



SUPERCELLTM

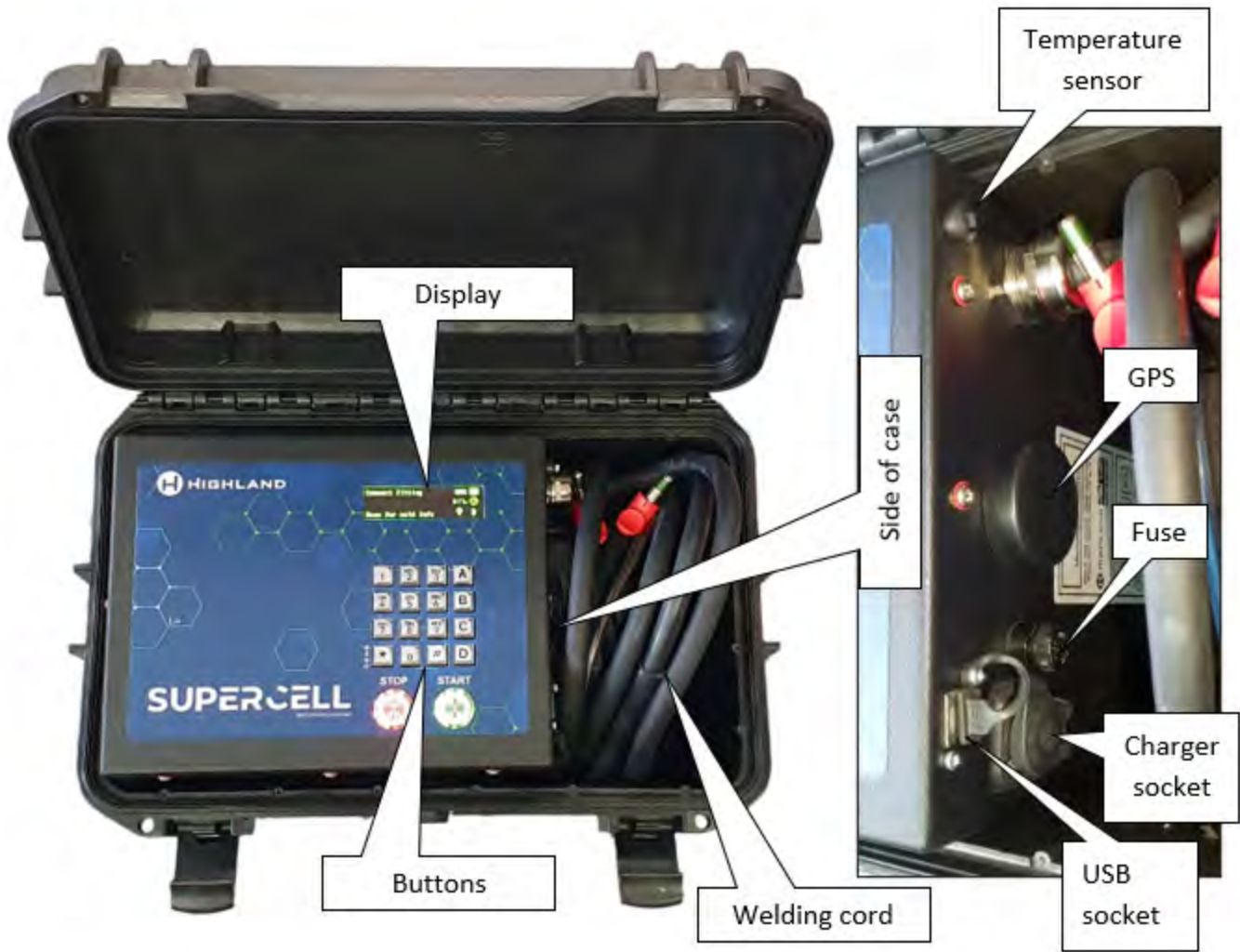
Lithium-ion powered electrofusion processor

Operations Manual

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OPERATING CONTROLS



DELIVERED ITEMS

Carefully remove the welding processor from its packaging and check that you have the following items:

- Welding processor.
- Wireless bar code scanner.
- Mains powered battery charger.
- +12V dc car charging lead.
- USB memory drive.

Note: to download a copy of this manual, visit www.supercellef.com

INTENDED USE

This equipment is intended to fuse constant voltage electrofusion fittings suitable for low, medium, and high-pressure pipe work systems, up to a maximum diameter of 14 inch (355mm).

This welding processor has been designed to comply with the International Organization for Standardization standard ISO12176-2:2000 "Plastic pipes and fittings, equipment for fusion jointing polyethylene systems, part 2, electrofusion".

INTRODUCTION

This manual gives instructions on the correct assembly and safe use of your electrofusion processor. It is important that you read these instructions and always keep these instructions with the unit.

This manual does not detail the specific welding procedure for the fittings: peeling, clamping and assembly of joints. For this information, please contact the fittings manufacturer or refer to your organization's internal procedures.

PRODUCT SPECIFICATION

Operating Type:	Controlled voltage.
Operating Modes:	Manual, Bar Code
Operating Languages:	English, French, Spanish (Others on request)
Operating Temperature:	-4°F to 113°F #1
Welding Voltage:	8 to 48 V (39,5 V) (true rms)
Welding Current:	1 to 65 A (true rms)
Welding Power:	8 VA to 2600 VA
Welding Time:	1 to 3000 seconds
Data log memory:	>10,000 welds (solid state internal storage)
Data download/upload:	USB flash memory drive
Protection Level:	IP54
Weight:	30.8 lb
Size:	17.5" x 11.5" x 12"
Supply voltage:	Lithium-Ion rechargeable batteries.

Battery charger.

Supply voltage:	100V to 240V
Supply Power:	550W (@ 240V)

#1 The batteries can only be charged between 32°F to 113°F.

Highland has a policy of continuously improving product design, and as such reserve the right to change specification of its products without prior notice and with impunity.

SAFETY NOTES

- **WARNING: RISK OF ELECTRIC SHOCK! Do not open. No user serviceable parts inside. Only to be opened by an approved service agent.**
- **WARNING: RISK OF EXPLOSION! This electrofusion processor is NOT intrinsically safe and must NOT be used in a gaseous atmosphere. Do not use this equipment in the trench.**
- **WARNING:** This product can expose you to chemicals which are known to the state of California to cause cancer. For more information, visit www.p65warnings.ca.gov
- Before use, always visually inspect the unit to see that the cords and connectors are not worn or damaged. Replace any damaged parts before use.
- Switch off before adjusting, cleaning, or if the cords are entangled and before leaving the unit unattended for any period.
- To avoid damaging the unit, do not disconnect the output cables, while the unit is fusing.
- Do not lift or pull the unit by its cords.
- Do not disconnect the output cables by pulling on them, always carefully pull off the connectors from the fitting using the integrated grips.
- Do not start a fusion without the pipe correctly inserted into the fitting.
- Do not touch the fitting while fusing.
- Do not operate the unit or leave the unit outdoors in precipitation (rain, snow, hail, etc...).
- Operate the unit in daylight or in good artificial light.
- The operator is responsible for accidents or hazards occurring to other people or their property while using this equipment. Keep the work area safe!
- Keep bystanders a safe distance away from the machine while welding.
- Never allow people unfamiliar with these instructions to use the electrofusion processor.

ELECTRICAL SAFETY

Supercell is battery powered and there is no requirement to carry out in-service electrical testing. However, batteries in equipment can potentially fail and cause fires. Supercell must be visually inspected for damage before each use.

The operator should carry out a visual inspection of Supercell every time it is used. If the case is split or broken, or any connectors are damaged, then the equipment must not be used, and it should be returned to your distributor for immediate repair.

The wall powered charger requires additional testing and is subject to both a visual inspection and an in-service electrical test.

The operator should carry out a visual inspection on the charger every time it is used.

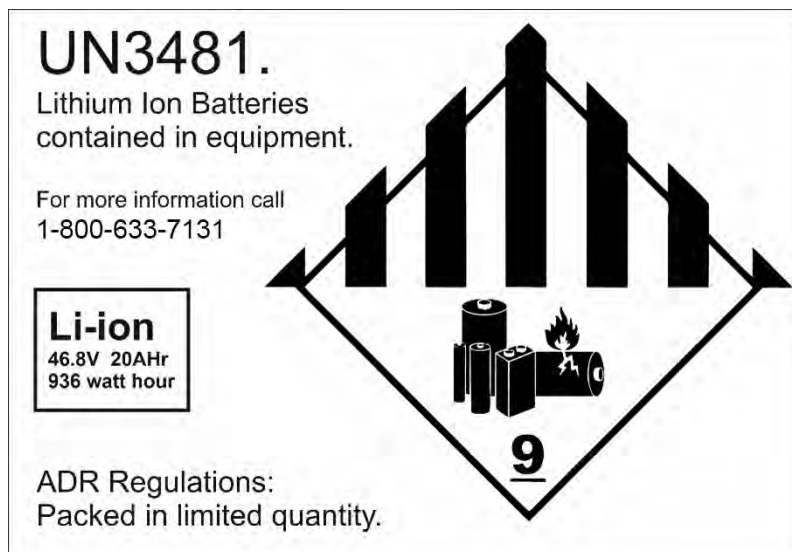
TRANSPORT OF DANGEROUS GOODS

Supercell contains a battery pack made from Lithium-ion batteries. These have been classified by the United Nations as hazardous materials and been assigned to **Class 9 - Miscellaneous Hazard Classification**.

Additionally, the United Nations Committee of Experts on the Transport of Dangerous Goods have classified them under **UN 3481 Lithium-ion batteries contained in equipment**.

The equipment has passed all relevant tests to allow it to be transported.

There is a requirement under UN3481 that the product is packaged and labeled correctly for transport. Please save the original packaging in case the machine needs to be transported. It is mandatory that the following label is attached to the outside of the packaging and the carrier is informed that it contains Lithium-ion batteries.



If you do not have the original packaging, then please contact your distributor, or visit www.supercellef.com/batteries for information on how to ship Supercell.

CAPACITY

Due to differences in fitting type and fitting manufacturing, each fitting will have different energy requirements for fusion. As such, capacity cannot be explicitly given. However, in testing the energy requirements of various fitting types from various manufacturers, the expected capacity on a full battery charge is as follows:

1" fittings: 195 on a full charge

2" fittings: 74 on a full charge

3" fittings: 21 on a full charge

4" fittings: 8 on a full charge

6" fittings: 5 on a full charge

14" fittings: 1 on a full charge

Note: This is given as a guide only, and exact capacity will depend on a range of factors.

BATTERY CHARGING



IMPORTANT. Supercell can only be charged at temperatures between 32° and 113° Fahrenheit. *If the battery pack is above 113F then you must allow it to cool before charging.*

An exclamation mark will be shown on the battery to signify it is too hot.

Keep the charger dry at all times. Do not charge in the rain.

Do not use the charger if it is damaged.

Supercell will only charge when it is turned off.

The charger will become hot with prolonged use.

Supercell can be charged using two methods:

- using the wall charger connected to the 120V/240V wall power, or a 120V/240V vehicle mounted inverter.
- using the +12V dc charger cord, connected to a 12V vehicle auxiliary socket.

Wall Charger

1. Make sure Supercell is turned off, (hold the red stop button in for 3 seconds to power off the machine).
2. Plug the charger into the wall and power it on. The green light will flash once per second.
3. Plug the charger output into the charging socket of Supercell.
4. The charger's indicator light will turn solid red, and the battery pack will start to charge.
5. The battery pack will charge from 0% to 100% in approximately 90 minutes (on 120V). When charging is complete, the charger's indicator light will turn solid green.
6. Power off the charger and unplug it. **CAUTION:** the charger will become hot with extended use.
7. If the charger's indicator light flashes red while charging, then there is a fault with either the charger or Supercell. Contact your distributor for help.
8. If the battery pack exceeds 113°F while charging, Supercell will detect this and halt charging, and the light will go solid green. This will happen even if the battery pack is not completely charged. Turn Supercell on and check the charge percentage to make sure the charge completed.

+12V Auxiliary charger.

1. Make sure Supercell is turned off, (hold the red stop button in for 3 seconds to power off the machine).
2. Plug the charger cord into the 12V auxiliary socket of the vehicle.
3. Plug the charger into the charging socket of Supercell.
4. The battery pack will start to charge. There is no indication of charge.
5. The battery pack will charge from 0% to 100% in approximately six hours.
6. To check the state of charge of the battery pack, turn Supercell on and check the battery percentage. If it is not fully charged turn Supercell off to resume charging.

USING THE EQUIPMENT – SCREEN SYMBOLS

The left-hand side of the screen shows prompts to the operator for the next steps that need to be taken, in this example, connect the welding cord to the fitting or press the star key for the menu. The right-hand side shows information icons. In this example the battery is at 98%, the time is 13:00, the GSM radio is disconnected (if fitted) and the Blue Tooth is disconnected.



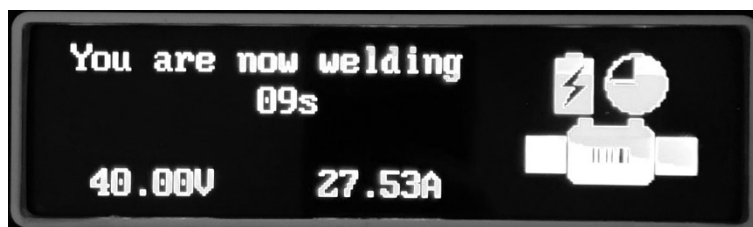
The right-hand side can also show symbols such as press the Start button:



In this example buttons A, B or C can be pressed:



This shows the fitting welding icon:



USING THE EQUIPMENT – ON / OFF

Turning the machine ON.

To turn the machine on, press and hold in the green START button for three seconds. The display will show:

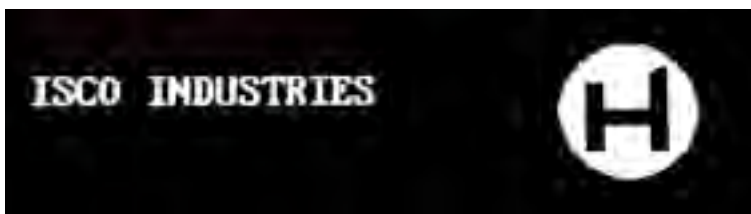
The manufacturer logo.



The product name.



The owner details.



The main screen.



Turning the machine OFF.

To turn the machine on, press and hold in the red STOP button for three seconds. The display will turn off.

The machine will auto power off after five minutes of inactivity.

TEMPERATURE MEASUREMENT

The processor's temperature sensor is located on the side of the enclosure. The temperature sensor does not respond immediately to thermal changes. To assure accurate ambient temperature measurements, the output cable end should be left in the fitting environment for at least 15 minutes. Direct exposure to sun light and other heat sources will adversely affect accuracy.

TEMPERATURE COMPENSATION

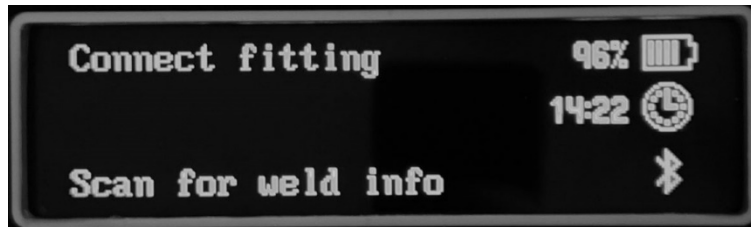
When using the Highland Electrofusion Processors in Barcode Fusion Mode or Manual Barcode Mode, to fuse fittings that require temperature compensation it is essential that care be given to ensure that the correct initial fusion temperature is measured. The processor will automatically adjust the fusion time per the measured temperature as specified by the fusion parameters.

THE PROCESSOR WILL NOT AUTOMATICALLY COMPENSATE FUSION TIME IN MANUAL MODE

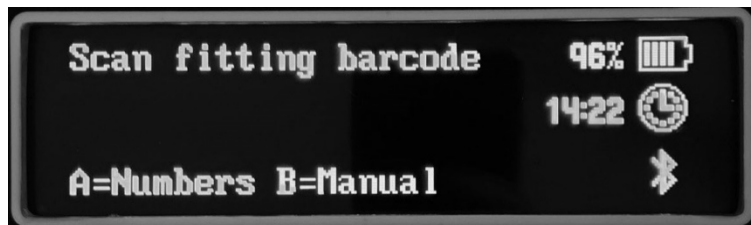
USING THE EQUIPMENT – BARCODE WELDING

Make sure that a barcode scanner/dongle is attached to the USB port.

Connect the output leads to the fitting.



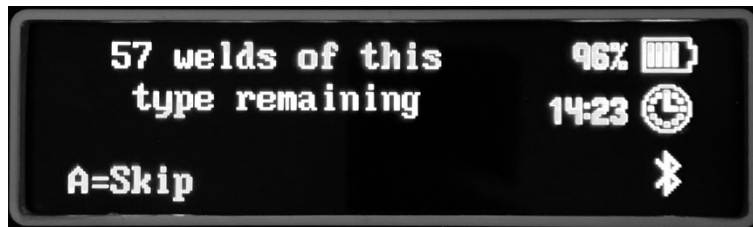
Scan the barcode on the fitting. If this doesn't read, then the numbers can be entered by pressing the A key.



When the barcode is read correctly this screen is shown.



The capacity of the battery is checked and the number of this type of fitting that can be fused is shown.



The resistance of the fitting is checked with the barcode to make sure the right code has been scanned.



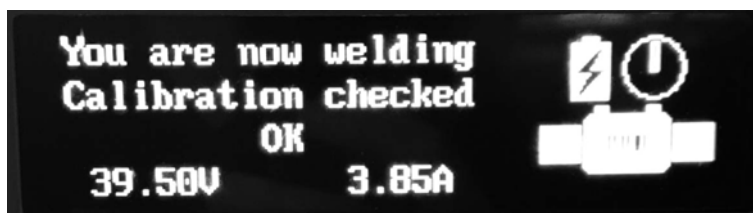
Scan the traceability code on the fitting or press the A key to move on.



The fitting details are shown. Press the green START button to begin fusion.



A couple of seconds after the start, the calibration is checked. This is the smart-calibration check.



As fusion progresses, the welding voltage and current are shown.



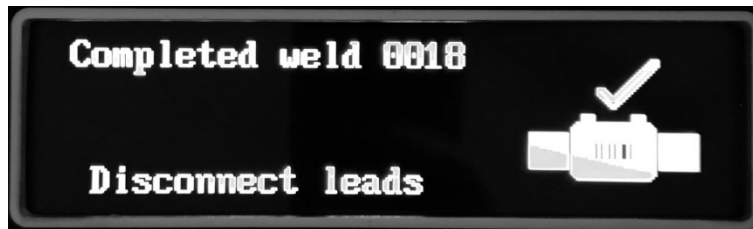
The time counts down to zero and the clock on the graphic fills up to show the fusion progress.



When fusion is complete the cooling time is shown. Allow to complete or press the A key to skip.



At the end of the cooling time, the fusion number is shown.

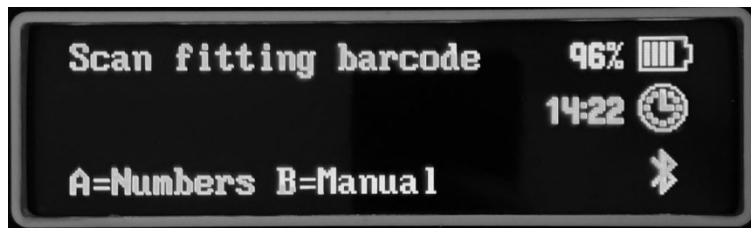


Disconnect the output leads from the fitting to reset the machine.



USING THE EQUIPMENT – MANUAL WELDING

Make sure that a barcode scanner/dongle is **NOT** attached to the USB port or, during the barcode fusion option, press the B key when the scan fitting message is shown.



Connect the output leads to the fitting.



Enter the fusion time and press the A key.



Enter the fusion voltage. Press the D key to select 39.5 volts.



When the voltage is entered, press the A key.



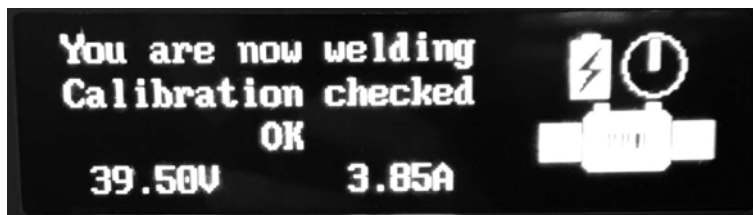
The capacity of the battery is checked and the number of this type of fitting that can be fused is shown.



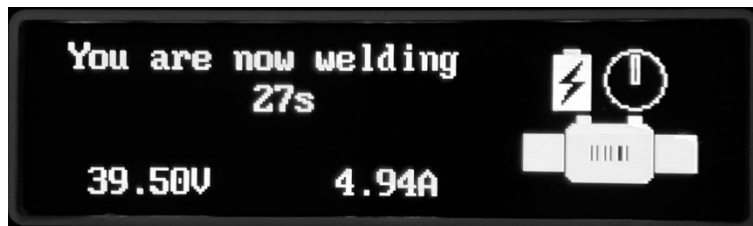
The fitting details are shown. Press the green START button to begin fusion.



A couple of seconds after the start, the calibration is checked. This is the smart-calibration check.



As fusion progresses, the welding voltage and current are shown.



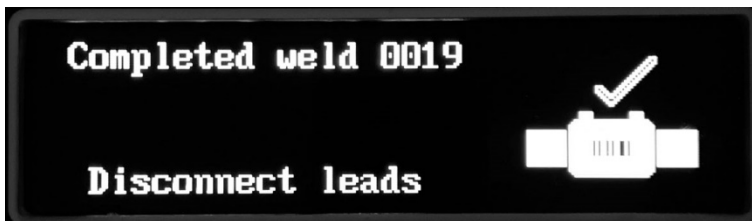
The time counts down to zero and the clock on the graphic fills up to show the fusion progress.



When fusion is complete the cooling time is shown. This will count upwards, press the A key to stop.



At the end of the cooling time, the fusion number is shown.



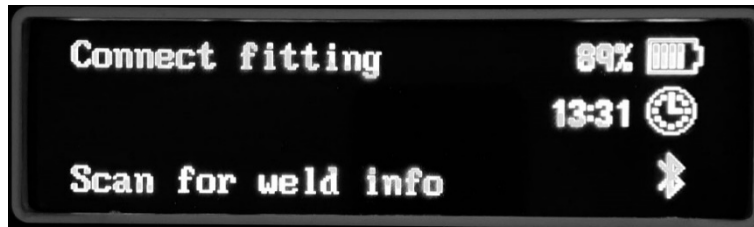
Disconnect the output leads from the fitting to reset the machine.



USING THE EQUIPMENT – CHECKING BATTERY CAPACITY

If you want to know what capacity the battery has or if you can fuse a specific fitting, scan the fitting barcode and the required energy will be checked from a lookup table held in memory.

When the screen shows connect fitting, with no fitting attached to the output leads, scan the fitting barcode.



The capacity for this type of fitting is shown.



USING THE EQUIPMENT – MAIN MENU

When the screen shows, press the star key to enter the main menu.



Three options are shown on the screen. Use the B and C keys to select the required option then press A.



USING THE EQUIPMENT – DOWNLOAD DATA LOG

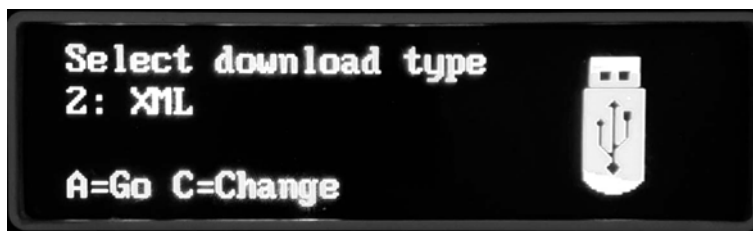
Select data download from the menu.



Select the data download type. The default is 1: Encrypted. This requires supporting software to view. Visit www.supercellef.com for more information

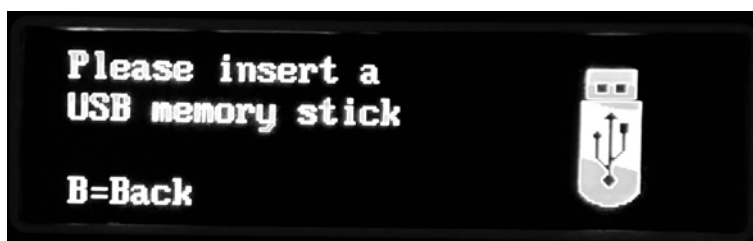


Option 2 is an unencrypted XML which can be viewed using most spreadsheet software.

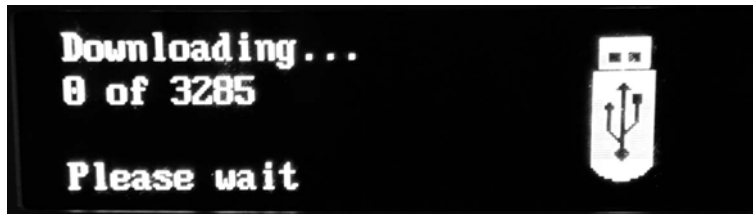


Insert a USB memory drive into the USB port on the machine. You may have to remove the barcode dongle first.

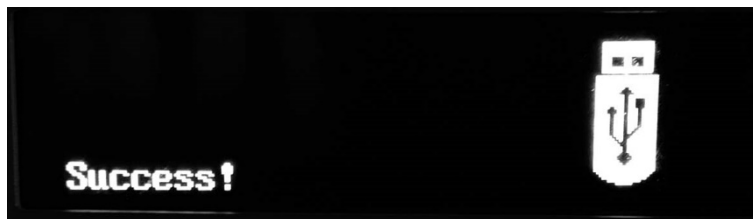
The data log will start to download.



The screen will show the progress of the downloads.

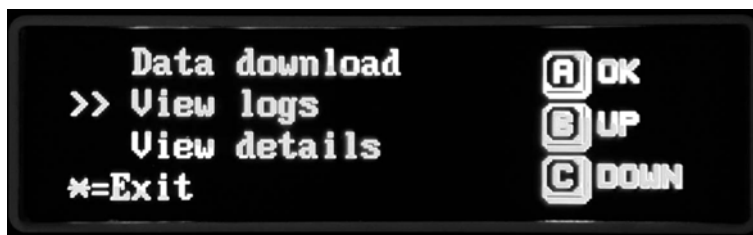


When Success is shown, remove the memory drive from the socket.



USING THE EQUIPMENT – VIEW LOGS

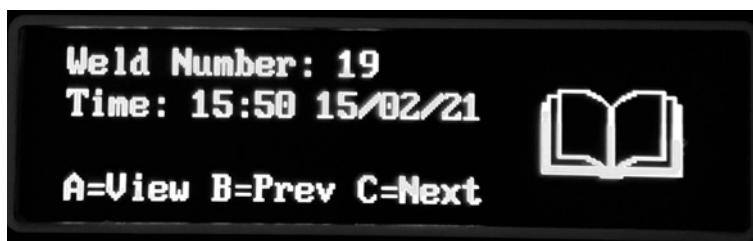
Select view logs from the menu.



Details of stored welds are shown. Press the A key to view the details.



Press the B and C keys to scroll between stored welds.

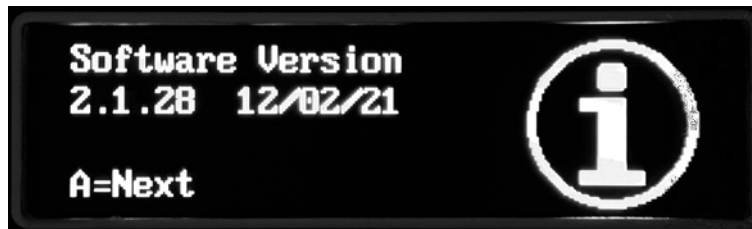


USING THE EQUIPMENT – VIEW DETAILS

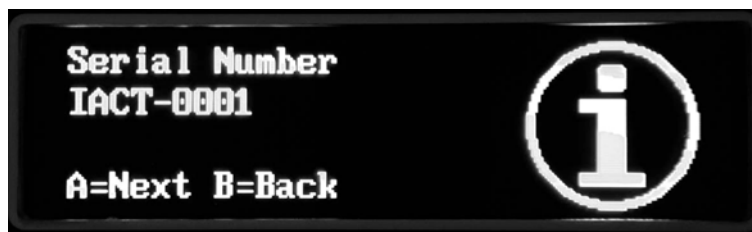
Select view details from the menu.



The software version number is shown.



Press the A key to display the serial number of the machine.



SERVICE AND CALIBRATION

It is important that the case of Supercell is not damaged. Regularly check for defects such as cracks, broken connectors, or damage that would allow water to enter the machine. If damage is found, stop using the unit immediately and contact your distributor.

There are no user serviceable parts inside Supercell. It should be returned to authorized service agent for repair and calibration. **WARNING:** The removal of the lid by unauthorized persons could result in electric shock or fire.

Calibration

Supercell is equipped with a Smart Calibration feature that allows the unit to check that fusion parameters are within specification before each fusion. This confirms that the output is correct and can extend the service period of the equipment. It is, however, recommended that Supercell be returned to an authorized service agent every two years.

FAULT FINDING

During operation, the welding processor monitors all aspects of its operation. If a fault occurs, then an error message will be shown.

0: Weld OK

No Fault, weld completed OK.

1: Stuck button on start up

This fault shows when the power is first switched on. Either the Stop, Start, or a keypad button is stuck in. Free the button to clear the fault.

2: Output fault before weld start

This fault shows when the power is first switched on. The unit will check the output terminals to make sure no voltage is present when first switched on. If this fault happens then the internal power relays have stuck in the closed position. The unit will need to be returned for service.

4: No calibration

This fault happens when the unit has no calibration. This will normally not show, and if the unit has been calibrated, would be caused by a fault with the internal memory. Return the unit for service.

7: Ambient temperature less than -4°F.

The unit has detected that the ambient temperature is very cold or the sensor has broken. If the temperature is not below -4°F then the unit will need to be returned to a service agent for repair.

8: Ambient temperature more than +113°F.

The unit has detected that the ambient temperature is very hot, or the sensor has broken, or a wire has gone open circuit. The unit must be returned to a service agent for repair.

14: Relay failed to latch on weld start

This fault could happen when the start button is pressed. If the main power relays do not operate correctly then this fault will be shown. The unit needs to be returned for service.

20: Low output volts (-1.25%)

This fault will happen if the output voltage is 1.25% lower than the set point for more than 3 seconds. The unit needs to be returned for service.

21: High output volts (+1.25%)

This fault will happen if the output voltage is 1.25% higher than the set point for more than 3 seconds. The unit needs to be returned for service.

22: Excess output volts (+6.25%)

This fault will happen if the welding voltage is 6.25% more than the set point for more than 2 seconds. The unit needs to be returned for service.

23: Low output current (<2.5A)

This fault will happen if the welding current is below 2.5 amps for more than 3 seconds. It can be caused by a faulty fitting. Try another fitting. If this doesn't clear the fault then there is a problem inside the unit and it must be returned for repair.

24: Shorted turn detected in fitting.

While welding, the unit has detected a sharp increase in welding current. This is normally caused by a shorted turn happening in the fitting. (An increase of 10%). If this happens then it is most likely a faulty fitting. This must be replaced. If the fault persists then it could be a fault within the unit.

25: User stop button pressed

The operator has pressed the stop button.

26: Relay unlatched

During welding, if the main power relay disconnects then this fault will be shown. It could be caused by the unit being knocked. If the fault persists then the unit should be returned for repair.

27: Fitting open circuit

This fault is shown if the welding cord disconnects from the fitting while welding. Follow the guidelines from the fitting manufacturer, reconnect the cord and try welding again.

29: High output current.

This fault is shown if the welding current is above a predefined limit for a set time. If the fault persists then the unit should be returned for repair.

30: Bar Code Mode: No fitting connected

This fault is shown if the output lead is not connected to a fitting when a bar code is read. Connect the fitting.

31: Bar Code Mode: Ohms error

This fault is shown if the connected fitting resistance is different from that coded into the bar code. Try another fitting.

40: Bar Code Invalid: Temperature Compensation.

Digits 22 and 23 of the bar code have been decoded incorrectly.

41: Bar Code Invalid: Resistance Coefficient.

Digit 18 of the bar code has been decoded incorrectly.

42: Bar Code Invalid: Welding Voltage.

Digits 13 and 14 of the bar code have been decoded incorrectly.

43: Bar Code Invalid: Regulation Mode.

Digit 12 of the bar code has been decoded incorrectly.

44: Bar Code Invalid: Fitting Size.

Digits 9, 10 and 11 of the bar code have been decoded incorrectly.

45: Bar Code Invalid: Cooling Time.

Digit 7 of the bar code has been decoded incorrectly.

46: Bar Code Invalid: Fusion Cycle Type.

Digit 5 of the bar code has been decoded incorrectly.

47: Bar Code Invalid: Energy Correction.

Digit 3 of the bar code has been decoded incorrectly.

48: Bar Code Invalid: Component Type.

Digits 1 and 2 of the bar code have been decoded incorrectly.

49: Bar Code Invalid: Check Digit.

Digit 24 of the bar code has been decoded incorrectly.

50: USB Memory: Disc full.

This fault will happen if the USB flash memory pen is full. Delete some files from the device.

52: USB Memory: File not found.

When performing a software upgrade, the required file was not found on the memory drive. Reload the upgrade files onto the memory drive.

101: Converter electronics error – Low battery voltage

The battery voltage into the electronics is too low. The unit should be returned for service.

102: Converter electronics error – High battery voltage

The battery voltage into the electronics is too high. The unit should be returned for service.

103: Converter electronics error – High output voltage

The voltage out of the electronics is too high. The unit should be returned for service.

104: Converter electronics warning – Over current

The current out of the electronics is too high. The unit should be returned for service.

105: Converter electronics warning – Communications

The communications between the converter electronics and the microprocessor control have broken down. The unit should be returned for service.

106: Converter electronics warning – Over temperature A

The temperature of the converter electronics phase A is too high. The unit should be returned for service.

107: Converter electronics warning – Over temperature B

The temperature of the converter electronics phase B is too high. The unit should be returned for service.

108: Converter electronics warning – Over temperature C

The temperature of the converter electronics phase C is too high. The unit should be returned for service.

109: Converter electronics error – Phase current

The current in the converter electronics is out of specification. The unit should be returned for service.

110: Converter electronics error – Relay open

The main control relay in the converter electronics is open circuit. The unit should be returned for service.

112: Converter electronics error – Voltage sense open

The voltage sensing relay in the converter electronics is open circuit. The unit should be returned for service.

113: Converter electronics warning – Peak time exceeded

The converter electronics timing circuit has broken. The unit should be returned for service.

114: Converter electronics warning – Phase current mismatch

The current in the converter electronics is out of phase. The unit should be returned for service.

115: Converter electronics warning – BMS fault

The battery management system has developed a fault. The unit should be returned for service.

127: Power off failure.

If the power is turned off while the unit is welding, this fault will be recorded to the data log.

HARDWARE RESET

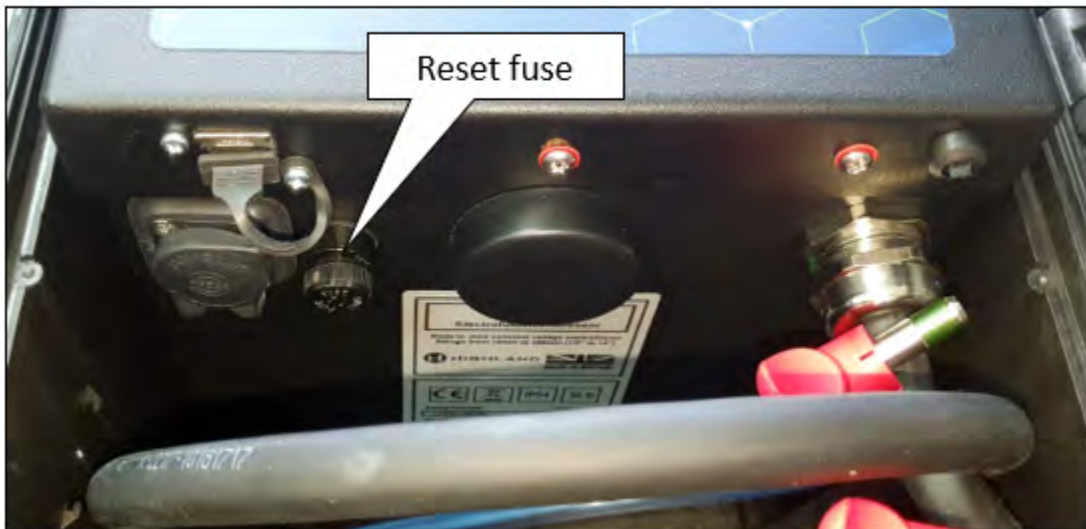
Because this machine is battery powered, if things go wrong, it is not possible to do a hardware reset by unplugging it from the mains supply. In case this happens, a reset fuse is provided.

RESET FUSE.

If the machine software locks-up and it cannot be turned off by pressing any of the buttons, the reset fuse can be removed.

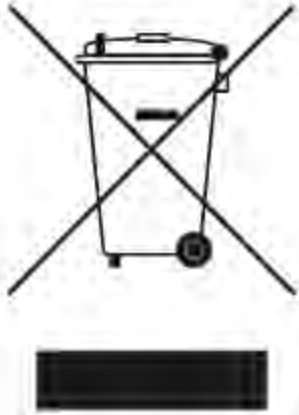
Carefully unscrew the fuse and remove it for around ten seconds. Replace the fuse and the machine will restart.

Warning: Only remove the fuse if the machine has locked up. Do not remove it while welding.



DISPOSAL – END OF LIFE

The equipment and packaging should be sorted for environmentally friendly recycling.



DO NOT DISPOSE OF THIS EQUIPMENT INTO HOUSEHOLD WASTE!

Before disposing of your equipment, please be sure to check federal, state, and local legislation regarding the proper disposal of electronics. Additionally, you may contact your distributor to arrange for proper disposal.



this equipment contains less than 100 parts per million (ppm) of cadmium and less than 1000 ppm of the following: lead, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.



Li-ion

This product contains **Lithium-Ion batteries** that must not be disposed of in household waste. Be sure to check federal, state, and local legislation regarding the proper disposal of lithium-ion batteries. Highland will take-back end-of-life batteries. Please contact your distributor for more information.

CALIBRATION AND WARRANTY

This welding processor has been manufactured, inspected, and tested in accordance with the quality control systems in place at Highland.

This welding processor has been calibrated using equipment that is traceable to national and international standards, through a NAMAS accredited laboratory. NAMAS (National Accreditation of Measurement and Sampling) is a service of UKAS (United Kingdom Accreditation Service).

This welding processor has a TWENTY-FOUR-month warranty period, active from the first use of the unit by the end user customer.

Conditions of Warranty:

This warranty covers only those defects to the product which arise from normal use of the product, and will become invalid if any of the following apply:

- The warranty void stickers have been tampered with.
- Failure to follow the operating instructions.
- Improper or inadequate maintenance.
- Unauthorized modification.
- Misuse or any use not in accordance with the operating manual or good industry practice.
- Physical abuse of the product.
- Operation outside the products specifications.
- Improper site preparation or site maintenance.
- Faulty pipe or fitting.

Extent of Warranty:

Subject to the conditions and limitations of warranty; Highland warrants that its electrical products will be free from defects in materials and workmanship for a period of twenty-four months, and its mechanical products for six months, from the date of purchase by the end-user customer.

If during this period, notice of a defect which is covered by this warranty is received, then Highland will either repair or replace the product at its option. Any replacement product will have functionality at least equal to that of the product being replaced, and will in our opinion, perform consistently with its age and usage.

Unless otherwise agreed, all warranty work will be carried out by Highland or an authorized and approved service facility.

Customers will prepay all shipping charges for products returned under warranty, and Highland will charge for return of the products back to the customer.

Limitations of Warranty:

Highland does not warrant the operation of any product to be uninterrupted or error free.

Highland specifically disclaims the implied warranties of satisfactory quality and fitness for a particular purpose.

Highland makes no other warranty of any kind, whether expressed or implied, with respect to its products.

To the extent that this warranty statement is inconsistent with the law of the locality where the customer uses the product, this warranty statement shall be deemed modified by the minimum necessary to be consistent with such local law.

To the extent allowed by local law, the remedies provided in this warranty statement are the customer's sole and exclusive remedies.

This equipment has been designed for use with the range of fittings and pipe available at the time of its design and development. Highland can accept NO liability for the equipment's ability or otherwise to be used with new or different fittings or pipe that subsequently appear in the marketplace.

This equipment is not intrinsically safe and must not be used in a gaseous or explosive atmosphere. Highland can accept NO liability if the equipment is used in these circumstances.

REPAIR

For all service and repair of this machine, please contact your distributor.

DISTRIBUTED BY:



ISCO Industries

800-345-ISCO (4726)

www.isco-pipe.com

Mailing Address:

100 Witherspoon Street 2 West

Louisville, KY 40202

Calibration and Service Shipping Address:

453 Shields Rd

Huntsville, AL 35811

8 HELPFUL TIPS

1. **Always** refer to this User Manual on how to correctly operate the machine.
2. If any **visible damage** to the machine, contact your supplier immediately as failure to do so could render the machine unusable.
3. **Always** charge the machine with the correct charging source provided.
4. **Always** charge the machine in a sheltered environment i.e., indoors or inside a work vehicle.
5. Make sure the machine is **switched off** before you input the charging lead. The charging lead will only be acknowledged when the machine is switched off.
6. The machine will **not attempt to charge** if the unit is turned on.
7. If charging in a work vehicle on a 120VAC inverter, **make sure the engine is running** to prevent the 120VAC inverter tripping out.
8. If charging in a work vehicle with the 12V charging lead, **make sure the engine is running**. The machine will not attempt to charge with the engine switched off to prevent flattening the vehicle battery.



HIGHLAND Commitment

We know you have work to do, and downtime is the enemy. That is why our commitment to customers is a guaranteed five-day or less turn around on calibration and service evaluation along with an industry leading two-year warranty.

With multiple service locations across the US and Canada, we are equipped to get you back in operation as soon as possible.



100 Witherspoon Street 2West - Louisville, KY 40202

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www.supercellef.com