNING

The Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radio-frequency disturbances.





WARNING

This equipment must be used by qualified personnel. Be sure that all installation, operation, maintenance and repair procedures are performed only by qualified person. Read and understand this manual before operating this equipment. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment. Read and understand the following explanations of the warning symbols. Lincoln Electric is not responsible for damages caused by improper installation, improper care or abnormal operation.

	<p>WARNING: This symbol indicates that instructions must be followed to avoid serious personal injury, loss of life, or damage to this equipment. Protect yourself and others from possible serious injury or death.</p>
	<p>READ AND UNDERSTAND INSTRUCTIONS: Read and understand this manual before operating this equipment. Arc welding can be hazardous. Failure to follow the instructions in this manual could cause serious personal injury, loss of life, or damage to this equipment.</p>
	<p>ELECTRIC SHOCK CAN KILL: Welding equipment generates high voltages. Do not touch the electrode, work clamp, or connected work pieces when this equipment is on. Insulate yourself from the electrode, work clamp, and connected work pieces.</p>
	<p>ELECTRICALLY POWERED EQUIPMENT: Turn off input power using the disconnect switch at the fuse box before working on this equipment. Ground this equipment in accordance with local electrical regulations.</p>
	<p>ELECTRICALLY POWERED EQUIPMENT: Regularly inspect the input, electrode, and work clamp cables. If any insulation damage exists replace the cable immediately. Do not place the electrode holder directly on the welding table or any other surface in contact with the work clamp to avoid the risk of accidental arc ignition.</p>
	<p>ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS: Electric current flowing through any conductor creates electric and magnetic fields (EMF). EMF fields may interfere with some pacemakers, and welders having a pacemaker shall consult their physician before operating this equipment.</p>
	<p>CE COMPLIANCE: This equipment complies with the European Community Directives.</p>
	<p>FUMES AND GASES CAN BE DANGEROUS: Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. To avoid these dangers the operator must use enough ventilation or exhaust to keep fumes and gases away from the breathing zone.</p>
	<p>ARC RAYS CAN BURN: Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing. Use suitable clothing made from durable flame-resistant material to protect you skin and that of your helpers. Protect other nearby personnel with suitable, non-flammable screening and warn them not to watch the arc nor expose themselves to the arc.</p>
	<p>WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION: Remove fire hazards from the welding area and have a fire extinguisher readily available. Welding sparks and hot materials from the welding process can easily go through small cracks and openings to adjacent areas. Do not weld on any tanks, drums, containers, or material until the proper steps have been taken to insure that no flammable or toxic vapors will be present. Never operate this equipment when flammable gases, vapors or liquid combustibles are present.</p>
	<p>WELDED MATERIALS CAN BURN: Welding generates a large amount of heat. Hot surfaces and materials in work area can cause serious burns. Use gloves and pliers when touching or moving materials in the work area.</p>
	<p>SAFETY MARK: This equipment is suitable for supplying power for welding operations carried out in an environment with increased hazard of electric shock.</p>

	<p>CYLINDER MAY EXPLODE IF DAMAGED: Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. Always keep cylinders in an upright position securely chained to a fixed support. Do not move or transport gas cylinders with the protection cap removed. Do not allow the electrode, electrode holder, work clamp or any other electrically live part to touch a gas cylinder. Gas cylinders must be located away from areas where they may be subjected to physical damage or the welding process including sparks and heat sources.</p>
	<p>MOVING PARTS ARE DANGEROUS: There are moving mechanical parts in this machine, which can cause serious injury. Keep your hands, body and clothing away from those parts during machine starting, operating and servicing.</p>

Installation Instructions

Read this entire section before installation or operation of the machine.

General Physical Description

- The MAXsa™ 10 CONTROLLER is a user interface and a feeder controller. The control is used to set all welding parameters and control any travel mechanisms. High-speed digital cables connect the control, wire drive, and the Power Wave power source together.
- The MAXsa™ 10 CONTROLLER is a self-contained control box designed to control the entire weld arc at one location.
- The user interface utilizes alphanumeric displays for advanced text messaging providing the end user with an intuitive interface allowing for easy set up and real-time control of all welding parameters.
- An eight button memory section has been included which provides easy storage and recall of stored welding parameters.
- The user interface can be removed from the control box and connected as a Pendant for remote control near the arc.

General Functional Description

- The MAXsa™ 10 CONTROLLER is one of the most versatile user interfaces ever created. Easy to use features make it a snap to adjust the arc for specific preferences.
- The user interface brightly displays essential welding information. Use it to quickly adjust weld settings, arc starting parameters, arc end parameters and set-up information.
- The memories allow for up to eight weld schedules to be stored and quickly recalled. The user interface allows for multiple levels of limits and lockouts.
- Digital communications to the power source provide the most accurate and reliable operation possible.
- When the MAXsa™ 10 CONTROLLER is coupled to the Power Wave® AC/DC 1000 SD welding power source, the result is a welding system with the best arc performance on the market.

Definitions of Welding Modes NON-SYNERGIC WELDING MODES

- A Non-synergic welding mode requires all welding process variables to be set by the operator.

SYNERGIC WELDING MODES

- A Synergic welding mode offers the simplicity of single knob control. The machine will select the correct voltage and amperage based on the wire feed speed (WFS) set by the operator.
- See the Power Wave® AC/DC 1000 SD Operator's Manual for available weld modes.

COMMON WELDING ABBREVIATIONS

SAW

- Submerged Arc Welding

GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL

	<p>PENDANT ARCLINK CONNECTOR</p>
	<p>WIRE FEEDER</p>
	<p>CONTROLLER ARCLINK INPUT CONNECTOR</p>
	<p>FLUX HOPPER CONNECTOR</p>
	<p>TRAVEL CARRIAGE CONNECTOR</p>

Design Features

- Easy control of all weld parameters.
- 8 Memories for easy storage and recall of weld schedules.
- Weld parameter limit setting and lockout capabilities.

- Digital communications for accurate and reliable performance.
- PC boards are potted in epoxy for the ultimate in outdoor protection.
- Connectors are filled with environmental protective grease.
- Designed for the Power Wave® AC/DC 1000 SD series of products for the best arc in the industry.
- Wire feed speed accuracy calibrated to within 2%.
- Digital display of voltage and wire feed speed.
- Tachometer controlled wire drive motor.
- Flux Fill Switch.
- Bright, high intensity digital read-outs.
- Option to convert to hand-held pendant included.

Recommended Processes and Equipment

- The MAXsa™ 10 CONTROLLER is best suited for submerged arc welding only with the Power Wave® AC/DC 1000 SD, the MAXsa™ 22 or the MAXsa™ 29 Feed Heads.
- SAW

Welding Voltage

Wire feed parts are electrically live while welding and while inching wire (with Touch Sense feature selection). The electrically live parts are listed below:

Electrode	Electrode Reel
Wire Drive Motor	Drive Rolls
Gear Box	Cross-seam Adjuster
Wire Straightener	Welding Nozzle
Welding Cables	Welding Cable Terminal

WARNING

- Do not touch electrically live parts or electrodes with your skin or wet clothing.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.

MECHANICAL HAZARDS

- Welding fixture or wire feeder will move during welding or inching. Keep away from pinch points.
- Electrode reel and drive rolls turn during welding or inching. Keep gloved hands away from areas that may catch the glove

Location and Mounting

The MAXsa™ 10 Controller will operate in harsh environments and can be used outdoors with an IP 23 rating. Even so, it is important that simple preventative measures are followed in order to assure long life and reliable operation. The MAXsa™ 10 Controller must be located where there is little risk of impacts to the Controller.

This equipment is for industrial use only and it is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in residential locations due to conducted as well as radiated radio-frequency disturbances. The EMC or RF classification of this equipment is Class A.

High Frequency Protection

Locate the MAXsa™ 10 Controller away from radio controlled machinery. The normal operation of the MAXsa 10 Controller may adversely affect the operation

of RF controlled equipment, which may result in bodily injury or damage to the equipment.

Auxiliary Equipment Input Power Connection

The MAXsa 10 Controller has the ability to control auxiliary equipment such as feeders, flux hoppers and travel motors using solid state relays. There are three relays (CR1, CR2 & CR3) in the MAXsa 10 Controller, controlled by two independent coil drivers. The coils of CR1 and CR2 are in parallel, therefore, they must turn ON and OFF at the same time. The CR1 and CR2 relays are designated for driving travel motors to control motion. CR3 is driven separately, and is designated to control flux hopper operation.

MAXsa 10 Controller Relay Ratings:

Coil: 12Vdc, resistance = 86 ohms at 25° C

Normally Closed (N.C.) Contacts: 3A @ 277VAC

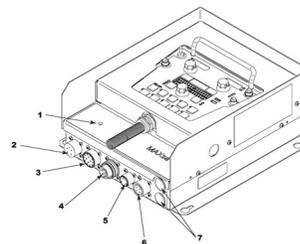
Normally Open (N.O.) Contacts: 30A @ 277VAC

The MAXsa 10 Controller does not provide the input power to feed any equipment, other than the MAXsa 22 or the MAXsa 29 feeders. Therefore a separate power feed must be provided by the end user. The MAXsa 10 Controller has been shipped standard with all of the wiring and connectivity to operate the Lincoln K325 TC-3 Travel Carriage (4-pin cable connector) and the Lincoln K219 Automatic Flux Hopper (3-pin cable connector). The CR2 Relay is wired to the 4-pin travel connector, and the CR3 Relay is wired to the 3-pin flux connector, both located on the bottom of the MAXsa 10 Controller.

If either of these is to be used with the MAXsa 10 Controller, the end-user must provide the 115VAC input power to the terminal strip located inside the MAXsa 10 Controller. Access to the terminal strip may be obtained via one of the two .875" dia. (22.2mm) access holes in the bottom of the MAXsa 10 Controller. These access holes are shipped with plug buttons installed. Remove the plug button and install a suitable strain relief to protect the wires. See Figure #1

WARNING

Although input power to MAXsa 10 Controller is turned off, the customer installed auxiliary input may be energized! Ensure that all input power to the MAXsa 10 Controller is turned off before opening the cover.



1. STATUS LIGHT
2. PENDANT CONNECTOR
3. MAXsa™ 22 or 29 WIRE DRIVE CONNECTOR (14-PIN)
4. POWER WAVE® AC/DC 1000 ARCLINK CONNECTOR
5. FLUX HOPPER CONNECTOR
6. TC-3 TRAVEL CARRIAGE CONNECTOR
7. ACCESS HOLE

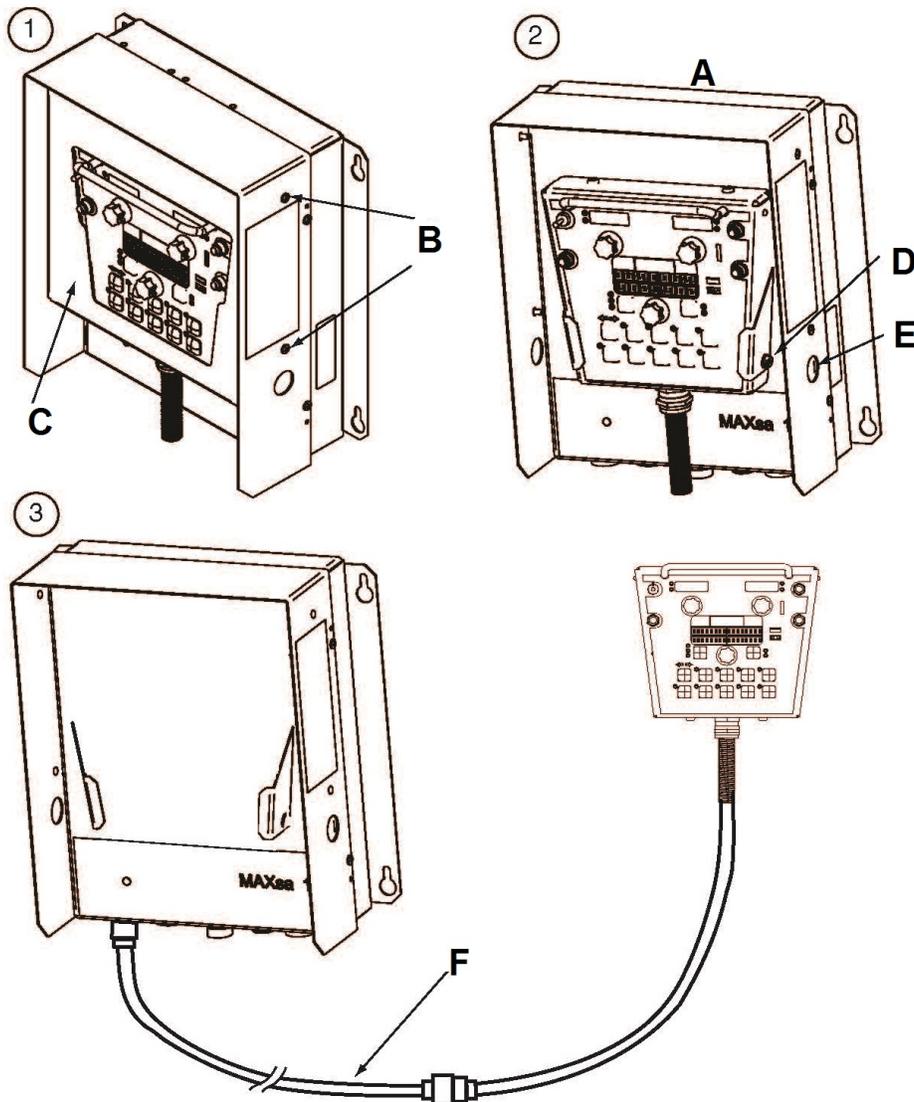
Figure #1: MAXsa 10 Connections

Interfacing to the MAXsa™ 10 Controller

The MAXsa 10 Controller is a versatile controller. The User Interface can be removed and used as a hand-held pendant. Most circuits can be accessed through the screw less terminal strip. The auxiliary relays can control standard Lincoln equipment, or they can be used to control any other auxiliary equipment custom controls. PLC interfacing to control starting, stopping, motion, etc, can be accomplished with ease.

Using the Controller as a Hand-held Pendant:

1. Remove the 4 screws from the MAXsa 10 Controller that hold the cover. See Figure #2.
2. Remove the 2 screws that hold the pendant in the brackets. Use the access holes shown.
3. Extend the control cable as needed with an Arc Link cable. See Figure #2.



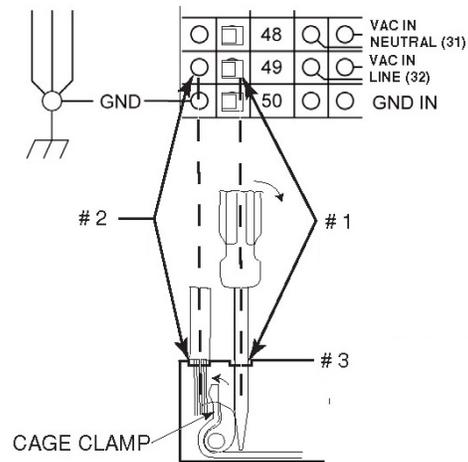
- A. Front View Cover
- B. Cover Screws (4 Places)
- C. Cover
- D. Pendant Screws (2 Places)
- E. Access Hole
- F. K1543-XX or K2683-xx Arclink Cable (Optional)

Figure #2: Hand Held Pendant

Auxiliary Input Power Connection Instructions

Use the appropriate size leads, at least 14AWG – 2wire with ground

1. Remove two Phillips Head screws on right side of front panel of hinged door to access terminal strip.
2. Remove a plug button and install a box connector to provide strain relief for the input power leads.
3. Strip off 1/4" (6.4mm) of insulation from the leads and route them through the strain relief.
4. Locate the 4-terminal blocks, numbered #48, #49, and #50. These are to be used to bring in auxiliary power. Terminal block #50 is used for the input ground connection. This terminal block is color-coded green and yellow for easy identification. Terminal blocks #48 and #49 are to be used to connect the input power circuit. (See Figure #3).
5. Using a flat-head screwdriver with a blade dimension of 0.137" (3.5mm) x 0.020" (.51mm), insert the screwdriver into the square hole next to the mounting hole to be used on the terminal strip. The screwdriver should be inserted until it bottoms out. This opens the screwless cage clamping style wire insertion port. With the cage clamp opened insert the wire into the round port until it bottoms out. While holding the lead securely, remove the screwdriver from the terminal block. This closes the cage clamp onto the lead holding it securely. Any open port on blocks #48, #49, and #50 may be used.



- #1: INSERT SCREW DRIVER HERE
 #2: INSERT WIRE HERE
 #3: REMOVE SCREW DRIVER FROM CAGE CLAMP HOLE.

Figure #3: Auxiliary Connections

Terminal blocks 48 and 49 are shipped connected to the contacts of CR2 and CR3 by leads 531 and 532. These relay contacts are also connected to the 4-pin Travel connector and the 3-pin Flux connector located on the bottom of the MAXsa™ 10 Controller. CR1 is available for a separate customer connection, but it will turn ON and OFF with CR2. Therefore, if Lincoln auxiliary equipment is to be used, connecting 115VAC to the terminal strip is all that is required to power the devices.

NOTE: The contacts of CR1 are not connected to terminals #48 and #49 when shipped. Applying power the #48 and #49 terminals will not transfer voltage to the CR1 relay. Connect leads from the #48 terminal to the #4 terminal and from the #49 terminal to the #3 terminal to supply power to the common contacts of the relay.

Once input power is applied to the terminal strip, this voltage is always on terminal strip blocks #3, #4 (if connected), #11, #17, and #18. These are the inputs to the solid state relay contacts. Input voltage is also present on terminal strip blocks #7, #8 (if connected), #15, #21, and #22 due to the N.C. contacts on the relays. When the CR1 relay is energized, input power is transferred to terminal strip blocks #5 and #6 (if connected). When the CR2 relay is energized, input power is transferred to terminal strip block #13. When the CR3 relay is energized, input power is transferred to terminal strip blocks #19 and #20. CR1 and CR2 will be turned ON and OFF at the same time.

Controlling Non-Lincoln auxiliary Equipment

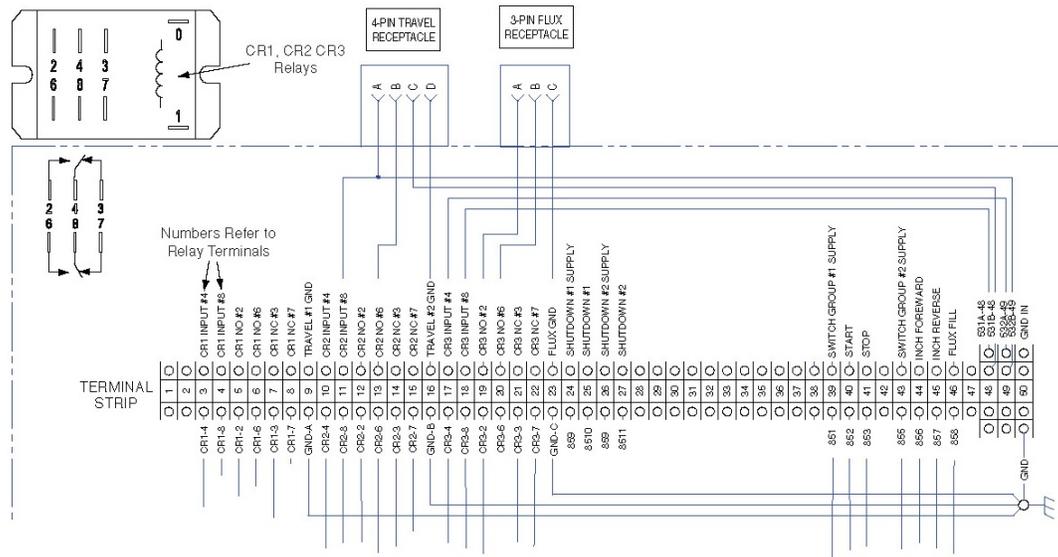


Figure #4: Controlling Non-Lincoln Equipment

Custom motion control and/or other auxiliary equipment can be powered using the terminal strip and relays. To use non-Lincoln motion control and/or flux hoppers, follow instructions below. See Figure #4.

1. Remove all input power to the MAXsa™ 10 Controller including any auxiliary power supplies.
2. Remove the wire duct cover to gain access to the leads on the right side of the terminal strip.
3. Remove a plug button from one of the .875" (22.2mm) access holes on the bottom of the MAXsa 10 Controller control box. Install a suitable strain relief to protect the leads. See **Figure #1**.
4. Remove the leads going from the terminal strip to the corresponding connectors, i.e. terminal strip blocks #11, #13, and #16 for the 4-pin TC-3 Travel Carriage or terminal strip blocks #19, #20, and #23 for the 3-pin Automatic Flux Hopper. See the **Wiring Diagram**.
5. These loose leads can be taped and secured in the wire duct.
6. Any custom or non-Lincoln equipment can be powered by the normally open contacts from relays CR1, CR2, or CR3. The contacts for CR1 are connected to the terminal strip blocks #3 through #8. The contacts for CR2 are Connected to terminal strip blocks #10 through #15. The contacts for CR3 are connected to terminal strip blocks #17 through #22. See Figure #3.

CR1 and CR2 relay coils are in parallel and are BOTH turned ON and OFF as determined by the Travel Options setting (P12 in the Setup Menu) as long as the TRAVEL MODE is set to AUTO. CR3 turns ON with the START command and OFF with the STOP Command.

7. The supply voltage to power the devices is provided by the end user. As shipped, the MAXsa™ 10 has the auxiliary supply blocks (terminal strip blocks #48

and #49) connected to the CR2 relay and CR3 relay inputs, respectively. When the end user connects a supply to the AUX blocks #48 and #49, this voltage will be jumpered to the CR2 and CR3 relay inputs on terminal strip blocks #11, #17, and #18.

NOTE: The CR1 relay is not connected to the AUX terminal strip blocks; the customer must connect power to this relay if it is to be used. See relay ratings listed earlier.

8. Connect input supply voltage per the Auxiliary Input Power Connection Instructions listed earlier.
9. The relays can also be used to provide contact closure for any interfacing signals out using the normally open contacts. An external auxiliary supply voltage would not be necessary to use the relays as hard contact closure out signals.

NOTE: The CR1 relay as shipped does not have AUX leads connected to it. This relay operates as described above and has two normally open / normally closed contacts that could be used as a signal out when interfacing to PLC's or custom controls.

Shutdowns Input

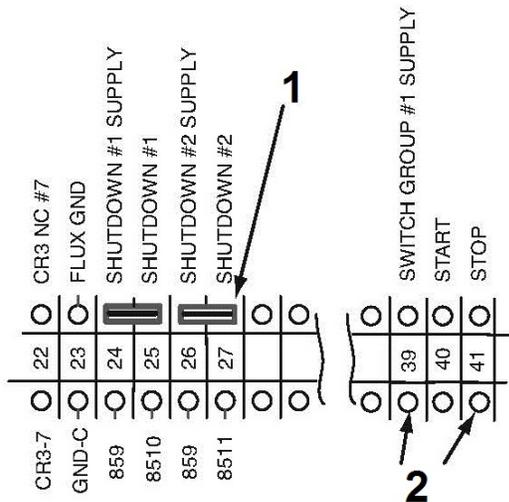
The MAXsa™ 10 Controller has two shutdown inputs available on the terminal strip. These are independent, normally closed inputs that can be used for limit switches, PLC inputs, etc, in order to shut down the welding operation for any reason. Shutdown #1 is located on terminal strip blocks #24 and #25. Shutdown #2 is located on terminal strip blocks #26 and #27.

1. Remove all input power to the MAXsa™ 10 Controller including any auxiliary power supplies.
2. Remove the wire duct cover to gain access to the leads on the right side of the terminal strip.
3. Remove one of the plug buttons located on the bottom of the MAXsa 10 Controller control box and

install some type of strain relief for the auxiliary control leads.

4. Connect the external shutdown circuit to either of the shutdown terminal blocks, #24 & #25, and/or #26 & #27. A normally closed circuit must be connected – the MAXsa 10 Controller will recognize an open circuit as a shutdown command.
5. Remove the shorting jumpers imbedded in the center of the terminal strip with a small screwdriver for the shutdown circuits to be used.

When a shutdown input is received, all welding will stop and an error message will be displayed on the MAXsa 10 Controller. The shutdown circuit must be closed before resetting Controller. To reset the system, the Mode Select Panel display will prompt the user to press the left Mode Select Panel Pushbutton.



1. Shorting Jumper
 2. Connect STOP Input Here
- Figure #5: Shutdown and Stop Inputs

Stop Input

The MAXsa™ 10 Controller has a Stop Input available on the terminal strip. The Stop Input will work just like pressing the STOP Pushbutton. This circuit is in parallel with the STOP Pushbutton located on the Switch Panel. Unlike the Shutdown Inputs, which completely shutdown all welding and auxiliary equipment, the STOP Input will allow all welding and auxiliary motion to continue based on the END OPTIONS configurations in the MAXsa™ 10 Controller. See Figure #5.

1. Remove all input power to the MAXsa 10 Controller including any auxiliary power supplies.
2. Remove the wire duct cover to gain access to the leads on the right side of the terminal strip.
3. Remove one of the plug buttons located on the bottom of the MAXsa™ 10 Controller control box and install some type of strain relief for the auxiliary control leads.
4. Connect the external Stop Input circuit to terminal blocks #39 and #41

NOTE: The STOP circuit only needs a momentary closure to be recognized by the MAXsa™ 10 Controller

Connection Diagram: Single Arc System

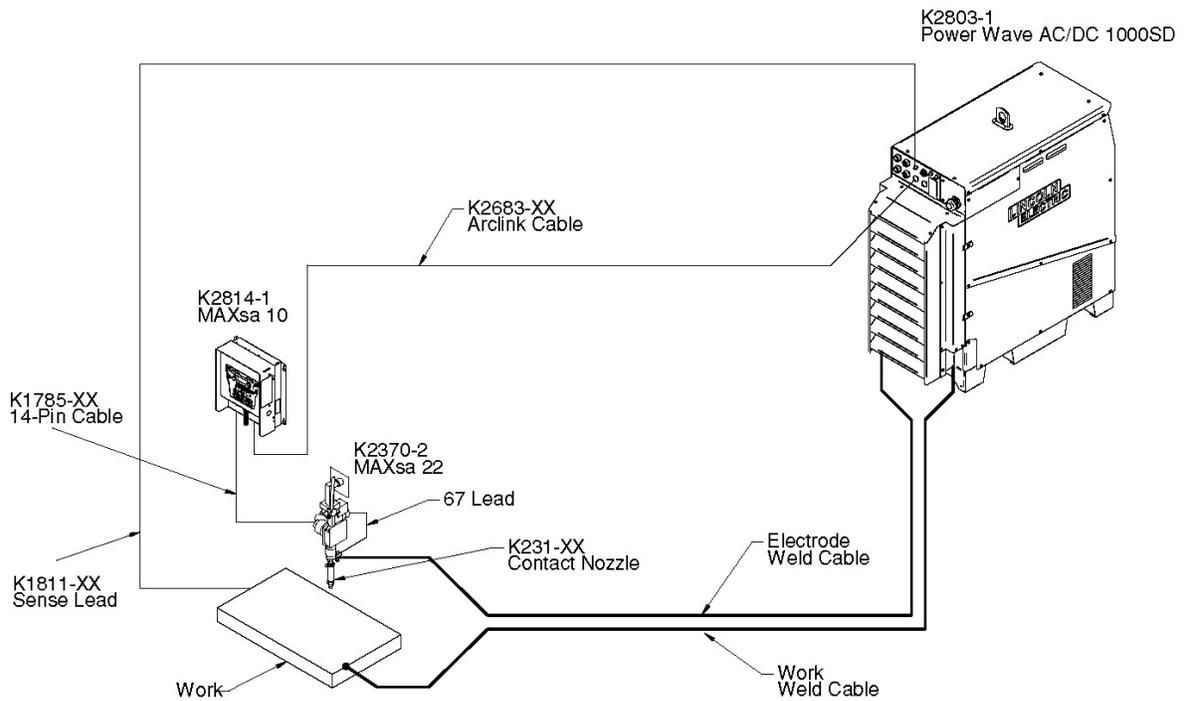


Figure #6
Connection Diagrams for Additional
Configurations (Multi- Arc and Parelleled Power Sources)
are in the Power Wave AC/DC 1000SD Operators Manual

Installation Instructions for MAXsa™ 10 Being used with Power Wave® AC/DC SD

⚠ WARNING

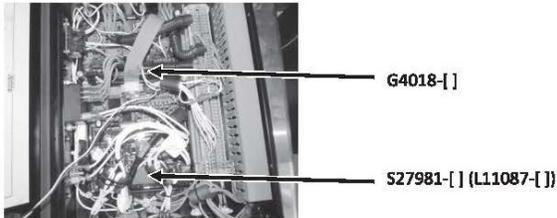


ELECTRI SHOCK Can kill.

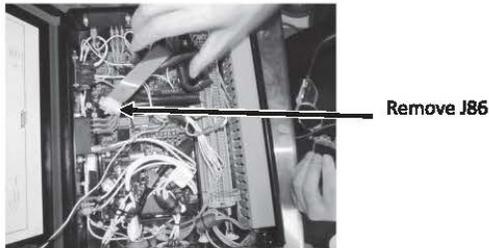
- Turn the supply power OFF at the disconnect switch before working on this equipment.
- Do not touch electrically hot parts.
- Only qualified personnel should install, use or service this equipment.
- Follow all national and local safety procedures.
- Wear the appropriate Personal Protective Equipment

Note: DO NOT DISTURB ANY OTHER HARNESS, LEAD, OR EXISTING GROUND CONNECTIONS DURING INSTALLATION.

1. Open control box and locate S27981-[] (L11087-[]) and G4018-[] boards.



2. Remove J86 connector from the S27981-[] (L11087-[]) board.



3. Remove J331 from the G4018-[] board.



4. 4- G4018-[] is no longer needed. It can stay or be removed.
5. Replace S27981-[] (L11087-[]) board with the S30221-[] (G6752-[]) board.

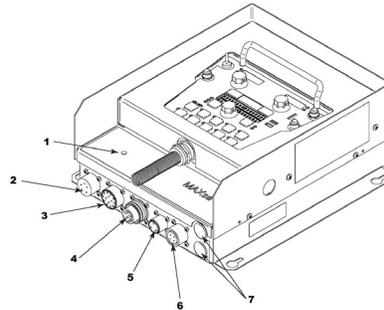


6. 6- Reconnect the J331 connector to J88 on the S30221-[] (G6752-[]) board, then reconnect the rest of the connectors.



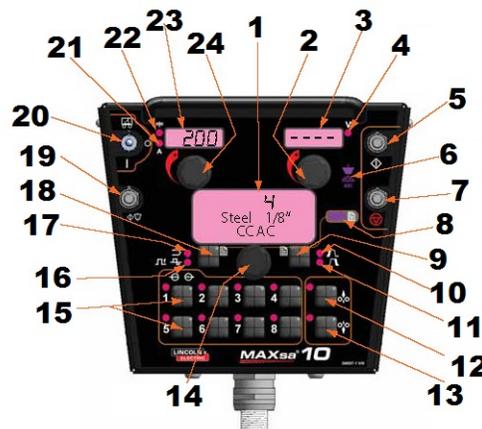
7. Reconnect the input power and assure proper output.

Operation Instruction



1. STATUS LIGHT
2. PENDANT CONNECTOR
3. MAXsa™ 22 or 29 WIRE DRIVE CONNECTOR (14-PIN)
4. POWER WAVE® AC/DC 1000 ARCLINK CONNECTOR
5. FLUX HOPPER CONNECTOR
6. TC-3 TRAVEL CARRIAGE CONNECTOR
7. ACCESS HOLE

Figure #7: Input & Output Connections



1. MODEL SELECT PANEL (MSP) DISPLAY
2. VOLTS CONTROL
3. VOLTS DISPLAY
4. VOLTS INDICATOR
5. START BUTTON
6. WELD OUTPUT INDICATOR
7. STOP BUTTON
8. SET UP MENU INDICATOR
9. ARC START/END OPTIONS SELECTOR
10. START OPTIONS INDICATOR
11. END OPTIONS INDICATOR
12. FEED REVERSE
13. FEED FORWARD
14. WELD MODE, OPTIONS, AND LIMITS CONTROL
15. MEMORY BUTTONS (8)
16. FREQUENCY AND BALANCE INDICATOR
17. WELD MODE INDICATOR
18. WELD MODE SELECTOR
19. FLUX FILL SWITCH
20. TRAVEL SWITCH (AUTO/OFF/MANUAL)
21. AMPS INDICATOR
22. WFS INDICATOR
23. AMPS/WFS DISPLAY
24. AMPS/WFS CONTROL

Power-up Sequence



When power is first applied to the machine the MODE SELECT Display reads “MAXsa Initializing...”. Once the PowerWave AC/DC has initialized (20 to 60 seconds) a “lamp test” is performed.

- All discrete LED’s, seven segment displays and alpha numeric displays will be turned ON for 2 seconds
- After 2 seconds all displays are turned OFF again and the MODE SELECT Display will show:



After initialization is complete, the MSP Display will show the weld mode, the upper displays will show the parameters that were selected when the machine was last powered down and the WELD MODE Indicator will be ON.

Wire Feeder Setup

Use the INCH DOWN pushbutton to insert wire into the feed mechanism.

⚠ WARNING

Prior to inserting the wire make sure that the “Touch Sense” option is disabled. (P.15 in the Setup Menu).



Setting Feed Forward/Reverse

While pressing either the FEED FORWARD or FEED REVERSE pushbutton the MSP Display will read as shown in Figure above and the preset wire feed speed will be displayed on the left (AMPS/WFS) display.

The feed speed can be changed by adjusting the control knob below the display while pressing either button.



FEED REVERSE Use to retract the wire from the feed mechanism.



FEED FORWARD Feeds the wire downward toward the work piece.

NOTE: The MAXsa™ 10 has an option in the Setup Menu (P.15) to enable the “Touch Sense” circuitry. See the **Setup Menu**. When P.15 is enabled and the FEED FORWARD button is pressed, the display will read.



NEW PICTURE!!!!

⚠ WARNING

This “Hot Feed” feature enables the output of the power source and there is voltage on the wire while inching down. Avoid touching any exposed parts as defined in the SAFETY PRECAUTIONS.

Changing and Setting weld Modes

To select a weld mode, press the WELD MODE SELECTOR button until the WELD MODE indicator comes ON (it may already be lit by default at power up). Turn the control knob to select the desired mode. After about 1 second, the parameters for the new mode will be

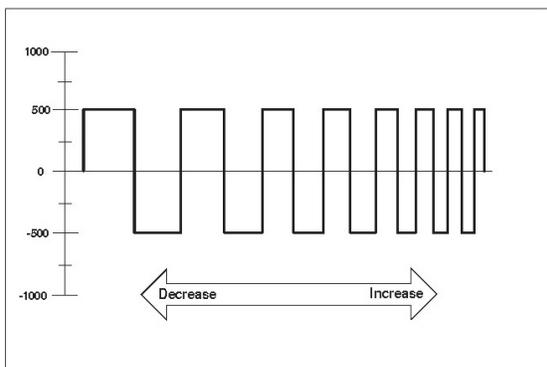
displayed. These parameters can be adjusted with the control knobs below each display.



NOTE: CC Modes will show AMPS in the upper left display. CV Modes will show wire feed speed and the WFS indicator will be lit.

Frequency/Balance Control FREQUENCY ADJUST

Press the WELD MODE selector until the FREQUENCY/BALANCE indicator comes ON and the MSP Display reads "Frequency". If the selected mode allows for frequency adjustment, the Control Knob can be used to select the desired frequency between 20 and 100hz.



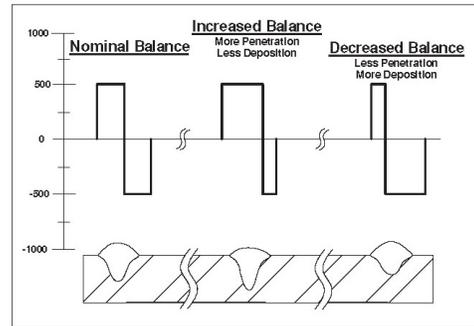
- Use Frequency to fine tune stability of imbalanced waveforms and multiple arc systems
- Frequency adjustment can be used to fine tune stability of imbalanced waveforms and multiple arc system.

BALANCE ADJUST

Press the WELD MODE selector until the MSP Display reads "Balance". If the selected mode allows for balance adjustment, the Control Knob can be used to select the desired wave balance through a range of 25% to 75%.



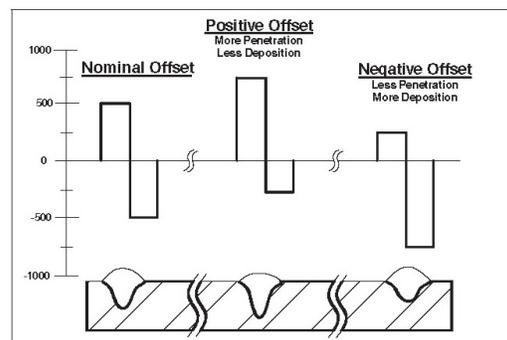
NEW PICTURE!!!!



Adjusting the Balance (the ratio between Positive and Negative half cycle 'on time') changes the deposition for more efficient welding.

OFFSET ADJUST

Press the WELD MODE selector until the MSP Display reads "Offset". If the selected mode allows for offset adjustment, the Control Knob can be used to select the desired offset. The amount of offset allowed is determined by the selected weld mode.



Independent control of the Positive and Negative cycles allows for more precise control of penetration and deposition.

Weld Mode Searching

The Weld Mode Search feature allows the selection of a welding mode based on certain criteria (wire size, process type, etc.).

SEARCHING FOR A WELD MODE

To search for a mode, press and release the control knob while the WELD MODE indicator is lit. Another way to search for a mode is to turn the control knob until “Weld Mode Search” is displayed. This will appear in between the highest and the lowest weld mode number.

Once “Weld Mode Search” is displayed, pressing the right push-button labeled “Begin” will start the search process.

During the search process, pressing the right pushbutton typically acts as a “next” button and the left pushbutton typically acts as a “back” button. Pressing the control knob also acts as a “next” button.

Rotate the control knob then press to select relevant welding details such as welding process, wire type, wire size, etc.

When the final selection is made, the MAXsa™ 10 will automatically change to the weld mode found by the Weld Mode Search process.

Earlier products may not have this feature. To activate this feature, a software update may be needed from www.power-wavesoftware.com

Multiple Arc Configuration

Power Wave® AC/DC 1000SD / MAXsa™ systems can be used in multiple arc set ups with up to six arcs. To minimize magnetic interaction between the arcs it is imperative that they be phased correctly. Phasing is essentially a time offset between the waveforms of different arcs. The phase of each arc is set via the User Interface of the lead arc.

The ideal situation is to have adjacent arcs 90° offset as illustrated in table below.

TABLE B.1 - PHASE RELATIONSHIP

In table B.1 when using 50% balance on all arcs

	ARC 1	ARC 2	ARC 3	ARC 4	ARC 5	ARC 6
2 Arc System	0°	90°	X	X	X	X
3 Arc System	0°	90°	180°	X	X	X
4 Arc System	0°	90°	180°	270°	X	X
5 Arc System	0°	90°	180°	270°	0°	X
6 Arc System	0°	90°	180°	270°	0°	90°

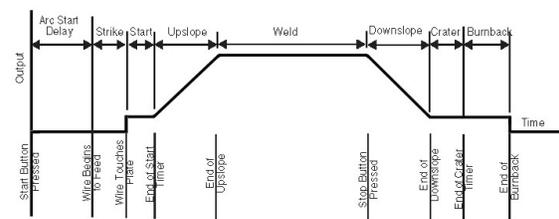
(for balances waveforms only)

See the Power Wave® AC/DC Operator’s Manual for

more information regarding the configuration of multiple arc systems.

Weld Sequence

The weld sequence defines the weld procedure from beginning to end. All adjustments are made through the user interface.



Start Options

The strike, start and upslope parameters are used at the beginning of the weld sequence to establish a stable arc and provide a smooth transition to the welding parameters. They are described in the following:

- **ARC DELAY** inhibits the wire feed for up to 5 seconds to provide an accurate weld start point. Typically used in multi-arc systems.
- **STRIKE** settings are valid from the beginning of the sequence (Start) until the arc is established. They control run-in (speed at which the wire approaches the workpiece) and provide the power to establish the arc. Typically output levels are increased, and WFS is reduced during the strike portion of the weld sequence.
- **START** values allow the arc to become stabilized once it is established. Extended start times or improperly set parameters can result in poor starting.
- **UPSLOPE TIME** determines the amount of time it takes to ramp from the start parameters to the weld parameters. The transition is linear and may be up or down depending on the relationship between the start and weld settings.

Start Options Operation

Pressing the Arc Start/End Options Pushbutton will illuminate the START OPTIONS LED and the Arc Delay Time parameter will show on the MSP Display.

AGGIUNGERE FORO NUOVA!!!

Use the **Mode Select Panel Control** to select the desired delay time. Press the **Weld Mode Selector** to exit the Start parameters.

Repeated pressing of the **Arc Start/End Options** pushbutton will scroll through the parameters. Turning the **Mode Select Panel Control**, while on a parameter will change its value.

When the Start Option is set to a value other than OFF, the START OPTIONS LED will blink synchronous with the WFS or Amps and/or the Volts LED located on the Dual Display Panel prompting the user to enter these parameters. The parameters that can be set by the user in the START OPTIONS will be as follows:

- ARC DELAY TIME
- STRIKE WFS
- STRIKE TIME

START WFS/AMPS
 START VOLTS
 START TIME
 UPSLOPE TIME

End Options

The downslope, crater, and burnback parameters are used to define the end of the weld sequence. They are defined in the following:

- Downslope determines the amount of time it takes to ramp from the weld parameters to the crater parameters. The transition is linear and may be up or down depending on the relationship between the weld and crater settings.
- Crater parameters are typically used to fill the crater at the end of the weld and include both time and output settings.
- Burnback defines the amount of time the output remains on after the wire has stopped. This feature is used to prevent the wire from sticking in the weld puddle and to condition the end of the wire for the next weld. A burnback time of 0.4 second is sufficient in most applications. The output level for burnback is generally set to the same level as the last active weld sequence state (either weld or crater).
- Restrike time determines how long the system will try to re- establish the arc in the event of a poor start or if the arc goes out for any reason (short circuit or open circuit). During restrike, the WFS and outputs are driven in an attempt to reestablish the arc.
 - A restrike time of 1 to 2 seconds is sufficient in most applications.
 - A restrike time of 0 seconds allows the restrike function to continue indefinitely.

End Options Operation

Pressing the Arc Start/End Options Pushbutton after scrolling through the Start Options will illuminate the END OPTIONS LED and the Downslope Time parameter will show on the MSP Display.

AGGIUNGERE NUOVA FOTO!!!!

Use the **Mode Select Panel Control** to select the desired delay time. Press the **Weld Mode Selector** to exit the End parameters.

Repeated pressing of the Arc Start/End Options Pushbutton will toggle through the parameters. Turning the Mode Select Panel Knob while on a parameter will change its value. When the Crater Time is set to a value other than OFF, the END OPTIONS LED will blink synchronous with the WFS or Amps LED (depending on CC or CV Weld Modes) and with the Volts LED located on the Dual Display Panel prompting the user to enter these parameters. The parameters that can be set by the user in the END OPTIONS will be as follows:

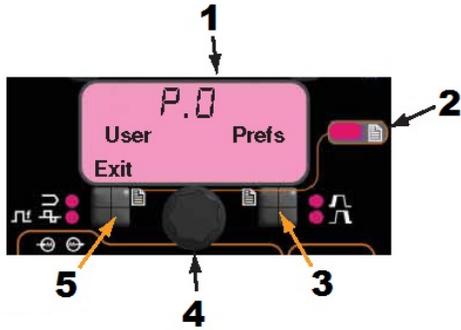
DOWNSLOPE TIME
 CRATER WFS/AMPS
 CRATER VOLTS
 CRATER TIME
 BURNBACK TIME
 RESTRIKE TIME

Setup Menu Features

The Setup Menu provides access for configuring user preferences, which are generally only set at installation. The user preferences are grouped as shown in the following table.

PARAMETER	DEFINITION
P.1 through P.99	Unsecured Parameters (always adjustable)
P.101 through P.199	Diagnostic Parameters (always read only)
P.501 through P.599	Secured Parameters (only accessible with Weld Manager)

Accessing the Setup Menu



1. Mode Select Panel (MSP)
2. Setup Menu Indicator
3. Right Button
4. Control Knob
5. Left Button

1. ACCESS

To access the Setup Menu, Press the Left Button and Right Button simultaneously. The Setup Menu Indicator will light and the lower display will read as shown below.

Note: The Setup Menu cannot be accessed during

welding, or if a fault is displayed. To resume welding, exit the Setup Menu.

2. PREFERENCE SELECTION

Scroll through the Preference list by rotating the Control Knob. Press the Right Button to edit the selected preference.

3. PREFERCE CHANGE

Scroll through the preference options by rotating the Control Knob. Change the preference setting by pressing the Right Button.

To cancel, press the Left Button.

4. EXIT

To exit the Setup Menu, press both buttons simultaneously or select P.0 and press the Left Button. Sixty seconds of inactivity will automatically exit the Setup Menu.

Note: If a product is missing any of the preference options listed below, a software update may be needed from www.powerwavesoftware.com.

User Defined Parameters

Parameter	Name and Description
P.0	<p>Exit Setup Menu This option is used to exit the setup menu. When P.0 is displayed, press the Left Button to exit the setup menu.</p>
P.1	<p>Wire Feed Speed Units This option selects which units to use for displaying wire feed speed. English = inches/minute wire feed speed units (default). Metric = meters/minute wire feed speed units.</p>
P.2	<p>Arc Display Mode This option selects what value will be shown on the upper left display while welding. Amps = The left display shows Amperage while welding (default). WFS = The left display shows Wire Feed Speed while welding.</p>
P.3	<p>Display Options This setup parameter was previously named "Display Energy"</p> <p>If the previous software revision had this parameter set to display energy, that selection will remain.</p> <p>This option selects the information displayed on the alphanumeric displays while welding. Not all P.3 selections will be available on all machines. In order for each selection to be included in the list, the power source must support that feature. A software update of the power source may be needed to include the features.</p> <p>Standard Display = The lower displays will continue to show preset information during and after a weld (default). Show Energy = Energy is displayed, along with time in HH:MM:SS format. Show Weld Score = The accumulative weld score result is shown</p>
P.12	<p>Travel Carriage Start/Stop - Travel Starts This option allows the adjustment of the start and end travel options for a travel carriage. Press the Right Button to enter the option and rotate the Control Knob to select either starting or ending options. Press the Right Button to enter the selected option. Rotate the Control Knob to select the desired function. After selecting the function, press the Left Button to save the function and back out to select another option. Rotate the Control Knob to make another selection, or press the Left Button to exit this option.</p>
P.12	<p>Travel Carriage Start/Stop - Travel Ends This option allows the adjustment of the start and end travel options for a travel carriage. Press the Right Button to enter the option and rotate the Control Knob to select either starting or ending options. Press the Right Button to enter the selected option. Rotate the Control Knob to select the desired function. After selecting the function, press the Left Button to save the function and back out to select another option. Rotate the Control Knob to make another selection, or press the Left Button to exit this option.</p>
P.13	<p>Arc Force Adjustment Options This option allows the adjustment of Arc Force values for Start, Weld and Crater. Press the Right Button to enter the option and rotate the Control Knob to select the desired weld state to adjust. Press the Right Button again to adjust the value on the upper Left Knob. Press the Left Button to save the value and back out to select another weld state. Rotate the Control Knob to make another selection, or press the Left Button to exit this option. This option will not appear if the presently selected weld mode does not support Arc Force.</p>
P.14	<p>Reset Consumable Weight Use this option to reset the initial weight of the consumable package. Press the Right Button to reset the consumable weight. This option will only appear with systems using Production Monitoring.</p>
P.15	<p>Hot-Inch Touch Sense Option This option allows enabling or disabling touch sense when feeding wire forward. Disabled = Touch sensing is disabled when feeding the wire forward (default). Enabled = Touch sensing is active when feeding the wire forward.</p> <p>When enabled and feeding wire forward, the wire is electrically "hot" and waiting to short to the plate. When a short occurs, the wire feed automatically stops and the flux hopper relay is activated until the feed forward button is released.</p>
P.18	<p>Wire Drive Gear Ratio This option selects the Wire Drive Gear Ratio that will be used. The possible selectable values are read from the Wire Drive on startup. For semi-automatic systems, if the feedhead board has dip switches, this option does not appear in the menu. Gear ratio can be selected using the dip switches.</p> <p>Note: Changing this value will cause the system to reset.</p>
P.21	<p>Shutdown 2 Function Select This option allows selection of the Shutdown 2 input function on the control box. Normal Shutdown = The Shutdown 2 input functions as a standard shutdown input that locks out all input buttons (default) Output Disable = The Shutdown 2 input functions as a machine output lockout to disable the welding circuit but still allow cold feeding of the wire.</p>

P.23	<p>Trigger Fan-Out For Sub-Arc Lead Arc machines only. Allows the Lead Arc MAXSA™ 10 to control all machine triggers in a multi-arc system. No = Only the machine connected to the MAXSA™10 can be triggered on and off (default). Yes = All machines in the system can be triggered on and off simultaneously.</p>
P.30	<p>Input Control This option allows the front panel controls of the MAXSA™ 10 to be enabled/disabled. The remote inputs are always functional when connected, but there may be applications where it is necessary to disable the inputs on the pendent. Panel & Remote = All pendent buttons are enabled (default). Panel Locked = The Start, Flux and feed buttons are disabled at the pendent. The pendent's Stop button is always active and cannot be disabled</p>
P.80	<p>Sense From Studs Use this option for diagnostic purposes only. When power is cycled, this option is automatically reset to False. False = Voltage sensing is automatically determined by the selected weld mode and other machine settings (default). True = Voltage sensing is forced to "studs".</p>
P.99	<p>Show Test Modes? Most power sources contain weld modes used for calibration and test purposes. By default, the machine does not include test weld modes in the list of weld modes that are available to the operator. To manually select a test weld mode, set this option to "Yes". When the power source is turned off and back on again, the test modes will no longer appear in the mode list. Test weld modes typically require the machine output to be connected to a grid load and cannot be used for welding.</p>
P.100	<p>View Diagnostics? Diagnostics are only used for servicing or troubleshooting the Power Wave system. Select "Yes" to access the diagnostic options in the menu. Additional parameters will now appear in the setup menu (P.101, P.102, etc).</p>
P.101	<p>View Event Logs Used for viewing all the system event logs. Press the Right Button to enter the option. Rotate Control Knob to select the desired event log to read. Press the Right Button again to enter the selected log. Rotating the Control Knob will scroll through the event log, displaying the log index number, event code and some other data. Press the Left Button to back out to select another log. Press the Left Button again to exit this option.</p>
P.102	<p>View Fatal Logs Used for viewing all the system fatal logs. Press the Right Button to enter the option. Rotate Control Knob to select the desired fatal log to read. Press the Right Button again to enter that log. Rotating the Control Knob will scroll through the log, displaying the log index number and fatal code. Press the Left Button to back out to select another log. Press the Left Button again to exit this option.</p>
P.103	<p>View Software Version Information Used for viewing the software versions for each board in the system. Press the Right Button to enter the option. Rotate Control Knob to select the desired board to read. Press the Right Button again to read the firmware version. Press the Left Button to back out to select another board. Rotate the Control Knob to select another board, or press the Left Button to exit this option.</p>
P.104	<p>View Hardware Version Information Used for viewing the hardware version for each board in the system. Press the Right Button to enter the option. Rotate Control Knob to select the desired board to read. Press the Right Button again to read the hardware version. Press the Left Button to back out to select another board. Press the Left Button again to exit this option.</p>
P.105	<p>View Welding Software Information Used for viewing the Weld Set in the Power Source. Press the Right Button to read the Weld Set version. Press the Left Button to back out and exit this option.</p>
P.106	<p>View Ethernet IP Address Used for viewing the IP address of Ethernet compatible equipment. Press the Right Button to read the IP Address. Press the Left Button to back out and exit this option. The IP address cannot be changed using this option.</p>
P.107	<p>View Power Source Protocol Used for viewing the type of power source the feeder is connected to. Press the Right Button to identify the power source as either LincNet or ArcLink. Press the Left Button to back out and exit this option.</p>
P.501	<p>Encoder Lockout Locks one or both of the upper knobs (encoders), preventing the operator from changing wire feed speed, amps, volts or trim. The function of each upper knob depends on the selected weld mode. When a constant current weld mode is selected (e.g. Stick, TIG, Gouge), the upper right knob will always function as an on/off switch. This parameter can only be accessed using Power Wave Manager software.</p>
P.502	<p>Memory Change Lockout Determines if the memories can be overwritten with new contents. No = Memories can be saved and limits can be configured (default). Yes = Memories cannot be changed - saving is prohibited and limits cannot be re-configured. This parameter can only be accessed using Power Wave Manager software.</p>
P.503	<p>Memory Button Disable Disables the specified memory button(s). When a memory is disabled, welding procedures cannot be</p>

	restored from or saved to that memory. If an attempt is made to save or restore a disabled memory, a message will be displayed on the lower display indicating the memory number is disabled. In multi-head systems, this parameter disables the same memory buttons on both feed heads. This parameter can only be accessed using Power Wave Manager software.
P.504	<p>Mode Select Panel Lock Selects between several Mode Select Panel lockout preferences. When a Mode Select Panel selection is locked and an attempt is made to change that parameter, a message will be displayed on the lower display indicating the parameter is locked.</p> <p>All MSP Options Unlocked = All adjustable parameters on the Mode Select Panel are unlocked. All MSP Options Locked = All knobs and buttons on the Mode Select Panel are locked. Start & End Options Locked = The Start and End parameters on the Mode Select Panel are locked, all others are unlocked. Weld Mode Option Locked = The weld mode cannot be changed from the Mode Select Panel, all others Mode Select Panel settings are unlocked. Wave Control Options Locked = The Wave Control parameters on the Mode Select Panel are locked, all others are unlocked. Start, End, Wave Options Locked = The Start, End and Wave Control parameters on the Mode Select Panel are locked, all others are unlocked. Start, End, Mode Options Locked = The Start, End and Weld Mode Select parameters on the Mode Select Panel are locked, all others are unlocked. This parameter can only be accessed using Power Wave Manager software.</p>
P.505	<p>Setup Menu Lock Determines if the setup parameters can be modified by the operator without entering a passcode. No = The operator can change any set menu parameter without first entering the passcode even if the passcode is non-zero (default). Yes = The operator must enter the passcode (if the passcode is non-zero) in order to change any setup menu parameters. This parameter can only be accessed using Power Wave Manager software.</p>
P.506	<p>Set User Interface Passcode Prevents unauthorized changes to the equipment. The default passcode is zero which allows full access. A nonzero passcode will prevent unauthorized: changes to memory limits, saving to memory (if P.502 = Yes), changes to setup parameters (if P.505 = Yes). This parameter can only be accessed using Power Wave Manager software.</p>
P.509	<p>UI Master Lockout Locks all user interface controls, preventing the operator from making any changes. This parameter can only be accessed using Power Wave Manager software.</p>

Touch Sense

The Touch Sense option, when enabled, allows the operator to feed the wire forward until it touches the workpiece. When contact to the work is made, the wire will stop and the flux hopper (if used) will activate to put flux around the wire and fill the flux feed system. The flux hopper will stay active until the Feed Forward button is released.

WARNING

If the Touch Sense is enabled the Power Source output is ON as long as the Feed Forward button is held. Avoid touching any portion of the weld circuit while feeding down.

If the Touch Sense option is disabled, the wire is “cold” during the Feed Forward time. It will not stop when it touches the work and the flux hopper will not activate.

Lockout / Security

The MAXsa™ 10 can be configured to prevent the operator from changing selected User Interface panel controls. By default, the welder will be able to change the weld mode, all relevant wave controls and all relevant start and end options.

Note that when an option is locked, its value can still be monitored. For example, if start and end options are locked, the welder can still press the right Mode Select Panel Pushbutton and see the value set for Start Time. If the welder attempts to change its value, a message will briefly appear on the Mode Select Panel indicating “MSP Option is LOCKED”

The lockout features are only available through the use of Weld Manager.

Making a Weld

Once the necessary parameters have been set and the desired Weld Mode selected:

Press the START BUTTON to begin welding.

The ARC ESTABLISHED INDICATOR will ‘flash’ as the wire feeds towards the work piece to show that OCV is present and switch to ON when the arc is lit.

If “Start” parameters have been set they will be in effect for the specified time and then the Weld Mode parameters will take effect.

The two upper displays will indicate the “actual” parameters as the weld progresses.

If the TRAVEL function is selected it will begin moving as prescribed in the P.12 Parameter setting.

Press the STOP BUTTON to end the weld.

If “End” parameters have been set, they will take effect for the specified time.

If the TRAVEL function is selected it will stop moving as prescribed in the P.12 Parameter setting.

The ARC ESTABLISHED INDICATOR will go OFF when the power source output is disabled (after Burnback).

The displays will return to the idle state in preparation for the next weld



1. ARC ESTABLISHED INDICATOR
2. START BUTTON
3. STOP BUTTON

Figure: Making a Weld

Using the Memory Option

The MAXsa™ 10 has eight available memory locations for storing procedural information. Each location will store the following information:

- Weld Mode
- Amperage(or WFS)
- Voltage
- Frequency
- Balance
- DC Offset
- Arc Start Options
- Arc End Options

Naming a Saved Procedure

Procedures stored in memory can be given a name that the user will easily recognize such as “Root Pass” “Fill Pass” or “Cap Pass”. As with the Lockout Option, this option is only available through the use of Weld Manager.

Multi Procedure Welding

The MAXsa™ 10 Controller can do “On-The-Fly” welding changes with multiple weld procedures by using the Memory Panel. While welding, any Memory location can be accessed, and the parameters stored in that memory location will be switched in while actively welding.

NOTE: This can only be done with Memory locations that have the same Weld Mode.

While welding, any Memory location trying to be accessed with a different Weld Mode than the one currently being used will be ignored and an error message will be displayed. Up to eight different weld procedures can be used while actively welding by using all of the memory locations, as long as each location utilizes the same Weld Modes.

Memory saving can be optionally disabled using Lockout Levels. If the user attempts to save a procedure to memory location that is locked, the Mode Select Panel will briefly display "Memory Save is DISABLED!". Presently, Memory Panel Lockout Levels can only be accessed through Weld Manager.

Saving a Procedure to a Memory Location

Once the parameters have been set:

- Press and Hold the Memory button of the desired location for 2 seconds.
- The LED for that location will come ON.
- After 2 seconds the LED will go OFF
- The MSP display will show briefly that the information is saved, then return to the Weld Mode.

NOTE: Do not hold the button for longer than 5 seconds.

Recalling a Procedure from a Memory Location

- Press and release the desired Memory Button.
- The LED for that location will come ON and the stored procedure information will show in the displays.
- The LED will remain ON until another location is selected

NOTE: Do not hold the button for longer than 1 second



1. MSP DISPLAY
2. LED INDICATOR
3. MEMORY BUTTON
 - Hold for 2 seconds to save
 - Press and release to recall

Optional Limit Setup

The Limits feature allows the operator to set minimum and maximum values for various parameters depending on the Weld Mode selected.

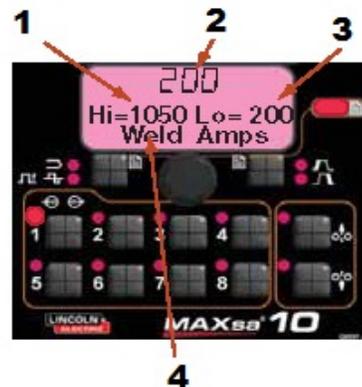
Each memory location may have a different set of limits, even if the Weld Mode is the same. For example: Memory Location 1 can be set for a maximum wire feed speed of 140"/min; Memory Location 2 may be set for a minimum of 100"/min and a maximum of 160"/min and Memory Location 3 may have no WFS limit set.

Parameters are constrained by the machine limitations or by memory limits. When the Memory Limits are enabled the parameter will flash if an attempt is made to set a value outside of the prescribed limit (if less than the machine capabilities). The parameter will not flash if an attempt is made to exceed the machine limits.

NOTE: Weld Modes cannot be selected through the Limits Setup Menu. They must be chosen and saved before entering the Limits Menu.

Setting Limits

1. Press and hold the desired Memory Button until the LED for that location begins to blink rapidly.
 - The MSP Display will read:
 - High Limit
 - Low Limit
 - Parameter Name
2. After 2 seconds the display will change to show the following items:
 - Memory Value



1. Set High Limit
2. Value Low Limit
3. Set Low Limit
4. Parameter Name

3. The Parameter Name on the MSP Display will flash to indicate it is ready to be changed. If no limits were previously set, the High and Low values are the limits of the Power Source
 - Press the Arc Start/End Options button to select that parameter.
 - Use the Mode Select Panel Control to adjust the High Limit (flashing).
 - Press the Arc Start/End Options button.
 - Use the the Mode Select Panel Control to adjust the Value (flashing).
 - Press the Arc Start/End Options button.
 - Use the the Mode Select Panel Control to

- adjust the Low Limit (flashing).
 - Press the Arc Start/End Options button.
 - Use the the Mode Select Panel Control to select another Parameter Name (flashing) and repeat the above sequence until all Limits are set.
4. Press the selected Memory when all limits are set to desired values. The MSP Display will read:



- Use the Weld Mode or the Arc Start/End button to either save or discard the changes

Maintenance

WARNING

For any maintenance or repair operations it is recommended to contact the nearest technical service center or Lincoln Electric. Maintenance or repairs performed by unauthorized service centers or personnel will null and void the manufacturers warranty.

WARNING

Do not open this machine and do not introduce anything into its openings. Power supply must be disconnected from the machine before each maintenance and service. After each repair, perform proper tests to ensure safety.

ROUTINE MAINTENANCE

Check weld cables, control cables and gas hoses for cuts

PERIODIC MAINTENANCE

Not applicable.

CALIBRATION SPECIFICATION

All calibration is factory set on the MAXsa™ 10 Controller.

Customer Assistance Policy

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products

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

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

WEEE

07/06

English



Do not dispose of electrical equipment together with normal waste!

In observance of European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.

By applying this European Directive you will protect the environment and human health!

Spare Parts

12/05

For Spare Parts references visit the Web page : <https://www.lincolnelectric.com/LEExtranet/EPC/>

Authorized Service Shops Location

09/16

- The purchaser must contact a Lincoln Authorized Service Facility (LASF) about any defect claimed under Lincoln's warranty period.
- Contact your local Lincoln Sales Representative for assistance in locating a LASF or go to www.lincolnelectric.com/en-gb/Support/Locator.

Suggested Accessories

BASIC PACKAGE	
Item number	Description
K2803-x	Power Wave ^(R) AC/DC 1000 SD CE
K2370-x	MAXsa 22 Wire Drive
K2814-x	MAXsa 10 Controller/User interface
K2683-xx	Control Cable (5 pin- 5pin) – power source to MAXsa 10
K1785-xx	Control Cable (14 pin- 14pin) – MAXsa 10 to Wire Drive
OPTIONAL KITS	
K2312-x	MAXsa 29 Wire Drive (for Fixture builders)
K2311-1	Motor Conversion Kit (to convert existing NA-3/NA-4/NA-5 wire feeder gear boxes)

Options and Accessories are available at www.lincolnelectric.com

Follow these steps:

1. Go to www.lincolnelectric.com
2. In the Search field type E9.181 and click on the Search icon (or hit "Enter" on the keyboard)
3. On the results page, scroll down to the Equipment list and click on E9.181.

All of the information for the PowerWave System accessories can be found in this document.