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EMERSON



2000Xct HP
Power Supply

Instruction Manual

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BRANSON

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Manual Change Information

At Branson, we strive to maintain our position as the leader in ultrasonics plastics joining, metal welding, cleaning and related technologies by continually improving our circuits and components in our equipment. These improvements are incorporated as soon as they are developed and thoroughly tested.

Information concerning any improvements will be added to the appropriate technical documentation at its next revision and printing. Therefore, when requesting service assistance for specific units, note the Revision information found on this document.

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Foreword

Congratulations on your choice of a Branson Ultrasonics Corporation system!

The Branson 2000Xct HP system is process equipment for the joining of metal/plastic parts using ultrasonic energy. It is the newest generation of product using this sophisticated technology for a variety of customer applications. This Instruction Manual is part of the documentation set for this system, and should be kept with the equipment.

Thank you for choosing Branson!

Introduction

This manual is arranged into several structured chapters which will help you find the information you may need to know to safely handle, install, set up, program, operate, and/or maintain this product. Please refer to the Table of Contents of this manual to find the information you may be looking for. In the event you require additional assistance or information, please contact our Product Support department (see Chapter 8: Support for information on how to contact them) or your local Branson representative.

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Chapter 1: Safety

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1.1 Safety Requirements and Warnings

This chapter contains an explanation of the different Safety Notice symbols and icons found both in this manual and on the product itself and provides additional safety information for ultrasonic welding.

1.1.1 Symbols Found in this Manual

These symbols used throughout this manual warrant special attention:

DANGER	Indicates an immediate danger
	If these risks are not avoided, death or severe injury will be the result.

WARNING	Indicates a possible danger
	If these risks are not avoided, death or severe injury might result.

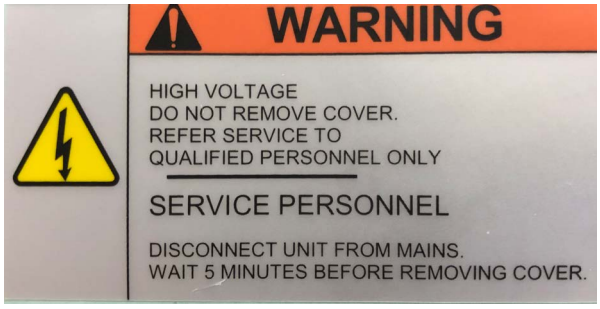
CAUTION	Indicates a possible danger
	If these risks are not avoided, slight or minor injury might result.

NOTICE	Indicates a possible damaging situation
	If this situation is not avoided, the system or something in its vicinity might be damaged. Application types and other important or useful information are emphasized.

1.1.2 Symbols Found on the Product

Familiar graphic warning symbol is used to alert the user to items of concern or hazard. The following warning symbol appears on the 2000Xct HP Power Supply.

Figure 1.1 Safety label shown on the rear of the 2000Xct HP Power Supply



1.2 General Precautions

Take the following precautions before servicing the power supply:

- To prevent the possibility of an electrical shock, always plug the power supply into a grounded power source
- To prevent the possibility of an electrical shock, ground the power supply by securing an 8 gauge grounded conductor to the ground screw located next to the air outlet
- Power supplies produce high voltage. Before working on the power supply assembly, do the following:

  Turn off the power supply;

  Unplug main power; and

  Allow at least 2 minutes for capacitors to discharge
- High voltage is present in the power supply. Do not operate with the cover removed
- High line voltages exist in the ultrasonic power supply assembly. Common points are tied to circuit reference, not chassis ground. Therefore, use only non-grounded, battery-powered multimeters when testing the power supply assembly. Using other types of test equipment can present a shock hazard
- Keep hands from under the horn. Down force (pressure) and ultrasonic vibrations can cause injury
- Do not cycle the welding system if either the RF cable or converter is disconnected
- When using larger horns, avoid situations where fingers could be pinched between the horn and the fixture
- Ensure power supply installation is performed by qualified personnel and in accordance with local standards and regulations
- In normal operation, bearing seals will retain an adequate amount of grease for safe bearing operation. Bearing can leak but contains enough grease for the life of the bearing. Removing and running without grease will void the warranty. For more information contact product support.

CAUTION	
	Sound level and frequency of the noise emitted during the ultrasonic assembly process may depend upon a. type of application, b. size, shape and composition of the material being assembled, c. shape and material of the holding fixture, d. welder setup parameters and e. tool design. Some parts vibrate at an audible frequency during the process. Some or all of these factors may result in an uncomfortable noise being emitted during the process. In such cases operators may need to be provided with personal protective equipment. See 29 CFR (Code of Federal Regulations) 1910.95 Occupational Noise Exposure.

1.2.1 Intended Use of the System

The 2000Xct HP power supply is designed to be used as part of an ultrasonic welding system. It is designed for a wide variety of welding or processing applications.

If the equipment is used in a manner not specified by Branson, the protection provided by the equipment may be impaired.

Branson Ultrasonics Corporation designs and manufactures machines giving the first priority to safety precautions, to allow customers to use the machines safely and effectively. Only trained operators should run and service the equipment. Untrained operators can misuse the equipment or ignore safety instructions that can result in personal injury or equipment damage. It is most essential that all operators and service personnel pay attention to safety instructions when operating and servicing the equipment.

1.2.2 Emissions

Because of the various types of toxic or injurious gases that may be liberated during the welding based on the material being processed, sufficient ventilation should be provided to prevent a concentration of these gases in excess of 0.1 ppm. Check with your materials suppliers for recommended protection when processing their materials.

CAUTION	
	Processing of many materials, such as PVC, can be hazardous to an operator's health and could cause corrosion/damage to the equipment. Use proper ventilation and take protective measures.

1.2.3 Setting up the Workplace

Measures for setting up a workplace for safe operation of the ultrasonic welder are outlined in Chapter 5: Installation and Setup.

1.2.4 Regulatory Compliance

This product meets EMC (Electromagnetic Compliance) requirements for North America and the European Union.

Chapter 2: Introduction

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2.1 Models Covered

This manual provides detailed instructions for installation, setup, operation, and maintenance of the 2000Xct HP power supply.

2.1.1 Overview of the Welding system

The welding system consists of a power supply, an actuator, and a converter-booster-horn stack. The system can perform a variety of ultrasonic welding operations and it is designed for use in automated, semi-automated, and/or manual production systems.

2.1.2 2000Xct HP Power Supply

The power supply consists of an ultrasonic power supply module and a system controller. The ultrasonic power supply module converts conventional 50/60 Hz line current to 20 kHz electrical energy. The system controller monitors and controls the welding system.

The power supply is configured with a UPS. The digital supply has a library of up to 1000 locked presets which are accessible for various process parameter modifications that are unique to the power supply itself. These modifications can be named to reflect specific applications, and are loaded into memory prior to shipment from the Branson factory. The parameters of the individual presets can be modified by a Branson representative. Initially, all presets are set to factory default. They are accessed via an RS232 link to the system controller.

The power supply provides the following features:

- **AutoTune with Memory (AT/M):** Allows the power supply to track and store the horn frequency of the last weld.
- **Auto Seek:** Tracks and starts the horn on the correct frequency. It does this by running the horn at a low-level amplitude (5%) to find and lock on to the horn operating frequency.
- **Line Regulation:** Maintains converter amplitude by regulating for variances in the line voltages.
- **S-Beam Load Cell:** Provides an indication of the force on a part during a weld. This indication can be used to determine when to trigger ultrasonics and also to produce a force/distance graph of the operating cycle.
- **Load Regulation:** Maintains converter amplitude over the full range of rated power.
- **System Protection:** Protects the power supply by providing five levels of protection.

  Voltage

  Current

  Phase

  Temperature

  Power
- **Frequency Offset:** Provides for applying an external frequency offset to the operating frequency.

2.1.3 The Ultrasonic Stack

Converter

The converter is mounted in the actuator as part of the ultrasonic stack. The ultrasonic electrical energy from the power supply is applied to the converter (sometimes called the transducer). This transforms the high frequency electrical oscillations into mechanical vibrations at the same frequency as the electrical oscillations. The heart of the converter are piezoelectric ceramic elements. When subjected to an alternating voltage, these elements alternately expand and contract, resulting in better than 90% conversion of electrical to mechanical energy.

Booster

Success in ultrasonic assembly depends on the right amplitude of movement at the horn face. Amplitude is a function of horn shape, which is largely determined by the size and form of the parts to be assembled. The booster can be used as a mechanical transformer to increase or decrease the amplitude of vibrations applied to the parts through the horn.

The booster is a resonant half-wave section of aluminum or titanium. It is mounted between the converter and the horn, as part of the ultrasonic stack. It also provides a clamping point for rigid stack mounting.

Boosters are designed to resonate at the same frequency as the converter with which they are used. Boosters are usually mounted at a nodal (minimum vibration) point of axial motion. This minimizes the loss of energy and prevents vibration from being transmitted into the actuator.

Horn

The horn is selected or designed for a specific application. Each horn is tuned typically as a half-wave section that applies the necessary force and vibration uniformly to the parts to be assembled. It transfers ultrasonic vibrations from the converter to the workpiece. The horn is mounted to the booster as part of the ultrasonic stack.

Depending on their profile, horns are referred to as stepped, conical, exponential, bar, or catenoidal. The shape of the horn determines the amplitude at the face of the horn. Depending on the application, horns can be made from titanium alloys, aluminum, or steel. Titanium alloys are the best materials for horn fabrication due to their high level of strength and low loss. Aluminum horns are usually chrome- or nickel-plated or hard-coated to reduce wear. Steel horns are for low amplitude requiring hardness, such as ultrasonic insertion applications.

2.2 Compatibility with Branson Products

The 2000Xct HP power supply is designed to be used with the converters listed in the following table:

Table 2.1 2000Xct HP Power Supply Compatibility with Branson Converters

Model	EDP
20 kHz/5500W	101-135-124
20 KHz/6500W	101-135-124
20 KHz/8000W Dual 5K5	101-135-124
20 KHz/8000W	1031288

2.3 Features of the System

Listed below are many features of the Branson 2000Xct HPt HP ultrasonic welding system.

- **1 Millisecond Control and Sampling Rate:** This feature provides sampling and control of the weld process 1000 times each second.
- **1000 Presets:** User-configurable setups that can be preset allowing you to simply recall a weld setup to start production.
- **Adjust While Running:** The 2000Xct HP allows you to modify the weld parameters while the welder is running.
- **Afterburst:** This feature allows you to set the system weld controls to turn the ultrasonics on after the weld and hold steps to release parts from the horn.
- **Alarms, Process:** These are set values used for part quality monitoring.
- **Amplitude Stepping:** A process controlled by the power supply. At a specified time, energy, peak power, distance, or by external signal you can change the amplitude during the weld to control the flow of plastic. This feature helps ensure part consistency, higher strength parts and control of flash.
- **Automatic Preset Naming:** If you choose not to name your preset, the power supply will give it a name that describes the weld mode and main parameter setting.
- **Autotuning:** Ensures that the welder is running at peak efficiency.
- **Collapse Limits in the Collapse Mode:** Plus and minus Suspect and Reject limits can be set in the Collapse Mode.
- **Control Limits:** With some power supply models, these secondary controls are used in conjunction with the main parameters of the weld. These user-programmed limits provide for adaptive control of the weld process.
- **Cycle Aborts:** These are user programmed conditions (missing part and ground detect) at which the cycle is terminated. These can be used as safety limits to save wear and tear on the system and your tooling.
- **Cycle Time and Date Stamp:** The power supply provides each cycle with a time and date stamp for production and quality control purposes.
- **Digital Amplitude Setting:** This feature allows you to set the exact amplitude necessary for your application, affording increased range and setting repeatability over analog systems.
- **Digital Horn Test Diagnostics:** In Test mode of the power supply, you can view the Horn Test results in digital form, using digital readouts and bar graphs on the power supply to give you the best picture of the stack's operation.
- **Digital Tuning:** Means to tune the power supply for applications and horns at the extremes of the power supply capture range.
- **Digital UPS:** The Digital UPS has programmable (through a digital interface from a system controller) features which allow true autotune and start ramp during set-up. Power supply presets can be customized.
- **Downspeed:** Controls the rate of descent and impact on the part.
- **Encoder:** Allows the power supply to monitor the distance the horn has travelled, enabling the use of distance functions.
- **Energy Compensation:** Extend the weld time up to 50% greater than the weld time setting or to whenever the min. energy is reached or; shut off the weld before the expected (set) weld time if maximum energy value is reached.
- **English (USCS)/Metric Units:** This feature allows the welder to be set up in the local units in use.
- **Foreign Languages:** Software supports user selectable languages; English, French, German, Italian, Spanish, Traditional Chinese, Simplified Chinese, Japanese and Korean.
- **Frequency Offset:** This process feature allows a user to set a frequency value, for certain specific applications, where the force imparted on the fixture or anvil causes a frequency shift in the Stack's operation. You should only use this feature when advised to do so by Branson.
- **Graphs, Auto-Scaling:** When you request a graphical display in Time Mode, the power supply automatically scales the time axis of the graph to give you the most meaningful graph possible.
- **Graphs of Power, Amplitude, Velocity, Collapse, Force, Frequency, and Horn Scan for the Power Supply:** The 2000Xct HP power supply supports graphical display of these items. These graphs include markers to show critical points in the weld. Use these graphs to optimize your weld process or diagnose application problems.
- **Graphs, User Selectable:** In any mode you can select the scale of the time axis on any graph so that you can zoom in on the start of the weld cycle.
- **Horn Down:** Clamp On: When in the horn down mode, the start switches can be released after the part is contacted while the part remains clamped in place. Press Retract Horn button to release. Clamp Off: The horn will retract whenever the start switches are released in the horn down mode.
- **Horn Down Display:** During Horn Down, the Absolute Distance, Force, Downspeed, and Pressure are displayed digitally so that you can determine correct values for process limits and cutoffs.

- **Horn Down Mode:** A manual procedure used to verify system setup and alignment.
- **Horn Scan:** A scan to enhance selection of operating frequency and control parameters.
- **Limits, Control:** These are controls that are used in conjunction with the main weld mode. These user programmed limits provide for additional control of the weld process.
- **Limits, Reject:** A class of user-definable process alarms that alert you if a part falls into a range that you classified as reject parts.
- **Limits, Suspect:** A class of user-definable process alarms that alert you if a part falls into a range that you have determined should be inspected.
- **Membrane Keyboard:** For high reliability and immunity from factory dust and oils.
- **Parameter Entry through Keypad:** A keypad is provided for direct entry. Plus (+) and Minus (–) keys are provided for adjusting existing values.
- **Parameter Range Checking:** If you enter an invalid parameter the power supply shows you the valid range.
- **Password Protection:** This feature allows you to secure your setup from unauthorized changes. You can select your own password.
- **Presets:** The Digital UPS is capable of storing presets of power supply operating parameters.
- **Pressure Sensor:** Allows the power supply to read the system pressure.
- **Pretrigger:** This feature allows you to set the system weld controls to turn the ultrasonics on before contact with the part to increase performance.
- **Process Alarm Display Showing Actual and Set Values:** When an alarm condition has occurred, you can view the value for the last weld and the suspect and reject settings you programmed into the controls.
- **Post Weld Seek:** This system feature provides a short burst of energy at the end of the weld Hold and Afterburst steps to automatically re-tune the power supply, if required.
- **Ramp Time:** The starting of the 2000Xct HP power supply and horn is done at the optimum rate to reduce electrical and mechanical stress on the system. This also helps make some tough-to-start applications possible.
- **Rapid Traverse:** Allows a high horn travel speed for a portion of the stroke. Once the set distance is reached, travel speed is reduced to the downspeed setting.
- **Safety Control System Monitoring:** The Safety Control System within the welder constantly monitors the system's safety related components for correct operation. When this system detects a fault condition, operation is interrupted and the system immediately goes to a safe state. A blinking of the power indicator light is used to signal a safety system alarm.
- **S-Beam Load Cell/Dynamic Follow Through:** The load cell allows the ultrasonics to be triggered at a designated force input into the power supply.
- **Seek:** Ensures operation at resonance; minimizes tuning errors; and operates the stack at low amplitude (approximately 5%), then provides a means of sensing and storing the resonant operating frequency value.
- **Setup Checking:** If you create a setup with conflicts the power supply notifies you of the specific conflict.
- **System Information Screen:** This is a screen that will give you information about your welding system (e.g., cylinder size, stroke length, number of cycles). Refer to this screen when contacting Branson for service and support.
- **Test Diagnostics:** In Test mode you can view the ultrasonic system results using digital readouts and bar graphs.
- **Timed Seek:** When turned ON, will do a Seek once every minute to update horn resonant frequency to memory. This is especially useful when the welding process affects the actual temperature of the horn, causing a resonant frequency shift.
- **True Wattmeter:** The controls on the power supply include a true wattmeter for accurate measurement of power and energy.
- **User-Nameable Presets:** You can refer to each preset by name or part number making identification of your presets simple.
- **View Weld Results:** From the Run Screen you can view any of the information available from the last completed cycle.
- **Weld Modes:** Time, Energy, Peak Power, Absolute, Collapse, and Ground Detect. The 2000Xct HP power supply offers multiple weld modes so that you can choose the mode of control that best meets your specific application need.
- **Weld Parameter Entry through Digital Keypad:** User Setup is direct and easy, by selecting the menu parameter by name and using the keypad to enter the precise value. The controls also support entry by incrementing existing values.

2.4 Power Supply Front Panel Controls

Figure 2.1 2000Xct HP Power Supply Front Panel

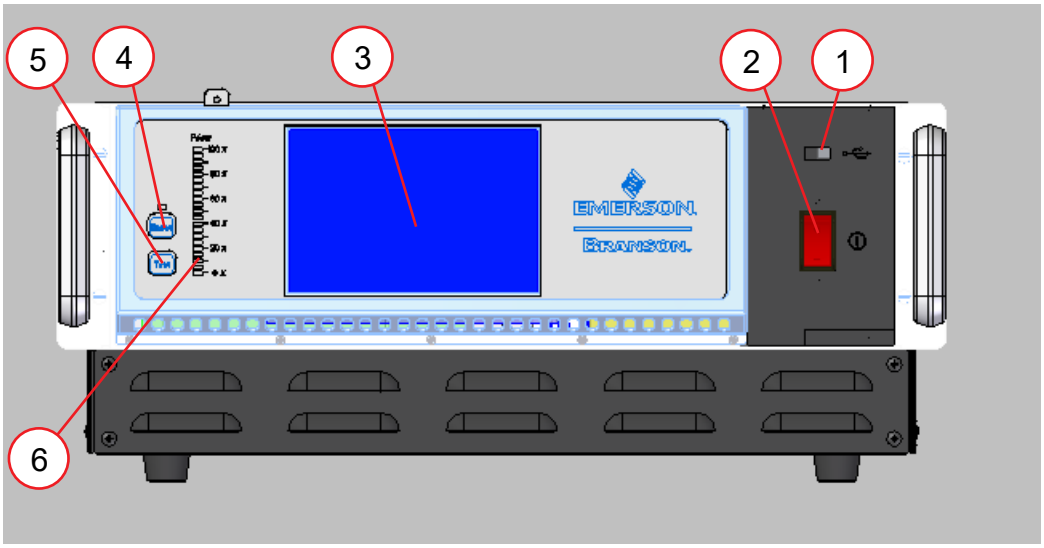


Table 2.2 2000Xct HP Power Supply Front Panel

Item	Name	Function
1	USB Port	Support plug and play and hot plug function. Insert USB memory stick to save the welding data to the memory stick.
2	Power Button	Press to turn the system On and Off. When you depress the button, it lights to indicate power is On.
3	Touch Screen	Used to browse all menus, set welding parameters and view alarms.
4	Reset Button	Press to clear alarms. Reset only functions on the Run screen.
5	Test Button	Press to display a menu you can use to test the ultrasonic power supply, horn, booster, and converter.
6	Power Bar Graph	Indicates the percentage of rated power delivered either during the last weld cycle or when Test is running. The indicator's scale can be increased for low-power settings.

2.5 Glossary of Terms

The following terminology may be encountered when using or operating a 2000Xct HP ultrasonic welding system.

Table 2.3 Glossary of Terms

Name	Description
AB Amplitude	The amplitude at the horn face during the afterburst step.
AB Delay	Time delay between the end of the hold and the start of the afterburst.
AB Time	The duration of the afterburst.
Absolute Cutoff	Ends the ultrasonic portion of the cycle when the set absolute distance is reached.
Absolute Distance	The distance the horn has traveled from home (ULS deactivation).
Absolute Mode	A mode of operation in which the ultrasonic portion of the cycle is terminated when a user-specified distance from home has been reached.
Absolute Position	The position of the actuator after clearing the Upper Limit Switch.
Accept-as-is	A disposition permitted for a nonconforming item when it can be established that the item is satisfactory for its intended use without violating safety or functional requirements.
Act Clr Output	Actuator Clear output signal, sent upon the welder reaching a safe position of the actuator return stroke.
Actual	A reported value that occurred during the weld cycle. The converse is the set parameter that was requested during the setup.
Actuator	The unit that houses the converter, booster, and horn assembly in a rigid mounting allowing it to move up and down either mechanically or pneumatically to apply a predetermined pressure on the workpiece.
Afterburst	Ultrasonic energy applied after the hold step. Used to break away sticking parts from the tooling.
Alarm Beeper	An audible signal that sounds when a general alarm has occurred.
Alarm Log	A record of alarms that have occurred to the welder. Records time, date, alarm number, and cycle number.
Amp A	The amplitude applied to the part from the start of the weld to the step change.
Amp B	The amplitude applied to the part from the step change to the end of the weld.
Amp Control	The ability to set amplitude digitally or by an external control.
Amplitude	The peak-to-peak movement at the horn face. Always expressed as a percentage of the maximum.
Amplitude Graph	A graph of amplitude percentage plotted against time.
Amplitude Step	A change in amplitude during the ultrasonic portion of the cycle.
Authority Check	Enables Authority level functions and menus.
Auto Scale Graph	When turned on, the graph will be auto scaled, when off allows X Scale to set scale.
Automatic	A pretrigger condition indicating that pretrigger engages when the actuator leaves the upper limit switch.
Automation	Used in automation when an operator log in is not required. When in automation, weld setup and configuration menus are disabled.
Basic/Expert	Expert (default) allows access to all functions and menus of the welder. Basic limits the configuration and weld setup menus to a minimum number.

Table 2.3 Glossary of Terms

Name	Description
Batch Setup	Controls how many parts will be welded in a batch.
Beep	An audible signal produced by the Branson control board. Used to alert the operator to an unexpected condition or that trigger has been reached.
Booster	A one-half wavelength long resonant metal section mounted between the converter and horn, usually having a change in cross-sectional area between the input and output surfaces. Mechanically alters the amplitude of vibration at the driving surface of the converter.
Cal Actuator	Calibrate Actuator. Menus to guide the user through actuator calibration; distance can be verified.
Cal Sensor	The menu title for accessing the calibration and verification of pressure and force.
Clamping Force	The pressure exerted by the horn on the workpiece.
Cold Start	A condition that restores a setup to its default values. Note: Use Carefully.
Collapse Distance	The distance the horn has traveled from the trigger point of ultrasonics.
Collapse Mode	A mode in which the ultrasonics portion of the cycle is terminated when a user-specified distance from the trigger point has been reached.
Components Verify	Verification, before running a weld, that the system configuration's system components and the weld preset's system components match.
Control Limits	Additional parameters that determine the end of the ultrasonic portion of the cycle and the move to the hold state.
Converter	The device that converts electrical energy into mechanical vibrations at a high frequency (an ultrasonic rate). The converter is a central component of the welding system and is mounted in the actuator.
Counters	A record of the number of cycles run by category, for example, alarms, good parts, and so on.
Cycle Aborts	Settings that end the cycle immediately.
Digital Filter	A smoothing technique used to provide more meaningful data.
Digital Frequency	A specific starting frequency for a horn. Set to Default (recommended) for factory default starting frequency.
Downspeed	The user-definable speed of descent (percentage of maximum speed) during the down stroke of the actuator.
Downspeed Tuning	Run actuator test cycles for measuring speed and allowing fine adjustments to the speed setting.
Energy Braking	Allows the power supply time to reduce the amplitude before the sonics are shut off. Any overloads that occur will be ignored in this state. They will be handled in the hold state.
Energy Compensation	Extend the weld time up to 50% greater than the weld time setting or whenever the minimum energy is reached, or shut off the weld before the expected (set) weld time if the maximum energy value is reached.
Energy Mode	A mode of operation in which ultrasonics are terminated at a user-specified energy value.
Event History	A record of changes made to the welder configuration and weld setup. Records time, date, user ID and comments made for changes. Used for audit purposes
Executive	Highest authority level allowed to the power supply. The Executive has access to all configuration and weld setup features. Only the Executive can create or modify the User ID Setup. Multiple Executive level users can be created in the User ID table. The User ID table must contain at least one Executive user.

Table 2.3 Glossary of Terms

Name	Description
External Amplitude Control	Enables you to access real-time amplitude control directly.
External Frequency Control	Enables you to access real-time frequency control directly.
External U/S Delay	If External Trigger Delay is enabled, weld state machine shall wait for external trigger delay input to become active in less than 30 seconds. When the time expires and input is still inactive, alarm will be recorded and cycle aborted.
Extra Cooling	When On, allows cooling air to start when upper limit switch is triggered and remains on throughout the cycle. When Off, air is applied at ultrasonics application.
F Actual	Actual Frequency. The operating frequency of the ultrasonic stack, as measured during a cycle.
F Memory	Frequency as stored in the power supply memory. The intended operating frequency value for an ultrasonic stack, stored in the memory of the power supply.
Force	Weld Force. The mechanical force applied to the part during the cycle.
Force Act	Actual Force. The measured mechanical force determined from the results of a weld cycle.
Force Graph	Displays force in pounds as a function of weld time.
Force/Col Graph	Dual display of collapse distance in inches and force in pounds as a function of time.
Freq Chg	Frequency Change. (Frequency at Start versus Frequency at End).
Freq End	The frequency at the end of the ultrasonic portion of the welding cycle (when ultrasonics are terminated).
Freq Max	Maximum Frequency. Highest frequency reached during weld cycle.
Freq Min	Minimum Frequency. Lowest frequency reached during weld cycle.
Freq Start	Frequency at Start. Frequency at the time ultrasonics was turned on.
Frequency	The operating frequency of the ultrasonic stack. The frequency stored is measured at the end of the ultrasonic portion of the cycle (when ultrasonics are terminated).
Frequency Graph	Displays operating frequency as a function of time.
Frequency Offset	An offset factor applied to the ultrasonic frequency stored in the power supply.
General Alarm	An alarm that occurs due to system fault and/or tripping a limit.
Gnd Det. Mode	Ground Detect Mode, available in all models of 2000Xct HP Power Supply. In this mode of operation, ultrasonics are terminated after detection of a ground condition between the horn and fixture or anvil.
Ground Det. Cutoff	Ground Detect Cutoff. Immediately terminates the weld process, including the hold step, when a ground detect has occurred.
Hold Force	The force on the part during the hold portion of the cycle.
Hold Pressure	The pressure applied during the hold portion of the cycle. If set to Default, hold pressure equals weld pressure.
Hold Time	The duration of the hold step.
Horn Clamp	If set to ON, the horn will stay down and hold the part in place in the event of an alarm. A Supervisor can reset it and remove the part.
Horn Down	A mode in which ultrasonics are locked out and the user can advance the actuator for setup and alignment.
I/O Connector	Presets 1 through 32 are available.

Table 2.3 Glossary of Terms

Name	Description
Key	Reserved for special product configuration codes.
Linear Encoder	Provides carriage (horn) distance measurement during the actuator cycle.
Main Menu	The list of categories of features available in the software, as displayed on the front panel of the power supply.
Max Energy	Maximum Energy. The maximum user-specified energy that produces a part without an alarm. Used with energy compensation to turn off the weld in Time mode.
Memory Full	Does not allow any welding until memory is cleared. Memory can be cleared by using Copy Now and deleting memory. If set to Continue, the system will write over older memory.
Min Energy	Minimum Energy. The minimum user-specified energy that produces a part without an alarm. Used with energy compensation to extend the weld to up to 50% of the weld time in Time mode.
Minus Limit	The user-defined lower limit, or lower extreme of an acceptable range for a given parameter. Used with suspect and reject limits.
Missing Part	A min/max distance where trigger is expected. Returns the actuator to the home position and displays an alarm indicating that the cycle was aborted because no part was present.
Operator	Authority level below Technician. The Operator can run a weld and view system information, weld history, and current setup. The Operator cannot access the weld setup or configuration menu.
Operator Authority	Special authority rights granted to operators beyond the basic level of welder operation. The setting for this is global and applies to all operator level users. Multiple Operator level users can be created in the User ID table.
P/Col Graph	Dual Display of% power and collapse distance as a function of time.
P/Force Graph	Dual display of% power and force as a function of time.
Parameter Range	Valid range of parameters accepted for a particular setup.
Part-ID Scan	A USB barcode reader or similar device must read and record the part ID before allowing the weld to occur. When set to ON and after a weld cycle, the welder will stay out of ready mode until another part ID is read. If set to OFF, no part ID reading is required before a weld.
Password Recovery Kit	PRK. A dongle that plugs into the back of the power supply to disable authority check.
Peak Power	A weld mode in which obtaining a power value (percentage of full power) will cause the ultrasonic energy to terminate.
Peak Power Cutoff	A power value that terminates the ultrasonics when peak power is not the primary control mode.
Plus Limit	The user-defined upper limit. See Control Limits, Suspect, Reject and Missing Part Limits.
Pneumatic Air Prep	This is a panel that mounts the cutoff valve, filter, and slow start valve that are normally located in the actuator. This panel is required for installations where the actuator is not positioned in a vertical plane, or is used without a Branson actuator support.
Post Weld Seek	Used to determine the operating frequency of the Stack, after the Hold and/or Afterburst portion of the weld cycle. Ultrasonics are run at a low level (5%) amplitude during this step, and the frequency is stored to memory.
Power Graph	A graph of power in percentage of maximum plotted against time.

Table 2.3 Glossary of Terms

Name	Description
Preset	User-stored parameters constituting a weld setup. Saved in non-volatile memory in the power supply, can be recalled for quick Setup of the system.
Preset Barcode Start	The character set for the Preset Barcode Start will indicate a preset is to be recalled. The number following the character indicates which preset number. Example; Preset Barcode Start = P indicates if a barcode reader sees the letter P as the first character of a barcode, it will recall a preset based on the number after P on the barcode.
Preset Name	The ability to name a preset in customer-defined terms.
Presets, External Selection	Presets can be changed externally using 5 user inputs on the user
Pressure Limits	Minimum and Maximum weld pressure limits.
Pressure Step	A change in weld pressure during the ultrasonic portion of the cycle. Pressure A must be less or equal to Pressure B.
Pretrg @ D	The distance at which pretrigger is turned on.
Pretrig Amp	Pretrigger Amplitude. The amplitude at the horn face during pretrigger.
Pretrigger	The setting that causes ultrasonics to start before contact with the part (or, before the set Trigger Force has been met).
Rapid Traverse/RAPID TRAV	Allows fast actuator descent to a user-defined point, before the Downspeed value is applied for control during the stroke.
Ready Position	State in which the welder is retracted to the home position and ready to receive the start signal, ready to operate.
Recall Preset	Allows a user to activate a preset from memory for purposes of operation or modification.
Reject Limits	User-definable limits at which the violating cycle is identified as having produced a bad part.
Reset Required	State used with limits indicating that a reset will be required when the limit is exceeded. The reset is accomplished by using the reset key on the front of the power supply, or by external reset at the User I/O.
Run Screen	The screen showing weld status, alarms, weld count, and process information. Available using a front-panel button on the power supply.
S-Beam Load Cell	Provides force measurement for accurate ultrasonic triggering and graphing of force.
Scrub Time	In Ground Detect mode, the amount of time after detection of a ground condition before the termination of ultrasonics, and end of the cycle.
Seek	The activation of ultrasonics at a low-level (5%) amplitude, for the purpose of finding the resonant frequency of the Stack.
Setup Limits	Minimum and maximum parameter changes allowed for a weld preset.
Stack	Converter, Booster, and Horn.
Start Frequency	The frequency stored in memory and the starting frequency of the horn.
Step @ Col (in)	User-definable collapse distance at which AmpA is changed to AmpB.
Step @ E (J)	User-definable energy at which AmpA is changed to AmpB.
Step @ Ext Sig	Allows you to step Amplitude based upon an external signal.
Step @ Pwr (%)	User-definable power at which AmpA is changed to AmpB.
Step @ T (S)	User-definable time at which AmpA is changed to AmpB.

Table 2.3 Glossary of Terms

Name	Description
Supervisor	Authority level below Executive. The Supervisor has access to all configuration and weld setup features. Multiple Supervisor level users can be created in the User ID table.
Suspect Limits	User-definable limits at which the resultant weld in a welding cycle is identified as potentially bad (suspect).
SV Interlock	SV Interlock input allows power supply to close an auxiliary door.
Sys Components	System Components. Assign names to the power supply, actuator, and stack. Assigned names will become part of the system configuration and weld preset.
Technician	Authority level below Supervisor. The supervisor can create and save a weld setup, perform a horn down test, and run diagnostics. The technician cannot validate, lock, or unlock a validated preset. The technician cannot access the configuration menu. Multiple Technician level users can be created in the User ID table.
Test Scale	The magnification of the power bar on the front panel of the power supply, useful for lower-power applications that want a more accurate (but smaller) scale.
Time Mode	Terminates the ultrasonics at a user-specified time.
Timeout	A time at which the ultrasonic energy terminates if the main control parameter has not been reached.
Trig Delay	Trigger Delay. A user-programmable time delay between engagement of the trigger switch and start of ultrasonics and ramping of force to the weld force.
Trigger	Trigger force triggers the start of ultrasonics based on a set force level. Trigger distance triggers the start of ultrasonics based on a set travel distance. Trigger distance doesn't consider force when used.
Trigger Beeper	An audible signal sounded when the trigger is made.
Upper Limit Switch (ULS)	A switch when activated indicates the actuator is in the home position.
UPS	Power supply module.
USB Copy Now	Allows a PDF copy of weld history, event history, weld setup, and User ID table to be copied to a USB flash drive. The flash drive must be installed for this function to appear.
USB Streaming Data Setup	Allows real time recording of weld data and graphs to a USB flash drive. The weld data and graphs can be viewed on a PC using the Branson Weld History Utility Program.
User I/O	The User I/O is used to configure actuator inputs and outputs. This menu can only be entered when the welder is not in a weld cycle.
User ID Setup	Add and modify users allowed access to the power supply.
User-defined Limits	For process resultants, where - is the user-defined lower limit, and + is the user defined upper limit: • -/+ S/R Energy: The energy reached during the weld. • –/+ Force: The force at the end of the weld. • -/+ S/R Freq: The peak frequency reached during a weld. • -/+ S/R Power: The peak power as a percentage of the maximum reached during the weld. • -/+ S/R Abs D: The absolute distance reached during the weld from the Upper Limit Switch. • -/+ S/R Col D: The collapse distance reached from trigger to end of weld. • -/+ S/R Trg D: The distance at which the trigger occurred. • -/+ S/R Time: The weld time reached during the weld.

Table 2.3 Glossary of Terms

Name	Description
Velocity Graph	A graph of the velocity of the actuator during weld.
View Setup	Available in Main Menu as a read only menu identical to the Weld Setup menu. It is not password protected even if the Weld Setup menu is protected.
Weld Count	Count of acceptable weld cycles.
Weld Energy	The energy specified to be applied to the part during the weld cycle.
Weld Force	The force at the end of the weld cycle.
Weld History	The last 100,000 weld summary data lines are saved.
Weld History Setup	Selects which characteristics will appear in the power supply Weld History screen.
Weld Results	A summary of information concerning the last weld cycle.
Weld Scale	The power bar LED scale during weld.
Weld Time	The time for which ultrasonics are on.
Windows Setup	Allows access to the Microsoft Windows screen.
Write In Fields	Assign a unique alphanumeric to a specific weld setup and cycle.
X Scale Graph	Allows a scaling factor to be applied when auto scale is turned off.

Chapter 3: Delivery and Handling

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3.3 Unpacking 28

3.1 Shipping and Handling

CAUTION	
	The power supply internal components are sensitive to static discharge. Many components can be harmed if the unit is dropped, shipped under improper conditions or otherwise mishandled.

3.1.1 Environmental Specifications

The internal components of both the power supply are sensitive to electrostatic discharge, and many of their components can be harmed if the unit is dropped, shipped under improper conditions, or otherwise mishandled.

The following environmental guidelines should be respected in the shipping of the power supply.

Table 3.1 Environmental Specifications

Environmental Condition	Acceptable Range
Storage / Shipping Temperature	-13°F ~ +131°F (-25°C ~ +55°C)
Shock / Vibration (transit)	18" & 36" shock height and 1-200Hz vibrations per ISTA 3A
Humidity	Maximum 95%, non-condensing

3.2 Receiving

Branson power supply units are carefully checked and packed before dispatch. It is recommended, however, that you follow the procedure below upon receiving your equipment.

Table 3.2 Receiving

Step	Action
1	Check the equipment immediately after delivery to ensure that they have not been damaged during transport.
2	Verify that all parts are complete according to the delivery note.
3	Determine if any component has become loose during shipping and, if necessary, tighten screws.

NOTICE	
	If the goods delivered have been damaged during shipping, please contact the forwarding agent immediately. Retain packing material (for possible inspection or for sending back the unit).

CAUTION	
	The power supply is heavy. Handling, unpacking, and installation may require the assistance of a colleague or the use of lifting platforms or hoists.

3.3 Unpacking

The power supply is fully assembled. It is shipped in a sturdy cardboard box. Some additional items are shipped in the box with the power supply.

When unpacking the power supply, take the following steps:

Table 3.3 Unpacking Procedure

Step	Action
1	Unpack the power supply as soon as it arrives. Save the packing material.
2	Inspect the controls, indicators, and surface for signs of damage.
3	Remove the cover of the power supply (7.7 Parts Replacement) to check if any components became loose during shipping.

NOTICE	
	If damage has occurred, notify the shipping company immediately. Retain packing materials for inspection.

Chapter 4: Technical Specifications

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4.1 Technical Specifications

4.1.1 Environmental Requirements

Table 4.1 Environmental Specifications

Environmental Condition	Acceptable Range
Ambient Operating Temperature	+5°C to +50°C (+41°F to +122°F)
Storage/Shipping Temperature	-25°C to +55°C (-13°F to +131°F)
Shock/Vibration (transit)	18" & 36" shock height and 1-200Hz vibrations per ISTA 3A
Operating Height	Up to 2000 m (6560ft)
Humidity	Maximum 95%, non-condensing
IP Rating	2X

4.1.2 Electrical Requirements

The following tables list input voltage and current requirements for the 2000Xct HP power supply, and includes power required when it is used with Branson Actuators.

Table 4.2 Electrical Input Operating Voltages

EDP	Model	Power	Nominal Input Operating Voltage	Current
1029892	2000Xct HP 20:5.5	5500 W	400-480V,3-phase,50/60 Hz	15 A
1030633	2000Xct HP 20:6.5	6500 W	400-480V,3-phase,50/60 Hz	18 A
1030870	2000Xct HP BALUN 20:8	8000 W, dual push	400-480V,3-phase,50/60 Hz	22 A
1020846	2000Xct HP 20:8.0	8000W	400-480V,3-phase,50/60 Hz	22 A

4.1.3 Ultrasonic Power Supply

The 2000Xct HP power supply is part of an industrial system that consists of power supply module and system controller module.

Figure 4.1 Rear View of 2000Xct HP Power Supply

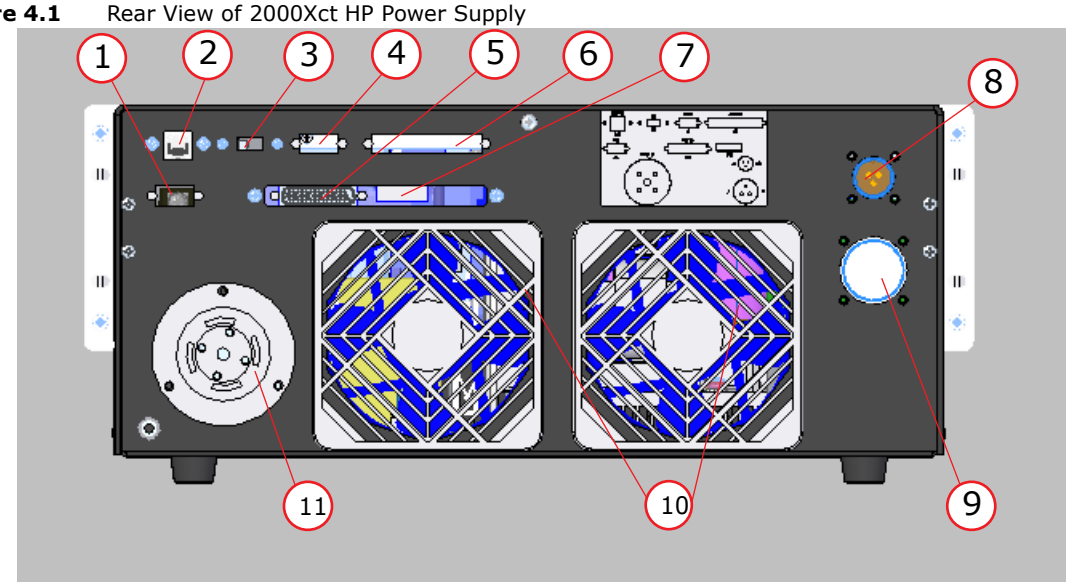


Table 4.3 Connections on Rear of Power Supply

Item	Description	Item	Description
1	VGA Connector	2	Ethernet Connector
3	USB Connector	4	RS232 Connector
5	User I/O Connector	6	Actuator Interface connector
7	SW1	8	Fans Connector
9	RF Connector	10	Fans
11	Power Cord		

The 2000Xct HP power supply consists of an ultrasonic power supply module and a system controller. The ultrasonic power supply module converts conventional 50/60 Hz line current to 20 kHz electrical energy.

The 2000Xct HP power supply's control system is microprocessor-based and controls the welding process. It employs fan-forced cooling, and is intended for horizontal placement. The front panel display and user controls are intended to be accessible from a comfortable position for an end user (operator), which means that the unit will often be installed approximately 0.9m to 1.5m off the floor.

4.1.4 Circuit Descriptions

The 2000Xct HP power supply contains the following modules:

- Line Board.
- System Control Board.
- Ultrasonic Power Module.
- DC Power Module.
- User I/O.

The following sections contain descriptions for each module.

Line Board

To filter out the ultrasonic signals from entering the AC main line and ensure the stability of the input voltage of the power supply.

System Control Board

The System Control Board controls the following functions of the power supply:

- Responding to start and stop signals
- Responding to alarm and reset signals
- Responding to user input from the front panel
- Activating and monitoring ultrasonics
- Provides information for Front Panel Displays
- Generate alarms
- Control communications

Ultrasonic Power Supply

The ultrasonic power supply module generates ultrasonic energy at the resonant frequency of your converter-booster-horn stack. The ultrasonic power supply module is configured as either analog or digital, and each contains five main circuits. The analog power supply has one preset which calls up the factory default setting. The digital power supply has a library of locked presets which are accessible for various process parameter modifications that are unique to the power supply itself. These modifications can be named to reflect specific applications, and are loaded into memory prior to shipment from the Branson factory. The parameters of the individual presets can be modified by a Branson representative. Initially all presets are set to factory default. They are accessed via an RS232 link to the system controller.

- **529VDC Power Supply:** converts AC line voltage to +529VDC for the output power devices
- **Output Circuit:** Matches the impedance of the output power device to the Converter-Booster-Horn Stack; and provides feedback to the Control circuit
- **Control Circuits:** perform the following functions

  Provide drive signal to output power device

  Determine true percentage of ultrasonic power used over a range of amplitudes

  Allow control of the resonant frequency

  Control starting amplitude

  Provide overload protection for the Ultrasonic Power Module

  Store operating frequency of last weld (frequency memory) and use the stored frequency as a starting point for the next weld

  Check and update frequency memory on start-up

  Provide switch-selective starting ramp times (Start)

DC Power Module

The Switching DC Power Module has the below functions:

- **5VDC Output:** Provides +5VDC for the analog and digital circuitry on the System Control Module
- **24VDC Output:** Provides +24VDC for the System Control Module control signal and user I/O voltage
- **12VDC Output:** Provides +12VDC for the System Control Board
- **12VDC Output:** Provides -12V for the System Control Board

User I/O

The User I/O provides a standard user interface and is accessed on the rear of the power supply. It gives the customer the ability to make their own interface for special control and/or special reporting needs. Electrical interface outputs may be configured for open collector mode or for signal mode (signal voltage levels as indicated) by setting the User I/O DIP switch located next to J3.

4.2 Declaration of Conformity

Figure 4.2 Declaration of Conformity

EC DECLARATION OF CONFORMITY
According to the Machinery Directive 2006/42/EC, Annex II A
EMC Directive 2014/30/EU

We, the manufacturer
BRANSON Ultrasonics (Shanghai) Co., Ltd.
2nd Floor, Building No. 5
No 758, East Rong Le Road,
Song Jiang Industrial Zone, Shanghai, PRC, 201613

declare under our sole responsibility, that following Metal Welding Systems consisting of:

1. Actuator: 20DP; Ultrasonic Power Supply (incl. controller): 2000Xdt 20kHz, 4.0kW; Converter: 932R
2. Actuator: 20DP; Controller: 2000Xct HP 20:5,5 (20kHz; 5,5kW); Converter: 20kHz 5.5kW
3. Actuator: 20MA; Ultrasonic Power Supply (incl. controller): 2000Xdt 20kHz, 4.0kW; Converter: 932R
4. Actuator: 20MA; Controller: 2000Xct HP 20:5,5 (20kHz; 5,5kW); Converter: 20kHz 5.5kW

to which this declaration relates is in conformity with the following European Directives:
2006/42/EC, Machinery Directive
2014/30/EC, EMC Directive
2011/65/EU, ROHS

The safety objectives set out in the Low Voltage Directive 2014/35/EC were kept in accordance Annex 1 No. 1.5.1 of the Machinery Directive 2006/42/EC.

The described systems are in conformity with the following standards:
EN ISO 12100:2010, EN 60204-1:2018, EN ISO 13849-1:2015, EN ISO 13849-2:2012, EN 13850:2015, EN ISO 13851: 2019, EN ISO 13855:2010, EN 55011:2016 + A1, EN 61000-6-2:2005, EN IEC 61000-6-2:2019

Person authorised to compile the technical file:
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Shanghai, China
March 1st, 2022

Emily Liu
Engineering Manager

4.3 Declaration of Incorporation

Figure 4.3 Declaration of Incorporation

DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY
According to the Machinery Directive 2006/42/EC, Annex II B

We, the manufacturer
BRANSON Ultrasonics (Shanghai) Co., Ltd.
2nd Floor, Building No. 5
No 758, East Rong Le Road,
Song Jiang Industrial Zone, Shanghai, PRC, 201613

declare under our sole responsibility, that all relevant essential requirements of the **2006/42/EC Machinery Directive** are applied on the partly completed machinery identified in this document, except following: *Protective devices.* It is supposed that safety and emergency interlock will be provided by the superior system in which the system identified in this document is to be integrated.

Partly completed machinery, Metal Welding Systems consisting of:
1. Actuator: 20DP; Ultrasonic Power Supply (incl. controller): 2000Xdt 20kHz, 4.0kW; Converter: 932R
2. Actuator: 20DP; Controller: 2000Xct HP 20:5,5 (20kHz; 5,5kW); Converter: 20kHz 5.5kW
3. Actuator: 20MA; Ultrasonic Power Supply (incl. controller): 2000Xdt 20kHz, 4.0kW; Converter: 932R
4. Actuator: 20MA; Controller: 2000Xct HP 20:5,5 (20kHz; 5,5kW); Converter: 20kHz 5.5kW

The safety objectives set out in the Low Voltage Directive 2014/35/EC were kept in accordance Annex 1 No. 1.5.1 of the Machinery Directive 2006/42/EC.

In addition, described systems are in conformity with the following European Directives:
2011/65/EU, ROHS

The described systems are in conformity with the following standards:
EN ISO 12100:2010, EN 60204-1:2018, EN ISO 13849-1:2015, EN ISO 13849-2:2012, EN 55011:2016 + A1, EN 61000-6-2:2005.

Relevant technical documentation is compiled in accordance with part B of Annex VII of Directive 2006/42/EC on Machinery.

We are committing to present any information relevant to health and safety and, in particular, the relevant technical documentation, in response to a duly reasoned request from the market surveillance authorities of one of the Member States.

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC on Machinery, where appropriate, and until the EC Declaration of Conformity according to Annex II A is issued.

Person authorised to compile the technical file:
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March 1st, 2022

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Chapter 5: Installation and Setup

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5.2 Handling and Unpacking 39
5.3 Installation Requirements 41
5.4 Installation Steps 43
5.5 Testing the Installation 50
5.6 Still Need Help? 51

5.1 About Installation

This chapter is intended to help the installer with the basic installation and setup of your new 2000Xct HP welding system.

CAUTION	
	The power supply is heavy. Handling, unpacking, and installation can require help or the use of lifting platforms or hoists.

Safety labels are found on the power supply and actuator. Those that are of importance during installation of the system are identified in the figures in this and other chapters of this manual.

5.2 Handling and Unpacking

If there are any visible signs of damage to the shipping containers or the product, or you later discover hidden damage, notify your carrier immediately. Save the packing material

1. Unpack the 2000Xct HP components as soon as they arrive. Refer to the following procedures
2. Verify you have all of the equipment ordered. Some components are packed inside other boxes.
3. Inspect the controls, indicators, and surfaces for signs of damage
4. Save all packing material, including the pallets and wood spacer blocks. Evaluation systems will be returned using this packing material

5.2.1 Unpack the Power Supply

Power supplies are shipped in a cardboard carton. It weighs approximately 30kg.

1. Open the box, remove the two foam top packing halves and lift the power supply out
2. Remove the toolkit(s) and other components shipped with the power supply. These items may be shipped in small, separate boxes, or underneath the power supply in the box
3. Save the packing material; evaluation systems will be returned using this packing material

5.2.2 Cables

Two cables connect the power supply and actuator: the actuator interface cable, and the RF cable. For other interfacing requirements, you may also need a user I/O cable. Check your invoice for cable types and cable lengths.

Table 5.1 List of Cables

Part Number	Description
100-246-630	Ground Detect Cable
101-241-203	Actuator Interface, 8"(J925S)
101-241-204	Actuator Interface, 15"(J925S)
101-241-205	Actuator Interface, 25"(J925S)
101-241-207	User I/O, 8" (J957S)
101-241-208	User I/O, 15" (J957S)
101-241-209	User I/O, 25" (J957S)
101-240-176	RF, CE - 8" (J931CS)
101-240-177	RF, CE - 15" (J931CS)
101-240-178	RF, CE - 25" (J931CS) Note: Not for 30kHz or 40kHz systems
101-240-179	RF, CE - 8" (J934C)
159-240-188	RF, CE - 15" (J934C)
159-240-182	RF, CE - 20" (J934C)
101-241-207D	User I/O, 8’(J957S) (Europe)
101-241-208D	User I/O, 15’(J957S) (Europe)
101-241-209D	User I/O, 25’(J957S) (Europe)

5.3 Installation Requirements

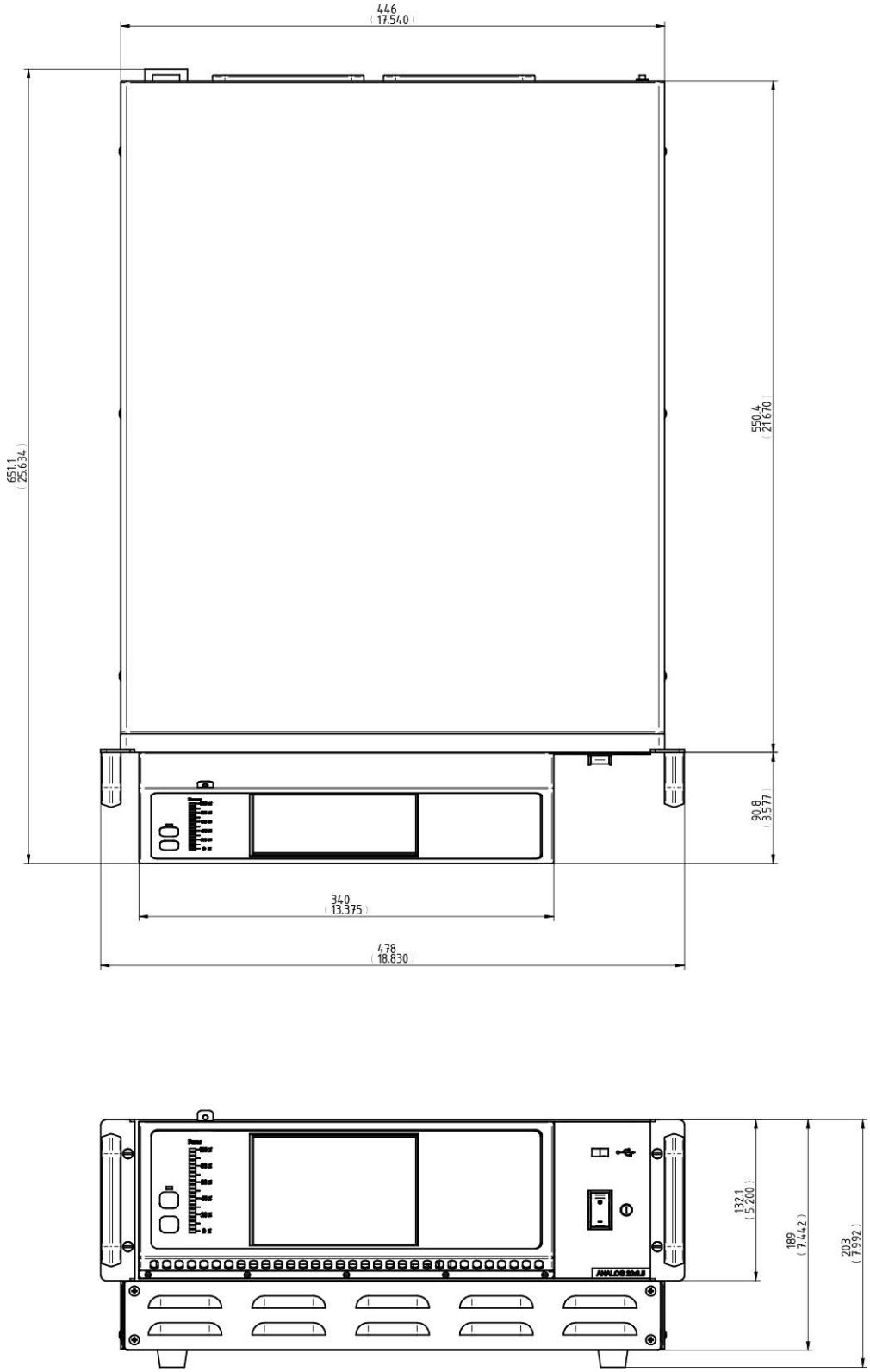
This section covers the location options, dimensions of the major assemblies, environmental requirements, electrical requirements and factory air requirements, to help you plan and execute your installation successfully.

5.3.1 Location

The power supply may be located up to 50 feet away for 20kHz from the actuator. The power supply must be accessible for user parameter changes and settings, and must be placed in a horizontal orientation. The power supply should be positioned so it does not draw in dust, dirt or material via its rear fans. Refer to the illustrations on the pages that follow for a dimensional drawing of each component. All dimensions are approximate and may vary between models:

Figure 5.1 Power Supply Dimensional Drawing

Figure 5.1 Power Supply Dimensional Drawing



5.4 Installation Steps

5.4.1 Mount the Power Supply

The power supply is designed to be placed on a workbench (rubber feet on bottom) within cable-length limits of the actuator, or it may be rack-mounted in a standard 19-inch Rack (using an optional rack mount handle kit). It has two rear-mounted fans which draw cooling air from rear to front, which must be free from obstruction. Do not place the power supply on the floor or in other locations that will allow dust, dirt or contaminants to be drawn into the power supply.

The controls on the front of the power supply must be accessible and readable for setup changes.

All electrical connections are made to the rear of the power supply, which should be positioned in your workspace with adequate clearance (approximately 4 inches or more on either side, and 6 inches to the rear) for cable access and ventilation. Do not place anything on top of the power supply case.

See Figure 5.1 for a dimensional drawing of the 2000Xct HP power supply.

The cable lengths are limited based on the operating frequency of the welding system. Performance and results can suffer if the RF cable is crushed, pinched, damaged or modified. Contact your Branson Representative if you have special cable requirements.

5.4.2 Input Power (Main)

The system requires 3-phase input power, which you connect to the power supply using the integral power cord. See Table 5.4 for plug and receptacle requirements for your specific power level.

Refer to the unit's Model Data Tag to be sure of the power rating of the Model in your system.

5.4.3 Output Power (RF Cable)

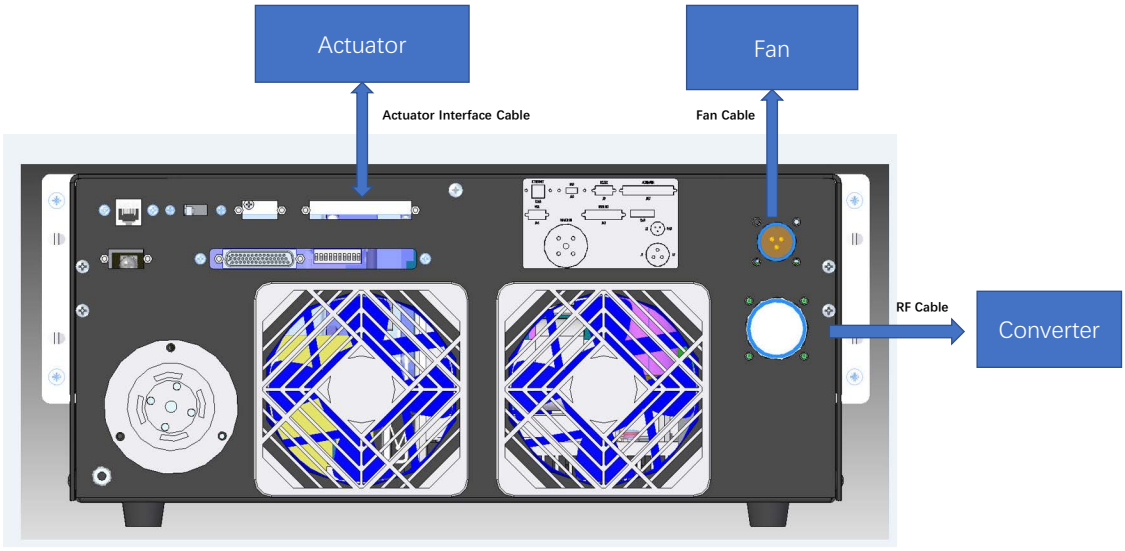
Ultrasonic Energy is delivered to a RF connector on the rear of the power supply, which is connected to the actuator or the converter (depending on your application).

CAUTION	
	Never operate the System with the RF Cable disconnected or if the RF Cable is damaged.

5.4.4 Interconnect between Power Supply and Actuator

The Branson Actuator has two electrical connections between the power supply and the actuator: the RF cable and the actuator interface cable. A 37-pin actuator interface cable is used for power and control signaling between the power supply and actuator. The cable connects to the rear of the power supply and the rear of the actuator.

Figure 5.2 Electrical Connections from Power Supply to a Actuator

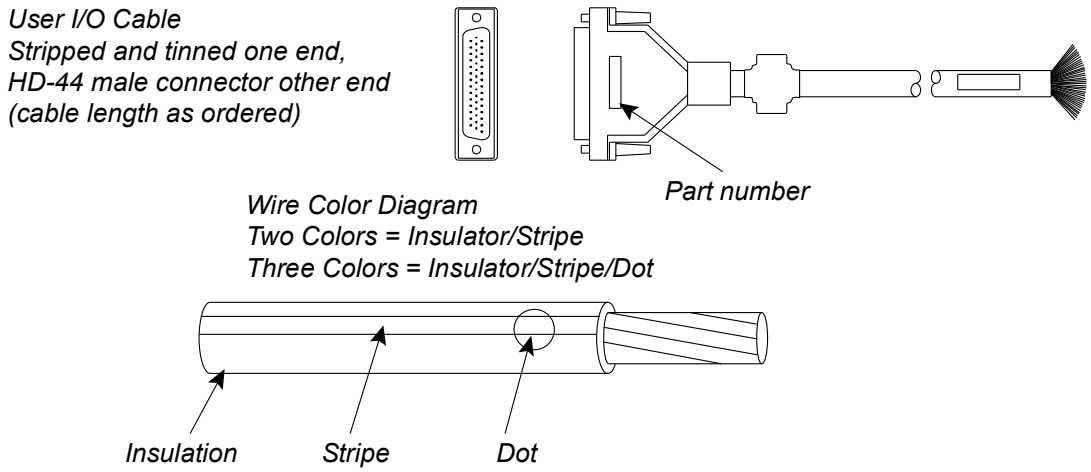


5.4.5 User I/O Interface

The user I/O is a standard user interface, provided on the power supply. It provides the ability for the customer to make their own interface for special control or reporting needs. The interface cable has an HD44 female D-shell connection on the rear of the power supply. The electrical interface outputs may be configured for open collector mode or for signal mode (signal voltage levels as indicated), by setting the user I/O DIP switch.

DIP switch SW1 for the user I/O is located next to the J3 on the back of the 2000Xct HP power supply. User I/O interface cable pinout is listed in Table 5.2。

Figure 5.3 User I/O Cable Identification and Wire Color Diagram



CAUTION	
	All unused wires must be individually electrically isolated from each other. Failure to properly isolate or incorrect wiring can cause the system controller board to fail.

CAUTION	
	Ensure GND pins and +24 V pins are wired correctly. Failure to properly wire these pins will cause damage to the system controller board.

Table 5.2 User I/O Cable Pin Assignments

Pin	Signal Name	Signal Type	Direction	Colors
1	J3_1_INPUT	24 V Logic 1 True	Input	White/Black
2	CYCLE_ABORT	24 V Logic 1 True	Input	Red/Black
3	EXT_RESET	24 V Logic 1 True	Input	Green/Black
4	SOL_VALVE_SRC	+24 V	Output	Orange/Black
5	REJECT	24 V Logic 0 True	Output	Blue/Black
6	G_ALARM	24 V Logic 0 True	Output	Black/White
7	ACT_CLEAR	24 V Logic 0 True	Output	Red/White
8	J3_8_OUTPUT	24 V Logic 0 True	Output	Green/White
9	MEMORY	Analog	Output	Blue/White
10	USER_AMP_IN	Analog	Input	Black/Red
11	MEM_CLEAR	24 V Logic 0 True	Output	White/Red
12	GND			Orange/Red
13	+24V			Blue/Red
14	G_ALARM_RELAY_1	Relay Contact	Output	Red/Green
15	READY_RELAY_2	Relay Contact	Output	Orange//Green
16	SV1RTN	+24 V return	Input	Black/White/Red
17	J3_17_INPUT	24 V Logic 1 True	Input	White/Black/Red
18	USER_EXT_SEEK+	24 V Logic 1 True	Input	Red/Black/Green
19	J3_19_INPUT	24 V Logic 1 True	Input	Green/Black/White
20	SUSPECT	24 V Logic 0 True	Output	Orange/Black/White
21	READY	24 V Logic 0 True	Output	Blue/Black/White
22	J3_22_OUTPUT	24 V Logic 0 True	Output	Black/Red/Green
23	10V_REF	Analog	Output	White/Red/Green
24	AMPLITUDE_OUT	Analog	Output	Red/Black/Green
25	USER_FREQ_OFFSET	Analog	Input	Green/Black/Orange
26	RUN	24 V Logic 0 True	Output	Orange/Black/Green
27	GND			Blue/White/Orange
28	+24V			Black/White/Orange
29	G_ALARM_RELAY_2	Relay Contact	Output	White/Red/Orange
30	WELD_ON_RELAY_1	Relay Contact	Output	Orange/White/Blue
31	J3_31_INPUT	24 V Logic 1 True	Input	White/Red/Blue
32	J3_32_INPUT	24 V Logic 1 True	Input	Black/White/Green
33	J3_33_INPUT	24 V Logic 1 True	Input	White/Black/Green
34	PB_RELEASE	24 V Logic 0 True	Output	Red/White/Green
35	WELD_ON	24 V Logic 0 True	Output	Green/White/Blue
36	J3_36_OUTPUT	24 V Logic 0 True	Output	Orange/Red/Green
37	PWR	Analog	Output	Blue/Red/Green
38	FREQ_OUT	Analog	Output	Black/White/Blue
39	SEEK	24 V Logic 0 True	Output	White/Black/Blue

Table 5.2 User I/O Cable Pin Assignments

Pin	Signal Name	Signal Type	Direction	Colors
40	MEMORY_STORE	Open Collector (Active	Output	Red/White/Blue
41	Analog GND			Green/Orange/Red
42	+24V			Orange/Red/Blue
43	READY_RELAY_1	Relay Contact	Output	Blue/Orange/Red
44	WELD_ON_RELAY	Relay Contact	Output	Black/Orange/Red

CAUTION



Ensure all unused wires are properly isolated. failure to do so may result in power supply or system failure.

NOTICE



When syncing multiple systems, refer to the Branson Automation Guide (EDP 100-214-273) for additional information about selection and use of Input and Output features listed in the following Table.

Table 5.3 Input/Output

Input		Output	
J3_1_INPUT J3_17_INPUT J3_19_INPUT J3_31_INPUT J3_32_INPUT J3_33_INPUT	Disabled Select Preset Ext U/S Delay Display Lock Ext Signal Sonics Disable Memory Reset Ext Tooling Sync In Part Present Confirm Reject	J3_8_OUTPUT J3_22_OUTPUT J3_36_OUTPUT	Disabled Confirm Preset Ext Beeper Cycle OK No Cycle Alarm Overload alarm Modified Alarm Note Missing Part Ext Tooling Sync Out Part-ID Ready

5.4.6 Input Power Plug

3-phase power input is connected with a special plug EDP 1029471. L1, L2, L3, PE are inputs. Note: no zero connection is required.

DANGER	
	The power supply can be permanently damaged if it is connected to the incorrect line voltage, or if the wiring connection is mis-wired. It also presents a safety hazard if mis-wired. Use of the correct plug or connector helps prevent incorrect connections.

Figure 5.4 3-phase plug



5.4.7 User I/O DIP Switch (SW1)

DIP switch SW1, for the user I/O is located next to the J3 on the back of the 2000Xct HP power supply, as shown in Figure 4.1 Rear View of 2000Xct HP Power Supply. The settings of these switches affect the user I/O signals. Factory default setting is for all dip switches is set to ON (closed: switch position closest to number designation).

- If the DIP switch is set to the ON (closed) position, the corresponding Output pin will be configured as the current source, 25mA max
- If the DIP switch is set to the OFF (open) position, the corresponding Output pin will be configured as an "open collector", 24VDC, 25 mA max. current sink

Table 5.4 User I/O DIP Switch Functions

Switch Position	Signal Description	Output Signal
1	REJECT_SIG	REJECT
2	SUSPECT_SIG	SUSPECT
3	PB_RELEASE_SIG	PB_RELEASE
4	G_ALARM_SIG	G_ALARM
5	READY_SIG	READY
6	WELD_ON_SIG	WELD_ON
7	ACTUATOR_CLEAR_SIG	ACT_CLEAR
8	J3_22_OUT_SIG	J3_22_OUTPUT
9	J3_36_OUT_SIG	J3_36_OUTPUT
10	J3_8_OUT_SIG	J3_8_OUTPUT

5.5 Testing the Installation

1. Turn on the air supply connections including the pneumatic dump valve and verify that the air pressure indicator light in the actuator is lit
2. Ensure there are no leaks in the air supply connections
3. Turn on the power supply. The power supply will begin its normal self-check
4. If the power supply displays an alarm message other than Recalibrate Actuator, find the alarm message definition, cause and correction in Appendix B: Alarms. If the power supply displays the alarm message Recalibrate Actuator, go on to the next step
5. Perform an actuator calibration by touching the Main Menu button, and then press the Calibration button. Verify that there is a minimum clearance from horn face to workpiece greater than 0.70"
6. Touch Cal Actuator
7. In the screen that follows, touch w/Start Switches
8. Press the Start switches to complete the calibration
9. Press the Test button
10. If the power supply displays an alarm message at this point, find the alarm message definition in Appendix B: Alarms. If there are no alarm messages displayed, go on to the next step
11. Fit a test part onto the fixture
12. Touch Horn Down on the Main Menu and press the palm buttons. The horn will descend to the fixture on the base of the actuator. This verifies specifically that the pneumatic system is working
13. Press the Retract button. The horn will retract. The system should now be functional and can be set up for your application

In summary, if the power supply does not display an alarm message and descends and retracts correctly, your ultrasonic welder is ready for operation.

5.6 Still Need Help?

Branson is pleased that you chose our product and we are here for you! If you need parts or technical assistance with your 2000Xct HP power supply system, call your local Branson representative or contact Branson customer service by calling the appropriate department as indicated in section 8.2 How to Contact Branson.

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Chapter 6: Power Supply Operation

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DANGER	
	High voltage is present in the 2000Xct HP power supply. When setting up and operating the welding system, observe the potential hazards listed below.

- Do not operate the power supply with the cover removed
- To prevent the possibility of electric shock, always plug the 2000Xct HP power supply into a grounded power source
- Keep hands out from under the horn. Down-force (pressure) and ultrasonic vibrations can cause injury
- Large plastic parts can vibrate within the audible frequency range when welded. If this occurs, use hearing protectors to prevent possible injury
- Do not press the Test switch or cycle the welding system if either the RF cable or the converter is disconnected. High voltage could be present at open power connections
- When using horns, avoid situations in which fingers could be pinched between the horn and the fixture
- Assure power switch is in the OFF position before making or breaking any electrical or pneumatic connections to the power supply, actuator or welder
- Do not touch Ultrasonic Horn during or immediately following the welding cycle. Vibrations and heat can burn skin

CAUTION	
	Do not allow a vibrating horn to touch a metal base or metal fixture.

NOTICE	
	The power supply MUST be set to the correct cylinder size for the actuator to function properly. The regulator will click as it is regulating or maintaining a pressure setting. If there is excessive noise, the supply pressure to the regulator maybe too low for the requested setting.

6.1 2000Xct HP Factory Default User and Password Setting

2000Xct HP is shipped with the following default user ID and password:

User: ADMIN

Password: 123456Aa#

The first time logging in you will need to enter this user ID and password. The system will ask you to create a new password for the user ADMIN after your first time log in.

NOTICE	
	Keep a record of your password and user ID.

NOTICE	
	Create multiple Executive level users for backup.

6.2 Operating System

The 2000Xct HP power supply uses an embedded Single Board Computer (SBC) to offer advanced user interface functions. It uses Windows Embedded Standard as its operating system.

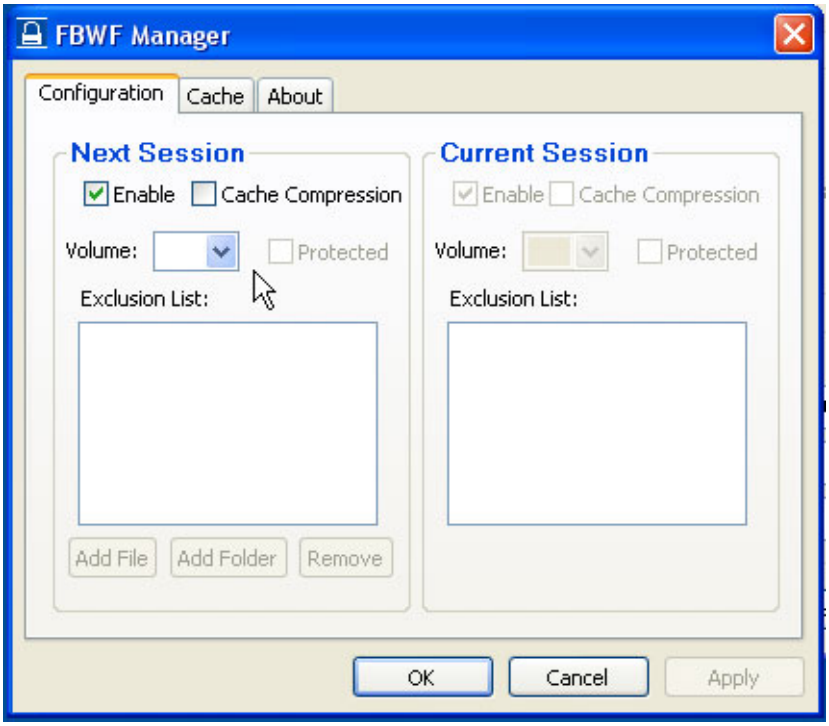
6.2.1 File Based Write Filter (FBWF)

The 2000Xct HP power supply SBC uses a solid state hard disk in the form of a CompactFlash card. While this CompactFlash card appears to be the same type used in digital cameras, it is a special industrial version which allows the Windows Embedded Standard operating system to boot.

To protect the application and the operating system, Windows Embedded Standard employs a File Based Write Filter (FBWF). This filter uses a RAM overlay to record changes to the CompactFlash card. Any changes made to the C: drive are lost during a power cycle. Only the *C:\Branson* folder remains unprotected allowing the 2000Xct HP power supply application to write directly to the CompactFlash card in order to save presets, sequences, setup parameters and log files.

The FBWF must be disabled before modifying the Windows Embedded Standard configuration. Changes made to Windows Embedded Standard configuration such as Local Area Network configuration will be lost if the FBWF has not been previously disabled. Once all changes have been saved, the FBWF must be re-enabled before resuming controller operations. Enabling and disabling the FBWF goes beyond the scope of this application user manual. Contact customer support if this becomes necessary (see section 8.2 How to Contact Branson).

Figure 6.1 FBWF Manager



6.3 2000Xct HP Power Supply External Communication Functions

6.3.1 Branson Remote Desktop Setup

Use Remote Desktop to communicate with a Branson 2000Xct HP power supply. It allows the user to remotely monitor and control the operation of the welder from a Windows-based PC.

Two options are available for networking the welder:

- In many companies, a computer network already exists. In this case, a network Ethernet drop can be installed near the welder. You will need to use a shielded Ethernet cable to connect the welder (the port is on the back of the power supply) to the network.

NOTICE	
	If there is a firewall on the network, you will only be allowed to view the welder within the network unless the company's IT department grants the computer outside the network access.

- If a network does not exist or if a direct link to a single PC is desired, you can use an Ethernet hub with cables to link the welder to the PC.

Before you begin the setup, you will need the following:

- A USB mouse and keyboard for the welder.
- A shielded Ethernet cable for connecting to the network.

6.3.1.1 Network Connection

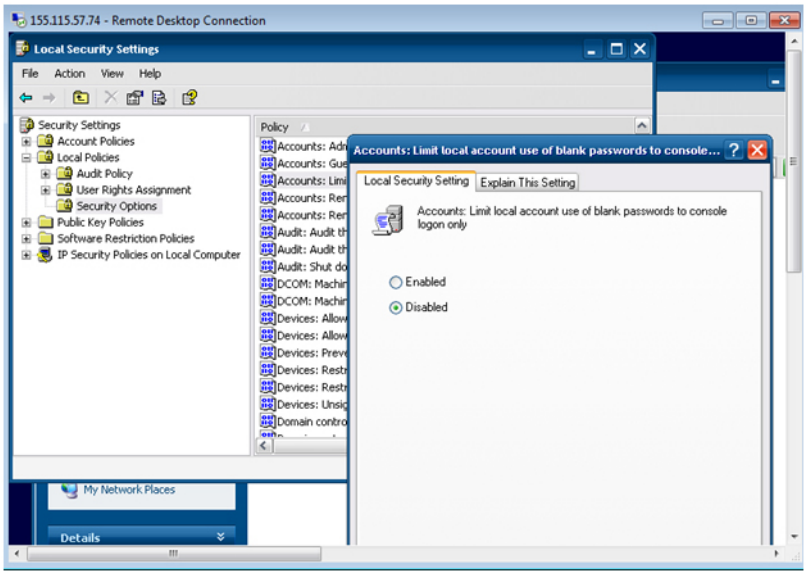
The following procedure is for connecting to a network.

1. Connect the welder to the network by inserting the shielded Ethernet cable into the Ethernet port on the back of the power supply and the network drop.
2. Now you are ready to begin the communication setup.

NOTICE	
	A mouse and keyboard connected to the USB port is necessary to navigate through the next several steps.

3. From the System Configuration menu, select Windows Setup.
4. Go to *Control Panel* > *Administrative Tools* > *Local Security Policy* > *Local Policies* > *Security Options* > *Accounts: Limit local account use of blank passwords to console logon only* and set the option to *Disabled*, and you will be able to remote desktop without the need for a password.

Figure 6.2 Remote Desktop Configuration



5. At the computer, open the Remote Desktop connection, enter the welder IP address in the Server box and click OK. The computer is now directly linked to the welder. You are now equipped to monitor the actions on the welder or control the welder from the PC. You can perform any function on the welder with the exception of initiating a cycle. You can actually have multiple PC linked to the welder simultaneously.

6.3.1.2 Point to Point Connection with a Cross-Over Ethernet Cable

If a network does not exist, a shielded Ethernet cable can be used for a point to point connection between a computer and the 2000Xct HP power supply. The connection can be made using a crossover Ethernet Cable.

NOTICE	
	Most computers now have a cable auto-detect feature that allows them to establish communication with either a straight through or cross-over cable.

PC Setting

The PC will need to be configured for a static IP Address:

1. From Windows, select: Start > Settings > Network and Dial-Up Connections.
2. Select: Local Area Connections > Properties > Internet Protocol > Properties.
3. Set the following IP address.
   IP: 1.1.1.3
   Subnet Mask: 255.0.0.0
   Gateway: 1.1.1.3
   Select OK and close all windows.
4. Select OK and close all windows.

Welder Setting

The welder also needs to be configured for a static IP Address:

1. Select Windows setup screen from the 2000Xct HPt HP controller.

NOTICE	
	A mouse and keyboard connected to the USB port is necessary to navigate through the next several steps.

2. From the Windows screen select: Start > Network Connections.
3. Double click Local Area Connection. Click Properties.
4. Under Internet Protocol (TCP/IP), set the following IP address manually.
   IP: 1.1.1.1
   Subnet Mask: 255.0.0.0
   Gateway: 1.1.1.3
5. Select OK. Close this window by clicking on the "X" on the upper right corner.
6. Double click the 2000Xct HP icon in the window screen to return to the 2000Xct HPt HP main screen.

NOTICE	
	The power supply needs to be restarted for new IP to take effect.

6.3.2 USB

The two USB ports available on the 2000Xct HP power supply are USB 2.0 compliant, allowing complete plug and play, and hot attach/detach for up to 127 external devices. USB 2.0 is fully backward compatible with USB 1.1, supporting speeds of 1.5, 12 and 480 Mbps. For example, keyboard and mouse can be used with USB port at low speed, while USB memory stick will run at High-speed. Information can be transferred to a PC using the Branson History Utility to view and process information. This can be useful when weld history data requirements exceed the maximum of 100,000 weld history data that can be stored in the power supply.

To download data and graphs, a memory stick must be inserted into the USB port (or hub). Then activate the communication through the touchscreen Main Menu:

Table 6.1 Download Data to USB

Step	Action
1	Enter the System Configuration menu. Located on the first screen is the USB DATA button.
2	Once in this menu, you need to switch the USB to On.
3	Select the weld data or graphs you would like to download. When selecting these, the user has the option of either downloading after a weld cycle (and at what interval, i.e., 1, 5, 20, 100, etc.) and/or when an alarm takes place.

The storage capacity of the memory stick will determine the number of cycles and graphs the stick can hold. The data space required for each weld cycle is: 1.0 KB for weld data and 1.35KB for each graph.

NOTICE	
	It is important to remember to turn off the USB feature prior to removing the memory stick; an alarm will be generated if the stick is simply removed.

To view the stored data on a PC you may use Branson's history utility program ***2000Xc History.exe***. For more information, see section 6.3.3 Branson 2000Xc History Utility.

NOTICE	
	If data is not being saved, confirm your USB stick is set to drive D:.

The USB port can also support barcode scanners. The barcode scanner must a have a keyboard emulation mode. Barcode scanner can be used to recall presets and enter the part ID.

NOTICE	
	Do not start scanning with your barcode scanner until the Main menu or Weld Results screen is displayed.

6.3.3 Branson 2000Xc History Utility

The Branson 2000Xc History Utility program is used to display weld history results from the 2000Xct HP power supply on a PC. See section 6.3.2 USB for more information.

Table 6.2 Branson 2000X History Utility

Step	Action
1	Install 2000Xc History Utility program on a PC running Windows 7 or later.
2	Insert the USB memory stick into the PC.
3	Run the 2000Xc History Utility program. Click on "File", then select either "Open P/S folder" or "Open Horn Scan". The window will display the drives available to the PC. Click on the USB drive and select the folder named with the P/S serial number. The software loads the information and enables you to view data and graphs.

Figure 6.3 History Utility



NOTICE	
	From this utility you can also print weld data, graphs, and horn scan data.

6.3.4 VGA Monitor

A touchscreen monitor is available from Branson. This touchscreen monitor can be connected directly to the power supply. Contact your Branson sales representative for purchasing information (see section 8.2 How to Contact Branson).

6.4 Front Panel Controls

You use the color touchscreen on the front panel of the 2000Xct HP power supply to navigate through all of the menus, set welding values, and view alarms about the most recently completed weld.

You press the Reset Button when you encounter an alarm condition requiring that you reset the power supply before performing another operation.

You press the Test Button to verify the integrity of the system setup. If the power supply displays an alarm, find and address the alarm message definition in the Maintenance section of Chapter 7: Maintenance of this manual.

6.4.1 Front Panel Color Touchscreen

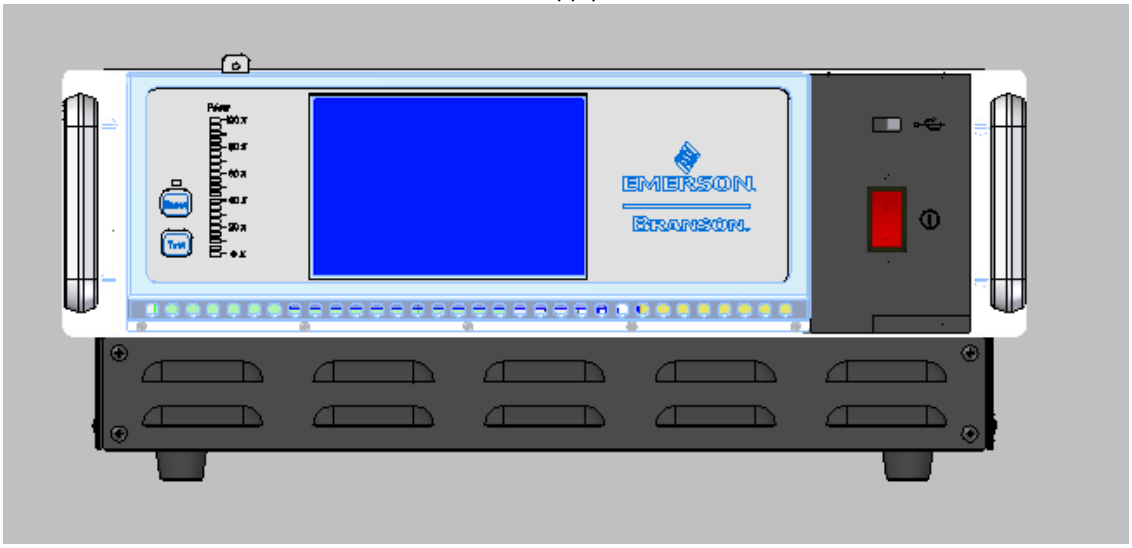
CAUTION	
	Do not use excessive force or a sharply pointed object to operate the touchscreen.

You can perform the following navigational and operational functions on the power supply front panel touchscreen:

- Touching the Weld Results Button will display the Weld Results from 7 weld cycles to be monitored from the Weld Results screen.
- Touching the Main Menu Button will display the Main Menu screen which access the Weld Setup, Screen Setup, View Current Setup, Weld History, System Configuration, System Information, Diagnostics, Save/ Recall Presets, Sequencing Presets and USB options.
- Touching the Weld Setup Button will display the Weld Setup screen which accesses the Weld Mode, and all Weld Parameters.
- Touching the Graphs Button will display the View Graphs, Auto Scale, X Scale and Auto Refresh menu buttons.
- Each of the preceding accessible buttons will provide the user with the appropriate navigation, parameter and choice options to control the operation of the power supply.

6.5 Power-Up and Navigation of the2000Xct HP Power Supply

Figure 6.4 Front Panel of the 2000Xct HP Power Supply



When powered up, the 2000Xct displays the BIOS start up screen for approximately 10 seconds before the Branson 2000Xc logo appears. A progress bar at the bottom of this screen shows the progress of the SBC configuration software loading. This finishes in about 25 seconds, and the screen goes blank for an additional 12 seconds while Windows OS is loading.

If Authority Check is on and Automation Mode is off, the Login screen will be displayed.

Located at the bottom of the Main Menu screen are the touchscreen buttons that allow for the navigation and operation of the power supply. They are:

Table 6.3

Main Menu			
Weld Results	Main Menu	Weld Setup	Graphs

NOTICE	
	You can return to any of these menus at any time by pressing the respective touchscreen button.

6.5.0.1 Button Types

There are 3 types of "buttons".

Navigation Button: Touching this button will "depress" it and display a new Screen

Toggle Parameter Button: Touching the button will change state, i.e. On/Off, +/-

Choice Parameter Button: Generates a pop-up with all choices shown as buttons.

6.5.1 Keypad Operation

There are 2 modes of keypad operation, numeric and alphanumeric. Numeric operation is typically used for all pop-ups except Presets and Password entry. Presets can be either, Password setup (located under System Configuration menu) is usually alphanumeric.

6.5.1.1 Numeric Keypad

The numeric entry mode displays numbers in the New Value field of the respective parameter pop-up as they are touched on the keypad.

The digits are entered from left to right. If you are to enter 10 seconds in Time Mode, touch 1, then 0, and ENT. The value displayed will then be 10.000 seconds, reflecting the resolution for the respective parameter. This will be entered in the New Value field.

In numeric keypad mode, the INC and DEC buttons become inactive when a number digit is pressed.

Once the INC or DEC buttons are pressed, the number digits are inactive. The INC and DEC will increment or decrement the Current Value field by 1 each time it is pressed.

Touching ESC will erase all digits in the New Value field. If you are using INC an DEC to change values and touch ESC, you will be able to enter digits again without changing screens.

Touching ENT will close the pop-up and return you to the Weld Setup screen.

If the value to be entered is not within the minimum / maximum range shown in the pop-up, the min/max field will indicate an error by turning red and beep.

6.5.1.2 Alphanumeric Keypad

The alphanumeric keypad shows the following keys:

- **Alphanumeric keys:** All of the letters and numbers on the keyboard. A-Z and 0-9
- **Punctuation keys:** All of the keys associated with punctuation such as the comma, period, semicolon, brackets, parenthesis and so on. Also, all of the mathematical operators such as the plus sign, minus sign, and equal sign
- **Special keys:** All of the other keys on the computer keyboard such as the function keys, control keys, arrow keys, caps lock key, delete key, etc

6.6 Testing the Welding System

After the power supply is installed, you can confirm that the ultrasonic welding system is operational by following this test procedure using a sample part. This assumes that the installation has been set-up and tested per Chapter 5: Installation and Setup of this manual.

To test the Welding System after installation, do the following:

Table 6.4 Testing the Welding System

Step	Action
1	On the actuator column, adjust the stroke length to 1/4 inch or more, depending on the part you will use for the test run. Position the system to allow for a minimum stroke length of 1/4 inch or more. Lock column after adjusting.
2	Position the part in the tooling.
3	Verify that factory air supply has been connected to the actuator and turned on. (If using optional pneumatic dump valve, ensure it is turned on.)
4	On the power supply front panel, press the power switch. The indicator light on the front of the actuator becomes illuminated.
5	The power supply will go through its normal turn on sequence. At the end of this sequence the Main Menu screen is displayed*. If the power supply displays an alarm message, find the alarm message definition, cause, and correction in Chapter 7: Maintenance of this manual. If the alarm message is Recalibrate Actuator, return to Chapter 5: Installation and Setup, and re-run the procedure in 5.5 Testing the Installation.
6	On the power supply touchscreen, press the Weld Setup button. Press the Trigger Force button. Set Trigger Force to 10 lbs.
7	On the power supply touchscreen, press the Weld Results key.
8	Activate both Start Switches simultaneously.
9	When the weld cycle is complete, and if the cycle has completed successfully, the cycle counter increments to show a completed cycle. If the Reset LED on the power supply front panel flashes and the second line displays an alarm message, the test did not complete successfully. See section 7.5 Troubleshooting, for information on alarm conditions and how to correct them.

*The default screen is Main Menu. The Weld Results screen can also be chosen as the startup screen on the System Configuration Menu.

NOTICE	
	If you power up and the actuator is not home, you will get two alarms. One is the Recal Actuator Alarm. Restore air to the system and power up again and a recal will not be needed.

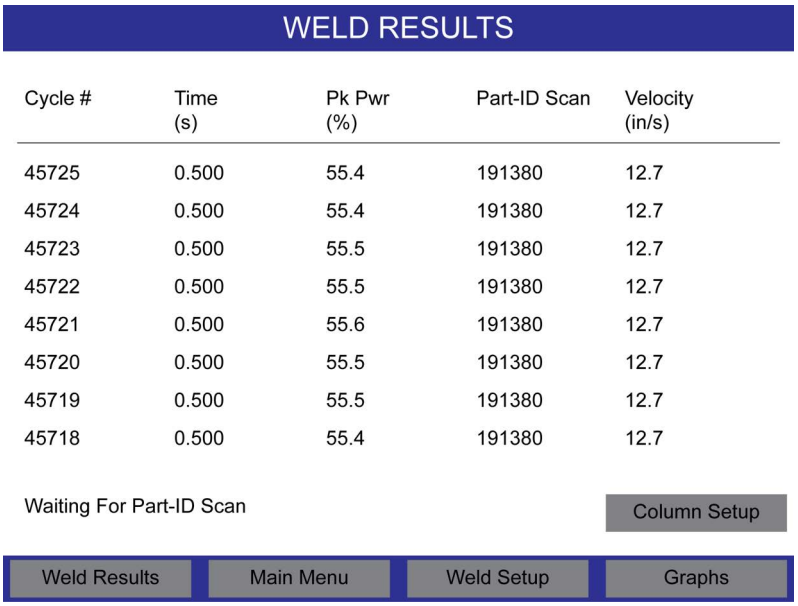
6.7 Weld Results

Pressing the *Weld Results* button displays the cycle number and 4 user configurable parameters. The values are updated at the end of the weld cycle. The top of the screen displays the current running preset's name, current cycle state, and batch count parameter.

The format for the batch counter is XXXXXX/YYYYYY where XXXXXX is the number of weld happened in this batch and YYYYYY is the total number of welds in this batch.

Users can scan a part ID barcode and the system will associate the next weld with the scanned part ID. Users can also scan a preset barcode and the system will recall the required preset from the preset list according to the scan. If Part-ID Scan is enabled, the lower left button will display *Waiting For Part-ID Scan* until it has been received.

Figure 6.5 Weld Results



NOTICE	
	Part ID can be up to 18 characters in length. If a part ID is longer, the system will truncate it. When displaying the part ID in a column on the Weld Results screen, only the first 10 characters will be shown.

6.8 Main Menu

Pressing the *Main Menu* button displays the Main Menu screens. The following choices are available on the Main Menu:

Table 6.5 Main Menu, Page 1

Main Menu	
Weld Setup	System Configuration
Screen Setup	System Information
View Current Setup	Diagnostics
Horn Down	Weld History

Table 6.6 Main Menu, Page 2

Main Menu	
Save/Recall Presets	Sequencing Presets
Calibration	USB
Alarm Log	Event History
Login	

6.9 Weld Setup

The Weld Setup Menu allows you to select and set all the parameters necessary to successfully operate in any available mode. The following parameters are available in Weld Setup.

Table 6.7 Weld Setup, Page 1

Weld Setup	
Weld Modes	Trigger
Trigger Force Trigger Distance	Weld Time, Weld Energy, Peak Power, Collapse, Absolute, Scrub Time
Amplitude Step Scrub Amplitude	Hold Time
Amplitude	Pressure Step

Table 6.8 Weld Setup, Page 2

Weld Setup	
Weld Pressure	Downspeed
Rapid Traverse	Hold Pressure
Pretrigger	Save/Recall Presets
Write In Field	Batch Setup

Table 6.9 Weld Setup, Page 3

Weld Setup	
Afterburst	Control Limits
Act Clr Output	Cycle Aborts
Pressure Limit	Power Match Curve
Ext U/S Delay	Digital UPS

Table 6.10 Weld Setup, Page 4

Weld Setup	
Post Weld Seek	Reject Limits
Energy Brake	Suspect Limits
Frequency Offset Timeout	Downspeed Tuning
Setup Limits	

6.9.1 Weld Modes

After analyzing your specific application, you can determine the Weld Mode to use to weld your parts. A Weld Mode is a set of parameters that governs the weld. (Contact the Branson Ultrasonics Applications Laboratory for more information on determining the best mode for welding your application. See section 8.2 How to Contact Branson.)

There are six Weld Modes to choose from Time, Energy, Peak Power, Collapse Distance, Absolute Distance, and Ground Detect Modes.

Table 6.11 Weld Modes

Weld Modes	
Time	Energy*
Peak Power*	Collapse Distance*
Absolute Distance*	Ground Detect*

NOTICE	
	*In these modes, timeout can be used for control limits.

6.9.1.1 Time

You can use Time Mode to select the length of time (in seconds) that ultrasonic energy is applied to your parts. Within Time Mode, you can also select several other parameters, ranging from Hold Time (in seconds) to Suspect and Reject Limits.

6.9.1.2 Energy

You can use Energy Mode to select the amount of ultrasonic energy (in Joules) that is applied to your parts. Within Energy Mode, you can also select several other parameters, ranging from Hold Time (in seconds) to Suspect and Reject Limits.

6.9.1.3 Peak Power

You can use Peak Power Mode to select the maximum percentage of the total available power that will be used to process your welds. When the power level you set is reached, ultrasonics will be terminated. From within Peak Power Mode, you can also select several other parameters, ranging from Hold Time (in seconds) to Suspect and Reject Limits.

6.9.1.4 Collapse Distance

You can use the Collapse Distance Mode to select the distance (in inches or milliliters) your part will be collapsed before ultrasonic energy is terminated. This distance parameter can be set when in Collapse Mode to establish Suspect and Reject Limits. Total Collapse Limits in Collapse Mode is that value achieved at the end of Hold. Within Collapse Mode, you can also select several other parameters, ranging from Hold Time (in seconds) to Suspect and Reject limits.

6.9.1.5 Absolute Distance

You can use the Absolute Distance Mode to select the distance (in inches or milliliters) the horn will travel before ultrasonic energy is terminated. Within Absolute Mode, you can also select several other parameters ranging from Hold Time (in seconds) to Suspect and Reject limits.

6.9.1.6 Ground Detect

You can use Ground Detect Weld Mode to have ultrasonic energy turn off when the horn comes in contact with your electrically isolated fixture or anvil. The electrically isolated fixture should be so designed that the insulator allows no continuity to the actuator base. It is necessary to install Branson cable EDP No. 100-246-630 from the MPS/GDS receptacle on the rear of the actuator to your isolated fixture/anvil in order to utilize this feature.

From within Ground Detect Mode, you can also select several other parameters, ranging from Hold Time (in seconds) to Suspect and Reject Limits.

6.9.2 Trigger

Press the *Trigger* button to toggle between Trigger Force and Trigger Distance.

6.9.3 Trigger Force

Set the number of pounds (Newtons) of trigger force that will trigger ultrasonics. When the force on your part is equal to the value you have set, ultrasonic energy is applied.

6.9.4 Trigger Distance

Set the number of pounds (Newtons) of trigger force that will trigger ultrasonics. When the force on your part is equal to the value you have set, ultrasonic energy is applied.

NOTICE	
	Start switches must be maintained from part contact through hold time.

6.9.5 Weld Time

Set the length of time (in seconds) that ultrasonic energy will be transmitted to your parts.

6.9.6 Weld Energy

Set the amount of energy (in Joules) that will be transmitted to your parts.

6.9.7 Peak Power

Set the peak power level (as a percentage of full power) at which the weld is terminated.

6.9.8 Collapse

Set the vertical distance (in inches or millimeters) that your part collapses before ultrasonics are terminated.

6.9.9 Absolute

Set the vertical distance (in inches or millimeters) that the horn travels from the home position before ultrasonics are terminated.

6.9.10 Scrub Time

Set the amount of time after detection of a ground condition to the termination of ultrasonics.

6.9.11 Scrub Amplitude

Sets the scrub amplitude in percent when ground detect mode is selected.

6.9.12 Hold Time

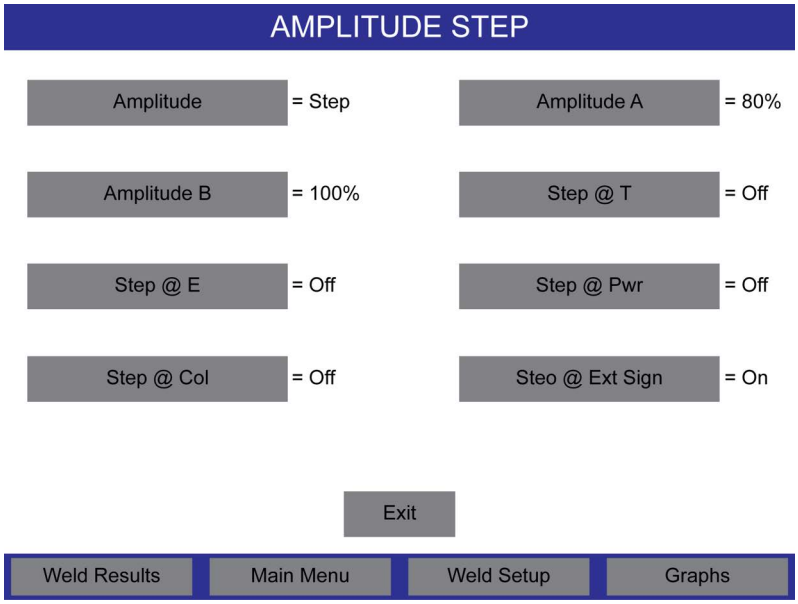
Sets the duration (in seconds) of the Hold step (the step during which there is no ultrasonic energy transmitted to your part, but pressure is maintained) in welding your parts.

You can turn off this function.

6.9.13 Amplitude Step

You can select whether you want to apply a fixed or stepped amplitude to the part during welding. If Step was selected ON from the Weld Setup page the following screens will be shown. Pressing Amplitude displays a screen with two choices, STEP or FIXED. If FIXED was selected ON from Weld Setup, the screen with 2 choices, STEP or FIXED is displayed. If you choose to use a stepped amplitude, you must also choose the first and second amplitudes (each as a percentage of the maximum) to use before and after the step point, as well as the criteria to use the step.

Figure 6.6 Amplitude Step



6.9.14 Amplitude

You can set the amplitude of the ultrasonic energy that will be delivered in any welding mode. The power supply's default is to use 100% of the available amplitude. By changing the amplitude to some lesser percentage of the total available, or by setting the amplitude to begin at one level and finish at another, you can "fine tune" your overall welding procedure without making changes to your tooling (converter, booster, horn, or fixture).

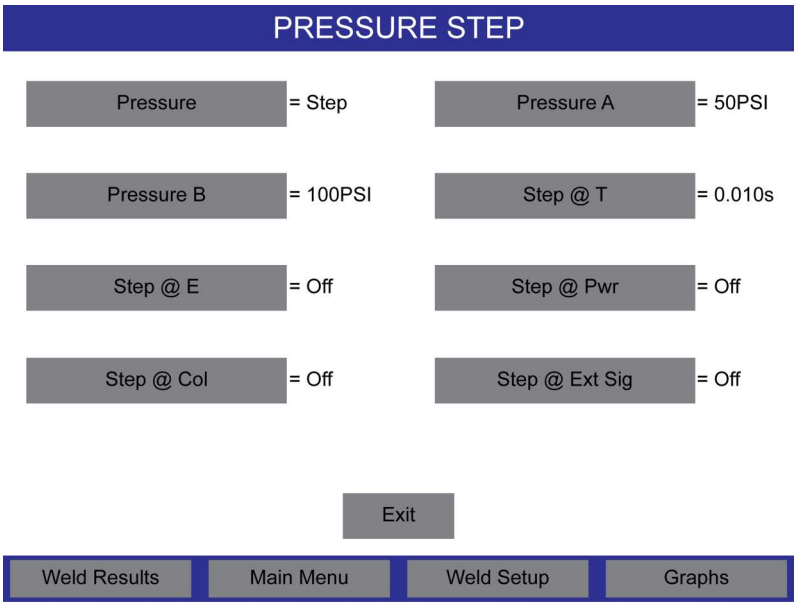
NOTICE	
	You can select the amplitude to use only when Amplitude is set to Fixed. If amplitude is Stepped, this parameter is inactive and the display shows *** for Amplitude.

NOTICE	
	If you set Amplitude Control to External in System Configuration, this parameter is inactive and the display shows Ext for Amplitude (%).

6.9.15 Pressure Step

You can select whether you want to apply a fixed or stepped pressure to the part during welding. If Step was selected ON from the Weld Setup page the following screens will be shown. Pressing Pressure displays a screen with two choices, STEP or FIXED. If FIXED was selected ON from Weld Setup, the screen with 2 choices, STEP or FIXED is displayed. If you choose to use a stepped pressure, you must also choose the first and second amplitudes (each as PSI) to use before and after the step point, as well as the criteria to use the step.

Figure 6.7 Pressure Step



6.9.16 Weld Pressure

You can set the PSI pressure that will be delivered in any welding mode. The power supply's default is to use 50 PSI pressure. By changing the pressure to some lesser PSI, or by setting the pressure to begin at one level and finish at another, you can "fine tune" your overall welding procedure without making changes to your tooling (converter, booster, horn, or fixture).

NOTICE	
	You can select the amplitude to use only when Pressure is set to Fixed. If pressure is Stepped, this parameter is inactive and the display shows *** for Pressure.

NOTICE	
	Pressure B must be greater than or equal to Pressure A.

6.9.17 Downspeed

Sets the percent air flow from the actuator's pneumatic cylinder for speed control. The settings can be made between 1 and 100%, and the speed will depend on air pressure and stroke length. The flow valve is motorized and does change instantaneous with adjustments.

If the Downspeed Tuning function is on in the System Configuration screen, the flow valve can be fine tuned to the actuator speed required.

6.9.18 Rapid Traverse

Allows a high horn travel speed for a portion of the stroke. Once the set distance is reached, travel speed is reduced to the downspeed setting.

NOTICE	
	Distance should be set at least 1.0 inches above the actual distance required to switch. Depending on your downspeed setting, the distance may have to be adjusted to touch the part at the required velocity.

Figure 6.8 Rapid Traverse



6.9.19 Hold Pressure

Hold Pressure sets the actuator air pressure during the hold portion of a cycle. If set for Default, the hold pressure will always equal the weld pressure. The hold pressure must always be equal or greater than the weld pressure or a setup alarm will occur.

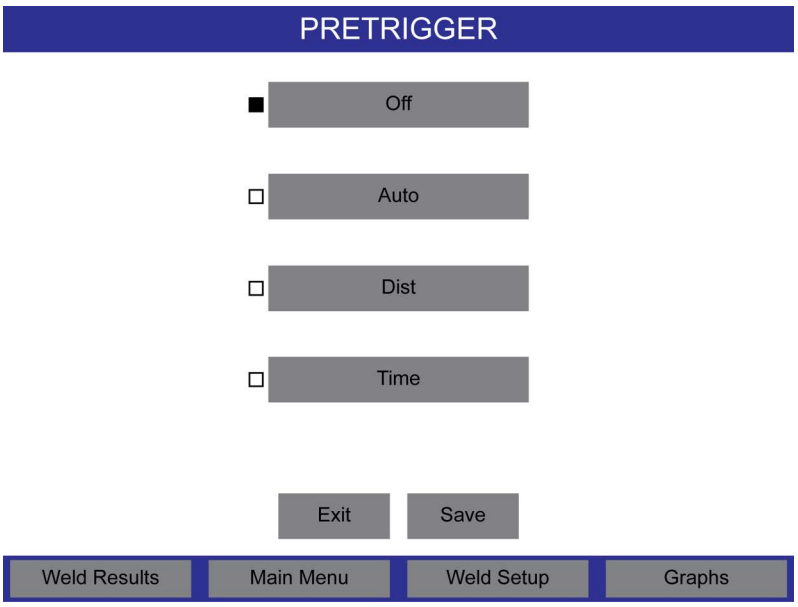
Figure 6.9 Hold Pressure



6.9.20 Pretrigger

You can select whether the ultrasonic energy will be started before the horn makes contact with the part. If you select ON, you can set the distance at which the pretrigger ultrasonics will be started, and the amplitude that will be used. Auto(pretrigger) is the default. When Auto Pretrigger is used, ultrasonic energy will start when the horn leaves the home position 1/8 in. (3.175 mm) travel. Pressing either the Auto or Dist button will give access to a keypad to enter Pretrg Amp(%) values. Pressing the Time will give access to a keypad to enter both Pretrg Amp(%) and Pretrg@T(s) values.

Figure 6.10 Pretrigger



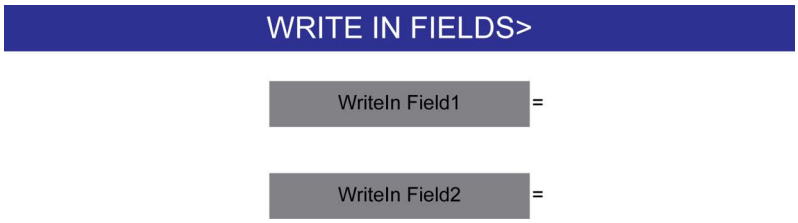
6.9.21 Save/Recall Presets

See section 6.17 Save/Recall Presets for more information.

6.9.22 Write In Field

Write In Field provides a means to assign a 10 digit alphanumeric to a specific weld setup and cycle. This is useful for tracking parameter performance relative to a specific welder, and its respective production run.

Figure 6.11 Write In Field



6.9.23 Batch Setup

Set the batch counter from this menu.

Figure 6.12 Batch Setup

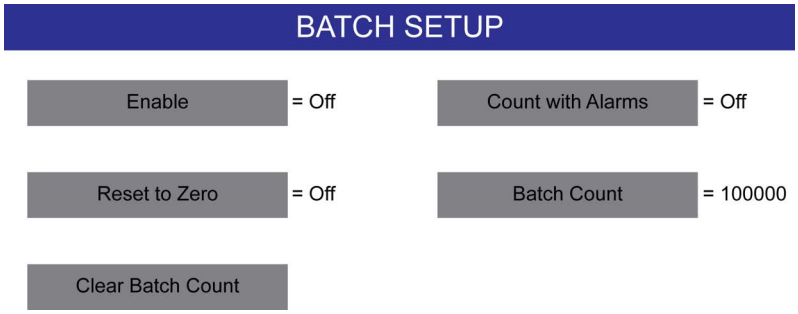


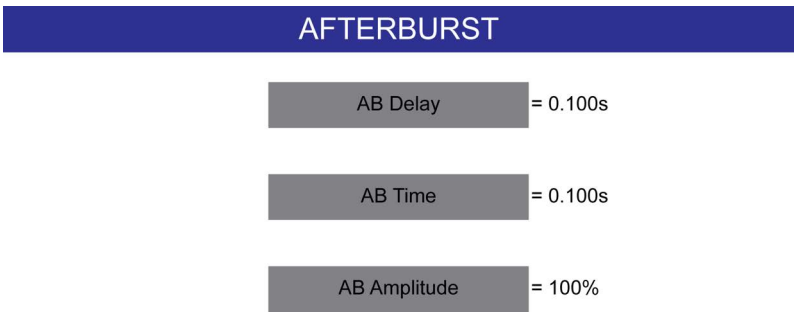
Table 6.12 Batch Setup

Name	Description
Enable	Toggle between On and Off.
Count with Alarms	If Count With Alarm is set to ON, Weld cycles with alarms will also increment the counter.
Reset to Zero	If Reset to Zero is set to On, resetting the batch counter alarm will reset the batch count.
Batch Count	Set the number of welds required in the batch.
Clear Batch Count	Clears the batch count.

6.9.24 Afterburst

You can select whether there will be a burst of ultrasonic energy after welding is complete. This feature is useful fore removing parts stuck to the horn. If you select ON, you can also set the delay and length of the afterburst (in seconds), and the amplitude that will be used.

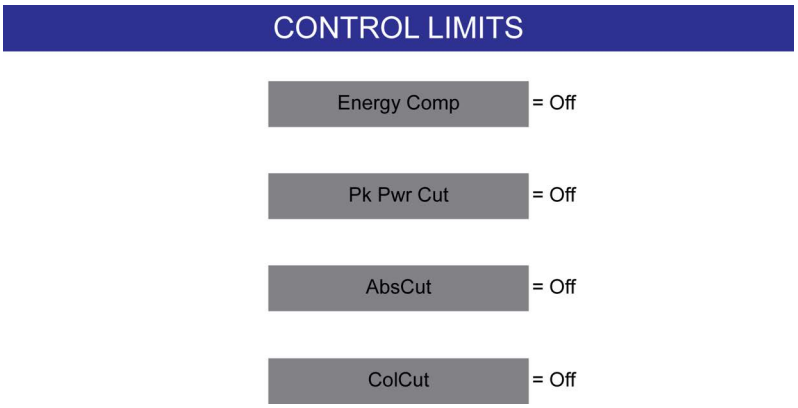
Figure 6.13 Afterburst



6.9.25 Control Limits

You can select whether to use Control Limits. If you select ON, you will set limits of minimum and maximum energy compensation (in Joules), a peak power cutoff (as a percentage of the maximum), an absolute distance (in) measured from the home position, or a collapse distance (in) measured from the trigger. The 2000Xct HP Power Supply uses these Control Limits in addition to the primary weld mode and parameter to determine the end of the welding cycle before moving to the Hold state. When energy compensation is on and the minimum energy computed value is not reached, the weld time will be extended up to 50% of the Set Weld time value in order to reach this limit. When the maximum energy computed value is reached, the Weld Time will be terminated and the Hold Time will start.

Figure 6.14 Control Limits

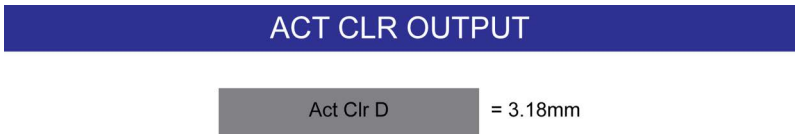


6.9.26 Act Clr Output

You can set an output from the controller board to become active at a set distance for both the upstroke and down stroke from the Home position. The set value ensures that indexing equipment will not contact the Horn after welding. Press the navigation button in the Actuator Clear Output screen to access the numeric keypad. Enter the desired value and Enter.

This distance is also used to deactivate the Ready For Clamp output.

Figure 6.15 Act Clear Output



6.9.27 Cycle Aborts

You can select whether to abort any cycle based on certain input conditions. You can set the Ground Detect Cutoff to ON or OFF (to indicate whether to abort the cycle if the horn contacts the electrically isolated fixture or anvil), and set Missing Part to ON or OFF (to indicate whether to abort the cycle if a part is not in the fixture). If you have set Missing Part to ON, you will access respective keypads to set Maximum and Minimum missing part distances. A missing part output can also be defined in the User I/O. Any cycle-abort conditions will generate an alarm and terminate the cycle.

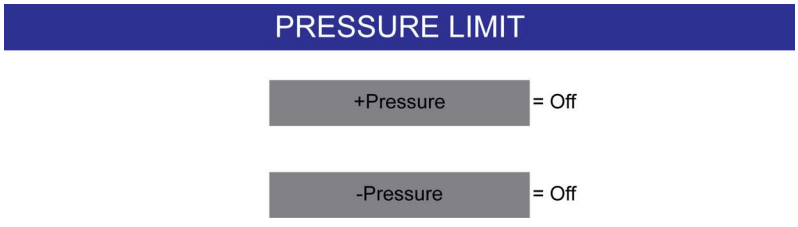
Figure 6.16 Cycle Aborts



6.9.28 Pressure Limit

Pressure limit sets the minimum and maximum weld pressure alarms. If the weld pressure is below the minimum or above the maximum an alarm will occur.

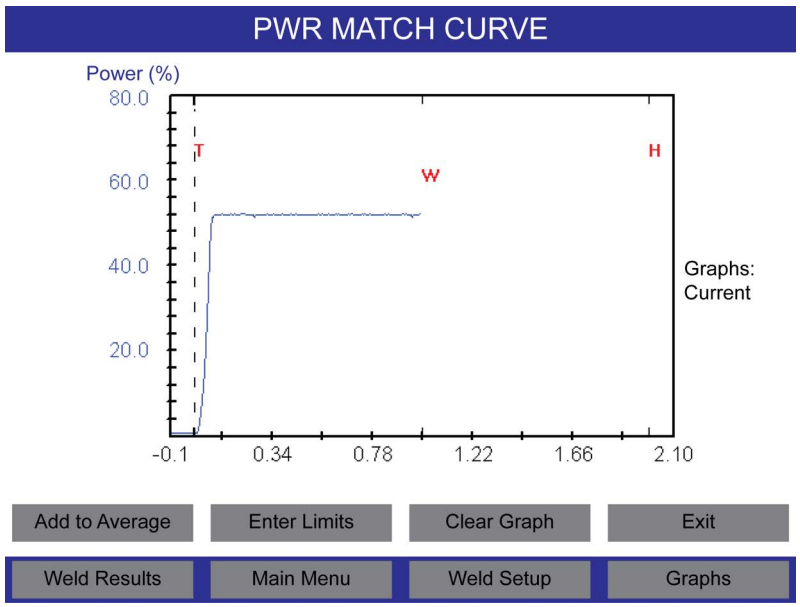
Figure 6.17 Pressure Limit



6.9.29 Power Match Curve

You can enter ± R Band limit values as a% of desired or expected Power to be compared with an actual Power curve of an acceptable weld. This provides a means of comparing welds in progress to previously determined successful weld parameters. Pressing the Enter Limits button will take you to the respective ± R Band buttons, which when pressed will open a keypad to enter values. Limits are then tailored to maintain weld quality. You can add each new weld to get a composite average by pressing the Add to Average button. Limit bands are only displayed when limits are entered. The current weld will display as blue; the average displays red; and the limit bands will display as black.

Figure 6.18 Power Match Curve



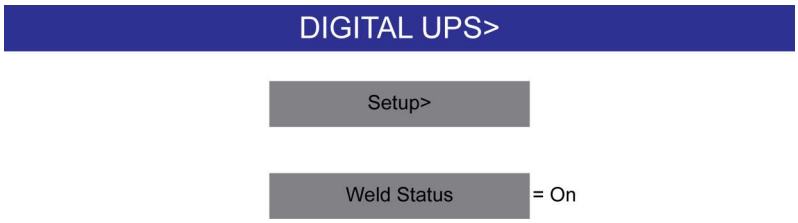
6.9.30 Ext U/S Delay

If turned on, go first to Sys Config> User I/O and select any available J3 INPUT pin, and then select Ext U/S Delay from the list of available Inputs. Weld will be delayed until the input is cleared.

6.9.31 Digital UPS

Use this screen to setup the DUPS and view available presets. This screen will only appear if the power supply has a DUPS module (Digital Universal Power Supply). The DUPS navigation screen is shown below.

Figure 6.19 Digital UPS



From the Setup navigation button, you can toggle to turn either memory, memory reset, or timed seek On or Off and set the ramp time and seek time.

Figure 6.20 Digital UPS Setup



When the Weld Status button is toggled Off, you can view Time, Peak Power and Frequency Change alarms accessed in Weld Results.

When the Weld Status button is toggled On, additional alarms unique to the DUPS can be accessed in Weld Results.

6.9.32 Post Weld Seek

You can select Post Weld Seek. Post Weld Seek operates the stack at a low-level (5%) amplitude immediately after the weld cycle completes, so the power supply can determine the current operating frequency of the stack. The Post Weld Seek button allows you to turn this feature On or Off.

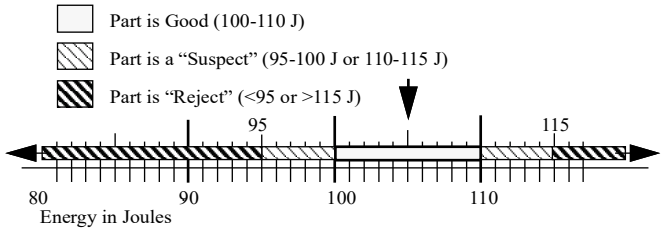
6.9.33 Setting Limits

From within any weld mode, you can set the main parameter (indicated by the name of the weld mode) and Hold Time and several other parameters. The other parameters you can set include Suspect Limits and Reject Limits. You can reduce the amount of scrap from unacceptable parts by identifying those parts that are slightly out of range using Suspect and/or Reject Limits. Upon manual inspection, you might find that these parts are acceptable. You can set the Suspect and Reject Limits on the power supply to identify (by counter, output, or alarm) all parts that fall into limit categories.

For example, consider a weld cycle in Time Weld Mode, where you have set the time to 0.280 second. You have determined (by laboratory testing, trial and error, or some other means) that you get an acceptable weld when 100 to 110 Joules of energy have been transmitted to the part. These are the limits that you should then set on the power supply as Suspect Limits. You have also determined that the part is a "reject" if it received fewer than 95 Joules or more than 115 Joules. This is illustrated by the following graph:

You can set Suspect and Reject Limits for meaningful parameters in each weld mode.

Figure 6.21 Setting Limits



6.9.34 Reject Limits

You can select whether to use Reject Limits to indicate that a part does not have a good weld. You can set limits of minimum and maximum time allowed for:

- weld time
- energy levels
- peak power levels
- collapse distance
- absolute distance
- trigger distance
- weld force
- frequency
- downspeed

If you set Reset Required to Yes, when an alarm is generated, you will need to press the Reset key prior to welding another part.

NOTICE	
	Reject limits put out a signal to pins 20 and 5 of J3 respectively. The 44 pin I/O cable J957 connects to J3.

6.9.35 Suspect Limits

You can select whether to use Suspect Limits to indicate that a part might not have a good weld. You can set limits of minimum and maximum time allowed for:

- weld time
- energy levels
- peak power levels
- collapse distance
- absolute distance
- trigger distance
- weld force

If you set Reset Required to Yes, when an alarm is generated, you will need to press the Reset key prior to welding another part.

NOTICE	
	Suspect limits put out a signal to pins 20 and 5 of J3 respectively. The 44 pin I/O cable J957 connects to J3.

6.9.36 Energy Brake

When turned on, the power supply has some time to reduce the amplitude before the sonics are shut off.

Figure 6.22 Energy Brake



6.9.37 Frequency Offset

You can select whether to use a Frequency Offset. If you select ON, you must also set the offset (in Hz), which the 2000Xct HP Power Supply will apply to the frequency value at the trigger point stored in the power supply.

Figure 6.23 Frequency Offset



6.9.38 Timeout

You select the duration (in seconds) of the maximum allowable time for the primary parameter to be reached during the weld in modes other than time. If the primary parameter has not been reached, the ultrasonic energy will be turned off and the Hold Time will start at the set timeout value. This feature is not available in Time mode. Touching the Timeout navigation button will access the keypad to set and enter the desired value.

NOTICE	
	This feature is not available when in time mode.

6.9.39 Downspeed Tuning

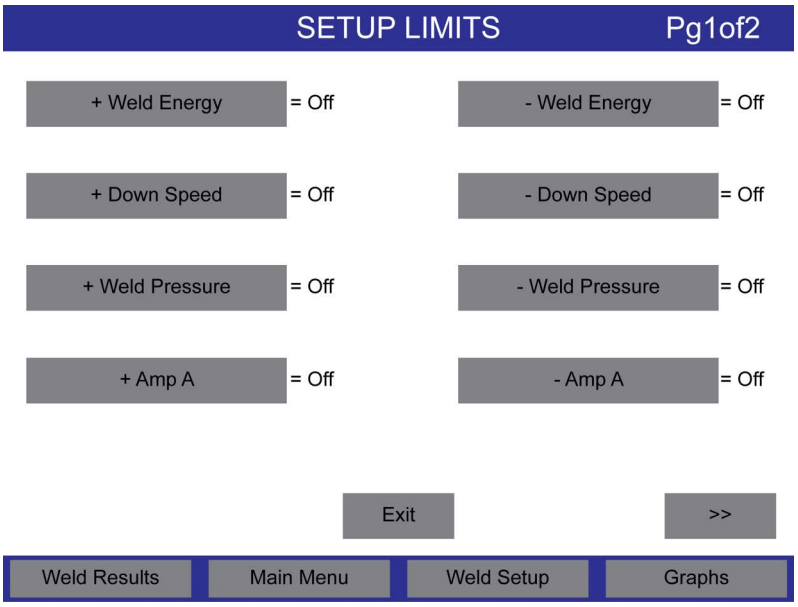
Downspeed tuning enables the downspeed setup menu to be shown every time the downspeed value is changed.

The downspeed tuning is a mechanism to hone in on a particular downspeed value by small increments.

6.9.40 Setup Limits

Setup Limits set the minimum and maximum parameter changes allowed to be made for a validated weld preset. When Setup Limits are enabled, a technician can change a validated and locked weld preset's setup parameters within the minimum and maximum range set.

Figure 6.24 Setup Limits



6.10 System Configuration

The following parameters are available in System configuration:

Table 6.13 System Configuration, Page 1

System Configuration, Page 01	
Units	Start Screen
User ID Setup	USB Data
Operator Authority	Cycle Counter
Basic/Expert	Time

Table 6.14 System Configuration, Page 2

System Configuration, Page 02	
Date	Part-ID Scan
Preset Barcode Start	Extra Cooling
Ext Presets	Windows Setup
Horn Clamp	User I/O

Table 6.15 System Configuration, Page 3

System Configuration, Page 03	
Bargraph Scales	Column Setup
Screen Setup	Beepers
Automation	Authority Check
Act Settings	Weld History Setup

Table 6.16 System Configuration, Page 4

System Configuration, Page 04	
Sys Components	Component Verify
Freq Offset	Memory Full
Digital Filter	Welder Addr
Reset Required	Amp Control

Table 6.17 System Configuration, Page 5

System Configuration, Page 05	
Downspeed Tuning	Key
RS232	Pressure Step Down
WebSrv Automation	WebSrv AuthCheck

6.10.1 Units

Press the *Units* button to toggle between USCS or metric units.

NOTICE	
	Select units (metric or USCS) before making selections. Rounding may cause an invalid preset alarm when using the minimum or maximum values, when changing units.

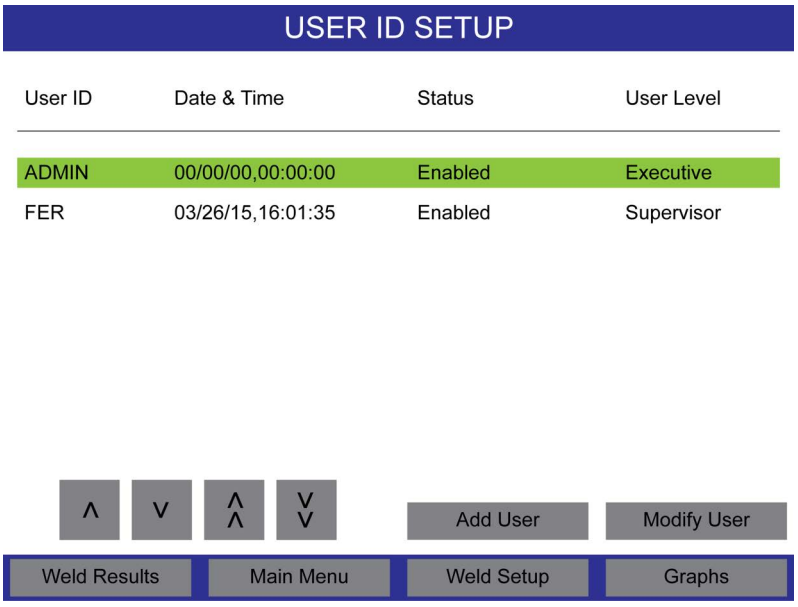
6.10.2 Start Screen

Press the *Start Screen* button to choose whether to start at the Main menu or Weld Results screen at startup.

6.10.3 User ID Setup

Displays current users and their creation/modification date. Users can be added or modified from this screen.

Figure 6.25 User ID Setup



6.10.3.1 Add User

Press the Add User button to add a new User ID.

Figure 6.26 Add User

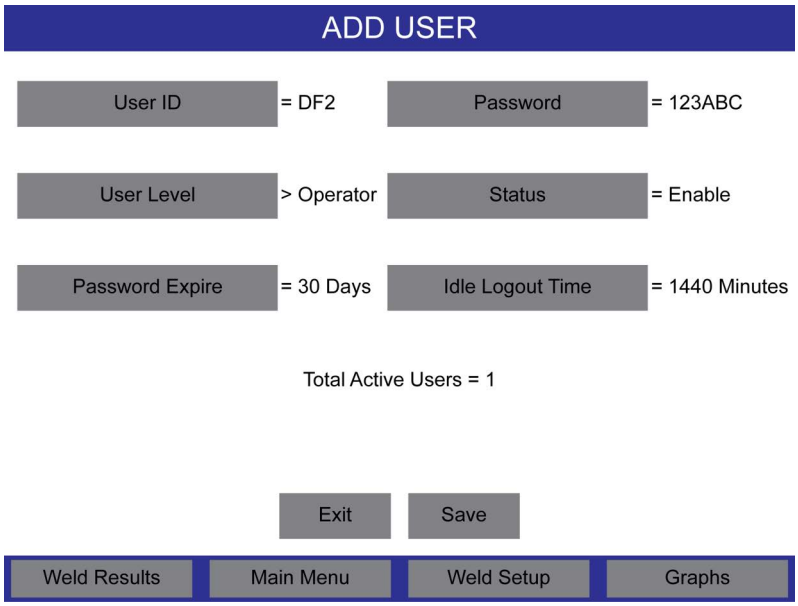


Table 6.18 Add User

Name	Description
User ID	Set the new User ID name.
Password	Set the password for the User ID. **NOTICE** Password must have at least one capital letter, one number and one small letter and one special character available. The minimum length of the password must be of 8 character and max is 10 character.
User Level	Set the user level to Operator, Technician, Supervisor, or Executive. • Operator can run Validated Presets, View Setup, System Information, Weld History, Alarm Log, Event Log, and Weld Results. • Technician level adds Unvalidated Presets, Horn Down, Sequencing, Preset changes, Calibration, and Diagnostics. • Supervisor level adds Validating Setup, and System Configuration. • Executive level has rights to all settings.
Status	Enable or disable users.
Password Expire	Set the time in days before users will have to change their password; otherwise it will expire and the User ID will be locked/disabled.
Idle Logout Time	Set the time after which the system will automatically logout the user in case of no activity. **NOTICE** Disabled in automation mode.

6.10.3.2 Modify User

Select a User ID from the list to modify the parameters of the selected user.

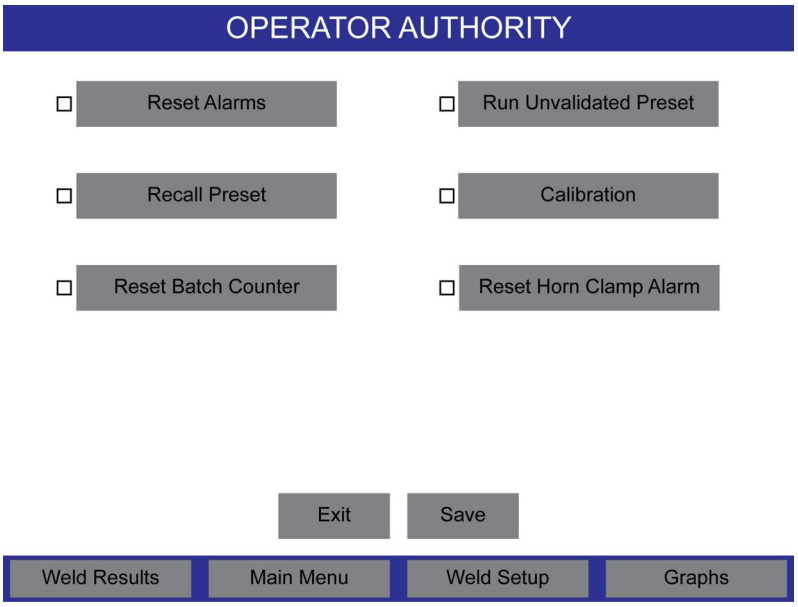
6.10.4 USB Data

See section 6.20.2 Streaming Data Setup for more information.

6.10.5 Operator Authority

Set additional authority options for the Operator user level. Operator could set alarm, recall preset, set batch counter, run inactive preset, perform calibration and reset horn clamp alarm without login credentials.

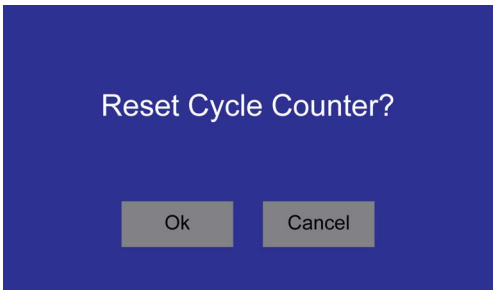
Figure 6.27 Operator Authority



6.10.6 Cycle Counter

Press the *Cycle Counter* button to reset the cycle counter.

Figure 6.28 Cycle Counter

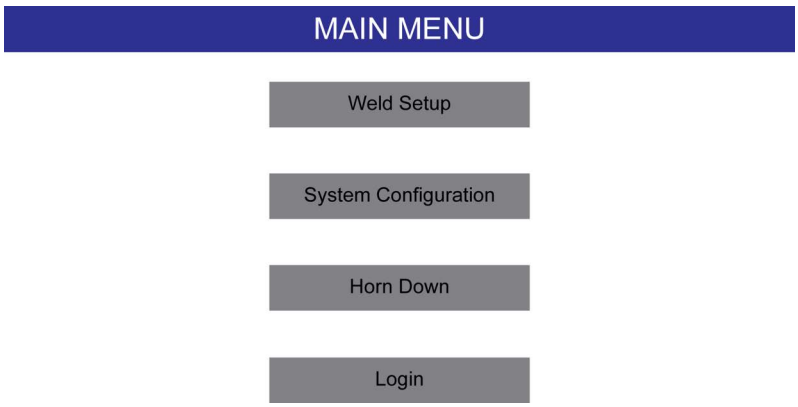


6.10.7 Basic/Expert

Expert (default) allows access to all functions and menus of the welder. Basic limits the configuration and weld setup menus to a minimum number:

- Weld Setup
- System Configuration (only Basic/Expert button)
- Horn Down
- Login button
- Bottom bar menus

Figure 6.29 Basic Mode



6.10.8 Time

Set the time of the power supply. Time will be displayed in Weld Results.

NOTICE	
	Time is set in 24 hour format.

6.10.9 Date

Set the date of the power supply. Date will be displayed in Weld Results.

6.10.10 Part-ID Scan

If set to ON, a USB barcode reader or similar device must read and record the part ID before allowing the weld to occur. When set to ON and after a weld cycle, the welder will stay out of ready mode until another part ID is read. If set to OFF, no part ID reading is required before a weld. The horn down and Diagnostic functions will not be enabled when out of ready mode.

6.10.11 Preset Barcode Start

Enter a character (letter or symbol) that will indicate a preset is to be recalled when scanned with a barcode. The number following the character indicates which preset number. Example; Preset Barcode Start = P indicates if a barcode reader sees the letter P as the first character of a barcode, it will recall a preset based on the number after P on the barcode.

6.10.12 Extra Cooling

When set to On, allows cooling air to start when upper limit switch is triggered and remain on throughout the cycle. When Off, air is applied at ultrasonics application.

6.10.13 Ext Presets

Press the *Ext Presets* button to toggle between On and Off.

External selection of presets is accessed and turned On or Off in the System Configuration menu. The selection goes into effect for the next weld cycle. When enabled, inputs can be read when start switch is received to start a new cycle. The user inputs J3-17, J3-19, J3-31, J3-32, J3-33 are used to decode which preset is recalled.

- When a preset is recalled externally, it will be verified if needed.
- A new alarm message has been added that will indicate that a preset has not been defined (saved) or an attempt has been made to recall a preset not available for a control level.
- External selection of presets will default to off. Cold start will not affect the setting

6.10.14 Windows Setup

Allows access to the Microsoft Windows screen. Double click the 2000Xc icon to return to the 2000Xct HP Power Supply interface.

Figure 6.30 2000Xc Icon



Language Utility

From the Windows interface, you can change the language of the 2000Xct HP Power Supply interface. Double click the Language Utility icon and select the language.

Figure 6.31 Language Utility Icon



Figure 6.32 Language Utility



6.10.15 Horn Clamp

If set to ON, the horn will stay down and hold the part in place in the event of an alarm.

NOTICE	
	A Supervisor can reset it and remove the part.

6.10.16 User I/O

The User I/O menu is used to configure custom actuator inputs and outputs. The User I/O menu can only be entered when the welder is not in the process of welding. If the welder is welding, the beeper will sound and entry will be denied. When entry does occur, the welder will no longer be ready, preventing welding, horn down and test. If horn down is not available, a 2-second message will be displayed indicating horn down is not available. Refer to the Branson Automation Guide (EDP 100-214-273) for additional information about selection and use of Input and Output features listed in the following Table.

Table 6.19 User I/O

User I/O Inputs		
Name	**Description**	**Signal Type**
Disabled	Disabled function to the pin.	Input/Output
Select Preset*	Select preset by using five BCD inputs. Can select up to 31.	Input
Ext U/S Delay	An external input starts the weld cycle after the horn makes contact.	Input
Display Lock	Locks the front touchscreen out from the user.	Input
Ext Signal	Used as the start signal when in handheld mode.	Input
Sonics Disable	Force ultrasonics off. If active throughout a weld cycle, a "dry" cycle will occur.	Input
Memory Reset	Sets the starting frequency of the horn to digital tune centered value.	Input
Ext Tooling Input	When the actuator receives a start input, the Ready for Clamp output indicates the start has been activated. The actuator stays in its home position until the Part Clamp input receives a signal. Then, the normal actuation cycle begins.	Input
Sync In	Used to start ultrasonics when multiple welders are used on the same part.	Input
Part Present	Input to indicate to the welder a part is in place and ready to weld.	Input
Confirm Reject	Input to welder to indicate a rejected part has been dealt with appropriately and the welder can return to ready mode.	Input
Confirm Preset	Output signal that indicates that a weld preset has been inputted from an external controller.	Output
Ext Beeper	Output that operates the same as the internal beeper.	Output
Cycle OK	Output to indicate no alarm conditions occurred in the last weld.	Output
No Cycle Alarm	Indicates the last weld cycle was aborted due to an abnormal welder internal system malfunction.	Output
Overload Alarms	Output that indicates a power supply overload has occurred during the last weld cycle, test, or seek.	Output
Modified Alarm	Output that indicates a user set compensating control limit condition occurred.	Output
Note	Output alarm condition of the lowest priority.	Output
Missing Part	Output that indicates the trigger occurred above the minimum or below the maximum user set allowable distance.	Output

Table 6.19 User I/O

User I/O Inputs		
Name	**Description**	**Signal Type**
Ext Tooling Output	When the actuator receives a start input, the Ready for Clamp output indicates the start has been activated. The actuator stays in its home position until the Part Clamp input receives a signal. Then, the normal actuation cycle begins.	Output
Sync Out	Used to start ultrasonics when multiple welders are used on the same part.	Output
Part-ID Ready	Output that indicates the barcode scanner has read the part ID and is ready to weld.	Output

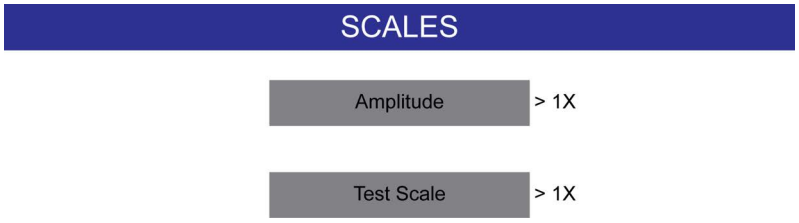
*This option is not available at J3-1 Input.

NOTICE	
	If an output pin is assigned to missing part, the missing part function must first be turned on. If not, the resulting setup alarm will list Cycle Aborts and User I/O as the additional information. Either turn on missing part or turn off the output pin assigned to missing part.

6.10.17 Bargraph Scales

Allows you to get the weld scale and test scale to 1X, 2X, or 3X.

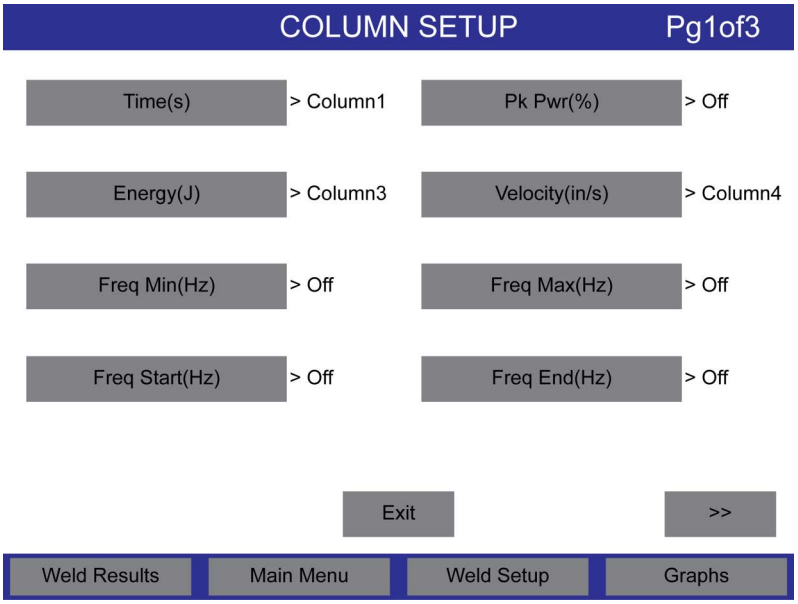
Figure 6.33 Bargraph Scales



6.10.18 Column Setup

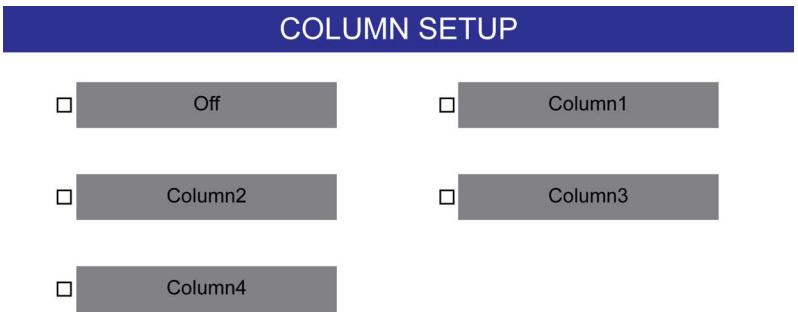
Up to 4 parameters from the Column Setup menu screens can be selected to be viewed in the Weld Results screen.

Figure 6.34 Column Setup



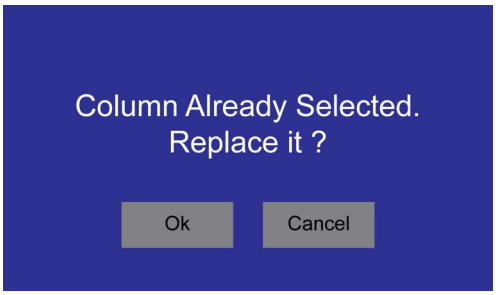
Select the parameter to be tracked by pressing the desired parameter button. You can select to turn a parameter off or select the column number position.

Figure 6.35 Column Setup



If you select a previously used column, you will be asked if you want to replace it.

Figure 6.36 Column Already Selected



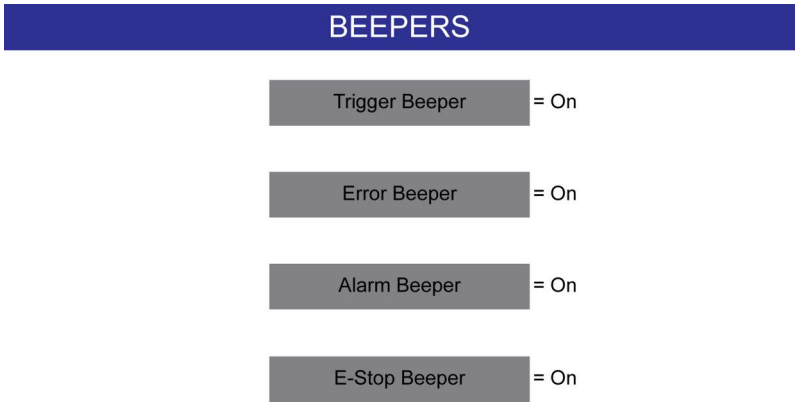
6.10.19 Screen Setup

See section 6.11 Screen Setup for more information.

6.10.20 Beepers

Select which events will have an audio beep.

Figure 6.37 Beepers



6.10.21 Automation

Set to ON when used in automation and an operator log in is not required. When in automation, weld setup and configuration menus are disabled.

6.10.22 Authority Check

Authority check ensures that users logging into the power supply only have access to features dependent on their authority level. Set to Yes to enables authority level functions and menus.

NOTICE	
	For Login authority to operate properly, Authority Check must be set to Yes.

Table 6.20 Authority Check

Feature or Menu	Authority Level			
	Operator	Technician	Supervisor	Executive
Run Validated Weld Presets	X	X	X	X
Run Unvalidated Weld Presets	X*	X	X	X
Reset Alarms	X*	X	X	X
Recall Weld Preset	X*	X	X	X
Reset Batch Counter	X*	X	X	X
Quick Calibration	X*	X	X	X
Weld Setup		X	X	X
Horn Down		X	X	X
Diagnostics		X	X	X
Modify Weld Preset Parameters within Min/Max Range		X	X	X
Save Presets to USB		X	X	X
System Configuration			X**	X
Validate and Lock Weld Presets			X	X
Modify Locked Weld Presets			X	X
Add/Modify User ID Setup				X
Set Authority Check to Yes				X

X = Access to feature or menu.
X* = Access to feature or menu with permission given.
X** = Access with some limitations.

NOTICE	
	It is recommended to disable the default Executive Admin account and create your own Executive accounts.

6.10.23 Act Settings

Change actuator settings.

Figure 6.38 Actuator Settings

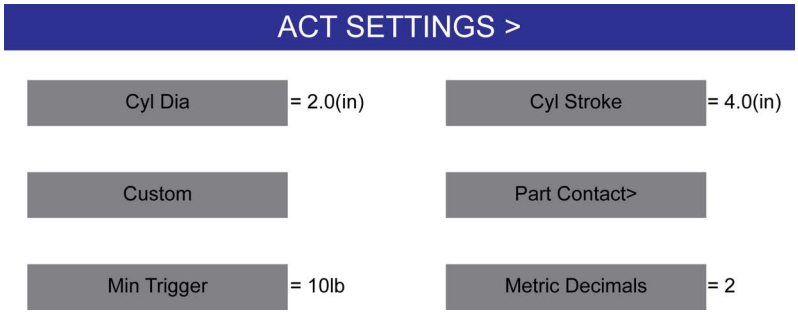


Table 6.21 Actuator Settings

Name	Description
Cyl Dia	Set the cylinder diameters.
Cyl Stroke	Set the cylinder stroke.
Custom	Set the upper limit switch and ground detect to 0 V or 24 V.
Part Contact	Set the velocity and force.
Min Trigger	Set the minimum trigger in lb.
Metric decimals	Set the number of metric decimals.

6.10.24 Weld History Setup

Select which parameters will be shown in Weld History. Available parameters are:

Table 6.22 Weld History

Name	Description
Weld Time	Ultrasonic weld time during cycle.
Peak Pwr	Peak Power. Peak power achieved during ultrasonic cycle.
Energy	Ultrasonic Energy applied during the weld.
Velocity	Velocity of actuator 1/4 inches before part contact.
Weld Abs	Weld Absolute. Distance the actuator traveled from home position to end of ultrasonic weld.
Total Abs	Total Absolute. Distance the actuator traveled from home position to end of hold time.
Weld Col	Weld Collapse. Distance the actuator traveled from part contact to end of ultrasonic weld.
Total Col	Total Collapse. Distance the actuator traveled from part contact to end of hold time.
Set Amp A	Set Amplitude A. Amplitude percentage of ultrasonics for fixed amplitude and first part of amplitude step.
Set Amp B	Set Amplitude B. Amplitude percentage of ultrasonics for second part of amplitude step.
Weld Force	Actuator force at end of weld.
Act Pressure	Actuator Pressure. Pressure during weld.
Freq Min	Frequency Minimum. Minimum ultrasonic frequency measured during the weld cycle.
Freq Max	Frequency Maximum. Maximum ultrasonic frequency measured during the weld cycle.
Freq Start	Frequency Start. Starting ultrasonic frequency of the horn during the weld cycle.
Freq End	Frequency End. Ending ultrasonic frequency of the horn during the weld cycle.
Freq Change	Frequency Change. Frequency Max minus Frequency Min.
Cycle Time	Total cycle time from the actuator leaving the home position to returning to the home position.
Hold Force	Actuator force at end of hold.

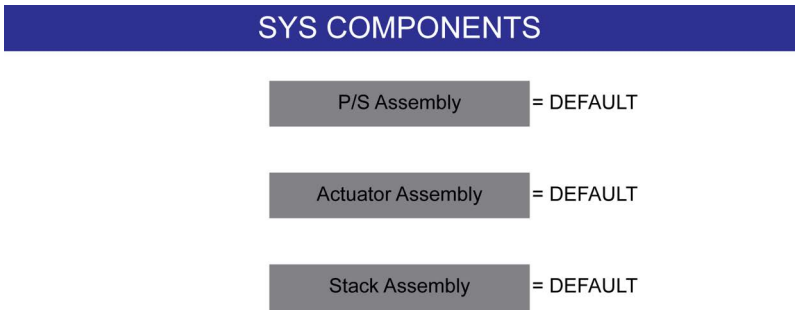
NOTICE	
	By default, every parameter is enabled.

6.10.25 Sys Components

Allows you to enter/scan power supply, actuator, and stack assemblies. These settings will be displayed in System Information. Every preset will have these assemblies at the time of preset validation.

NOTICE	
	Only Supervisor or Executive users can change these settings and any change will be recorded in the event history log.

Figure 6.39 Sys Components

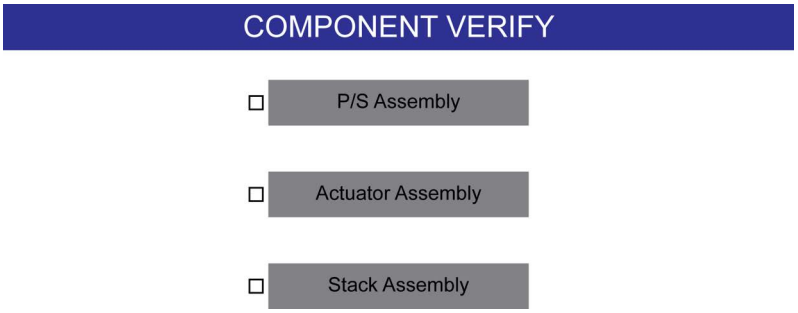


6.10.26 Component Verify

Users can decide to match any of these assemblies with the saved assembly in the Validated Preset screen before allowing a weld cycle. If any of assemblies are selected on the above screen then the assembly in System Configuration will be matched with the assembly in Validated Preset before starting a cycle. A Setup alarm will be generated in case of any mis match and weld will not be allowed for that preset.

NOTICE	
	Only Supervisor or Executive users can change these settings and any change will be recorded in the event history log.

Figure 6.40 Component Verify



6.10.27 Freq Offset

Set whether the frequency offset is internally (Int) or externally (Ext) controlled.

6.10.28 Memory Full

Set whether the welding cycle will be allowed to run once the system's internal memory is full for Weld History or Events. If allowed to Run, the oldest cycle will be overwritten with the next weld cycle. Memory can be cleared by using Copy Now and deleting memory.

NOTICE	
	Only Supervisor or Executive users can change these settings.

6.10.29 Digital Filter

Set the digital filter for graphing on or off.

NOTICE	
	Branson recommends that you set the Digital Filter to on.

6.10.30 Welder Addr

Turn on to assign a unique trackable number to a welder for data collection. This information will be displayed in System Information.

6.10.31 Reset Required

If Reset Required is set to On, the Reset key needs to be pressed before welding another part.

6.10.32 Amp Control

Press the *Amp Control* button to set the amplitude control to internal or external.

6.10.33 Downspeed Tuning

If the Downspeed Tuning function is set to on in the System Configuration screen, the flow valve can be fine tuned to the actuator speed required.

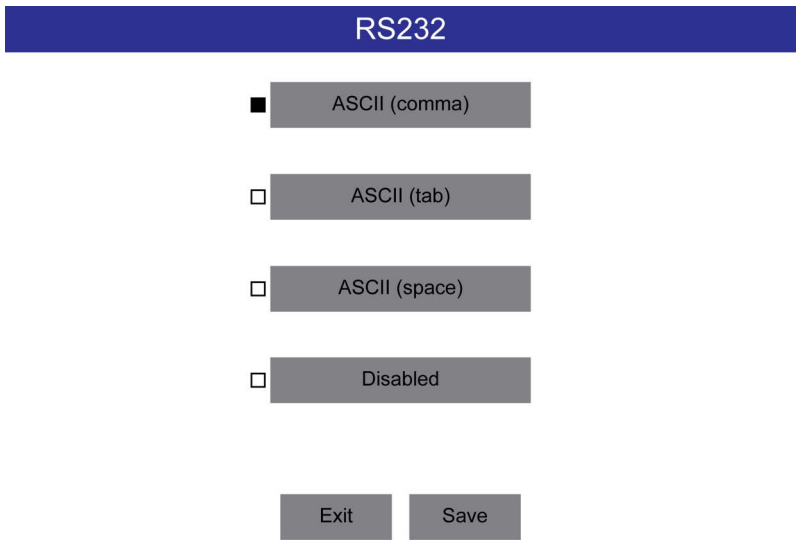
6.10.34 Key

Reserved for special product configuration codes.

6.10.35 RS232

An ASCII string of weld data is sent out through the RS232 port after each weld. The data is separated with the user-selected choice of a space, comma or tab. The end of the string contains both a carriage return and a line feed. The data contained within the string is dependent on the control level and actuator type. It is the same data that is printed on the single line data output to the printer. It is also formatted in the correct units. Te data can be read either by a PC or PLC and then saved to a file in a format (i.e. CSV) that can be read by a spreadsheet program such as Excel. Alarm information will not be sent out the RS232 port.

Figure 6.41 RS232



NOTICE	
	Select units (metric or USCS) before making selections. Rounding may cause an Invalid Preset alarm when using the minimum or maximum values, when changing units. See section 6.10.1 Units for more information.

6.10.35.1 Data String Sample Output

The following examples illustrate the data string that is sent out through the serial port after each weld. The table following these data strings shows the relationship between control levels. IDID can be any number from 1 to 9999. Table headings 1 through 4 respectively reference data string examples 1 through 4.

Table 6.23 Sample Output for Control Level t with an ae actuator

Output	Units
DID@cccccccc@hh:mm:ss@MM/DD/YY@Mode@tt.ttt@sfff@aaaCRLF	USCS
IDID@cccccccc@hh:mm:ss@DD/MM/YY@Mode@tt.ttt@sfff@aaaCRLF	Metric

Table 6.24 Sample output for Control Level ea, d, or f with an ae actuator

Output	Units
IDID@cccccccc@hh:mm:ss@MM/DD/YY@Mode@tt.ttt@ppp.p@eeeee@sfff@aaa@bbbCRLF	USCS
IDID@cccccccc@hh:mm:ss@DD/MM/YY@Mode@tt.ttt@ppp.p@eeeee@sfff@aaa@bbbCRLF	Metric

Table 6.25 Sample Output for Control Level d or f with an aed actuator

Output	Units
IDID@cccccccc@hh:mm:ss@MM/DD/ YY@Mode@tt.ttt@ppp.p@eeeee@w.wwww@z.zzzz@x.xxxx@FFF@hhh@sfff@aaa@bbb@vv.vCR LF	USCS
IDID@cccccccc@hh:mm:ss@DD/MM/ YY@Mode@tt.ttt@ppp.p@eeeee@ww.www@zz.zzz@xx.xxx@FFF@hhh@sfff@aaa@bbb@vv.vCR LF	Metric

Table 6.26 Sample Output for Control Level f with an aef actuator

Output	Units
IDID@cccccccc@hh:mm:ss@MM/DD/ YY@Mode@tt.ttt@ppp.p@eeeee@w.wwww@z.zzzz@x.xxxx@FFF@AAA@BBB@hhh@sfff@aaa@ bbb@vv.vCRLF	USCS
IDID@cccccccc@hh:mm:ss@DD/MM/ YY@Mode@tt.ttt@ppp.p@eeeee@ww.www@zz.zzz@xx.xxx@FFF@AAA@BBB@hhh@sfff@aaa@ bbb@vv.vCRLF	Metric

6.10.35.2 Code Output

Table 6.27 Code Output

1	2	3	4	Where	Definition
x	x	x	x	cccccccc@	is up to an 8-digit cycle count (Cycle Number)
x	x	x	x	hh:mm:ss@	is time of cycle in hours, minutes and seconds (Time)
x	x	x	x	MM/DD/YY@	is date in month, day and year (Date)
x	x	x	x	Mode@	is weld mode (TIME, ENERGY, PKPWR, COL. ABS, G DET)
x	x	x	x	tt.ttt@	length of ultrasonics in seconds (Act. Time)
	x	x	x	ppp.p@	is the peak power in percentage (Peak Power)
	x	x	x	eeeee@	is energy in joules (Act. Ener)
		x	x	w.wwww@	is absolute distance at end of hold in inches or mm (Total Absolute)
		x	x	z.zzzz@	is collapse at end of weld in inches or mm (Weld Collapse)
		x	x	x.xxxx@	is collapse at end of hold in inches or mm (Total Collapse)
		x	x	FFF@	is the trigger force in pounds or Newton’s (Trig. Force)
			x	AAA@	is set weld force or force A in pounds or Newton’s (Set Force A)
			x	BBB@	is set force B in pounds or Newton’s or N/A (Set Force B)
		x	x	hhh@	is the weld force in pounds or Newton’s (Weld Force)
x	x	x	x	sfff@	is frequency change (Hz) from start of ultrasonics to end (Freq. Chg)
x	x	x	x	aaa@	is the set amplitude (or amplitude A) in percentage (Set AmpA)
	x	x	x	bbb@	is the set amplitude B in percentage or N/A (Set AmpB)
		x	x	CRLF	is the velocity in/sec or mm/sec (Act. Vel)
x	x	x	x	@	is either a space, tab or comma as selected by user
x	x	x	x	IDID	is a 4 digit # assigned by “welder Addr” in system configuration

6.10.36 Pressure Step Down

If the Pressure Step Down function is set to On, the system will allow Step Pressure and Hold Pressure settings to be lower than the Weld pressure setting. See section 6.9.15 Pressure Step and 6.9.19 Hold Pressure for more information.

NOTICE	
	Weld alarms may occur when setting Pressure Step Down to On. If Trigger Lost or other nuisance alarms happen after a step-down pressure, they will be ignored and not reported.

6.10.37 WebSrv Automation

Set to ON when Web Services are used in automation and an operator log in is not required.

6.10.38 WebSrv AuthCheck

Authority check ensures that users logging into the power supply only have access to features dependent on their authority level. Set to Yes to enable authority level functions when using Web Services. See section 6.10.22 Authority Check for more information.

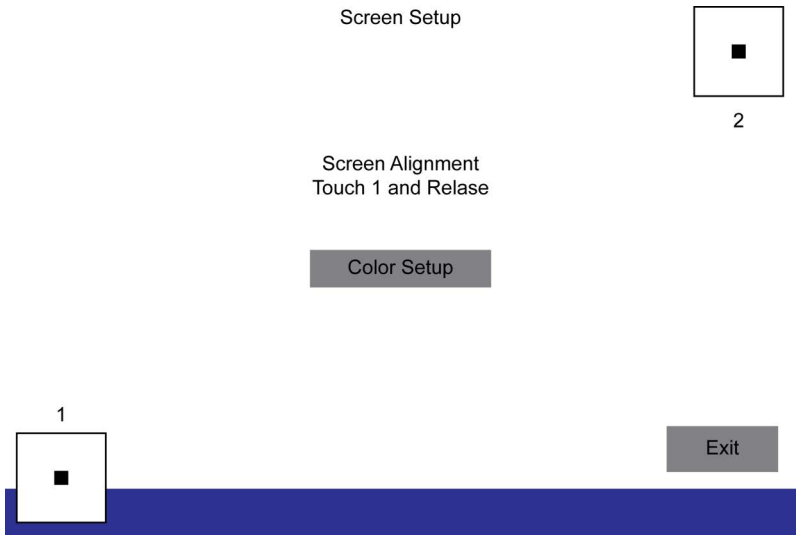
6.11 Screen Setup

Use this feature if you find a need to recalibrate the touch areas for the buttons on the screen.

To calibrate screen touch position, press and release the button marked 1. If it changes to green, the first part of the calibration is successful. Then press and release button 2 to complete the recalibration of the screen. It will also indicate a successful procedure by changing to green. If either button does not result in a change to green, repeat procedure.

Press the *Done* button to return to the Main Menu.

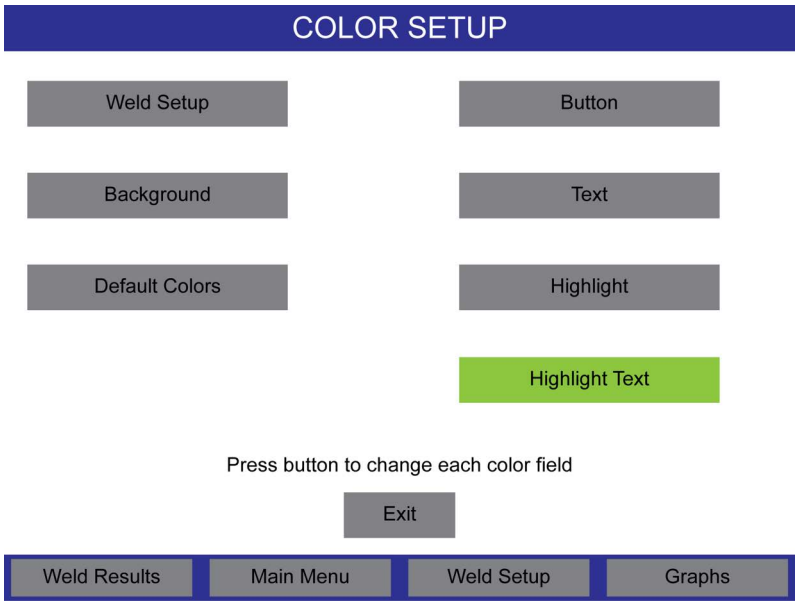
Figure 6.42 Screen Setup



6.11.1 Color Setup

The Color Setup screen allows you to change colors for the Title Bar, Buttons, Background, Text, and Highlight. Pressing the buttons will cycle through several colors you can select from. User can revert back to default colors by pressing the *Default Colors* button.

Figure 6.43 Color Setup



6.12 System Information

You can view information from the System Information screen about the current setup of your System. This screen should be available whenever you are calling Branson for troubleshooting help.

Software upgrade can be performed from this screen.

Figure 6.44 System Information

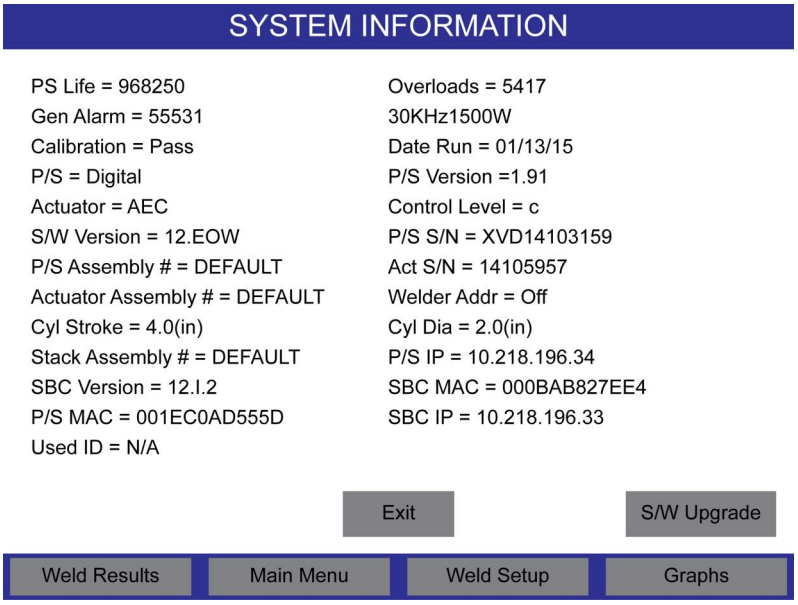


Table 6.28 System Information

Item	Description
PS Life	Counter for the lifetime number of cycles that have been processed through the power supply.
Gen Alarm	Counter for the lifetime number of alarms that have been addressed on the power supply.
Calibration	Indicates either Pass, Fail, or Factory.
P/S	Analog or Digital.
Actuator	Displays the actuator type.
S/W Version	Displays the power supply software version number.
P/S Assembly	Displays the power supply assembly number.
Actuator Assembly #	Displays the actuator assembly number.
Cyl Stroke	Displays the maximum cylinder stroke for all standard diameter cylinders.
Stack Assembly #	Displays the stack assembly number.
SBC Version	Displays the software version of the Single Board Computer that controls the display.
P/S MAC	Displays the power supply MAC address.
User ID	Displays the user ID name.
Overloads	Counter for lifetime number of overloads encountered on the power supply.

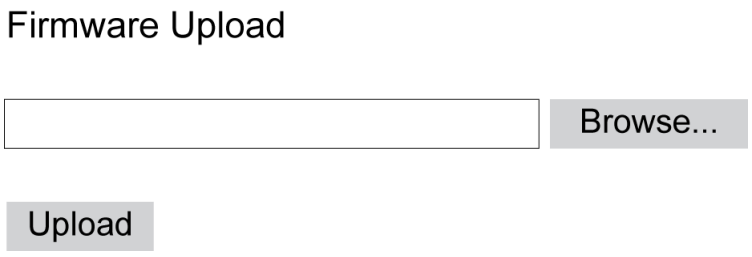
Table 6.28 System Information

Item	Description
Frequency and Power	Displays the power supply frequency and power in watts.
Date Run	Displays current date.
P/S Version	Displays the power supply version.
Control Level	Displays the control level (C).
P/S S/N	Displays the power supply serial number.
Act S/N	Displays the actuator serial number.
Welder Addr	Turn on to assign a unique trackable number to a welder for data collection.
Cyl Dia	Displays the cylinder diameter.
P/S IP	Displays the power supply IP.
SBC MAC	Displays the Single Board Computer MAC address.
SBC IP	Displays the Single Board Computer IP.

6.12.1 Software Upgrade

Press the *S/W Upgrade* button to open the Firmware Upload screen. Browse the system files to locate and upload the new firmware file.

Figure 6.45 Firmware Upload

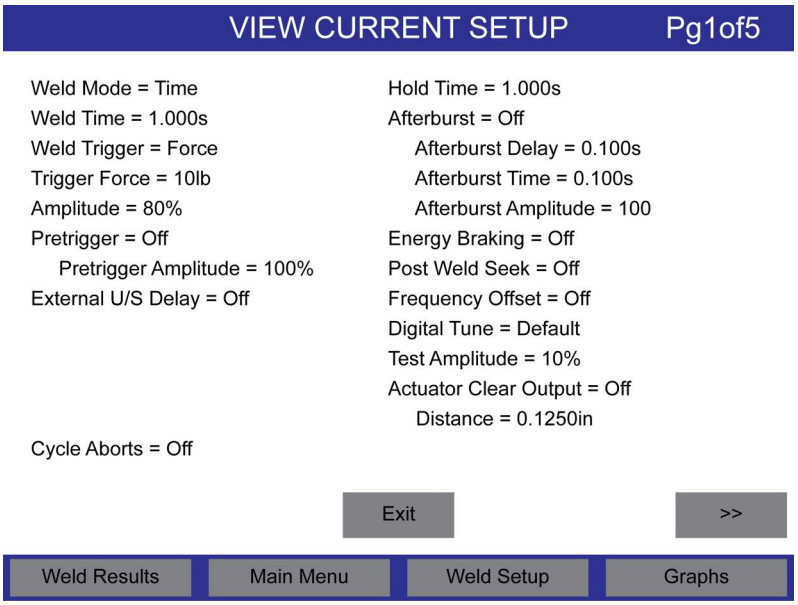


NOTICE	
	Wait 5 minutes after the message *File has been uploaded, wait for system to restart.*

6.13 View Current Setup

Displays the current setup, including batch count, pressure limits, actuator assembly number, power supply assembly number, stack assembly number, flow control, rapid traverse distance, hold pressure, weld pressure, trigger type, trigger distance.

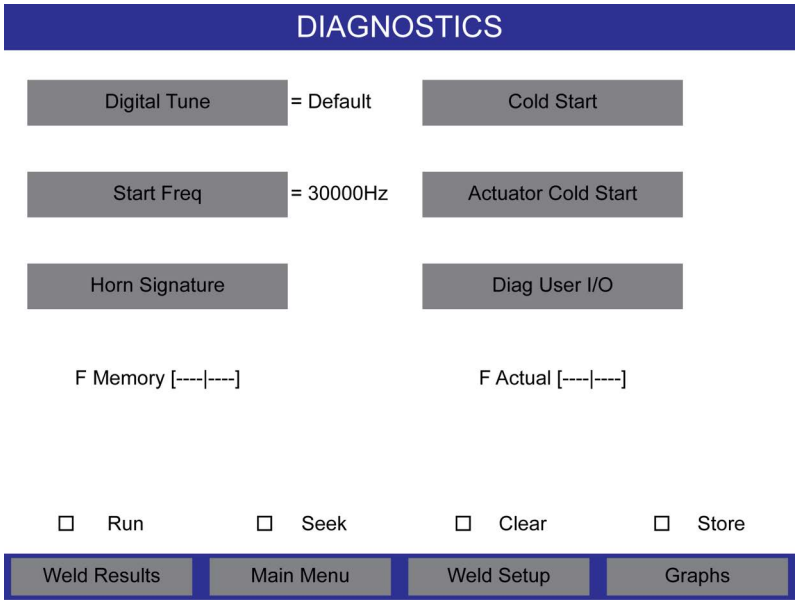
Figure 6.46 View Current Setup



6.14 Diagnostics

You can use the Diagnostic menu to perform a cold start, set the start frequency of your stack, and diagnose your system.

Figure 6.47 Diagnostics



The Diagnostics Screen is divided into 2 sections, upper and lower. The upper section consists of diagnostic parameters. The lower section is refreshed every 250 ms with the following data:

Table 6.29 Diagnostics

Data	Description
F Memory	This bar graph represents the stored frequency at the end of the last cycle. This is the frequency the power supply will start at for the next cycle.
F Actual	This bar graph represents the running (natural) frequency of the stack in real time.
Run	Indicates that ultrasonic energy is on.
Seek	Indicates the power supply is running at 5% amplitude for the purpose of finding the resonant frequency of the stack.
Clear	Indicates there was an overload in Run or Test Mode and memory was cleared.
Store	Indicates the running frequency of the system is stored into memory at the end of a cycle or at the end of a seek.

6.14.1 Digital Tune

Press the *Digital Tune* button to toggle between On and Default. This must be set to On in order to set the start frequency.

NOTICE	
	Do not use this feature unless advised to do so by Branson. It is not required for most applications.

6.14.2 Start Frequency

Press the Start Freq button to set the start frequency.

6.14.3 Cold Start

Press the Cold Start button to open the Cold Start screen.

A cold start clears the Weld Setup Menu values and restores them to original factory defaults. It is not necessary to perform a cold start during normal operation and servicing, but you might find a cold start helpful when:

- You suspect the system is not operating properly
- You want to make a new setup

NOTICE	
	A cold start may take between 6 seconds and 1 minute depending on when it is done and what actuator and control level is connected.

NOTICE	
	Using the Cold Start procedures will erase your current setup and some of the Setup parameters in the System Configuration menu. Be sure you have a record of your setup if you want to retain it. Your settings can be saved to a preset.

Figure 6.48 Cold Start



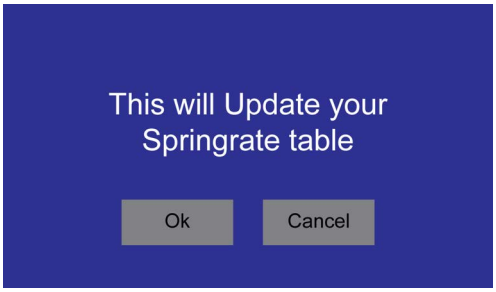
6.14.4 Actuator Cold Start

Press the *Actuator Cold Start* button to open the actuator cold start screen.

NOTICE	
	Using the Act Cold Start procedures will return the Spring Rate settings to factory default.

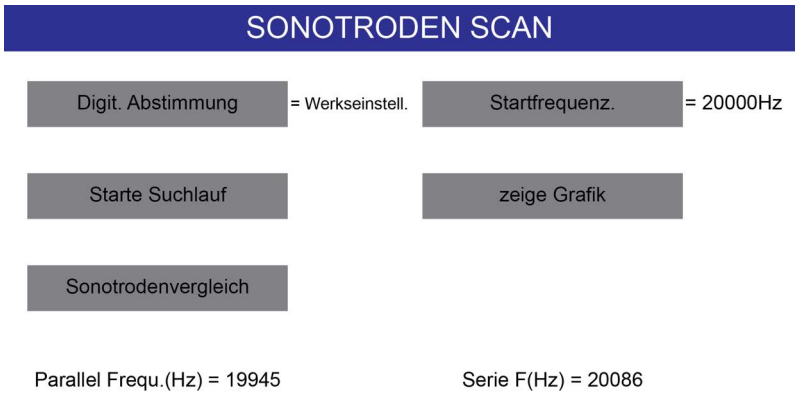
A cold start clears the Spring Rate Table values stored in BBR, and restores them to original factory defaults. It is not necessary to perform an Actuator Cold Start during normal operation and servicing, but you might find a cold start helpful when you are unable to make the system calibrate properly.

Figure 6.49 Actuator Cold Start



6.14.5 Horn Signature

Figure 6.50 Horn Signature



6.14.5.1 Digital Tune

Press the *Digital Tune* button to toggle between On and Default. This must be set to On in order to set the start frequency.

NOTICE	
	Do not use this feature unless advised to do so by Branson. It is not required for most applications.

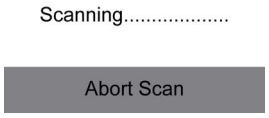
6.14.5.2 Start Frequency

Press the Start Freq button to set the start frequency.

6.14.5.3 Start Scan

Start Scan will generate a scan of horn reactance showing resonant frequencies at the zero crossover from capacitive to inductive reactance. Ideally there will be only one resonant frequency. The screen will display the text "Scanning..." with the rate of update for every dot being 1/4 second.

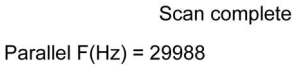
Figure 6.51 Scanning



Press the Abort Scan button if you wish to abort the horn signature scan.

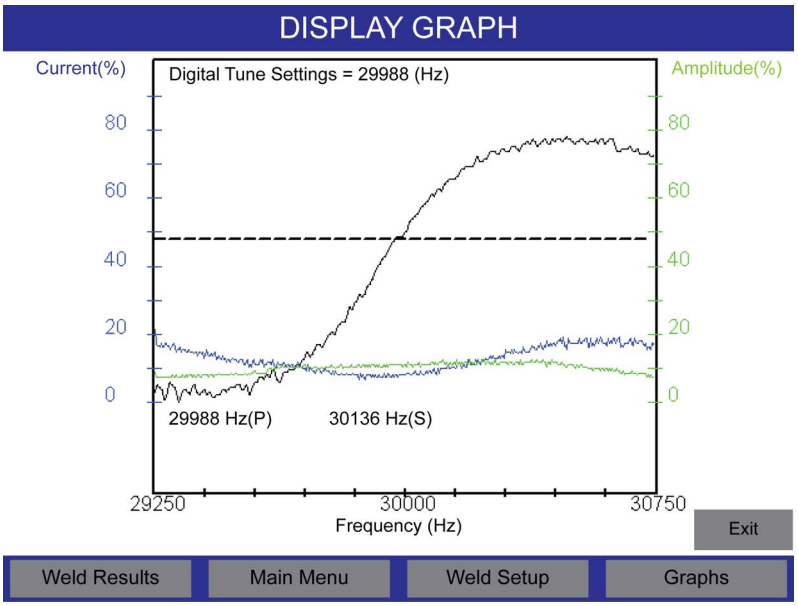
The result will appear on the screen.

Figure 6.52 Scan Complete



You can view a graph of these reactance values by pressing the *Display Graph* button.

Figure 6.53 Horn Signature Graph

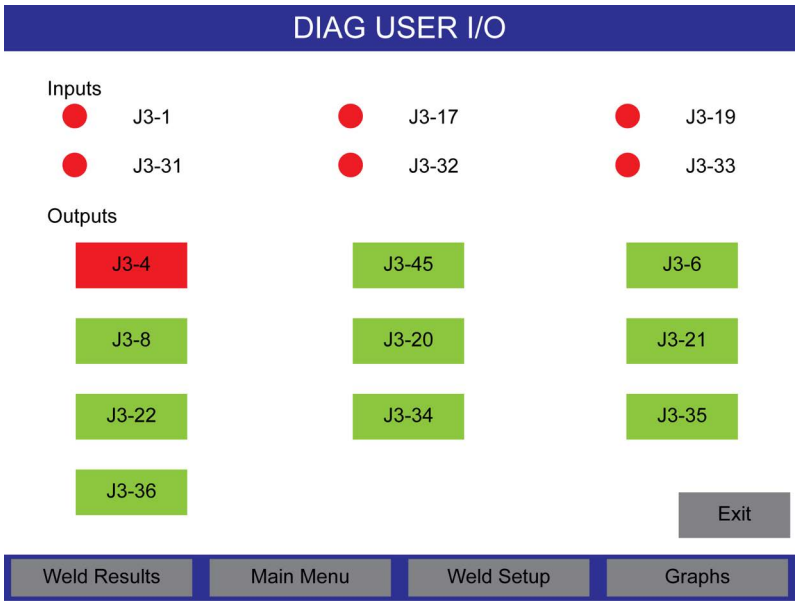


6.14.6 Diagnostic User I/O

This screen is updated at the rate of once per second. When input is not active, the circle (LED) color is red. When the input is active, the circle (LED) color is green for that particular input pin.

User Outputs will be displayed as buttons with red/green colors. Button will be displayed as red if the output is currently not active. If user press the button to turn the output active then the button color will change to green.

Figure 6.54 Diagnostic User I/O



NOTICE	
	Diagnostic User I/O function is used to test the pin connection and not functionality.

NOTICE	
	The operation of SV output can only be tested while palm buttons are being held.

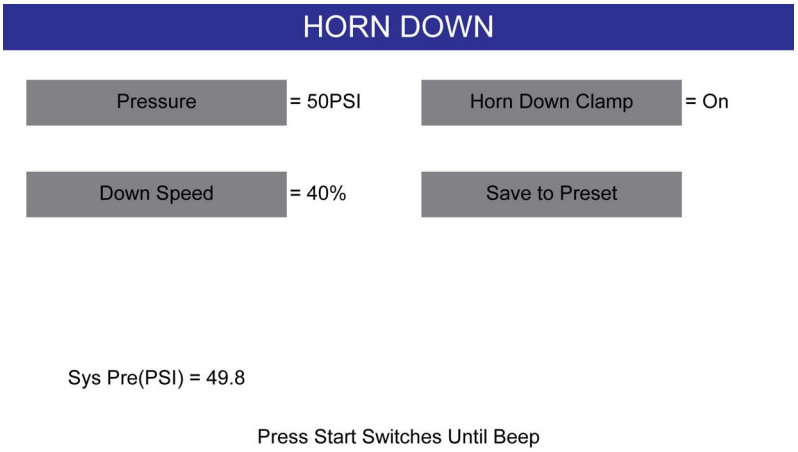
6.15 Horn Down

Use Horn Down to verify that your fixture is properly set up or to determine the absolute distance that the horn needs to travel to weld your parts. After pressing the *Horn Down* button you can press the start switches, or you can use manual override to bring the horn down to the position you have set without ultrasonic energy on by using the mechanical stop. Once the horn is in position, you can release the start switches in order to verify your setup.

Each time you enter the Horn Down menu, the weld force and downspeed settings are transferred from the weld setup.

DANGER	
	Make sure all hands are clear of the horn and base surface.

Figure 6.55 Horn Down



Turning the Horn Down Clamp On will cause the horn to remain at the workpiece when the Start Switches are released, until it is released by pressing the *Weld Results* Button. Pressing *Retract* will bring the horn up, and you will remain in the Horn Down screen.

With *Horn Down Clamp Off*, the horn will only stay down as long as the start switches are held on.

Pressure and downspeed can also be changed from this menu.

Press the *Save to Preset* button to copy the horn down pressure and downspeed to the current preset.

6.16 Weld History

Weld History shows the last 100,000 weld data lines saved in the power supply or USB stick.

NOTICE	
	*USB Recall* and *USB Setup* buttons are only available when there is a USB stick present.

Figure 6.56 Weld History

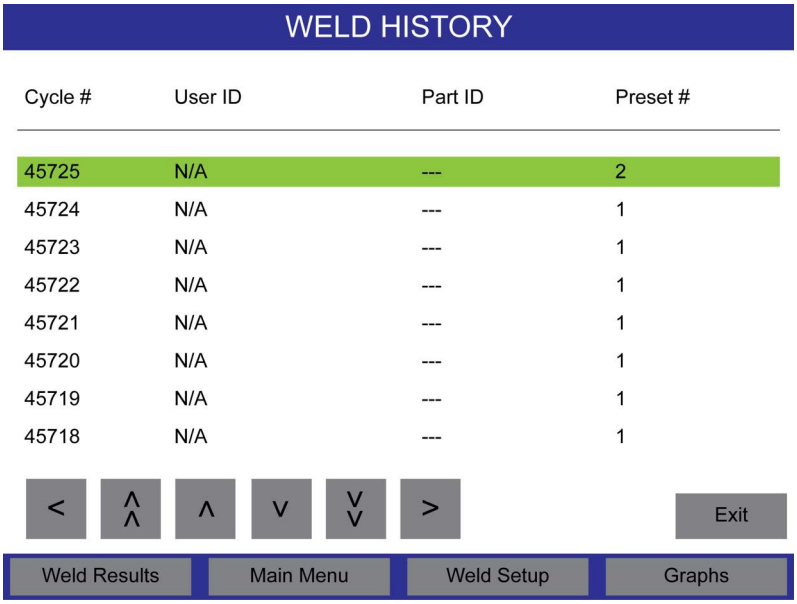


Table 6.30 Weld History

Data		
Cycle #	Pk Pwr (%)	Act Press (PSI)
User ID	Energy (J)	Freq Min (Hz)
Part ID	Velocity (in/s)	Freq Max (Hz)
Preset #	Weld Abs (in)	Freq Start (Hz)
Preset Rev	Total Abs (in)	Freq End (Hz)
Preset Valid	Weld Col (in)	Freq Chg (Hz)
Act Assem #	Total Col (in)	Cycle Time (s)
P/S Assem #	Set Amp A (%)	Hold Force (lb)
Stack Assem #	Set Amp B (%)	
Time (s)	Weld Force (lb)	

6.17 Save/Recall Presets

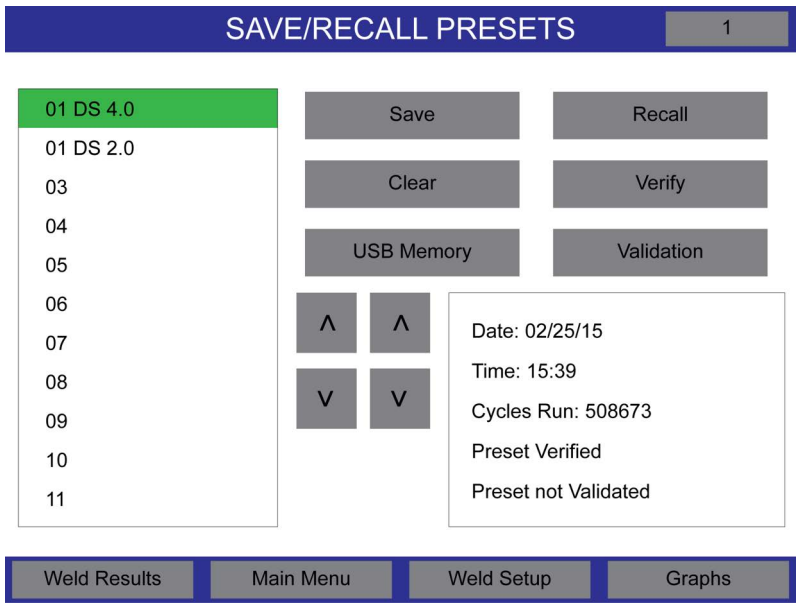
You can set up the 2000Xct HP power supply to weld a particular application and then save the settings to a preset. You can do this for up to 1000 presets.

NOTICE	
	Always set the power supply to the combination of parameter settings that you want to save before entering the Save/Recall Presets menu.

Pressing the *Presets* button will display the *Save*, *Recall*, *Clear*, *Verify*, *USB Memory*, and *Validation* buttons.

NOTICE	
	USB Memory button will only show when a USB stick is inserted.

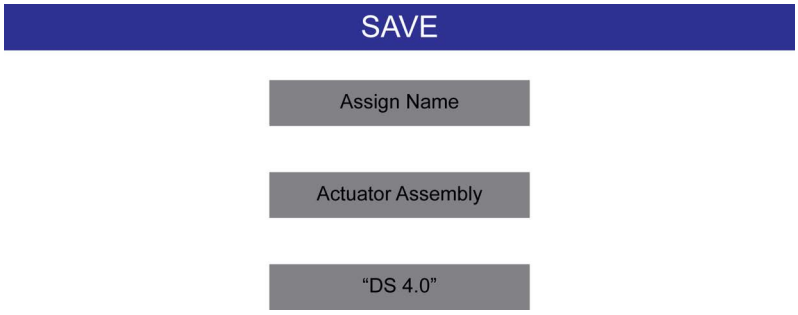
Figure 6.57 Save/Recall Presets



6.17.1 Save Preset

To save a preset, scroll to the desired preset number and press the *Save* button.

Figure 6.58 Save



Press the *Automatically Name* button to save the preset with an automatic generated name.

Table 6.31 Preset Naming Convention

Mode	Name
Time	Tm = xxxxS
Energy	En = xxxxJ
Peak Power	PP = xxx%
Absolute	Ab = xxx IN
Collapse	Cl = xxx IN
Ground Detect	GD = xxxS

Press the *Assign Name* button to type the desired name, using 10 alphanumeric characters.

NOTICE	
	If the selected preset number has a preset already saved, the overwrite screen will be displayed.

6.17.2 Recall Preset

To recall a preset, scroll to the desired preset number and press the *Recall* button.

NOTICE	
	A preset recall is not allowed if a cycle is in progress.

6.17.3 Clear Preset

To clear a preset, scroll to the desired preset number and press the *Clear* button.

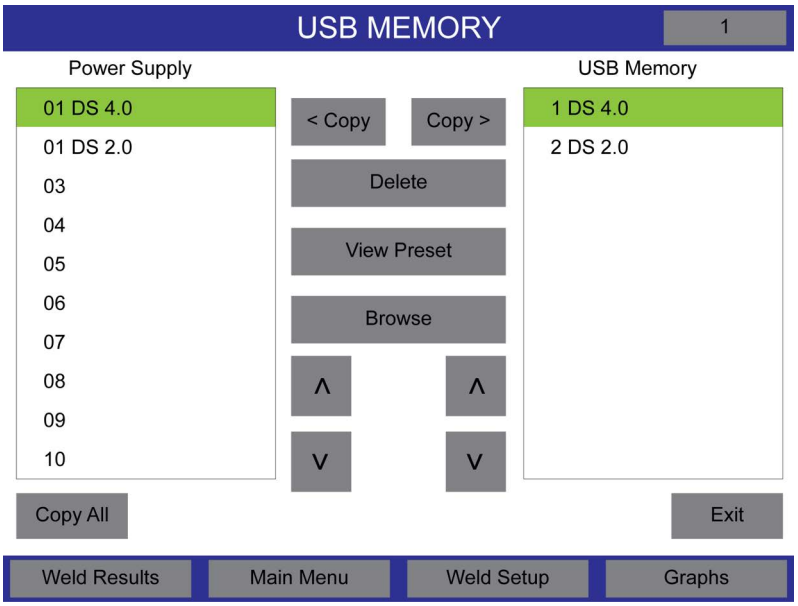
6.17.4 Verify Preset

To verify a preset, scroll to the desired preset number and press the *Verify* button.

6.17.5 USB Memory

Press the *USB Memory* button to save the preset to a USB stick.

Figure 6.59 USB Memory



To copy a preset from the power supply to a USB stick, scroll to the desired preset number under the power supply list and press the *Copy* > button.

To copy a preset from the a USB stick to the power supply, scroll to the desired preset number under the USB Memory list and press the < *Copy* button.

Press the *Delete* button to delete the selected preset on the USB stick.

Press the *View Preset* button to view the current setup before saving.

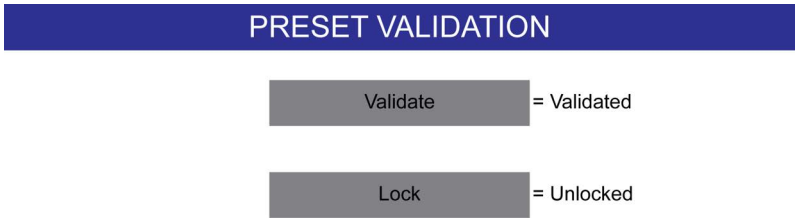
Press the *Copy All* button to copy all the preset from the power supply to the USB stick.

6.17.6 Validation

To validate a preset, scroll to the desired preset number and press the *Validation* button. Press the *Validate* button to toggle between Validated and Non Validated. A validated preset means that a Supervisor or Executive user has deemed the preset meets the requirements for the current weld. Any change to a validated preset will cause it to become invalidated.

NOTICE	
	You must type an event reason before a preset validation change.

Figure 6.60 Preset Validation

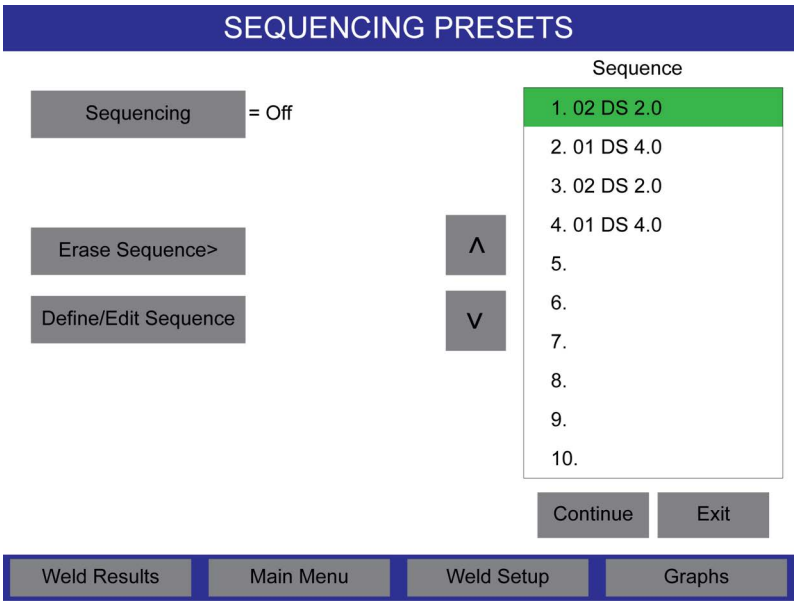


Press the *Lock* button to lock a validated preset. A locked preset can only be modified by Supervisor or Executive users.

6.18 Sequencing Presets

Sequencing presets a list of preset numbers to be run in a defined order. The list contains between 2 and 16 presets. Any non-setup alarm will allow you to restart the sequence or to continue from where the alarm occurred.

Figure 6.61 Sequencing Presets



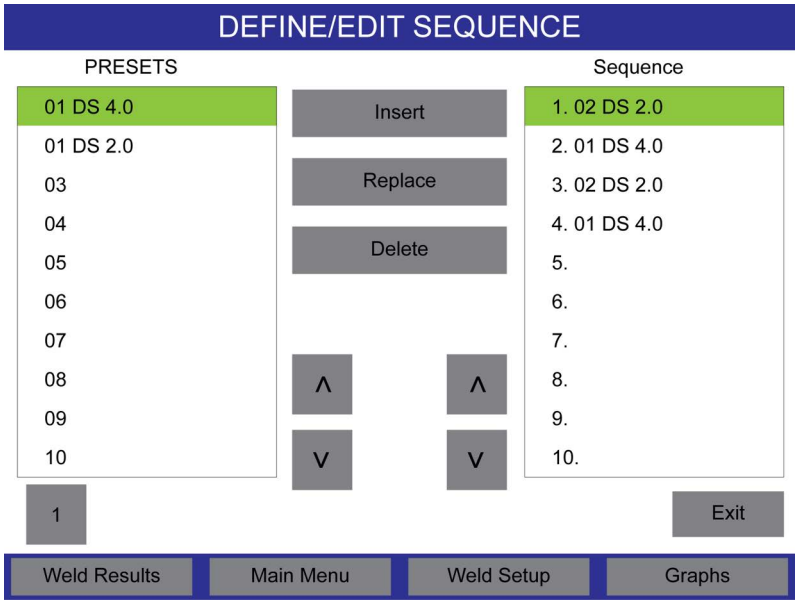
Press the *Sequencing* button to toggle between On or Off.

Press the *Erase Sequence* button to delete the entire sequence.

6.18.1 Define/Edit Sequence

Press the *Define/Edit Sequence* button to define the sequence of presets to run.

Figure 6.62 USB Memory



To insert a preset from the power supply to the sequence list, scroll to the desired preset number under the Presets list and press the *Insert* button. The preset will be inserted in the selected sequence number.

To replace a preset from the sequence, scroll to the desired preset number under the Presets list and press the *Replace* button. The preset will replace the selected sequence number.

Press the *Delete* button to delete the selected sequence number.

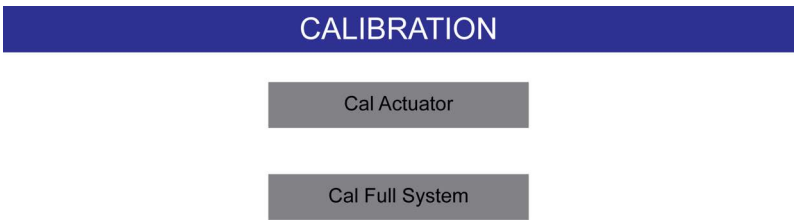
6.19 Calibration

Use the Calibration Menu to calibrate the pressure sensor and force readout of the S-Beam load cell. The actuator calibration may be required when changing the booster, horn, or regulator pressure. You will be prompted to perform the actuator calibration the first time you power up the system, or any time the controls sense a significant change in the stack weight greater than five pounds. The sensor calibration is set at the factory and should be good for the life of the system. But if you are operating under regulatory requirements, calibrate the sensors according to their schedule and Branson standards. For more detailed information on calibrating the sensors, you can contact Branson by calling the Technical Support as indicated in section 8.2 How to Contact Branson.

DANGER	
	Before continuing, make sure all hands are away from the Horn and base surface. The horn will accelerate rapidly to the base surface no matter which screen you are in.

NOTICE	
	Velocity is not to be used for validation.

Figure 6.63 Calibration

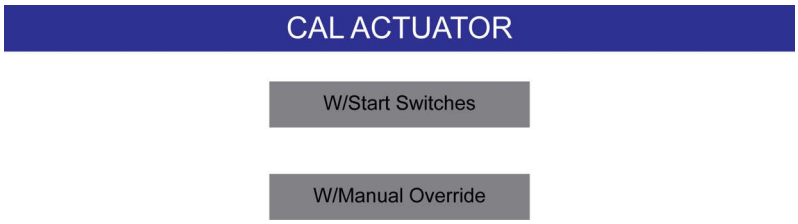


6.19.1 Cal Actuator

Press the *W/Start Switches* button to perform the calibration using the start switches.

Press the *W/Manual Override* button to perform the calibration using the manual override on valve.

Figure 6.64 Cal Actuator



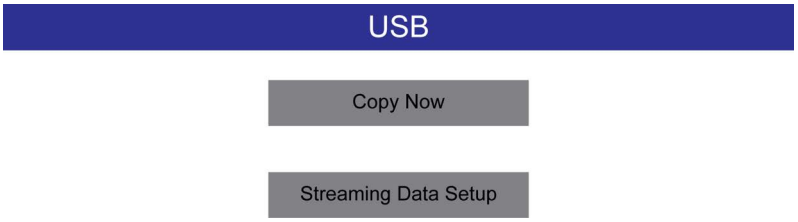
6.19.2 Cal Full System

NOTICE	
	Cal Full System requires critical test instruments. This should only be performed by qualified personnel. Contact your Branson representative for specific information regarding this calibration.

6.20 USB

Use this menu to copy Weld History, Weld Setup, Event History, and User ID Table in PDF format to the attached USB stick and to access the streaming data setup.

Figure 6.65 USB



6.20.1 Copy Now

Press the *Weld History*, *Weld Setup*, *Event History*, or *User ID Table* button to copy the related data to the attached USB stick.

NOTICE	
	Welding will not be allowed during this operation.

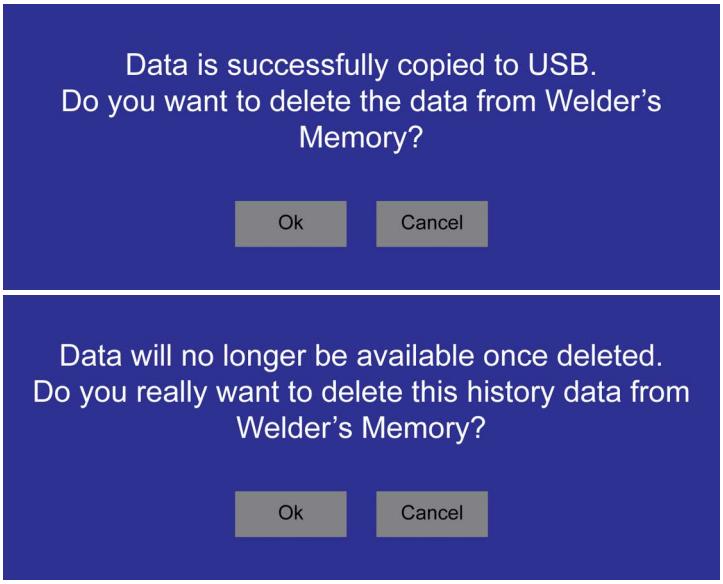
Figure 6.66 Copy Now



The PDF data will be saved in a folder named after the power supply serial number. The date of the file is generated when the file is saved to the USB stick.

A message will let the user know whether the requested data has been successfully copied or not. A Supervisor or Executive user can delete the Weld History and Event History data from the power supply after the data has been successfully copied to the USB stick. You need to confirm the action two times before deleting the data from the power supply.

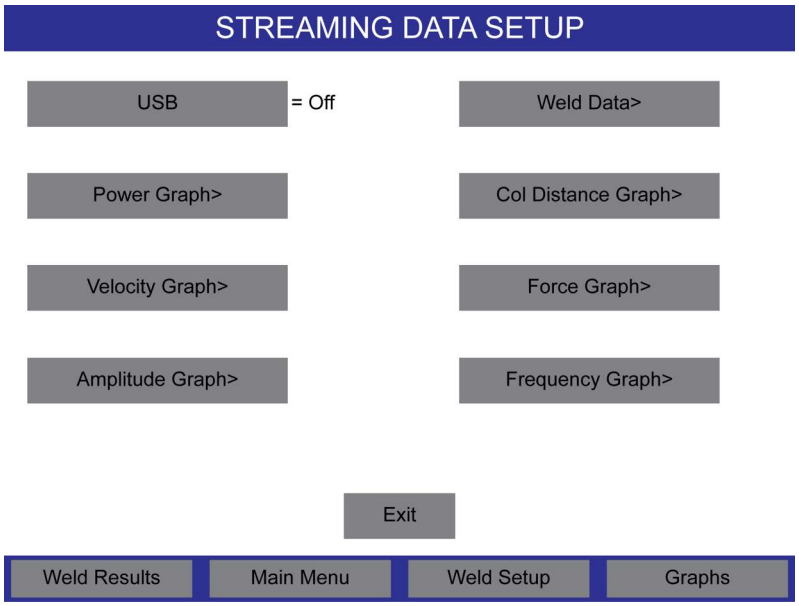
Figure 6.67 Delete Data



6.20.2 Streaming Data Setup

Use this to select which data will be automatically saved to a USB stick and how often the data will be saved.

Figure 6.68 Streaming Data Setup



6.21 Alarm Log

Displays the alarm log. See Appendix B: Alarms for more information.

Figure 6.69 Alarm Log

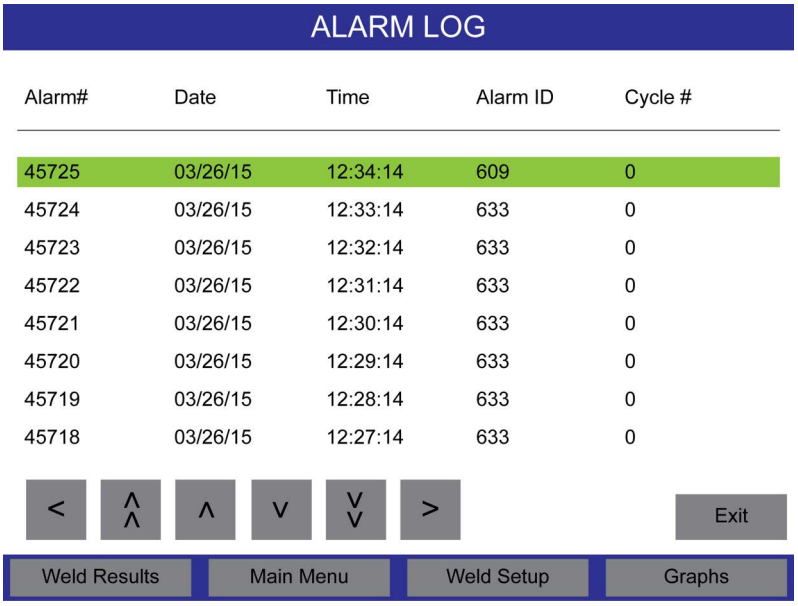


Table 6.32 Alarm Log

Data	Description
Alarm#	Alarm number.
Date	Date when alarm was logged.
Time	Time when alarm was logged.
Alarm ID	Alarm ID associated with an event.
Cycle#	Weld cycle number during which alarm was logged.
User ID	User ID at the time of alarm.
Preset#	Preset number at the time of alarm.
Rev Num	Preset revision number at the time of alarm.
Act Assem#	Actuator assembly number.
P/S Assem#	Power supply assembly number

6.22 Event History

Displays the event history log. See Appendix C: Events for more information.

Figure 6.70 Event History

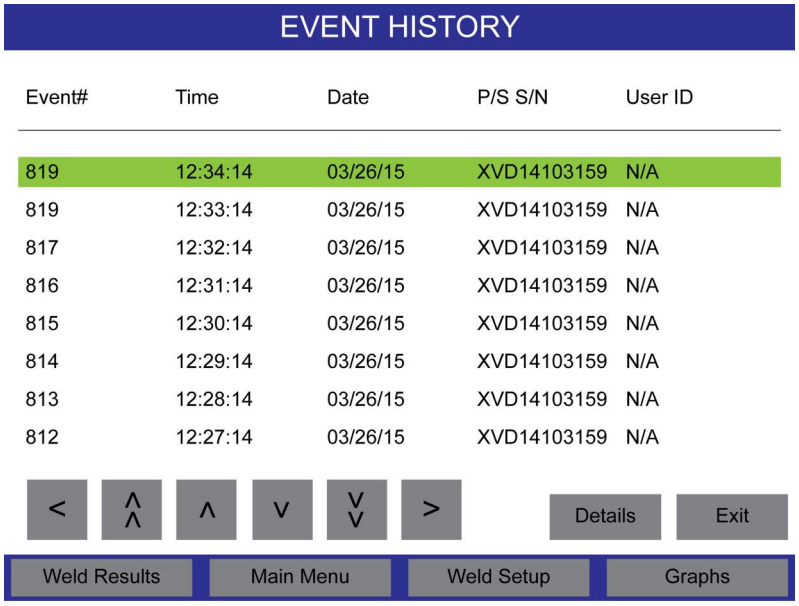


Table 6.33 Event History

Name	Description
Event#	Event number.
Time	Time when event was logged.
Date	Date when event was logged.
P/S S/N	Power supply serial number.
User ID	User ID at the time of event.
Preset#	Preset number at the time of event.
New Rev	New revision.

Press the *Details* button to see a description and reason for the selected event.

6.23 Login

The 2000Xct HP is shipped with the following default user ID and password:

User: ADMIN

Password: 123456Aa#

The first time logging in you will need to enter this user ID and password. The system will ask you to create a new password for the user ADMIN after your first time log in.

NOTICE
Keep a record of your password and user ID.

NOTICE
Create multiple Executive level users for backup.

NOTICE
The current logged in user can be viewed in the Main Menu's System Information screen.

Figure 6.71 Login

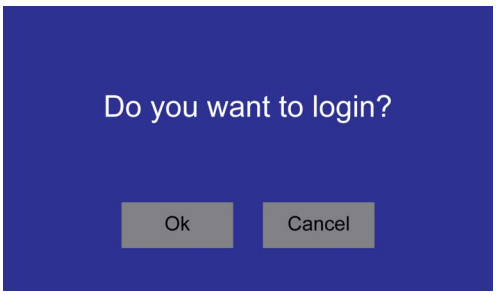
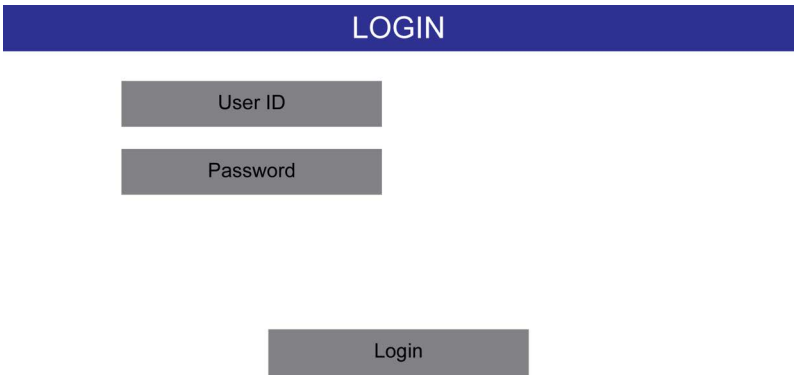


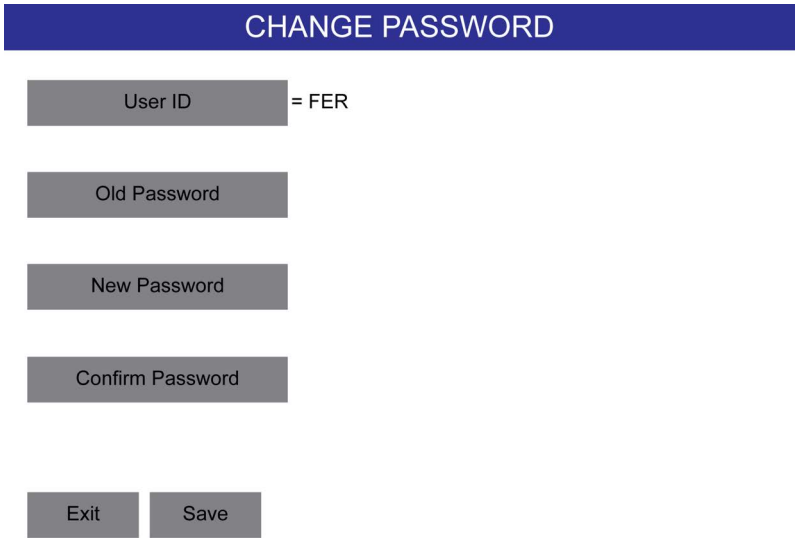
Figure 6.72 Login



6.23.1 Change Password

After logging in the for the first time, you will be prompted to change your password.

Figure 6.73 Change Password



NOTICE	
	Password must have at least one capital letter, one number and one small letter and one special character available. The minimum length of the password must be of 8 character and max is 10 character.

6.23.2 Password Recovery

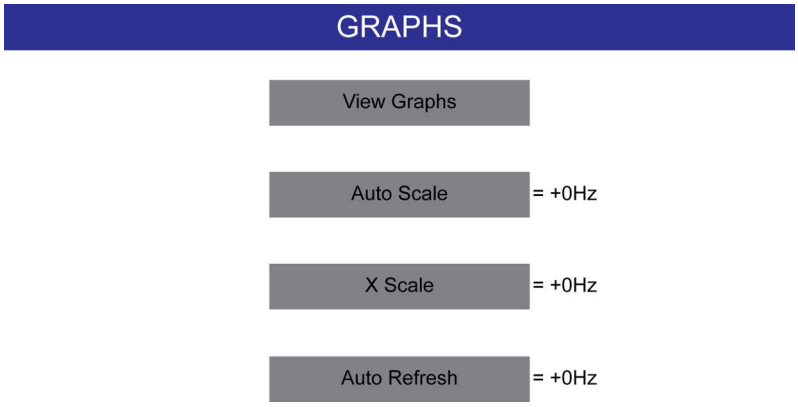
In the event an Executive level user cannot log into the system, the PRK (Password Recovery Kit) can be used to disable the Authority Check and recover the Executive user's password and ID. The PRK is a dongle that plugs into the back of the 2000Xct HP power supply. It can be ordered from Branson. EDP number is 101-063-1089.

- Power down the 2000Xct HP power supply
- Plug the PRK into the I/O connector located in the back of the power supply
- Power up the 2000Xct HP power supply
- The Authority check is now set to No and users are not restricted by authority levels or passwords
- Navigate to the System Configuration/User ID table to Enable a user Executive account and view the user ID and password
- Set Authority Check back to Yes
- Unplug the PRK, power down

6.24 Graphs

Access the View Graphs screen to display the graphs of 6 available parameters: Power, Amplitude, Velocity, Frequency, Force, and Collapse Distance.

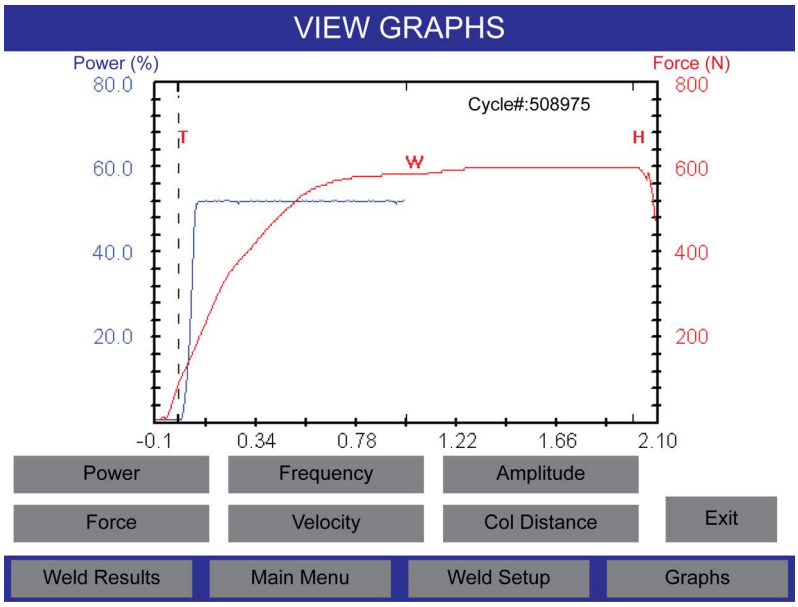
Figure 6.74 Graphs



NOTICE	
	X Scale = *** when Auto Scale is set to On.

Press the View Graphs button to display the graph.

Figure 6.75 View Graph



Chapter 7: Maintenance

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7.5 Troubleshooting. 140
7.6 Service Events 142
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7.1 Calibration

This product does not require scheduled Full System Calibration. However, if you are operating under requirements that mandate periodic calibration, for example, the FDA's Good Manufacturing Practices, you may need to calibrate the equipment according to that schedule and set of standards. Contact your Branson representative for additional information.

For standard actuator calibration, and resetting sensor calibration to factory default settings, refer to 6.19 Calibration.

7.2 Periodic and Preventive Maintenance

DANGER	
	Use LOTO (Lock Out Tag Out) lockable plug cover over line cord plug during any maintenance.

DANGER	
	When performing maintenance on the welder, make sure that no other automated systems are active.

The following preventive measures will help ensure long term operation of your Branson 2000Xct HPt HP series equipment.

7.2.1 Periodically Clean the Equipment

NOTICE	
	When it is necessary to clean the touchscreen, wipe gently with a soft cloth dampened with a mild detergent or Windex. Give a final wipe to the entire screen with the soft damp cloth. Under no circumstances should you use solvents or ammonia to clean the screen. Do not use excessive solution to avoid dripping or seeping into the power supply.

Periodically disconnect the unit from power, remove the cover and vacuum out any accumulated dust and debris. Remove material adhering to the fan blades and motor, transistors, heat sinks, transformers, circuit boards, cooling intake vents, and exhaust ports. Filters can be added to the power supply cooling fans for dusty environments. Periodically disconnect the airline from the air supply, open the air filter and clean the element and bowl with mild soap and water. External covers may be cleaned with a damp sponge or cloth using a solution of mild soap and water. Do not allow cleaning solution to enter the unit. Exposed steel surfaces, such as handles, hardware and the main column may require a very light film of oil, such as WD-40, to prevent rust in areas of high humidity.

7.2.2 Recondition the Stack (Converter, Booster, and Horn)

Stack components function with greatest efficiency when the mating interface surfaces are in proper condition. For 20kHz products, a Branson Mylar washer should be installed between the horn and the booster, and booster and converter. Replace the washer if torn or perforated. We recommend that stacks using Mylar washers be inspected every three months.

Stacks used with silicone grease, as with certain 20 kHz products, should be periodically reconditioned to eliminate fretting corrosion. We recommend that a stack using silicone grease be inspected every two weeks for corrosion. The inspection interval can then be adjusted longer or shorter as required, when experience is gained for specific stacks. Refer to the following procedure for correct stack interface reconditioning.

NOTICE	
	The operating efficiency of the equipment will be greatly affected if the mating interfaces of the converter, booster, and horn are not flat, make poor contact with each other, or become corroded. A poor contact condition wastes power and makes tuning difficult. It may also affect the noise level and damage the converter.

To recondition the interfaces:

1. Remove the stack from the actuator
2. Disassemble the converter, booster, and horn stack. Observe the following rules:

In the event that you must disassemble a Stack, always use the correct spanner wrench and a suitable soft-faced vise to remove a horn or booster, and reverse the procedures described earlier in this Section.

DANGER	
	NEVER attempt to remove a horn or booster by holding the converter housing or booster clamp ring in a vise.

NOTICE	
	Use a soft-jawed vise (brass or aluminum) to remove square or rectangular horns, or horns otherwise unremovable.

3. Wipe the interfaces with a clean cloth or paper towel
4. Examine all interfaces. If any interface is corroded or shows a dark, hard deposit, it should be reconditioned
5. If the interfaces appear to be in good condition, go to step 13
6. If necessary, remove the coupling studs
7. Tape a clean sheet of #400 grit (or finer) emery cloth to a clean, smooth flat surface. A piece of glass is suitable
8. Hold the part to be conditioned at its lower end and carefully stroke it in one direction across the emery cloth. Do not press down. the weight of the component provides enough pressure

9. Perform a second stroke. Rotate the part 1/3 around and stroke it twice across the cloth.

NOTICE	
	Use no more than two strokes in one position. Use the same number of strokes at each location.

10. Turn the part the remaining 1/3 and repeat
11. Re-examine the interface and repeat steps 8, 9, and 10 until the surface appears clean and smooth. This should not take more than 2 or 3 complete rotations of the part being reconditioned
12. Clean the threaded hole, using a clean cloth or paper towel
13. Replace the stud with a new one if removed. Torque the 3/8-24 studs to 290 inch pounds (32.77 Nm). Torque 1/2-20 studs to 450 inch pounds (50.84 Nm). Torque M8x1-1/4 studs to 70 inch pounds (7.9 Nm)

NOTICE	
	The use of a Branson torque wrench or the equivalent is recommended. P/N 101-063-787 for 20kHz systems and 101-063-618 for 40kHz systems.

CAUTION	
	Failure to follow torque specifications may cause the stud to loosen or break, and the system to overload. The use of a Branson torque wrench or equivalent is required.

14. Reassemble the stack and install it in the actuator

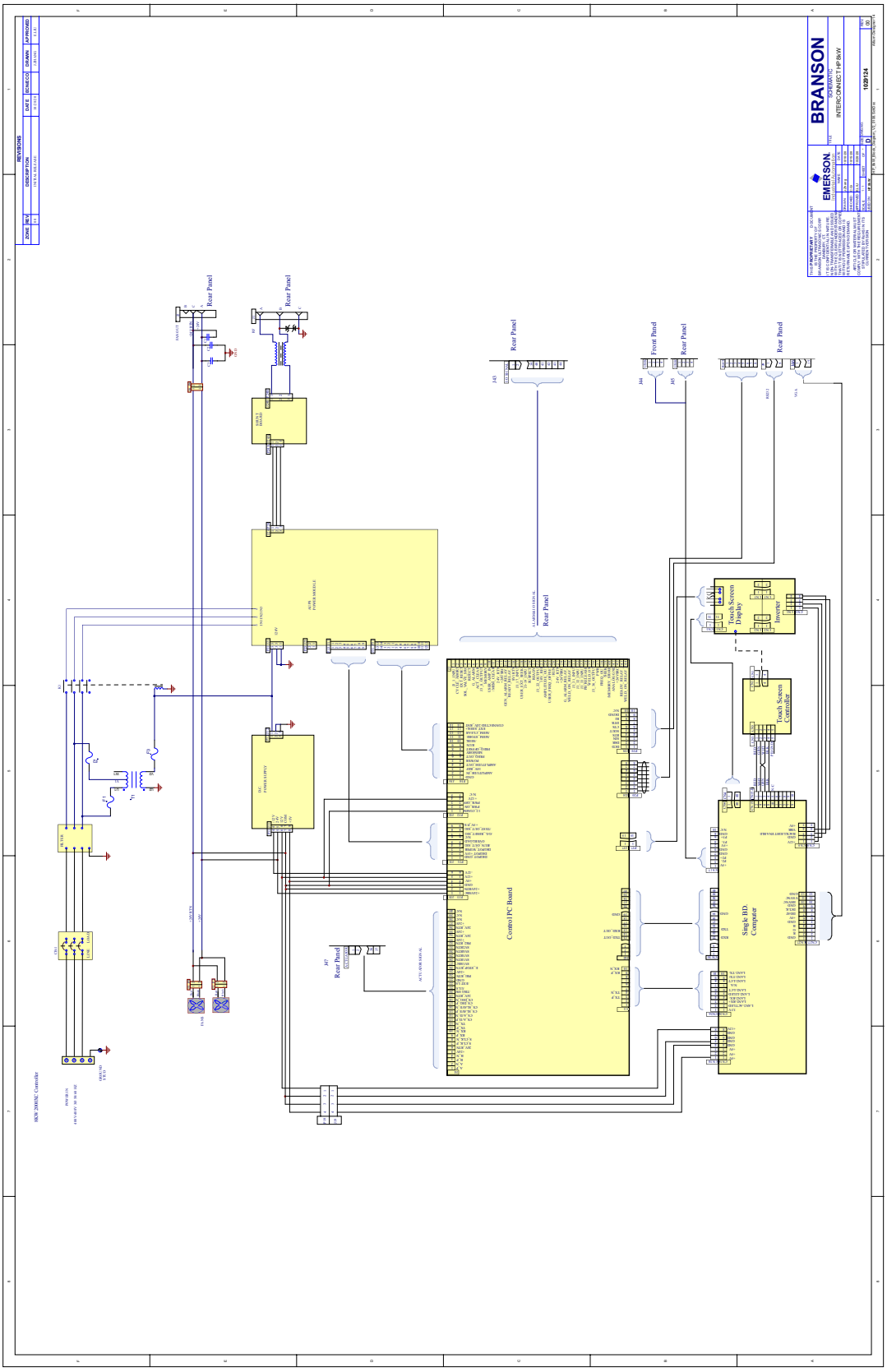
7.3 Spare Parts List

Table 7.1 Spare Part List

Description	EDP Number
System Controller Board Kit	102-242-1025R
3-phase Contactor	200-084-108R
Fan Filter	890-117-102
Fan	100-126-022R
AUPS Module	100-244-081
3-phase Breaker Switch	1029133
3-phase Filter	1030144
Reducing Transformer	1029132
3A Fuse	200-049-152
1A Fuse	200-049-092R
Switch Power	1020804
VGA Touchscreen Kit	100-063-1073
VGA Touchscreen	200-220-025R
VGA Touchscreen Controller Board	200-245-045
CR2032 Battery	200-262-003

7.4 Circuits

Figure 7.1 Interconnect Diagram, EDP 1029124



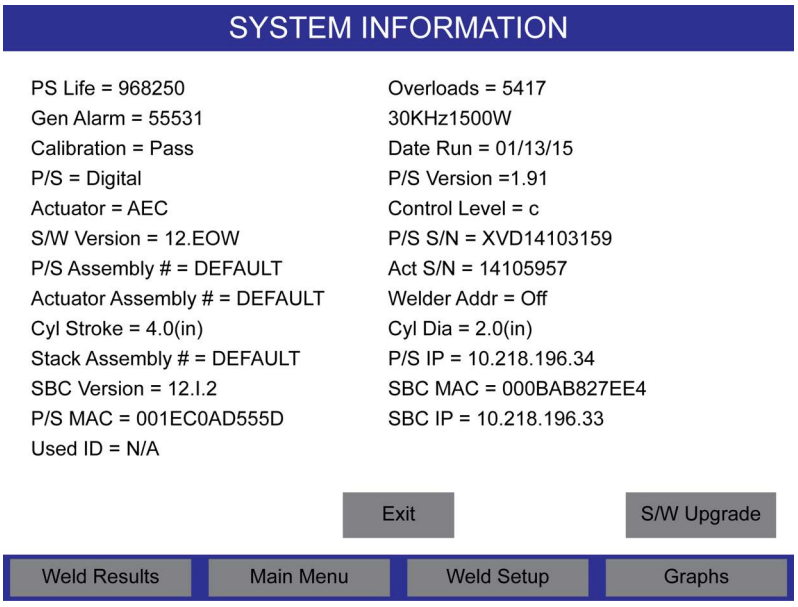
7.5 Troubleshooting

When the 2000Xct HP power supply encounters a situation that is outside of the normal conditions, an alarm is generated. If there is any alarm condition, the Front Panel displays the number of alarms and generates an audible alarm. Pressing the Alarm button will display a message for corrective action. Some types of alarms have a secondary button to press to address the alarm. If no additional information is displayed, refer to the System Alarm Tables.

NOTICE	
	The power supply MUST be set to the correct cylinder size for the actuator to function properly. The regulator will click as it is regulating or maintaining a pressure setting. If there is excessive noise, the supply pressure to the regulator maybe too low for the requested setting.

If you use the emergency stop button on the actuator to terminate a weld, twist the button to reset it. (The welder will not operate until this button is reset). You must then press Reset at the power supply.

Figure 7.2 Alarm Signal Displayed on the System Information Screen



NOTICE	
	If you have been directed to this Section from an alarm message on the power supply screen, go directly to the table for the alarm type specified in the message. Location of the alarm tables is detailed in the following text.

NOTICE	
	If you experience an Operating System error message, please turn the power supply off (Wait 30 Seconds), and then turn the power supply on again, this will initiate a restart sequence for the Operating System. If the Operating System error persists, please contact Branson Product Support by calling the appropriate department as indicated in section 8.2 How to Contact Branson.

Appendix B: Alarms details the alarm conditions that you can encounter while using the 2000Xct HP power supply. There are eight classes of alarms: Cycle Modified, Failure of, No Cycle, Setup, Suspect, Reject, Overload, and Note. Following is a brief description of each type of alarm, followed by Tables Table B.1 through Table B.1 which detail alarm messages, causes, and corrective actions for each type of alarm.

- A Cycle Modified alarm (Table B.1) occurs when the most recent weld cycle has been modified by some event. For example, if the amplitude step did not occur as requested.The specific alarm that has occurred is indicated by the message on your display, and will advance the general alarm counter. If you encounter numerous or successive cycle modified alarms, review your weld parameter setup. See individual alarms for advancement of cycle counter
- Equipment Failure alarms, (Table B.2) are those which might occur for hardware failure, or hardware disconnected. The specific equipment failure that has occurred is indicated by the message on your display. Repair or replace the equipment before you run another weld cycle. Alarms will advance the general alarm counter. For more detailed information on repairing your equipment contact Branson Product Support by calling the appropriate department as indicated in section 8.2 How to Contact Branson.

DANGER	
	You should always power down your system prior to repairing any portion of it.

- A No Cycle alarm (Table B.3) occurs when the most recent weld cycle was aborted before any weld took place. The specific no weld failure that has occurred is indicated by the message on your display. No Cycle alarms will advance the general alarm counter, but will not advance the cycle counter. You should continue with the next weld cycle; in most cases the part can be re-used
- A Suspect or Reject alarm (Table B.4) occurs when the most recent weld cycle fell outside your programmed limits. The specific conflict that has occurred is indicated by the message on your display. Suspect/Reject alarms will advance the general alarm counter, but only once per cycle regardless of the number of alarms generated. You should inspect any part that was welded during a cycle that resulted in an alarm. If you encounter numerous or successive alarms you should review your weld parameter setup
- A Setup alarm (Table B.5) occurs when you have entered parameters that create a conflict with other parameters. For example, trying to step an amplitude at weld time 1.000 seconds, but the weld time is only set for 0.500 seconds.The specific conflict that has occurred is indicated by the message on your display. All setup alarms must be resolved before a new cycle can be run. Setup alarms will advance the general alarm counter, but will not advance the cycle counter. If you are uncertain as to the cause of the conflict
- An Overload alarm (Table B.6) occurs when your ultrasonic power supply has overloaded. Overload alarms advance the general alarms counter. The specific overload that has occurred is indicated by the message on your display
- Note alarms (Table B.7) occur to alert you that an alarm is imminent or the cycle ran with authorized modifications

7.6 Service Events

DANGER	
	Service events should be performed only by qualified individuals. The potential for injury or death exists, as well as that for damage to the equipment (which can include loss of product warranty) or loss of valuable setup information for your application. When servicing the system, the service person(s) can have a need for certain conventional hand tools, and you might need to have the following information for testing or returning the system to service.

7.6.1 Required Tools

Special tools for the ultrasonic Converter, such as spanner wrenches, are provided with your system. You might also need the following hand tools or service tools:

- Six-inch or longer Phillips-head screwdriver with a magnetic tip or screw starter
- Good-quality multi-meter for continuity, AC and DC voltages, and resistance, with insulated test probes

7.6.2 Voltage Test Points

See section 7.7.5 DC Power Supply.

Table 7.2 Voltage Test Points

DC Power Supply
+V1 to COM 5V
+V2 to COM 12V
V3 to COM 24V
-V4 to COM -12V

7.6.3 Cold Start Procedures

The power supply internal memory stores the system default settings and the parameters that you set. A cold start clears the Weld Setup Menu values and restores them to original factory defaults. It is not necessary to perform a cold start during normal operation and servicing, but you might find a cold start helpful when:

- You suspect the system is not operating properly
- You want to make a new setup

Some system memory locations and parameters, such as internal power supply history and serial number information, will not be cleared by these Cold Start procedures.

7.6.3.1 Performing a Cold Start

Select Diagnostics from the Main Menu. Press the Cold Start button to initiate the Cold Start. The screen will return to Weld Setup when the Cold Start is complete. See section 6.14 Diagnostics.

NOTICE	
	Using the Cold Start procedures will erase the current preset and some of the Setup parameters in the System Configuration menu. Be sure you have a record of your setup if you want to retain it. Your settings can be saved to a preset.

7.7 Parts Replacement

CAUTION	
	The 2000Xct HP power supply contains components that can be degraded or damaged by electrostatic discharge. Always use a Grounded Wrist strap and use a grounded work area when handling or servicing the 2000Xct HP. In the following paragraphs, you are provided instructions on removing and replacing components. Before you begin to disassemble any parts of the power supply, ensure that the power supply is turned off, and the main power is disconnected. After the power supply cover is removed, wait at least two minutes to allow capacitors to discharge. When necessary, refer to Figure 7.3 and Figure 7.4 to help you with these procedures.

The 2000Xct HP power supply is designed for a long service life. In the event the system malfunctions, many of the internal components (Modules) are replaceable as a unit. If a particular module has failed, it should be replaced or repaired at a Branson Depot Facility.

The 2000Xct HP power supply is designed with an extensive Alarms Message system. Refer to the list of error messages to assist your troubleshooting. These error codes are described in 7.5 Troubleshooting.

The following parts are replaceable. Refer to the following views of the power supply to see the location of each of these components or modules.

7.7.1 Power Supply Cover

The cover is held in place with seven screws, three on each side of the case and one on the rear. Lift the rear of the cover up to remove it. The cover must be in place when the system is operating due to fan-forced ventilation design.

Figure 7.3 Component Location of 2000Xct HP Module

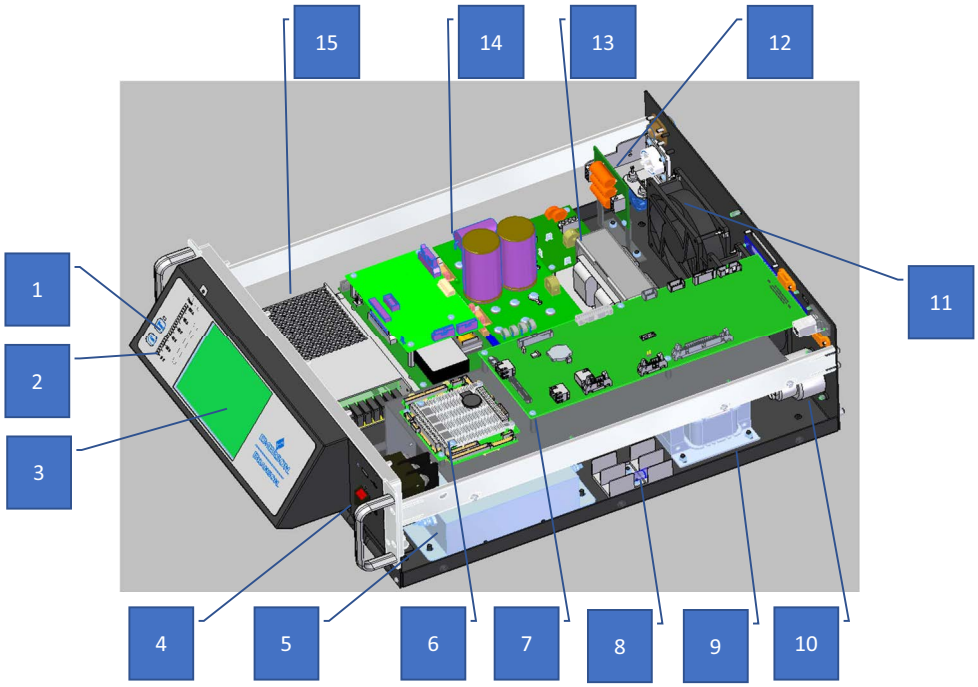
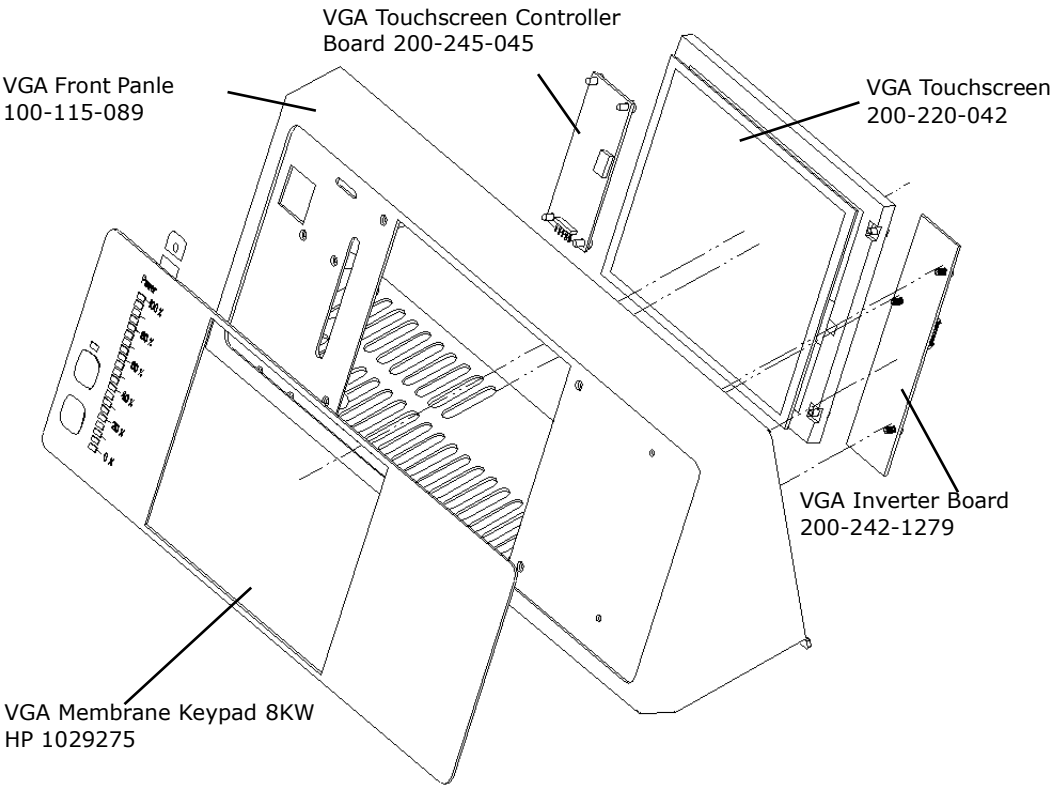


Table 7.3 2000Xct HP Module

Item	Name	Item	Name
1	Test/Reset button	2	Power bargraph
3	VGA touchscreen	4	Power switch
5	Filter	6	SBC
7	System controller board	8	Fuse
9	Isolation transformer	10	3-phase socket
11	Cooling fans	12	Shunt board
13	RF transformer	14	AUPS module
15	DC power supply	16	

Figure 7.4 Front Panel, Exploded Parts View



7.7.2 Circuit Boards and Modules

Replaceable modules are shown in Figure 7.3. Ribbon cables and connectors are unique and keyed to prevent the mis-connection of an appropriate connector in a location within the power supply case. Fans use identical wiring harnesses, with one tying back the extra lead length.

Make note of any wiring paths if you are removing a module, before you disassemble. In some cases, there are several possible paths, but one preferred location. Be especially careful with harnesses and wires that go between the two portions of the case, as they can be pinched by the metal case if mis-routed.

7.7.3 Front Panel Membrane and Touchscreen Display (VGA)

To remove and replace the touchscreen display, take the following steps:

Table 7.4 Removing the Touchscreen Display (VGA)

Step	Action
1	Turn off the power supply.
2	Unplug the main power. Allow at least two minutes for capacitor discharge.
3	Using a #2 Phillips screwdriver, remove 7 screws from the 2000Xct HP power supply cover (3 on each side, 1 on the rear). Remove the cover.
4	Remove: 5 screws at front bottom of VGA unit using a #0 Phillips screwdriver 3 screws securing the nose assembly from the front, inside, top of the chassis, using a #2 Phillips screwdriver 1 slotted screw and washer at the top right (from rear) that secures the ground ribbon from the Membrane Keypad
5	You will now have access to remove the: VGA Display with VGA PC board VGA Inverter board VGA Touchscreen Controller board, as required
6	If you need to replace any of the boards from Step 5, please note any details that will be necessary to install the replacement board without damaging the assembly.
7	To reinstall repaired VGA Assembly, reverse steps being careful not to pinch any wires.

NOTICE	
	Be sure the touchscreen is installed in its original orientation.

7.7.4 Power Supply Module

The ultrasonic power supply module is affixed to the bottom of the power supply box with four screws through the bottom board. To remove the power supply module, perform the following steps listed in Table 7.5.

Table 7.5 Removing the Power Supply Module

Step	Action
1	Turn off the power supply.
2	Unplug the main power.
3	Allow at least two minutes for capacitor discharge.
4	Using a #2 Phillips screwdriver, remove 7 screws from the 2000Xct HP cover (3 on each side, 1 on the rear). Remove the cover.
5	Disconnect P13, P51 from controller board.
6	Disconnect P21 and P24 from the lower board. Disconnect 3-phase connection among IN1, IN2 and IN3.
7	Use a Phillips screwdriver to remove retaining screws.
8	Slide the module out of the power supply

To reinstall the power supply module, reverse the removal procedure.

7.7.5 DC Power Supply

The DC power supply is mounted to the rear of the power supply case. It is mounted so it will swivel up to service the DC power supply, line board, and fuses. See Figure 7.3.

To remove the DC power supply, take the following steps:

Table 7.6 Removing the DC Power Supply

Step	Action
1	Turn off the power supply.
2	Unplug the main power.
3	Allow at least two minutes for capacitor discharge.
4	Using a #2 Phillips screwdriver, remove 7 screws from the 2000Xct HP cover(3 on each side, 1 on the rear). Remove the cover.
5	Using a #1 Phillips screwdriver, on the top of the DC power supply, remove 1 rear screw. (See Figure 7.3).
6	Using a #1 Phillips screwdriver, on the left side of the DC power supply, remove the rear screw. (See Figure 7.3).
7	Loosen the connection of 7 wires by cross screwdriver.
8	Remove the DC power supply.

To reinstall the DC power supply, reverse the removal procedure.

NOTICE	
	When reconnecting wires, observe the color coding that you previously noted.

7.7.6 Battery for the Real Time Clock RAM

To remove and replace the battery, take the following steps:

Table 7.7 Battery for the Real Time Clock RAM

Step	Action
1	Turn off the power supply.
2	Unplug the main power. Allow at least two minutes for capacitor discharge.
3	Using a #2 Phillips screwdriver, remove 7 screws from the 2000Xct HP power supply cover (3 on each side, 1 on the rear). Remove the cover.
4	Allow at least two minutes for capacitor discharge.
5	Remove and replace the battery, located on the controller board.
6	Replace cover and screws. Plug in main power and turn on the power supply.

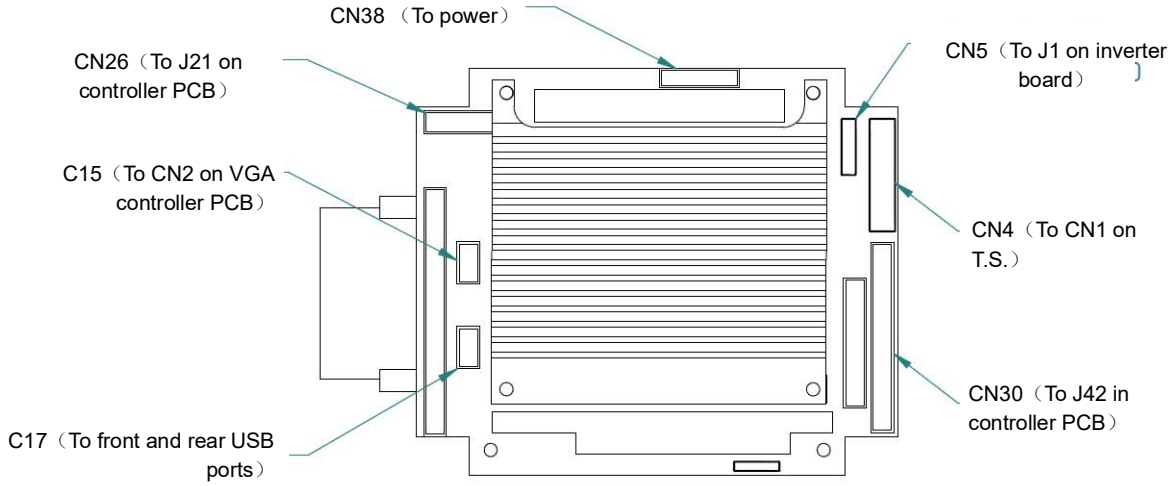
NOTICE	
	After replacing battery, re-enter Date, Time, and current preset.

7.7.7 System Controller Board

To remove the System Controller Board, turn off the power supply, unplug the main power and allow at least two minutes for capacitor discharge. Remove the cover and unplug J4, J20, J21, J30, J31, J32, J33, J37, J42. Unscrew the two screws on the user I/O and six screws on the system controller board to remove the board.

7.7.8 Single Board Computer (SBC)

Figure 7.5 SBC PC Board Connector Layout



To remove the SBC, take the following steps:

Table 7.8 Removing the SBC PC Board

Step	Action
1	Turn off the power supply.
2	Unplug the main power.
3	Allow at least two minutes for capacitor discharge.
4	Using a #2 Phillips screwdriver, remove 7 screws from the 2000Xct HP cover (3 on each side, 1 on the rear). Remove the cover.
5	Disconnect C15, C17, CN4, CN5, CN26, CN30, and CN38. Refer to Figure 7.5 above.
6	Using a #1 Phillips screwdriver, remove the 4 screws that hold the SBC.
7	Remove the SBC.

To reinstall the SBC PC board, reverse the removal procedure.

7.7.9 Cooling Fans

To remove a cooling fan, take the following steps:

Table 7.9 Removing a Cooling Fan

Step	Action
1	Turn off the power supply.
2	Unplug the main power.
3	Using a #2 Phillips screwdriver, remove 7 screws from the 2000Xct Hp cover (3 on each side, 1 on the rear). Remove the cover.
4	Allow at least two minutes for capacitor discharge.
5	Remove fan screw and nut after the system controller board is removed to remove a cooling fan.
6	Cut the tie-wraps from the fan wiring.
7	Disconnect the electrical connector(s).
8	Remove the 4 fan mounting screws and nuts.
9	Remove the fan and shield.

To reinstall the a cooling fan, reverse the removal procedure while observing the direction of air flow.

NOTICE	
	Be sure that you reinstall the fan shields on the back of the power supply.

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Chapter 8: Support

8.1 Warranty 156
8.2 Contact Us 157
8.3 Cybersecurity Vulnerability Reporting 158

8.1 Warranty

For warranty information please reference the warranty section of Terms and Conditions found at: https://www.branson.emerson.com/en/branson-terms-conditions.

8.2 Contact Us



Our dedicated experts are here to assist you with any questions or concerns you may have, ensuring you get the help you need.

Visit https://www.emerson.com/en/corporate/contact-us to find the technical support information, documentation, and software updates you need for your Emerson products and systems.

8.3 Cybersecurity Vulnerability Reporting

If you discover a potential vulnerability, please report it to us using the dedicated contact channel: Branson.PSIRT@emerson.com or via the reporting form available at https://emerson.com/reportvulnerability.

Appendix A: FAQ

A.1 FAQ: 2000Xct HP Series. 160

A.1 FAQ: 2000Xct HP Series

Q. What is the User ID and Password:?

A. The 2000Xct HP system is shipped with a default user name: ADMIN and default password: 123456Aa#. The password will need to be changed after the first log in. It is highly recommended to create multiple Executive users for backup.

Q. I've lost my user name or password. How can I get in?

A. The Executive is the only authority that can recover user names and password. If the Executive lost his password or user name, the Password Recovery Kit will need to be used to turn off the Authority Check. The Password Recovery Kit is a dongle that plugs into the back of the 2000Xct HP power supply. It can be ordered from Branson. EDP number is 101-063-1089. See section 6.23.2 Password Recovery for more information.

Q. My user name has been disabled. How do I reactive it?

A. The Executive can disable and re-enable users.

Q. Can Branson give us a temporary or global user name and password for logging in?

A. No, there is no backdoor password to enter the system. If all the user and passwords are lost, the Password Recovery Kit will need to be used.

Q. I've logged in as a Supervisor and/or Executive but none of the features in the configuration screen are accessible.

A. Verify that the system is not in Automation mode. If Automation is set to on, accessibility to configuration options is limited.

Q. What are the electrical characteristics of the input/output lines in the START and USER I/O cables?

A. They are rated at 10ma. 24Vdc. This is compatible with most PLC's available.

Q. Can't I use 120 volt AC LOGIC?

A. Not directly. Use relays to interface between the 2 logic levels. Note: use relays with low-power requirement coils, and use back biased diodes to suppress induced back EMF.

Q. But you forgot about the RELAY outputs in your diagrams.

A. They are SOLID STATE relays, and can safely withstand 40 V ac 250 ma, or 24 V dc, 250 ma. So they may be suited better to drive relays, if required to interface to relay coils.

Q. Why do you have so many pins in the USER I/O cable?

A. We combined the alarm and advanced feature connector outputs from the 900 Series with 2000 Series additions to provide maximum features and flexibility while retaining most feature backward compatibility.

Q. What do I do with the UNUSED PINS?

A. You should electrically isolate each unused pin so that shorts to ground and other outputs are avoided. This could possibly damage the controller board and other system components.

Q. Do I ground the shields on the USER I/O cable?

A. No; leave the shield from the cable isolated and cut-back so they do not touch ground: this prevents ground loop interference from occurring.

Q. Should I ground the RETURN lines in the USER I/O cable?

A. If required: this generally is not a problem. If problems occur, see "OTHER THAN 24 VOLTS".

Q. What are those SQUARE PLASTIC HOUSINGS on the cables?

A. They are ferrites that are used to reduce crosstalk and interference from entering the system. DO NOT remove them.

Q. How LONG can I run the CABLES?

A. Cable sets are available in 8, 15, 25, and on special order 50-foot lengths. Contact Branson Product Support or Customer Service if you have special needs.

Q. Can I run the Branson welder cables in a WIRING TROUGH with other system cables?

A. Generally yes. But it would be best to avoid other noise trouble source cables or wiring.

Q. What other system cables might cause a NOISE TROUBLE SOURCE?

A. Avoid wiring of devices such as solenoids, large relays, motors, or anything that has the potential of large inductive currents. Digital devices may also create broad-spectrum noise. Generally, all automation controls can be noise generators.

Q. Why do you require the READY signal to be monitored by the system PLC?

A. The welder mandatory requirements dictate the unit be READY or else the unit will DISREGARD any start command.

Q. Why must I MAINTAIN THE START SIGNAL?

A. This is the way the built-in safety circuits operate. Also, the vast library of error-detection firmware code is based on these same requirements. Watch for the PB RELEASE signal, then you can release the START SIGNAL

Q. What can I do to make sure I run at MAXIMUM CYCLE RATE for my machine?

A. You can:

- RESET immediately after an GENERAL ALARM output
- RELEASE the DUAL START inputs immediately after an GENERAL ALARM output
- RELEASE the DUAL START inputs immediately after sensing PB RELEASE output
- Never run in an open-loop mode, if possible. Fixed timing can be too short should a fault occur, or may be longer in time than is necessary

Q. Do all models run at the same CYCLE RATE?

A. See above.

Q. Are there any special requirements for operation with the ACTUATOR UP-SIDE DOWN?

A. Always let Branson know when you plan to run in this manner. Model-specific advice will be provided.

Q. Are there any special requirements for operation with the ACTUATOR HORIZONTAL?

A. Always let Branson know when you plan to run in this manner. Model-specific advice will be provided.

Q. Horn Down and Horn Scan are not working.

A. Horn Down and Horn Scan only operate when the welder is in ready mode. If the Part-ID Scan in the system configuration is on, the system will not be ready until part is scanned. The Part-ID Scan will need to be set to off or a part scan will need to be made to use Horn Down and Horn Scan.

Q. How does EMERGENCY STOP work?

A. Keep in mind that it is meant for EMERGENCY usage only, not for normal head retraction functions. Additional time is allotted for checking the welders' hardware and system status after an EMERGENCY STOP. Note: A front panel or external signal Reset is required after an Emergency Stop to re initialize the welder. Also see CYCLE ABORT below.

Q. So the CYCLE ABORT function is the preferred fast welder head retraction function?

A. Yes. It does not require the additional time that is allotted for checking the welders' hardware and system status that is used for EMERGENCY STOP.

Q. How does RESET work? Can I hold it on?

A. RESET is only acted upon after a GENERAL ALARM. Do not hold it in the RESET state as it will be ignored.

Q. My system logic uses some value OTHER THAN 24 VOLTS. What do I do?

A. A set of dipswitches are provided on the rear panel slot that contains the USER I/O connector. Setting the switches to OFF (open) converts the 24volt USER I/O to OPEN COLLECTOR configuration. The same voltage/current spec.'s apply when in this mode. (24 volt dc,25ma max.) Use them to control devices that have outputs compatible to your requirements.

Q. Are there any environmental conditions to be concerned about?

A. Any electrical/electronic equipment does not work well in: high humidity (condensing) conditions: also in dusty areas, in particular conductive dust (carbon granule or fiber, charcoal, metal particle, etc.)

A Fan Filter Kit with instructions can be factory or customer installed for just ordinary dusty areas.

Always contact your area representative, Branson Product Support or Customer Service should any like conditions or for inquires about explosion-proof requirements.

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Appendix B: Alarms

B.1 System Alarm Tables 166

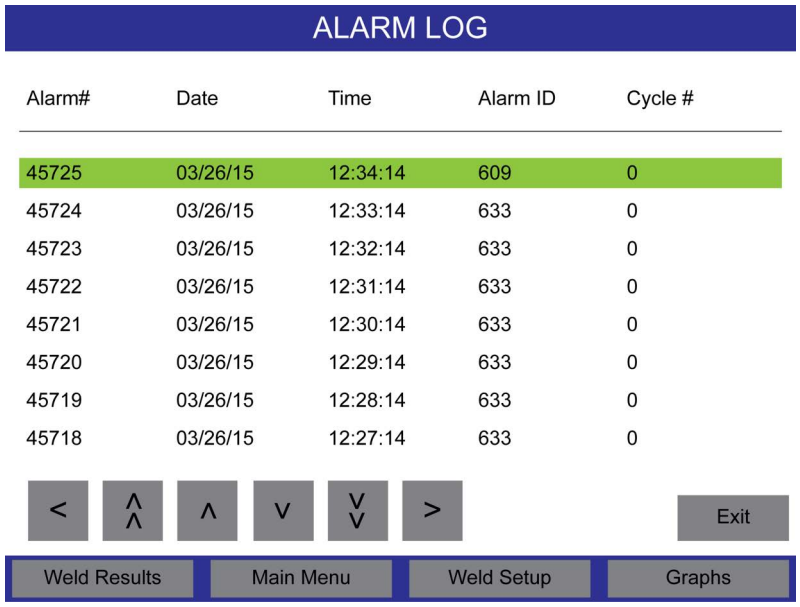
B.1 System Alarm Tables

The following tables detail alarms that you can encounter on the 2000Xct HP power supply, listed in numeric order for each group that is presented on the front panel. The message on the display panel of the Power Supply is shown in the first column. A more detailed message is shown in the second column. The third and fourth columns indicate the condition that led to the alarm and the corrective action you should take.

B.1.1 Alarm Index

An alphabetical list of the alarms that appear on the system display is included in B.1.1 Alarm Index.

Figure B.1 Alarm Log



B.1.2 Cycle Modified Alarms

Table B.1 Cycle Modified Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
301	Trigger Lost in Hold	The cycle was aborted because trigger force on the part was lost.	Verify that there is adequate pressure from your pneumatic supply.
301	Trigger Lost in Weld	The cycle was aborted because trigger force on the part was lost.	Verify that there is adequate pressure from your pneumatic supply. Verify stroke length < 3.75”.
303	Ground Detect Abort	The cycle was aborted because ground detect occurred during weld or hold.	Verify part placement and distance parameters.
304	Max Timeout	The ultrasonics ran for the maximum allowed time because the set parameter could not be achieved.	Manually inspect the part. If the part is acceptable, you might want to adjust your main parameter to avoid this alarm.
305	No Amplitude Step	The amplitude time step trigger was not reached.	Manually inspect the part. If the part is acceptable, turn amplitude stepping off. If the part is not acceptable, you might want to adjust your main parameter.
307	No Amplitude Step	The amplitude energy step trigger was not reached.	Manually inspect the part. If the part is acceptable, turn amplitude stepping off. If the part is not acceptable, you might want to adjust your main parameter.
309	No Amplitude Step	The amplitude collapse distance step trigger was not reached.	Manually inspect the part. If the part is acceptable, turn amplitude stepping off. If the part is not acceptable, you might want to adjust your main parameter.
314	Energy Not Reached	The weld time has been extended up to 50% and the minimum energy has still not been reached.	Discard the part. If you encounter numerous or successive alarms with good parts, you might change your minimum energy setting.
315	Trigger > Weld Force	The force at the end of the weld is less than the trigger force you set.	Increase your downspeed and/ or system pressure. If you very frequently receive this alarm, contact Branson
421	Sonics Disabled		Remove Sonics Disable input.
2EE	Input PIN Conflict		
30C	No Amplitude Step	The amplitude power step level was not reached.	Manually inspect the part. If the part is acceptable, turn amplitude stepping off. If the part is not acceptable, you might want to adjust your main parameter.

Table B.1 Cycle Modified Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
30D	No Amplitude Step	The amplitude step at external signal input was not received.	Make sure Ext Signal is defined in the User I/O.
41B	Peak Power Cutoff	The peak power cutoff was reached. The main parameter you set for the weld cycle was not used.	Manually inspect the part. If the part is acceptable, you might want to adjust your main parameter to avoid this alarm.
41C	ABS Cutoff	The absolute distance cutoff you set was reached. The main parameter you set for the weld cycle was not used to the end of the cycle.	Manually inspect the part. If the part is acceptable, you might want to adjust your main parameter to avoid this alarm.
70F	Ground Detect Abort	The cycle was aborted because ground detect occurred during Weld or Hold	Manually inspect the part. If the part is acceptable, you might want to adjust your main parameter to avoid this alarm.

B.1.3 Failure of Alarms

Table B.2 Failure of Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
601	Start Switch Closed	Start switches are still active after the carriage is at ULS for 6 seconds.	Deactivate start switches.
604	Upper Limit Switch	Upper Limit Switch was not engaged at the end of weld cycle. The switch might have failed or the electrical wiring might be loose.	Verify the electrical connections for the Upper Limit Switch or replace the switch.
609	Start Switches Lost	Checked after both start switches, and before trigger.There is a 10 ms debounce time before considered lost.	Press start switches again.
620	Pretrigger Timeout	Pretrigger has not occurred within 10 seconds of carriage leaving home (of upper limit becoming inactive).	Check the distance setting for pretrigger to be sure the carriage is traveling at least that far. Repair/replace Control Board.
623	Thermal Overload	Thermal sensors on the Power Supply indicate that the temperature is above the maximum operating temperature.	Lower the duty cycle by decreasing the on time or increasing the off time. Ensure fans are operational and internal components are free of dust.
624	Preset Data/BBR	Corrupted data in preset. Checked at power up.	Repair/replace the Control Board. Replace battery.
625	Horn Return Timeout	The Horn did not retract to the home position after the weld was completed and within the correct time. The Horn might be jammed or air pressure might have failed. The Upper Limit Switch might also have failed.	Verify that air pressure is correct. Check for obstructions or jams that would prevent the Horn from returning. Verify the operation of the Upper Limit Switch.
626	Actuator NovRam Error Code = 10	The Actuator NovRam has corrupted data	Perform a Cold Start. Check setup/ cable. Repair/replace Interface board in actuator.
626	Actuator NovRam Error Code = 20	Cylinder size is not 1.5, 2.0, 2.5, 3.0, 50mm, 63mm, 80mm, or Custom.	Perform a Cold Start. Check setup/ cable. Repair/replace Interface board in actuator.
626	Actuator NovRam Error Code = 30	Stroke length is not 4”, 5”, 6”, 7”, 8”, 80mm, 160mm, or Custom.	Perform a Cold Start. Check setup/ cable. Repair/replace Interface board in actuator.
626	Actuator NovRam Error Code = 40	When each successive element in the Pressure Sensor Calibration Table is not greater than the preceding one.	Perform a Cold Start. Check setup/ cable.Repair/replace Interface board in actuator.

Table B.2 Failure of Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
626	Actuator NovRam Error Code = 50	When each successive element in the Load Cell Table is not larger than the preceding one.	Perform a Cold Start. Check setup/ cable.Repair/replace Interface board in actuator.
626	Actuator NovRam Error Code = 60	Could not write to the actuator NovRam.	Perform a Cold Start. Check setup/ cable. Repair/replace Interface board in actuator.
627	P/S NovRam	The power supply NovRam failed. It is checked only at power up.	Repair/replace Control Board.
628	Start Sw Time	You did not activate both start switches within the required time interval.	Activate both start switches at the same time to rerun the cycle.
629	USB Memory Full	Data was selected to be saved on the USB memory stick, but the memory stick is now full.	Welding will be stopped until corrected. If all data from the weld will not fit, then no data will be written. All data from any given weld cycle must be written on one USB stick.
630	Actuator Clear Function	The carriage is home before the actuator clear condition was met.	Make sure the linear encoder cable is connected properly. Replace Linear Encoder. Repair/replace Control Board.
632	Actuator Type	Actuator type detected at power up is different from the actuator type that was used on the last weld cycle. Checked at power up and after E-Stop is removed.	Verify serial number (excepting ae/ao) and type, then reset. If you did not change the actuator, troubleshoot your system.
635	USB Memory Lost	The USB memory stick has been removed or it is not functional.	Since weld data was configured to be saved on the USB stick, welding must be stopped until either the USB stick is functional or weld data is no longer required to be saved.
62A	Wrong Actuator	The power supply has detected an actuator that cannot be used with a power supply of this type.	Use the correct actuator for this power supply.
62B	Ultrasonics P/S	Checked during power up. Seek was requested but no run signal detected, or the amplitude from the Power output is less than 2%. A DUPS communication error occurred.	Contact Branson. Repair/replace the power supply Module.
62F	Recalibrate Actuator Error Code = 100	Either the actuator serial number is different from the last time power was turned on, or your new setup requires a calibration.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu.
62F	Recalibrate Actuator Error Code = 200	A collapse of more than 0.2500” and less than 35 lbs. of force was reached.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu. Also check part alignment.

Table B.2 Failure of Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
62F	Recalibrate Actuator Error Code = 300	A change in horn weight of 6-7 lbs since the last power down or E-stop.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu.
62F	Recalibrate Actuator Error Code = 400	Carriage travel greater than -0.25 after trigger.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu.
62F	Recalibrate Actuator Error Code = 600	Actuator type has changed.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu.
62F	Recalibrate Actuator Error Code = 700	In Horn Down, a bad Trigger has occurred.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu.
62F	Recalibrate Actuator Error Code = 800	Part contact flag has been lost.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu.
62F	Recalibrate Actuator Error Code = 900	Carriage travels greater than 0.250 and less than 35 lbs. force was developed after part contact and before trigger.	Run an Actuator Calibration procedure from the Alarm Information screen or from Calibrate in the Main Menu.

B.1.4 No Cycle Alarms

Table B.3 No Cycle Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
702	Trigger Timeout	Trigger force was not achieved within the 10 second allowed time.	Verify that the part is in the fixture; verify that there is adequate pressure from your pneumatic supply. Verify stroke length <3.75”
703	Trg Delay Timeout	Ext trigger delay has been turned on, but the assigned input did not go inactive within the 30 seconds allowed.	Check external timing. Activate Ext Trg Delay.
706	Missing Part Abort	Checked during downstroke. The missing part minimum distance has not been reached before trigger occurred or the maximum distance has been exceeded before trigger occurred.	Insert a part into the fixture. Use the horn down feature to determine the distance to the part, and reset the minimum and maximum settings as necessary through the Alarm Information screen or Setup menu.
708	Trig Before Pretrig	Trigger has occurred before pre-trigger distance, upper limit switch is inactive, or pre-trigger time delay has not timed out.	Check each condition and correct where necessary.
70C	Abs Before Trg	The absolute distance has been reached before trigger. This alarm in other modes means the absolute cutoff distance has been reached before trigger.	Reset your absolute distance parameter through the Alarm Information screen or the Setup menu.
70D	Amp Step Before Trg	The amplitude step trigger has been detected within 2 ms of start of weld time.	Reset your amplitude step parameter through the Alarm Information screen or the Setup menu.
70F	Ground Detect	The ground detect input is either improperly configured, in the wrong condition or failed.	Reconfigure properly, change condition or replace faulty input.

B.1.5 Suspect or Reject Alarms

Table B.4 Suspect/Reject Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
500	- R Trg Dist Limit	The actual trigger distance value did not reach the minus reject trigger distance limit.	Adjust - reject trigger distance limit through the Alarm Information screen or Setup menu. Discard the part if you encounter numerous or successive alarms.
503	+R Pk Power Limit	The actual peak power value exceeded the plus reject peak power limit.	Discard the part if you encounter numerous or successive alarms with good parts. Consider changing your Peak Power settings.
504	- R Pk Power Limit	The peak power used in the most recent weld was less than the lower reject limit you set.	Discard the part. If you encounter numerous or successive alarms with good parts, you might change your reject peak power limits.
505	- R Time Limit	The actual time value did not reach the minus reject time limit.	Discard the part if you encounter numerous or successive alarms with good parts. Consider changing your Time settings.
506	+R Time Limit	The actual time value exceeded the plus reject time limit.	Discard the part if you encounter numerous or successive alarms with good parts. Consider changing your Time settings or your reject time limits.
507	- R Energy Limit	The energy used in the most recent weld was less than the lower reject limit you set.	Discard the part. If you encounter numerous or successive alarms with good parts, you might change your reject energy limits.
508	+R Energy Limit	The energy used in the most recent weld was greater than the upper reject limit you set.	Discard the part. If you encounter numerous or successive alarms with good parts, you might change your reject energy limits.
509	- R Col Dist Limit	The collapse distance used in the most recent weld was less than the lower reject limit you set.	Discard the part. If you encounter numerous or successive alarms with good parts, you might change your reject collapse distance limits.
510	+R Weld Force Limit	The actual Weld Force exceeded the plus Reject Weld Force limit.	Discard the part if you encounter numerous or successive alarms with good parts. Consider changing your Weld Force settings.
512	-R Freq Limit	The system Bandwidth Limit (SBL) function has determined the frequency has dropped too much and is now close to the series resonant point.	Verify integrity of stack. Review application.

Table B.4 Suspect/Reject Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
513	+R Freq Limit	The system Bandwidth Limit (SBL) function has determined the frequency has risen too much and is now close to the series resonant point.	Verify integrity of stack. Review application.
514	+R PMC Band Limit	The Power Match Curve function has detected points above the acceptable curve.	Run additional cycles to determine if this is a trend or an anomaly. Examine process and adjust accordingly.
515	-R PMC Band Limit	The Power Match Curve function has detected points below the acceptable curve.	Run additional cycles to determine if this is a trend or an anomaly. Examine process and adjust accordingly.
551	- S Energy Limit	The energy used in the most recent weld was less than the lower suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect energy limits.
552	+S Energy Limit	The energy used in the most recent weld was greater than the upper suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect energy limits.
553	- S Pk Power Limit	The peak power used in the most recent weld was less than the lower suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect peak power limits.
554	+S Pk Power Limit	The peak power used in the most recent weld was greater than the upper suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect peak power limits.
555	- S Col Dist Limit	The actual collapse distance value did not reach the minus suspect collapse distance limit.	Inspect your parts. For numerous or successive alarms, you might adjust the collapse distance value through the Alarm Information screen or Setup menu.
556	+ S Col Dist Limit	The collapse distance used in the most recent weld was greater than the upper suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect collapse distance limits.
557	- S Abs Dist Limit	The absolute distance used in the most recent weld was less than the lower suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect absolute distance limits.

Table B.4 Suspect/Reject Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
558	+S Abs Dist Limit	The absolute distance used in the most recent weld was greater than the upper suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect absolute distance limits.
559	- S Trg Dist Limit	The actual trigger distance value did not reach the minus suspect trigger distance limit.	Inspect your parts. For numerous or successive alarms, you might adjust the Trigger Distance Limit through the Alarm Information screen or Setup menu.
50A	+ R Col Dist Limit	The collapse distance used in the most recent weld was greater than the upper reject limit you set.	Discard the part. If you encounter numerous or successive alarms with good parts, you might change your reject collapse distance limits.
50B	- R Abs Dist Limit	The absolute distance used in the most recent weld was less than the lower reject limit you set.	Discard the part. If you encounter numerous or successive alarms with good parts, you might change your reject absolute distance limit.
50C	+R Abs Dist Limit	The actual distance value exceeded the plus reject absolute distance limit.	Discard the part if you encounter numerous or successive alarms with good parts. Consider changing your Absolute settings.
50E	+R Trg Dist Limit	The actual trigger distance value exceeded the plus reject trigger distance limit.	Adjust + reject trigger distance limit through the Alarm Information screen or Setup menu. Discard the part if you encounter numerous or successive alarms.
50F	- R Weld Force Limit	The actual Weld Force did not reach the minus reject Weld Force limit.	Adjust - reject weld force through the Alarm Information screen or Setup menu. Discard the part if you encounter numerous or successive alarms.
55A	+ S Trg Dist Limit	The trigger distance used in the most recent weld was greater than the upper suspect limit you set.	Manually inspect the part for a good weld. If you encounter numerous or successive alarms with good parts, you might change your suspect trigger distance limits.
55B	- S Weld Force Limit	The actual Weld Force did not reach the minus suspect Weld Force limit.	Inspect your parts. For numerous or successive alarms, you might adjust the Weld Force value through the Alarm Information screen or Setup menu.
55C	+S Weld Force Limit	The actual Weld Force exceeded the plus suspect Weld Force limit.	Inspect your parts. For numerous or successive alarms, you might adjust the Weld Force value through the Alarm Information screen or Setup menu.

Table B.4 Suspect/Reject Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
55D	- S Time Limit	The time used in the most recent weld was less than the lower suspect limit you set.	Inspect your parts. For numerous or successive alarms, you might adjust the Time value through the Alarm Information screen or Setup menu.
55E	+S Time Limit	The actual time value exceeded the plus suspect time limit.	Inspect your parts. For numerous or successive alarms, you might adjust the Time value through the Alarm Information screen or Setup menu or change suspect time limits.

B.1.6 Setup Alarms

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
203	Invalid Preset Error Code = 1		Currently, MPS is not available.
203	Invalid Preset Error Code = 2		Change the settings in your preset. A cold start may be needed.
203	Invalid Preset Error Code = 3		Change the settings in your preset. A cold start may be needed.
203	Invalid Preset Error Code = 4		Change the settings in your preset. A cold start may be needed.
203	Invalid Preset Error Code = 5		Change the settings in your preset. A cold start may be needed.
203	Invalid Preset Error Code = 6		Change the settings in your preset. A cold start may be needed.
203	Invalid Preset Error Code = 7		Change the settings in your preset. A cold start may be needed.
203	Invalid Preset Error Code = 8		Change the settings in your preset. A cold start may be needed.
203	Invalid Preset Error Code = 9		Change the settings in your preset. A cold start may be needed.
207	+ - Time Limit Crossed	The suspect limits for time that you have entered are reversed.	Change the suspect time limits through the Alarm Information screen or Setup menu.
208	+ - Time Limit Crossed	The reject limits for time that you have entered are reversed.	Change the reject time limits through the Alarm Information screen or Setup menu.
209	+- Eng Limit Crossed	The suspect limits for energy that you have entered are reversed.	Change the suspect energy limits through the Alarm Information screen or Setup menu.
210	+ - Abs Limit Crossed	The suspect limits for absolute distance that you have entered are reversed.	Change the suspect absolute distance limits through the Alarm Information screen or Setup menu.
211	+ - Col Limit Crossed	The reject limits for collapse distance that you have entered are reversed.	Change the reject collapse distance limits through the Alarm Information screen or Setup menu.
212	+ - Col Limit Crossed	The suspect limits for collapse distance that you have entered are reversed.	Change the suspect collapse distance limits through the Alarm Information screen or Setup menu.
213	+ - F Limit Crossed	The minus reject weld force limit is equal to or greater than the plus reject weld force limit.	Change the - reject weld force limit and/or the +reject weld force limit through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
214	+ - F Limit Crossed	The minus suspect force limit is equal to or greater than the plus suspect force limit.	Change the - suspect weld force limit and/or the +suspect weld force limit.through the Alarm Information screen or Setup menu.
215	Amp Step Conflict	The time that you have set for the amplitude to step is greater than the time that you have set for the weld cycle.	Change the step time for the amplitude and/or the time setting for the weld cycle.
216	Amp Step Conflict	The amplitude step value is equal to or greater than the plus reject peak power limit value.	Change the amplitude step or +reject peak power limit through the Alarm Information screen or Setup menu.
217	Amp Step Conflict	The amplitude step value is equal to or greater than the plus suspect peak power limit.	Change the amplitude step or +suspect peak power limit through the Alarm Information screen or Setup menu.
218	Amp Step Conflict	The amplitude step value is equal to or greater than the plus reject energy limit.	Change the amplitude step or +reject energy limit through the Alarm Information screen or Setup menu.
219	Amp Step Conflict	The amplitude step value is equal to or greater than the plus suspect energy limit.	Change the amplitude step or +suspect energy limit through the Alarm Information screen or Setup menu.
226	Amp Step Conflict	The amplitude step at power value is equal to or greater than the peak power value. This alarm is for peak power mode only.	Change the amplitude step or peak power main parameter through the Alarm Information screen or Setup menu.
227	Amp Step Conflict	The amplitude step at energy value is equal to or greater than the max energy compensation value.	Change the amplitude step or maximum energy compensation limit through the Alarm Information screen or Setup menu.
229	Amp Step Conflict	The amplitude step value is equal to or greater than the peak power cutoff value. This alarm is in all modes but peak power.	Change the amplitude step or peak power cutoff through the Alarm Information screen or Setup menu.
231	Amp Step Conflict	The energy level you have set for the amplitude to step is in conflict with the energy level you have set for the weld cycle.	Change the step energy for the amplitude and/or the energy level for the weld cycle.
232	Timeout Conflict	The plus reject time limit is equal to or greater than the maximum timeout value.	Change the +reject time limit or maximum timeout value through the Alarm Information screen or Setup menu.
233	Timeout Conflict	The minus suspect time limit is equal to or greater than the maximum timeout value.	Change the +suspect time limit or maximum timeout value through the Alarm Information screen or Setup menu.
234	Timeout Conflict	The minus reject time limit is equal to or greater than the maximum timeout value.	Change the - reject time limit or maximum timeout value through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
237	- S Trg > - S Abs	The minus suspect trigger limit value is equal to or greater than the minus suspect absolute distance limit.	Change the - suspect trigger limit and/ or the - suspect absolute distance limit through the Alarm Information screen or Setup menu.
238	+S Trg > +S Abs	The plus suspect trigger limit is equal to or greater than the plus suspect absolute limit.	Change the +suspect trigger limit and/ or the +suspect absolute limit through the Alarm Information screen or Setup menu.
239	- R Trg > - R Abs	The minus reject trigger limit is equal to or greater than the minus reject absolute limit.	Change the - reject trigger limit and/or the - reject absolute limit through the Alarm Information screen or Setup menu.
244	Time S/R Limit Cross	The plus reject time limit is equal to or less than the minus suspect time limit.	Change the +reject time limit or - suspect time limit through the Alarm Information screen or Setup menu.
245	Time S/R Limit Cross	The plus suspect time is equal to or less than the minus reject time limit.	Change the +suspect time limit or - reject time limit through the Alarm Information screen or Setup menu.
246	Time S/R Limit Cross	The plus reject time limit is equal to or less than the plus suspect time limit.	Change the +reject time limit or +suspect time limit through the Alarm Information screen or Setup menu.
247	Time S/R Limit Cross	The minus reject time limit is equal to or greater than the minus suspect time limit.	Change the - reject time limit or - suspect time limit through the Alarm Information screen or Setup menu.
248	Eng S/R Limit Cross	The plus reject energy limit is equal to or less than the minus suspect energy limit.	Change the +reject energy limit or - suspect energy limit through the Alarm Information screen or Setup menu.
249	Eng S/R Limit Cross	The plus suspect energy limit is equal to or less than the minus reject energy limit.	Change the +suspect energy limit or - reject energy limit through the Alarm Information screen or Setup menu.
250	Abs S/R Limit Cross	The plus reject absolute distance limit is equal to or less than the minus suspect absolute distance limit.	Change the +reject absolute distance or - suspect absolute distance limit through the Alarm Information screen or Setup menu.
251	Abs S/R Limit Cross	The plus suspect absolute distance limit is equal to or less than the minus reject absolute distance limit.	Change the +suspect absolute distance or - reject absolute distance limit through the Alarm Information screen or Setup menu.
252	Abs S/R Limit Cross	The plus reject absolute distance limit is equal to or less than the plus suspect absolute distance limit.	Change the +reject absolute distance or +suspect absolute distance limit through the Alarm Information screen or Setup menu.
253	Abs S/R Limit Cross	The minus reject absolute distance limit is equal to or greater than the minus suspect absolute distance limit.	Change the - reject absolute distance limit or the - suspect absolute distance limit through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
254	Col S/R Limit Cross	The plus reject collapse distance limit is equal to or less than the minus suspect collapse distance limit.	Change the +reject collapse distance limit or - suspect collapse distance limit through the Alarm Information screen or Setup menu.
255	Col S/R Limit Cross	The plus suspect collapse distance limit is equal to or less than the minus reject collapse distance limit.	Change the +suspect collapse distance limit or - reject collapse distance limit through the Alarm Information screen or Setup menu.
256	Col S/R Limit Cross	The plus reject collapse distance limit is equal to or less than the plus suspect collapse distance limit.	Change the +reject collapse distance limit or +suspect collapse distance limit through the Alarm Information screen or Setup menu.
257	Col S/R Limit Cross	The minus reject collapse distance limit is equal to or greater than the minus suspect collapse distance limit.	Change the - reject collapse distance limit or - suspect collapse distance limit through the Alarm Information screen or Setup menu.
258	F S/R Limit Cross	The plus reject force limit is equal to or less than the minus suspect force limit.	Change the +reject force limit and/or the - suspect force limit through the Alarm Information screen or Setup menu.
259	F S/R Limit Cross	The plus suspect force limit is equal to or less than the minus reject force limit.	Change the +suspect force limit and/or the - reject force limit through the Alarm Information screen or Setup menu.
260	Trg S/R Limit Cross	The plus reject trigger distance limit is equal to or less than the minus suspect trigger distance limit.	Change the +reject trigger limit or - suspect trigger limit through the Alarm Information screen or Setup menu.
261	Trg S/R Limit Cross	The plus suspect trigger distance limit is equal or less than the minus reject trigger distance limit.	Change the +suspect trigger limit or - reject trigger limit through the Alarm Information screen or Setup menu.
262	Trg S/R Limit Cross	The plus reject trigger distance limit is equal to or less than the plus suspect trigger distance limit.	Change the +reject trigger limit or +suspect trigger limit through the Alarm Information screen or Setup menu.
263	Trg S/R Limit Cross	The minus reject trigger distance limit is equal to or greater than the minus suspect trigger distance limit.	Change the - reject trigger limit or - suspect trigger limit through the Alarm Information screen or Setup menu.
269	Energy Comp Crossed	The energy minimum and maximum settings are crossed. This alarm is only valid when energy compensation is on.	Change the minimum and maximum energy compensation limits through the Alarm Information screen or Setup menu.
270	Pretrigger Conflict	The pretrigger distance is equal to or greater than the plus suspect absolute limit.	Change the pretrigger distance or +suspect trigger limit through the Alarm Information screen or Setup menu.
271	Pretrigger Conflict	The pretrigger distance is equal to or greater than the plus reject trigger limit.	Change the pretrigger distance or +reject trigger limit through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
272	Pretrigger Conflict	The pretrigger distance is equal to or greater than the plus suspect trigger limit.	Change the pretrigger distance or +suspect trigger limit through the Alarm Information screen or Setup menu.
273	Pretrigger Conflict	The pretrigger distance is equal to or greater than the minus reject trigger limit.	Change the pretrigger distance or - reject trigger limit through the Alarm Information screen or Setup menu.
274	Pretrigger Conflict	The pretrigger distance is equal to or greater than the minus suspect trigger limit.	Change the pretrigger distance or - suspect trigger limit through the Alarm Information screen or Setup menu.
275	Pretrigger Conflict	The pretrigger distance is equal to or greater than the absolute cutoff distance	Change the pretrigger distance or absolute cutoff through the Alarm Information screen or Setup menu.
276	Pretrigger Conflict	The pretrigger distance is equal to or greater than the absolute distance.	Change the pretrigger distance or absolute distance through the Alarm Information screen or Setup menu.
277	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the minus reject absolute limit.	Change the absolute cutoff distance or - reject absolute distance limit through the Alarm Information screen or Setup menu.
278	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the minus reject trigger limit.	Change the absolute cutoff distance or - reject trigger distance limit through the Alarm Information screen or Setup menu.
279	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the minus suspect absolute limit.	Change the absolute cutoff distance or - suspect absolute distance limit through the Alarm Information screen or Setup menu.
280	Missing Part Conflict	The missing part maximum distance is equal to or less than the minus reject trigger limit.	Change the missing part minimum limit or - reject trigger limit through the Alarm Information screen or Setup menu.
282	Missing Part Conflict	The missing part minimum distance is equal to or greater than the minus suspect absolute limit.	Change the missing part minimum distance limit or - suspect absolute distance limit through the Alarm Information screen or Setup menu.
283	Missing Part Conflict	The missing part maximum distance is equal to or less than the minus suspect trigger limit.	Change the missing part maximum distance limit or - suspect trigger limit through the Alarm Information screen or Setup menu.
284	Missing Part Conflict	The missing part minimum distance is equal to or greater than the minus suspect trigger limit.	Change the missing part minimum distance limit or - suspect trigger limit through the Alarm Information screen or Setup menu.
285	Missing Part Conflict	The missing part maximum distance is equal to or greater than the plus reject absolute limit.	Change the missing part maximum distance limit or +reject absolute limit through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
286	Missing Part Conflict	The missing part minimum distance is equal to or greater than the plus reject absolute limit.	Change the missing part minimum distance limit or +reject absolute distance limit through the Alarm Information screen or Setup menu.
287	Missing Part Conflict	The missing part maximum distance is equal to or less than the plus reject trigger limit.	Change the missing part maximum distance or +reject trigger distance limit through the Alarm information screen or Setup menu.
288	Missing Part Conflict	The missing part minimum distance is equal to or less than the plus reject trigger limit.	Change the missing part minimum distance limit or +reject trigger distance limit through the Alarm Information screen or Setup menu.
289	Missing Part Conflict	The missing part maximum distance is equal to or less than the plus suspect absolute limit.	Change the missing part maximum distance limit or +suspect absolute distance limit through the Alarm Information screen or Setup menu.
290	Missing Part Conflict	The missing part maximum distance is equal to or greater than the absolute distance setting. This alarm occurs in absolute mode only.	Change the missing part maximum distance limit or absolute distance through the Alarm Information screen or Setup menu.
291	Energy Comp Conflict	The plus reject energy limit is equal to or less than the minimum energy compensation value. This alarm occurs in time mode only.	Change the +Reject energy limit or minimum energy compensation through the Alarm Information screen or Setup menu.
292	Energy Comp Conflict	The plus suspect energy limit is equal to or less than the minimum energy compensation value. This alarm occurs in time mode only.	Change the +Suspect energy limit or minimum energy compensation through the Alarm Information screen or Setup menu.
298	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the minus reject absolute limit.	Either increase the reject distance limit or decrease the rapid traverse distance.
633	Sys. Pres. Incorrect	The system pressure is out of tolerance (+/-3 PSI). The pressure is read only after five seconds of idle time while in ready. This alarm does not remove the ready signal because that would prevent entry into horn down. Horn down is the only place where the pressure can be viewed.	
20A	+- Eng Limit Crossed	The reject limits for energy that you have entered are reversed.	Change the reject energy limits through the Alarm Information screen or Setup menu.
20B	+ - Pwr Limit Crossed	The suspect limits for power that you have entered are reversed.	Change the suspect power limits through the Alarm Information screen or Setup menu.
20C	+ - Pwr Limit Crossed	The reject limits for power that you have entered are reversed.	Change the reject power limits through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
20E	+ - Rej Limit Crossed	The + reject freq limit and - reject freq limit values are crossed.	Either make the correction or run a horn scan to automatically correct. This alarm is valid for VGA only.
20F	+ - Abs Limit Crossed	The reject limits for absolute distance that you have entered are reversed.	Change the reject absolute distance limits through the Alarm Information screen or Setup menu.
22A	Amp Step Conflict	The amplitude step at collapse value is equal to or greater than collapse cutoff.	Change the amplitude step or collapse cutoff through the Alarm Information screen or Setup menu.
22B	Amp Step Conflict	The amplitude step at collapse distance is equal to or greater than the collapse distance.	Change the amplitude step or collapse distance through the Alarm Information screen or Setup menu.
22C	Amp Step Conflict	The amplitude step at time value is equal to or greater than the maximum timeout value. This occurs in all modes except time.	Change the amplitude step at time value and/or the maximum timeout value through the Alarm Information screen or Setup menu.
22D	+ - Trg Limit Crossed	The reject limits for trigger distance that you have entered are reversed.	Change the reject trigger distance limits through the Alarm Information screen or Setup menu.
22E	+ - Trg Limit Crossed	The suspect limits for trigger distance that you have entered are reversed.	Change the suspect trigger distance limits through the Alarm Information screen or Setup menu.
22F	Preset Not Available	Preset is recalled via external inputs and the preset is not defined or is not allowed for the control level.	Check control level availability for preset. Preset is not defined. Make sure presets do not exceed 16.
23A	+R Trg > +R Abs	The plus reject trigger limit is equal to or greater than the plus reject absolute distance limit.	Change the +reject trigger limit and/or the +reject absolute distance limit through the Alarm Information screen or Setup menu.
23B	Timeout Conflict	The plus suspect time limit is equal to or greater than the maximum timeout value.	Change the +suspect time limit or maximum timeout value through the Alarm Information screen or Setup menu.
23C	Cutoff Conflict	The minus reject power limit is equal to or greater than the peak power cutoff value.	Change the - reject power limit or peak power cutoff through the Alarm Information screen or Setup menu.
23D	Cutoff Conflict	The plus reject power limit is equal to or greater than the peak power cutoff value.	Change the +reject power limit or peak power cutoff through the Alarm Information screen or Setup menu.
23E	Cutoff Conflict	The minus suspect power limit is equal to or greater than the peak power cutoff value.	Change the - suspect power limit or peak power cutoff through the Alarm Information screen or Setup menu.
23F	Cutoff Conflict	The plus suspect power limit is equal to or less than the peak power cutoff value.	Change the +suspect power limit or peak power cutoff through the Alarm Information screen or Setup menu.
24A	Eng S/R Limit Cross	The plus reject energy limit is equal to or less than the plus suspect energy limit.	Change the +reject energy limit or +suspect energy limit through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
24B	Eng S/R Limit Cross	The minus reject energy limit is equal to or greater than the minus suspect energy limit.	Change the - reject energy limit or - suspect energy limit through the Alarm Information screen or Setup menu.
24C	Pwr S/R Limit Cross	The plus reject power limit is equal to or less than the minus suspect power limit.	Change the +reject power limit or - suspect power limit through the Alarm Information screen or Setup menu.
24D	Pwr S/R Limit Cross	The plus reject power limit is equal to or less than the plus suspect power limit.	Change the +reject power limit or +suspect power limit through the Alarm Information screen or Setup menu.
24E	Pwr S/R Limit Cross	The plus suspect power limit is equal to or less than the minus reject power limit.	Change the +suspect power limit or - reject power limit through the Alarm Information screen or Setup menu.
24F	Pwr S/R Limit Cross	The minus reject power limit is equal to or greater than the minus suspect power limit.	Change the - reject power limit or - suspect power limit through the Alarm Information screen or Setup menu.
25A	F S/R Limit Cross	The plus reject force limit is equal to or less than the plus suspect force limit.	Change the +reject force limit and/or the +suspect force limit through the Alarm Information screen or Setup menu.
25B	F S/R Limit Cross	The minus reject force limit is equal to or greater than the minus suspect force limit.	Change the - reject force limit and/or the - suspect force limit through the Alarm Information screen or Setup menu.
26A	Missing Part Conflict	The missing part minimum is equal to or greater than the missing part maximum setting.	Change the missing part minimum and/or the missing part maximum setting through the Alarm Information screen or Setup menu.
26D	Pretrigger Conflict	The pretrigger distance is equal to or greater than the minus reject absolute limit.	Change the pretrigger distance or - reject absolute limit through the Alarm Information screen or Setup menu.
26E	Pretrigger Conflict	The pretrigger distance is equal to or greater than the minus suspect absolute limit.	Change the pretrigger distance or - suspect absolute limit through the Alarm Information screen or Setup menu.
26F	Pretrigger Conflict	The pretrigger distance is equal to or greater than the plus reject absolute limit.	Change the pretrigger distance or +reject absolute limit through the Alarm Information screen or Setup menu.
27A	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the minus suspect trigger limit.	Change the absolute cutoff distance or - suspect trigger distance limit through the Alarm Information screen or Setup menu.
27B	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the plus reject absolute limit.	Change the absolute cutoff distance or +reject absolute distance limit through the Alarm Information screen or Setup menu.
27C	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the plus reject trigger limit.	Change the absolute cutoff distance or +reject trigger distance limit through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
27D	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the plus suspect absolute limit.	Change the absolute cutoff distance or +suspect absolute distance limit through the Alarm Information screen or Setup menu.
27E	Abs Cutoff Conflict	The absolute cutoff distance is equal to or less than the plus suspect trigger limit.	Change the absolute cutoff distance or +suspect trigger distance limit through the Alarm Information screen or Setup menu.
28A	Missing Part Conflict	The missing part minimum distance is equal to or greater than the plus suspect absolute limit.	Change the missing part minimum distance limit or +suspect absolute distance limit through the Alarm Information screen or Setup menu.
28B	Missing Part Conflict	The missing part maximum distance is equal to or less than the plus suspect trigger limit.	Change the missing part maximum distance limit or +suspect trigger distance limit through the Alarm Information screen or Setup menu.
28C	Missing Part Conflict	The missing part minimum distance is equal to or greater than the plus suspect trigger limit.	Change the missing part minimum distance limit or +suspect trigger distance limit through the Alarm Information screen or Setup menu.
28D	Missing Part Conflict	The missing part minimum distance is equal to or greater than the absolute distance cutoff.	Change the missing part minimum distance limit or absolute cutoff through the Alarm Information screen or Setup menu.
28E	Missing Part Conflict	The missing part maximum distance is equal to or greater than the absolute distance cutoff.	Change the missing part maximum distance limit or absolute cutoff through the Alarm Information screen or Setup menu.
28F	Missing Part Conflict	The missing part minimum distance is equal to or greater than the absolute distance setting. This alarm occurs in absolute mode only.	Change the missing part minimum distance limit or absolute distance through the Alarm Information screen or Setup menu.
29A	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the minus suspect absolute limit.	Either increase the suspect distance limit or decrease the rapid traverse distance.
29C	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the plus reject absolute limit.	Either increase the reject distance limit or decrease the rapid traverse distance
29E	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the plus suspect absolute limit.	Either increase the suspect distance limit or decrease the rapid traverse distance.
29F	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the plus reject trigger limit.	Either increase the reject distance limit or decrease the rapid traverse distance
2A0	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the plus suspect trigger limit.	Either increase the suspect distance limit or decrease the rapid traverse distance.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
2A1	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the minus reject trigger limit.	Either increase the reject distance limit or decrease the rapid traverse distance.
2A2	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the minus suspect trigger limit.	Either increase the suspect distance limit or decrease the rapid traverse distance.
2A3	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the absolute distance cutoff. This alarm can occur in all weld modes except absolute.	Either increase the absolute cutoff distance or decrease the rapid traverse distance.
2A4	Rapid Trav. Conflict	The rapid traverse distance is equal to or greater than the absolute distance. This alarm can occur only in the absolute welding mode.	Either increase the absolute cutoff distance or decrease the rapid traverse distance.
2A6	Hold Pressure Conflict	Hold pressure less than weld pressure.	Change the hold pressure to be greater than or equal to the weld pressure.
2D6	Trg Force Conflict	The trigger force is equal to or greater than the plus suspect weld force limit	Change the trigger force and/or the +suspect weld force limit through the Alarm Information screen or Setup menu.
2D7	Trg Force Conflict	The trigger force is equal to or greater than the plus reject weld force limit.	Change the trigger force and/or the +reject weld force limit through the Alarm Information screen or Setup menu.
2DC	Energy Comp Conflict	The minus reject energy limit is equal to or less than the minimum energy compensation value.	Change the - Reject energy limit or minimum energy compensation through the Alarm Information screen or Setup menu.
2DD	Energy Comp Conflict	The minus suspect energy limit is equal to or less than the maximum energy compensation value. This alarm occurs in time mode only.	Change the - Suspect energy limit or maximum energy compensation through the Alarm Information screen or Setup menu.
2DE	Energy Comp Conflict	The plus energy reject limit is equal to or greater than the energy compensation maximum value	Change the +Reject energy limit or maximum energy compensation through the Alarm Information screen or Setup menu.
2DF	Energy Comp Conflict	The plus suspect energy limit is equal to or greater than the energy compensation maximum value.	Change the +Suspect energy limit or maximum energy compensation through the Alarm Information screen or Setup menu.
2E2	- S Trg > +S Abs	The minus suspect trigger limit is equal to or greater than the plus suspect absolute limit.	Change the - suspect trigger limit and/or the +suspect absolute limit through the Alarm Information screen or Setup menu.
2E4	- R Trg > +S Abs	The minus reject trigger limit is greater than or equal to the plus suspect absolute distance limit.	Change the - reject trigger limit and/or the +suspect absolute distance limit through the Alarm Information screen or Setup menu.

Table B.5 Setup Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
2E5	- R Trg > +R Abs	The minus reject trigger limit is greater than or equal to the plus reject absolute distance limit.	Change the - reject trigger limit and/or the +reject absolute distance limit through the Alarm Information screen or Setup menu.
2E6	- S Trg > Abs	The minus suspect trigger limit is greater than or equal to the absolute distance.	Change the - suspect trigger limit and/ or the absolute distance through the Alarm Information screen or Setup menu.
2E7	- R Trg > Abs	The minus reject trigger limit is greater than or equal to the absolute distance.	Change the - reject trigger limit and/or the absolute distance through the Alarm Information screen or Setup menu.
2E9	Ext U/S Delay Conflict	External trigger delay and pretrigger are both on.	Turn one off.
2EA	Ext U/S Delay Conflict	External trigger delay has been enabled in weld setup, but no input pin has been defined.	Assign pin in System Configuration Menu.
2EB	Part Clamp Setup	Either the input or output pin is not defined.	Assign a pin in the system configuration menu.
2EF	Sync Setup	The sync input pin and the sync output pin are not both defined.	Define missing sync pin.
2F0	Ext Signal	Ext Start requires both an input pin and an output pin to function. One of the pins is not defined.	Define both and input and an output pin for the SV Interlock.
2F1	Preset Conflict	Both the external selection of presets and sequencing are turned on.	Turn off one of these.
2F2	Min Trigger Conflict	The trigger force is set below the minimum allowable value.	Minimum trigger force is changed after the trigger force has been set, or if downloaded via host command.
2F3	Sequence Empty	Preset sequencing is enabled and a start signal has been received, but there is o sequence defined.	Define sequence.

B.1.7 Overload Alarms

You encounter an overload alarm when your ultrasonic power supply has overloaded. The specific overload that has occurred is indicated by the message on your display.

The following table details the overload alarms that you can encounter on the 2000Xct HP power supply. The message on the display panel of the power supply is shown in the first column, with the more detailed message shown in the second column. The third and fourth columns indicate what condition led to the alarm and the corrective action you should take.

If you are using a Digital Power Supply, frequency, phase, current and voltage information is also available for each of the overload alarms listed in Table B.6.

Table B.6 Overload Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
017	Energy Braking Overload	UPS overload was detected in hold state. Alarm is called 'Energy Braking' because it could be caused by power supply overload during Energy Braking state, but the state is designed to ignore overloads.	Turn off Energy Braking, and call for application assistance.
020	Weld O/L	The ultrasonic power supply was overloaded during the weld cycle. The @ Time and frequency change (Freq Chg) are from trigger. Peak power is at the time of the overload.	Check the Peak Power reading in Weld Results. If Peak Power is above 100%, reduce your amplitude and/ or force settings.
B21	Seek Overload	The ultrasonic power supply was overloaded during the seek cycle at power up.	Check the stack. Repair/ Replace the power supply module. For digital UPS only, check that the stack is properly attached and the RF cable is hooked up.
B22	Test Overload	The ultrasonic power supply was overloaded during the test cycle. Pressing Test will clear the overload before the power supply goes into test mode. A new cycle can't be run until reset is pressed, even though test can be pressed again.	Check the stack. Repair/ replace the power supply module. For digital UPS only, check that the stack is properly attached and the RF cable is hooked up.
B23	Pretrigger Overload	The @Time is from start of pretrigger, the frequency and peak power is at the time of the overload.	Check the stack. Repair/ replace the power supply module.
B25	Post Weld Seek O/L	An overload occurred during post weld seek. The @ Time and frequency change (Freq chg) are from the start of seek. The peak power is at the time of the overload.	Check the stack. Repair/ replace the power supply module.
B26	Afterburst Overload	An overload occurred during afterburst. An overload occurred during afterburst. The @ Time and frequency (Freq Chg) is from the start of afterburst. Peak power is at the time of the overload.	Check the stack. Repair/ replace the power supply module.

B.1.8 Note Alarms

In addition to the previously described alarms there are several Note alarms that the Controls can issue to alert you that an alarm is imminent, or that the cycle ran with authorized modifications.

The following table details the Note alarms you can encounter on the 2000Xct HP power supply. The message on the display panel of the power supply is shown in the first column; the detailed message is in the second column. The third and fourth columns indicate the condition that led to the alarm and the corrective action you should take.

Table B.7 Note Alarms and Messages, with Probable Cause and Corrective Action

Alarm ID	Display Message	Alarm Condition/Cause	Corrective Action
416	Absolute Cutoff	The absolute cutoff distance that you requested has been reached.	Manually inspect the part. If, with acceptable parts, you repeatedly get this alarm, reset your Absolute cutoff.
417	Act Clr Not Reached	The actual absolute distance reached during the weld cycle did not reach the actuator clear distance that you set.	Using Horn Down to obtain size and distance readings, reset your Actuator Clear Distance to an obtainable value.
418	Max Energy Reached	The maximum energy compensation value has been reached.	None. This is only a notice that an adaptive control feature that you programmed is in use.
421	Sonics Disabled	A complete weld cycle has been run but the ultrasonics were disabled by a user defined input.	Remove 24V from Sonics Disable input; undefined Sonics Disable input pin.
422	USB Memory Nearly Full	The USB memory stick is over 98% full. At the current rate of storing, this is enough room for less than 100 welds. When full the welder will stop cycling.	Replace USB memory stick.
41D	Time Extended	Weld time has been ex-ended up to 50% for energy compensation. This alarm occurs in Time Mode only.	None. This is only a notice that an adaptive control feature that you programmed is in use.
41E	Act Recal Suggested	A preset has been loaded and calibration should be run	Calibrate actuator through Note menu, or calibrate from the Main Menu.
41E	Act Recal Suggested	A preset has been loaded and calibration should be run.	Additional information will not be available if the carriage is not at upper limit, the actuator Novram has failed or the palm buttons are still pressed. This note will be disabled when the preset has been recalled via external preset selection, through the host or sequencing.
41F	Collapse Cutoff	The collapse cutoff distance you requested has been reached.	Manually inspect the part. If you repeatedly get this alarm with acceptable parts, reset your collapse cutoff.

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Appendix C: Events

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C.1 Events

The following table details the Events you can encounter on the 2000Xct HP power supply.

Table C.1 Event Records

Event ID	Name	Description	Reason Required?
EV100	Parameter Changed on a Validated Preset	Any change in any parameter on a validated preset will reset the preset's validated bit and create an event record. The parameter changed will be in current preset only and will not affect the saved preset until saved by the user. Operator will not be allowed to change any parameter in a validated preset.	Yes
EV101	Preset Validation Bit is Set	This event is created every time the value of the preset validation bit is set manually from the Save/Recall Preset screen by the user.	Yes
EV102	New User Created	This event will be created when an Executive level user is creating a new User ID.	Yes
EV103	User Modified	This event is created if the user changes the below parameters related to the User ID from menu or web service. User level Status Password Operator Authority	Yes
EV104	Date Or Time Changed	This event is created when the user modifies the date or time of the system from menu.	Yes
EV105	Factory Automation Mode	This event is created when the user toggles the factory automation status from menu.	Yes
EV106	H/W Assembly Number Change	This event is created when any of the assembly number is changed from menu.	Yes
EV107	H/W Verify Setup Change	This event is created when component verify setup is changed from menu.	Yes

Table C.1 Event Records

Event ID	Name	Description	Reason Required?
EV108	Software Version Change	This event is created at power up when software version of the code is found different from that in previous power up.	No
EV109	Authority Check Changed	This event is created when the user toggles the authority check from the menu.	Yes
EV110	Actuator Cold Start	This event is created after an actuator cold start is done from the Diagnostic menu.	Yes
EV111	RTC Low Battery Failure	This event is created at power up if the battery providing power to RTC, when 24 volt is not present, is found to be low below a threshold. **NOTICE** The date or time of the system should be set from system Configuration menu at least once. Otherwise this event will occur at every power up independent of battery status.	No
EV112	Calibration Completed	This event is created after Pressure or Force calibration from menu is passed or failed.	Yes
EV113	Preset Validation Bit is Cleared	This event is created every time a validation bit is cleared.	Yes
EV117	Power On CRC Changed	This event is created at power up when code CRC is found different from that in previous power up.	No
EV118	Clock Lost	This event is created when unexpected loss of lock condition occurs for CPU clock.	No
EV202	Parameter Changed	Non-validated preset parameter changed.	No
EV303	Horn Scan Completed	This event is created after Horn Scan is completed successfully.	No
EV416	Program Firmware	This event is created after a new firmware is successfully uploaded to the system from Ethernet interface.	No
EV501	User Login	User successfully logs in.	No
EV502	User Logout	User logs out.	No

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Appendix D: Web Services

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D.1 Web Services

D.1.1 Introduction

The 2000Xct HP Web Services provide functionality to access the system through Java Script Object Notation (JSON) web requests. This web access encompasses practically every aspect of the 2000Xct HP's features; from modifying and reading presets to configuring hardware and getting access to the internal logs of the power supply. In addition to that, the web service interface offers fully functional login/logout capability that can allow the client to remotely do anything that can be done from the front panel LCD.

This document gives the details of the web service implementation and interface to the 2000Xct HP. It also gives the details of JSON Service URLs and the data format required by the client to implement custom software for the interface. Lastly, this document provides examples of server/client interaction with details of the data to be expected.

D.1.2 Breakdown

The web service itself is broken down into 2 distinct portions: the URL string and the POST data.

D.1.3 Service URL

The 2000Xct HP has a built-in web server that can handle various web requests. In order to provide the web service functionality, the URL string that is to be sent to the power supply to initiate the service is of the form:

http://<2000Xct HP IP Address>/Services/<Service Name>

Where the <2000Xc IP Address> is the IP Address found on the System Information screen with the label "P/S IP" and the <Service Name> is the feature you wish to exploit. See section 6.12 System Information for details.

D.1.4 POST Method

As with many web requests there is typically additional data to be sent to the server that accompanies the request. The two most widely used methods are GET and POST. It is important to note that even though many of the services are attempting to retrieve, or GET, data from the 2000Xct HP, all services are accompanied with a POST request. If an attempt is made to use the GET method, a "Notfound" response will be returned to the client.

The POST data is in JSON format and is specific to each service. All data must follow JSON guidelines or else the server will reject the request with a specific error code.

D.2 Command List

This section will define all the possible web requests that can be sent to the server. All URLs and accompanying POST data is made available here. All POST data is required unless otherwise specified.

D.2.1 Login

If system traceability is required (Authority Check = Yes), a user must login through a specific service before accessing the system. A successful login shall create a unique session ID (SID) to be used in future service requests. The session remains active for a certain interval (the interval is defined in the system configuration as “Idle Logout Time”). Once the session is timed out, the logged in user shall be logged out automatically and the SID will be invalidated. An error code will be sent after the session is timed out for any future service requests with an invalid SID. The user shall be required to login again to access the system. This unique SID is also reset if the user logs out through the appropriate service request.

The user credentials received through JSON data shall be compared with the User ID list in the power supply. If the credentials match, then the user becomes logged in and becomes the active user for which all records will be associated with. Additionally, if someone is logged in via the web services, then nobody can login through the front panel unless a successful logout command is received from the web services.

Upon requesting a login, the success status is returned along with the unique SID that needs to be retained for all future commands. For all service requests after logging in, if the associated SID in the POST data does not match with the ID received in the login JSON Response, an error code will be sent. It is very important to note that since the logout function also requires this SID, then if the SID is lost or forgotten you must wait for the idle logout time to expire or power the 2000Xct HP off and back on before any access will be granted to the power supply.

URL

http://<2000Xct HP IP Address>/Services/SystemLogin

POST Data

{"UserId":"ADMIN","Password":"123456Aa#"}

Successful Response

{“ErrorCode”:0,”Sid”:12345}

NOTICE	
	To bypass Authority Check, set the WebSrv AuthCheck function to OFF. See section 6.10.38 WebSrv AuthCheck for more information.

D.2.2 Logout

The logout service is only necessary when Authority Check is enabled and another user wishes to login either from the front panel or through the web services again.

The act of logging out of the system creates an event that is stored in the Event History.

URL

http://<2000Xct HP IP Address>/Services/SystemLogout

POST Data

{"Sid":12345}

Successful Response

{ "ErrorCode":0,"UserId":"ADMIN"}

D.2.3 Get Software Version

This service is specifically used to get the 3 main versions of software running inside the 2000Xct HP: SBC software, Controller Board software, and Power Supply software.

URL

http://<2000Xct HP IP Address>/Services/GetPSVersionNum

POST Data

{"Sid":12345}

Successful Response

{"ErrorCode":0,"S/WVersion":"12.0","SBCVersion":"12.0","P/SVersionNum":"191"}

D.2.4 Get Last Weld Result

his service request satisfies the need to get weld results on a regular basis at the end of every weld. Typically, monitoring the 2000Xct HP Ready signal should trigger a request to get the most recent weld result using this service.

URL

http://<2000Xct HP IP Address>/Services/GetWeldResult

POST Data

{"Sid":12345}

Successful Response

{ "ErrorCode":0,

"1":Value*,

"2":Value*,

…

…

"37":Value*}

*Some values are strings, others are numeric. Regardless of the data type, the response follows proper JSON formatting.

See Weld History IDs for the lookup table of IDs in Table D.3.

D.2.5 Set Preset Value

This service is the access point for setting any value that is stored in the Preset. Any time a value is written with this service, the value will be stored in the Current Preset only. Setting Preset values in this manner follows the same rules for User Authority as does the front panel. If a user does not have proper privileges to modify a value, an error code will be returned.

There are two methods of using this service. The first is setting a single value on each service request, or there is also an option to send bulk Preset values to be set using a JSON array. This is useful if the entire Preset is stored externally and needs to be copied to the Power Supply.

NOTICE	
	Since a reason for changing a Preset value is only sometimes needed (modifying a validated Preset), then instead of keeping track of when a reason is required or not, simply send a reason with every change and the Power Supply will take care of it.

D.2.5.1 Setting a Single Value

URL

http://<2000Xct HP IP Address>/Services/SetPresetValue

POST Data

{"Sid":12345,"ParamId":177,"ParamValue":0.250}

Successful Response

{"ErrorCode":0}

D.2.5.2 Setting Multiple Values

URL

http://<2000Xct HP IP Address>/Services/SetPresetValue

POST Data

{"Sid":12345,"Preset":[{"ParamId":177,"ParamValue":0.250,"Reason":"xyz"},{"ParamId":177,"ParamValue":0.250,"Reason":"xyz"}]}

Successful Response

{"ErrorCode":0}

All other Error Codes can be found in Table D.1 and the list of Parameter IDs can be found in Table D.2.

D.2.6 Set System Value

This service is the access point for setting any value that is considered system related. Setting system values in this manner follows the same rules for User Authority as does the front panel. If a user does not have proper privileges to modify a value, an error code will be returned.

There are two methods of using this service. The first is setting a single value on each service request, or there is also an option to send bulk system values to be set using a JSON array. This is useful if multiple power supplies need to be setup the same way.

NOTICE	
	Since a reason for changing a system value is only sometimes needed (modifying an assembly value), then instead of keeping track of when a reason is required or not, simply send a reason with every change and the Power Supply will take care of it.

D.2.6.1 Setting a Single Value

URL

http://<2000Xct HP IP Address>/Services/SetSystemConfigValue

POST Data

{"Sid":12345,"ParamId":1151,"ParamValue":1,"Reason":"xyz"}

Successful Response

{"ErrorCode":0}

D.2.6.2 Setting Multiple Values

URL

http://<2000Xct HP IP Address>/Services/ SetSystemConfigValue

POST Data

{"Sid":12345,"SystemConfig":[{"ParamId":1151,"ParamValue":1,"Reason":"xyz"},{"ParamId":1141,"Param Value":1,"Reason":"xyz"}]}

Successful Response

{"ErrorCode":0}

All other Error Codes can be found in Table D.1 and the list of Parameter IDs can be found in Table D.2.

D.2.7 Get Preset Value

In order to get the value of any given Preset setting, this simple service request is available. Simply provide the appropriate parameter ID for the desired Preset value and the request will return the value.

The returned value is the value stored in the Current Preset.

URL

http://<2000Xct HP IP Address>/Services/GetPresetValue

POST Data

{"Sid":12345,"ParamId":177}

Successful Response

{"ErrorCode":0,"ParamValue":0.250}

D.2.8 Get System Value

In order to get any given system value this simple service request is available. Simply provide the appropriate parameter ID for the desired system value and the request will return the value.

URL

http://<2000Xct HP IP Address>/Services/GetSystemConfigValue

POST Data

{"Sid":12345,"ParamId":1151}

Successful Response

{"ErrorCode":0,"ParamValue":1}

D.2.9 Save Preset

One of the most widely used features of the 2000Xct HP is the ability to save Presets. This service is the method of doing so. The only requirement is the Preset Number that you want to save the preset to. The 2000Xct HP has intelligence to automatically name a preset if none is supplied. See section 6.17 Save/Recall Presets for details on how the presets are automatically named. The name of the saved Preset will always be returned in the response.

When saving a Preset, the data that is stored in the Current Preset will be copied into the Preset location. In the 2000Xct HP those locations can be anywhere from 1 to 1000.

URL

http://<2000Xct HP IP Address>/Services/SavePreset

POST Data

{"Sid":12345,"PresetNum":24,"PresetName":"Red Part"}

Successful Response

{"ErrorCode":0,"PresetName":"Red Part"}

Successful Response – No Name Given

{"ErrorCode":0,"PresetName":"Tm 0.25S"}

D.2.10 Recall Preset

The ability to recall a Preset is also available via a web service request. There are only 3 conditions required to recall a Preset: the proper authority is given to the logged in user, the Preset requested has previously been saved, and the Power Supply is in Ready.

If an attempt is made to recall a Preset when the system is not in Ready, then the appropriate error code is sent. Simply retry the request if this is the error response received. If multiple retries fails, then something is preventing the Power Supply from being Ready and further investigation should be done.

URL

http://<2000Xct HP IP Address>/Services/RecallPreset

POST Data

{"Sid":12345,"PresetNum":24}

Successful Response

{"ErrorCode":0,"PresetName":"Tm 0.25S"}

D.2.11 Verify Preset

Verifying a Preset is necessary before running it. This web service request makes that possible. All that is needed is the Preset number and the SID. Currently there is no way to know from a web service request why a Preset verification has failed. One possible reason is because the Power Supply is not Ready.

Verifying a Preset will also recall the Preset.

URL

http://<2000Xct HP IP Address>/Services/VerifyPreset

POST Data

{"Sid":12345,"PresetNum":24}

Successful Response

{"ErrorCode":0}

D.2.12 Clear Preset

Clearing a Preset is not always a necessary measure to take due to the number of Presets available in the system. However the ability to remove a preset from memory is sometimes desired.

NOTICE	
	Clearing a Preset is not necessary before Saving or Overwriting.

URL

http://<2000Xct HP IP Address>/Services/ClearPreset

POST Data

{"Sid":12345,"PresetNum":24}

Successful Response

{"ErrorCode":0}

D.2.13 Get Number of Events

Due to the nature of getting the Power Supply Event information, this web service is necessary to be called before any request to get the Event History. This service will simply return the total number of Events that the Power Supply has stored in its memory.

URL

http://<2000Xct HP IP Address>/Services/GetNumEvents

POST Data

{"Sid":12345}

Successful Response

{"ErrorCode":0,"TotalEventPresent":200}

D.2.14 Get Event History

Once the number of Events is known via the Get Number of Events request, then this service can be properly called. Since there are internal limitations to data bandwidth, only a maximum of 50 Events can be requested at any given time. There are two ways of getting the Event information.

1. Get the most recent 50 Events. This is accomplished by setting both the "From" and "To" values to 0
2. Get any random chunk of up to 50 consecutive events. E.g. Event # 120-169

In the POST data request there are two additional fields required along with the SID. These are the "From" and "To" values. These fields are how the specific Event #s are requested. The difference between these values cannot exceed 50.

URL

http://<2000Xct HP IP Address>/Services/GetEventHistory

POST Data

{"Sid":12345,"From":120,"To":169}

Successful Response

{"ErrorCode":0,
"EventData":[
{"1":Value,"2":Value,…,"9":Value},
{"1":Value,"2":Value,…,"9":Value},
…
{"1":Value,"2":Value,…,"9":Value}]}

See Event History IDs for the lookup table of IDs in Table D.4.

D.2.15 Get Number of Weld History

Due to the nature of getting the Power Supply Weld History, this web service is necessary to be called before any request to get the Weld History. This service will simply return the total number of Welds that the Power Supply has stored in its memory.

URL

http://<2000Xct HP IP Address>/Services/GetNumWeldData

POST Data

{"Sid":12345}

Successful Response

{"ErrorCode":0,"TotalWeldDataPresent":200}

D.2.16 Get Weld History

Once the number of Welds is known via the Get Number of Weld History request, then this service can be properly called. Since there are internal limitations to data bandwidth, only a maximum of 50 Welds can be requested at any given time. There are two ways of getting the Weld data.

1. Get the most recent 50 Welds. This is accomplished by setting both the "From" and "To" values to 0
2. Get any random chunk of up to 50 consecutive welds. E.g. Weld # 120-169

In the POST data request there are two additional fields required along with the SID. These are the "From" and "To" values. These fields are the index into the array of welds stored in memory from 0 to 99999. The difference between these values cannot exceed 50.

URL

http://<2000Xct HP IP Address>/Services/GetWeldHistory

POST Data

{"Sid":12345,"From":120,"To":169}

Successful Response

{"ErrorCode":0,

"WeldData":[

{"1":Value,"2":Value,…,"37":Value},

{"1":Value,"2":Value,…,"37":Value},

…

{"1":Value,"2":Value,…,"37":Value}]}

See Weld History IDs for the lookup table of IDs in the Table D.3.

D.2.17 Get Number of Alarms

Due to the nature of getting the Power Supply Alarm information, this web service is necessary to be called before any request to get the Alarm Log. This service will simply return the total number of Alarms that the Power Supply has stored in its memory.

URL

http://<2000Xct HP IP Address>/Services/GetNumAlarms

POST Data

{"Sid":12345}

Successful Response

{"ErrorCode":0,"TotalAlarmPresent":200}

D.2.18 Get Alarm Log

Once the number of Alarms is known via the Get Number of Alarms request, then this service can be properly called. Since there are internal limitations to data bandwidth, only a maximum of 50 Alarms can be requested at any given time. There are two ways of getting the Alarm information.

1. Get the most recent 50 Alarms. This is accomplished by setting both the "From" and "To" values to 0
2. Get any random chunk of up to 50 consecutive alarms. E.g. Alarm # 120-169

In the POST data request there are two additional fields required along with the SID. These are the "From" and "To" values. These fields are how the specific Alarm #s are requested. The difference between these values cannot exceed 50.

URL

http://<2000Xct HP IP Address>/Services/GetAlarmLogData

POST Data

{"Sid":12345,"From":120,"To":169}

Successful Response

{"ErrorCode":0,
"AlarmData":[
{"1":Value,"2":Value,…,"9":Value},
{"1":Value,"2":Value,…,"9":Value},
…
{"1":Value,"2":Value,…,"9":Value}]}

See Alarm Log IDs for the lookup table of IDs in the Table D.5.

D.2.19 Get Number of Users

Due to the nature of getting the users info from the Power Supply, this web service is necessary to be called before any request to get the User Table. This service will simply return the total number of Users that the Power Supply has stored in its memory; both active and inactive.

URL

http://<2000Xct HP IP Address>/Services/GetUserCount

POST Data

{"Sid":12345}

Successful Response

{"ErrorCode":0,"TotalUserPresent":200}

D.2.20 Get Users

Once the number of Users is known via the Get Number of Users request, then this service can be properly called. Since there are internal limitations to data bandwidth, only a maximum of 50 Users can be requested at any given time. There are two ways of getting the User information.

1. Get the most recent 50 Users. This is accomplished by setting both the "From" and "To" values to 0
2. Get any random chunk of up to 50 consecutive Users. E.g. User # 120-169

In the POST data request there are two additional fields required along with the SID. These are the "From" and "To" values. These fields are how the specific User #s are requested. The difference between these values cannot exceed 50.

URL

http://<2000Xct HP IP Address>/Services/GetUsers

POST Data

{"Sid":12345,"From":120,"To":169}

Successful Response

{"ErrorCode":0,
"UserDetails":[
{"1":Value,"2":Value,…,"7":Value},
{"1":Value,"2":Value,…,"7":Value},
…
{"1":Value,"2":Value,…,"7":Value}]}

See UserID Table IDs for the lookup table of IDs in the Table D.6.

D.2.21 Create/Update User

Creating and Updating Users are two separate web requests, but they are grouped together here because they have the same POST data and very similar requirements. There are minor differences when it comes to error codes as a response, but they are described in Table D.1.

User Level is key when dealing with creating or updating user data. Only certain levels of authority can manage this and therefore the appropriate user must be logged in through web services to successfully complete these requests.

There is no method of deleting a User. Users must always remain in the power supply and therefore can either be activated or deactivated. This is referred to as the "Status" value that is sent with this request. It can be either 0 or 1 for inactive or active respectively.

There are a maximum of 1000 total users allowed in the power supply and a maximum of 500 active users at any given time. Any attempt to add additional users will result in an error as well as any attempt to modify a particular user to be active that causes the threshold to be exceeded will also result in an error.

The new User or updated user information must follow the password guidelines.

URL-Create

http://<2000Xct HP IP Address>/Services/SetUser

URL-Update

http://<2000Xct HP IP Address>/Services/UpdateUser

POST Data

{"Sid":12345,"UserId":"User1","Password":"Def@1234","UserLevel":1,"Status":1,"Pass ExpTime":20,"Reason":"John Left Company"}

Successful Response

{"ErrorCode":0}

Password Expire Time is in minutes.

The lookup table for User Level IDs can be found in the Table D.7.

D.3 Error Codes

Table D.1 Error Codes

Error Code	Type	Description
0	Success	All services will respond with this Error Code if there are no errors preventing the web service from being accepted.
1	Login Failure	This error will occur when attempting to login when another user is already logged in. In order to prevent this error from occurring, there can be no other users logged in to the 2000Xct HP either from the web services OR from the front panel.
2	Not Logged In	This error will occur when any service is requested but the Login service has not yet been successful. Either login via the Login web service or disable the Authority Check option from the System Configuration menu.
3	Login Failure	This particular login failure will occur when the user attempts to login with incorrect username or password information.
4	Login Failure	This is a specific error code that comes when a user is attempting to login for the first time. A first time login is not permitted through the web services. The user must use the front panel to modify his password after first time login then use the web services.
5	Verify Preset Failure	If verifying the preset fails for any reason, this error code will be sent and the preset parameters must be inspected.
6	System Not Ready	This error code can be sent in reply to various service requests. Most typically it is used when attempting to modify or save a preset when the system is not in the Ready state.
7	Range Error	This error code is specific to trying to set any value that is out of bounds for the given parameter. This can be anything from the system clock to weld parameters to preset numbers.
8	Invalid Data	This error code is sent when the requested data to be set is not a valid ID. For example, if setting a preset value is sent with a param ID of 99999, this is not a valid value.
9	Range Error	This error code is sent if the data requested for a specified range is not available. For example, if the system only has 10 alarms and the data is requested from 50 to 99, then this error will be generated.
10	User Creation Failure	This error code is sent when requesting to add another user to the power supply list and the max number of active users has already been met (500 active users). This can also happen when attempting to modify a user and the modification puts it over the max number of active users.
11	User Creation Failure	This error code is sent when requesting to add a new user to the power supply database and the max number of users have already been added (1000 users)
12	User Creation Failure	This error code is sent when the password that is requested to be made for a new user does not meet the requirements. 1 Capital letter, 1 lower case letter, 1 number, 1 special character, between 8-10 total characters.
13	Too Much Data	This error is specifically sent in response to requests for log data. Weld History, Alarm Logs, Event Logs, and User ID table information are only able to be processed in chunks of 50 entries at a time. If the web request is made for more than 50 entries at a time, this error code will be returned.

Table D.1 Error Codes

Error Code	Type	Description
14	User Change Failure	This error code is sent if the requested changes to a user account cannot be made. For example, if the UserID does not exist.
15	Unauthorized Access	This error is sent whenever a user, most likely an Operator, attempts to perform an action that they are not authorized to make.
16	Login Failure	This error code is sent when the user's password has expired.
17	User Creation Failure	This error code is sent specifically when the user ID that is requested to be created already exists in the database.
18	Login Failure	This error code is sent when the user has attempted to login unsuccessfully too many times. This causes the user to be locked out of the power supply.
19	Data Request Failure	This error can occur if data is requested but cannot be processed due to an internal connection failure. Retry the web request if this error is received.
20	Invalid Data	This error code is sent when a change is made to the system and a reason for change is required but was not sent. Retry the web request but be sure to include the "Reason" in the POST data.
21	Recall Preset Failure	This error code occurs when an attempt is made to recall a preset that has never been saved before.
22	Invalid Data	This is a global error code that will be sent if any data is not recognized in the web request.
23	Invalid Data	This a global error code that will be sent if the proper JSON format for data is not followed.
24	Unauthorized Access	This error code is sent specifically when Automation Mode is enabled and therefore the requested access is not permitted.
25	Data Request Failure	This error can occur if data is requested but cannot be processed due to an internal communication timeout. Retry the web request if this error is received.
26	Invalid Data	This error code is sent specifically when attempting to modify the User I/O input to a value that is not valid.
27	Invalid Data	This error code is sent specifically when attempting to modify the User I/O input to a value that is not available for the current setup.
28	Invalid Data	Authority Check off.

D.4 IDs

D.4.1 Parameter IDs

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
		Weld Setup			
15	Amplitude1	Amplitude	%	10	100
249	AMP_1	Amplitude	%	10	100
35	Downspeed	Downspeed	%	1	100
87	Hold_Time	Hold Time	s	0.010	30.000
248	PRESSURE1	Weld Pressure	PSI	10	100
248	PRESSURE1	Weld Pressure	kPa	69	689
127	Trigger_Type	Trigger	N/A	0	1
128	Trigger_Distance	Trigger Distance	in	0.1250	4.0000
128	Trigger_Distance	Trigger Distance	mm	3.18	101.60
129	Trigger_Force	Trigger Force	lb	5	159
129	Trigger_Force	Trigger Force	N	22	707
		Save/Recall Presets			
137	Validate_Preset	Validate	N/A	-	-
138	Lock_Preset	Lock	N/A	-	-
		Current Setup			
117	Test_Amplitude	Test Amplitude	%	10	100
		Amplitude Step			
206	Amplitude_Step_Enable	Amplitude Fixed/Step	N/A	0	1
15	Amplitude1	Amplitude A	%	10	100
23	Amplitude2	Amplitude B	%	10	100
17	Amp_Step_Col_Val	Step @ Col	in	0.0004	1.0000
17	Amp_Step_Col_Val	Step @ Col	mm	0.01	25.40
18	Amp_Step_Ext_Enable	Step @ Ext Sig	N/A	1	1
19	Amp_Step_Time_Val	Step @ T	s	0.010	30.000
20	Amp_Step_E_Val	Step @ E	J	1	45000
21	Amp_Step_Power_Val	Step @ Pwr	%	1.0	100.0
		Pressure Step			
246	PRESSURE2_FLAG	Pressure Step/Fixed	N/A	0	1
248	PRESSURE_1	Pressure A	PSI	10	100

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
248	PRESSURE_1	Pressure A	kPa	69	689
247	PRESSURE_2	Pressure B	PSI	10	100
247	PRESSURE_2	Pressure B	kPa	69	689
240	PRESSURE_TRIGABSVALUE		N/A		
241	PRESSURE_TRIGCOLVALUE	Step @ Col	in	0.0004	1.0000
241	PRESSURE_TRIGCOLVALUE	Step @ Col	mm	0.01	25.40
242	PRESSURE_TRIGEXTFLAG	Step @ Ext Sig	N/A	1	1
243	PRESSURE_TRIGTIMEVALUE	Step @ T	s	0.010	30.000
244	PRESSURE_TRIGENERGYVALUE	Step @ E	J	1	45000
245	PRESSURE_TRIGPOWERVALUE	Step @ Pwr	%	1.0	100.0
250	PRSTPARMDEFID				
		Hold Pressure			
211	HOLD_PRESSURE_FLAG	Hold Pressure	N/A	0	1
74	HOLD_PRESSURE	Hold Pressure	PSI	10	100
74	HOLD_PRESSURE	Hold Pressure	kPa	69	689
		Rapid Traverse			
110	Rapid_Traverse_Enable	Rapid Traverse	N/A	0	1
109	Rapid_Traverse_Distance	R/T @ D	in	0.1000	4.0000
109	Rapid_Traverse_Distance	R/T @ D	mm	2.54	101.60
		Pretrigger			
99	Pretrigger_Enable	Pretrigger	N/A	0	3
100	Pretrigger_Amplitude	Pretr Amp	%	10	100
101	Pretrigger_Delay	Pretrg@T	s	0.010	10.000
102	Pretrigger_Delay_Enable			0	1
103	Pretrigger_Distance	Pretrg@D	in	0.1250	4.0000
103	Pretrigger_Distance	Pretrg@D	mm	3.18	101.60
104	Pretrigger_Distance_Enable		N/A	0	1
		Write In Field			
147	Write_In_Field1	WriteIn Field1	N/A		
148	Write_In_Field2	WriteIn Field2	N/A		

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
		Batch Setup			
27	Batch_Count_Enable	Enable	N/A	0	1
28	Batch_Count_With_Alarm	Count With Alarms	N/A	0	1
29	Batch_Count_Reset_On_Alarm	Reset to Zero	N/A	0	1
30	Batch_Count	Batch Count	N/A	1	100000
		Afterburst			
4	Afterburst_Flag	Afterburst	N/A	0	1
1	Afterburst_Amplitude	AB Amplitude	%	10	100
3	Afterburst_Delay	AB Delay	s	0.050	2.000
5	Afterburst_Time	AB Time	s	0.100	2.000
		Act Clr Output			
14	Act_Clear_Enable	Act Clr Output	N/A	0	1
13	Act_Clear_Dist	Act Clr D	in	0.1250	4.0000
13	Act_Clear_Dist	Act Clr D	mm	3.18	101.60
		Cycle Aborts			
44	Cycle_Abort_Enable	Cycle Aborts	N/A	0	1
71	Ground_Detect_Enable	Gnd Det Abort	N/A	0	1
78	Missing_Part_Enable	Missing Part	N/A	0	1
81	MissingPart_Min	Minimum	in	0.1250	4.0000
81	MissingPart_Min	Minimum	mm	3.18	101.60
82	MissingPart_Max	Maximum	in	0.1250	4.0000
82	MissingPart_Max	Maximum	mm	3.18	101.60
		Pressure Limit			
96	Pressure_Limit_Enable	Pressure Limit	N/A	0	1
94	Pressure_Limit_Minus	- Pressure	PSI	10	100
94	Pressure_Limit_Minus	- Pressure	kPa	69	689
95	Pressure_Limit_Plus	+ Pressure	PSI	10	100
95	Pressure_Limit_Plus	+ Pressure	kPa	69	689
		Digital UPS			
173	Clear_Mem_At_Reset_Enable	Memory Reset	N/A	0	1
207	Mem_Store_At_End	Memory	N/A	0	1
208	Timed_Seek	Timed Seek	N/A	0	1

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
		Power Match Curve			
165	PMC_Enable	Pwr Match Curve	N/A	0	1
161	PMC_High_Limit	+R Band	%	1	100
162	PMC_Low_Limit	-R Band	%	1	100
		Weld Setup - Ext U/S Delay			
58	Ext_Trigger_Delay	Ext U/S Delay	N/A	0	1
		Weld Setup - Weld Mode			
146	Weld_Mode	Weld Mode	N/A	0	5
145	Energy_Mode_Value	Weld Energy	J	1	45000
83	Peak_Power_Mode_Value	Peak Power	%	1.0%	100.0%
38	Collapse_Mode_Distance	Collapse	in	0.0004	1.0000
38	Collapse_Mode_Distance	Collapse	mm	0.01	25.40
8	Absolute_Mode_Dist,	Absolute	in	0.1250	4.0000
8	Absolute_Mode_Dist,	Absolute	mm	3.18	101.60
112	Scrub_Time_Enable	Scrub Time Enable	N/A	0	1
111	Scrub_Time	Gnd Detect	s	0.001	0.500
64	Frequency_Offset_Enable	Frequency Offset	N/A	0	1
113	Post_Weld_Seek_Enable	Post Weld Seek	N/A	0	1
		Weld Setup - Weld Mode - Time			
25	Auto_Scale_Enable (Graphs)	Auto Scale	N/A	0	1
		Weld Setup - Weld Mode - Energy			
48	Energy_Braking_Enable	Energy Brake	N/A	0	1
47	Energy_Brake_Time	Energy Brake	s	0.010	1.000
73	Weld_Pressure	Weld Pressure	PSI	10	100
73	Weld_Pressure	Weld Pressure	kPa	69	689
77	Max_Timeout	Timeout	s	0.050	30.000
72	Hold_Force	Hold Force	lb		
		Weld Setup - Weld Mode - Ground Detect			
24	Scrub_Time_Amp	Scrub Amp	%	10	100
		Setup Limits			
233	ABSDIST_MLT	- Absolute Distance	in	0.1250	4.0000
233	ABSDIST_MLT	- Absolute Distance	mm	3.18	101.60

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
232	ABSDIST_PLT	+ Absolute Distance	in	0.1250	4.0000
232	ABSDIST_PLT	+ Absolute Distance	mm	3.18	101.60
221	AMPA_MLT	- AMP A	%	10	100
220	AMPA_PLT	+ AMP A	%	10	100
231	COLLAPSEDIST_MLT	- Collapse Distance	in	0.0004	1.0000
231	COLLAPSEDIST_MLT	- Collapse Distance	mm	0.01	25.40
230	COLLAPSEDIST_PLT	+ Collapse Distance	in	0.0004	1.0000
230	COLLAPSEDIST_PLT	+ Collapse Distance	mm	0.01	25.40
236	SCRUBAMP_PLT	+ Scrub Amplitude	%	10	100
237	SCRUBAMP_MLT	- Scrub Amplitude	%	10	100
215	DOWNSPEED_MLT	- Down Speed	%	1	100
214	DOWNSPEED_PLT	+ Down Speed	%	1	100
217	HOLDPRESSURE_MLT	- Hold Pressure	PSI	10	100
217	HOLDPRESSURE_MLT	- Hold Pressure	kPa	69	689
216	HOLDPRESSURE_PLT	+ Hold Pressure	PSI	10	100
216	HOLDPRESSURE_PLT	+ Hold Pressure	kPa	69	689
219	HOLDTIME_MLT	- Hold Time	s	0.010	30.000
218	HOLDTIME_PLT	+ Hold Time	s	0.010	30.000
229	PEAKPOWER_MLT	- Peak Power	%	1.0%	100.0%
228	PEAKPOWER_PLT	+ Peak Power	%	1.0%	100.0%
235	SCRUBTIME_MLT	- Scrub Time	s	0.001	0.500
234	SCRUBTIME_PLT	+ Scrub Time	s	0.001	0.500
239	TRIGDIST_MLT	- Trigger Distance	in	0.1250	4.0000
239	TRIGDIST_MLT	- Trigger Distance	mm	3.18	101.60
238	TRIGDIST_PLT	+ Trigger Distance	in	0.1250	4.0000
238	TRIGDIST_PLT	+ Trigger Distance	mm	3.18	101.60
223	TRIGFORCE_MLT	- Trig Force	lb	5	159
223	TRIGFORCE_MLT	- Trig Force	N	22	707
222	TRIGFORCE_PLT	+ Trig Force	lb	5	159
222	TRIGFORCE_PLT	+ Trig Force	N	22	707
227	WELDENERGY_MLT	- Weld Energy	J	1	45000
226	WELDENERGY_PLT	+ Weld Energy	J	1	45000
213	WELDPRESSURE_MLT	- Weld Pressure	PSI	10	100
213	WELDPRESSURE_MLT	- Weld Pressure	kPa	69	689
212	WELDPRESSURE_PLT	+ Weld Pressure	PSI	10	100

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
212	WELDPRESSURE_PLT	+ Weld Pressure	kPa	69	689
225	WELDTIME_MLT	- Weld Time	s	0.010	30.000
224	WELDTIME_PLT	+ Weld Time	s	0.010	30.000
		Reject Limits			
106	Reject_Limits_Enable	Reject Limits	N/A	0	1
108	Reject_Reset_Req_Enable	Reset Required	N/A	0	1
9	Absolute_MLR, Reject -	-R Abs D	in	0.1250	4.0000
11	Absolute_PLR, Reject +	+R Abs D	in	0.1250	4.0000
39	Col_MLR	-R Col D	in	0.0004	1.0000
39	Col_MLR	-R Col D	mm	0.01	25.40
41	Col_PLR	+R Col D	in	0.0004	1.0000
41	Col_PLR	+R Col D	mm	0.01	25.40
210	DOWNSPEEDMLR	-R Downspeed	in/s	0.3	7.0
210	DOWNSPEEDMLR	-R Downspeed	mm/s	8	178
209	DOWNSPEEDPLR	+R Downspeed	in/s	0.3	7.0
209	DOWNSPEEDPLR	+R Downspeed	mm/s	8	178
53	Energy_MLR	-R Energy	J	1	45000
56	Energy_PLR	+R Energy	J	1	45000
90	Peak_Power_MLR	-R Pk Power	%	1	100
92	Peak_Power_PLR	+R Pk Power	%	1	100
69	SBL_Frequency_Enable	N/A	N/A	0	1
68	SBL_Max_Frequency	+R Freq	Hz	29400	30600
67	SBL_Min_Frequency	-R Freq	Hz	29400	30600
118	Time_MLR	-R Time	s	0.010	30.000
120	Time_PLR	+R Time	s	0.010	30.000
123	Trigger_Distance_MLR	-R Trg D	in	0.1250	4.0000
123	Trigger_Distance_MLR	-R Trg D	mm	3.18	101.60
125	Trigger_Distance_PLR	+R Trg D	in	0.1250	4.0000
125	Trigger_Distance_PLR	+R Trg D	mm	3.18	101.60
149	Weld_Force_MLR	-R Weld F	lb	10	159
149	Weld_Force_MLR	-R Weld F	N	44	707
151	Weld_Force_PLR	+R Weld F	lb	10	159
151	Weld_Force_PLR	+R Weld F	N	44	707
		Suspect Limits			

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
115	Suspect_Limits_Enable	Suspect Limits	N/A	0.000	1.000
116	Suspect_Limits_Reset_Req	Reset Required	N/A	0	1
10	Absolute_MLS, Suspect -	-S Abs D	in	0.1250	4.0000
10	Absolute_MLS, Suspect -	-S Abs D	mm	3.18	101.60
12	Absolute_PLS, Suspect +	+S Abs D	in	0.1250	4.0000
12	Absolute_PLS, Suspect +	+S Abs D	mm	3.18	101.60
40	Col_MLS	-S Col D	in	0.0004	1.0000
40	Col_MLS	-S Col D	mm	0.01	25.40
42	Col_PLS	+S Col D	in	0.0004	1.0000
42	Col_PLS	+S Col D	mm	0.01	25.40
54	Energy_MLS	-S Energy	J	1	45000
57	Energy_PLS	+S Energy	J	1	45000
59	Frequency_MLR	Frequency MLR			
60	Frequency_MLS	Frequency MLS			
61	Frequency_PLR	Frequency PLR			
62	Frequency_PLS	Frequency PLS			
63	Frequency_Offset_Value	Frequency Offset	Hz	0	600
75	Hold_Time_Enable	Hold Time Enable		0	1
203	Amp_Step_Distance_Val	Amplitude Step Distance			
204	Amp_Step_Force_Val	Amplitude Step Force			
91	Peak_Power_MLS	-S Pk Power	%	1.0	100.0
93	Peak_Power_PLS	+S Pk Power	%	1.0	100.0
119	Time_MLS	-S Time	s	0.010	30.000
121	Time_PLS	+S Time	s	0.010	30.000
124	Trigger_Distance_MLS	-S Trg D	in	0.1250	4.0000
124	Trigger_Distance_MLS	-S Trg D	mm	3.18	101.60
126	Trigger_Distance_PLS	+S Trg D	in	0.1250	4.0000
126	Trigger_Distance_PLS	+S Trg D	mm	3.18	101.60
150	Weld_Force_MLS	-S Weld F	lb	10	159
150	Weld_Force_MLS	-S Weld F	N	44	707
152	Weld_Force_PLS	+S Weld F	lb	10	159
152	Weld_Force_PLS	+S Weld F	N	44	707
		Control Limits			
85	Peak_Power_Cutoff_Enable	Peak Power Cutoff	N/A	0	1

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
43	Control_Limits_Enable	Control Limits	N/A	0	1
7	Abs_Cutoff_Flag	Absolute Cutoff	N/A	0	1
6	Abs_Cutoff_Distance	Absolute Cutoff Distance	in	0.1250	4.0000
6	Abs_Cutoff_Distance	Absolute Cutoff Distance	mm	3.18	101.60
37	Col_Cutoff_Distance	ColCut	in	0.0004	1.0000
37	Col_Cutoff_Distance	ColCut	mm	0.01	25.40
49	Energy_Compensation_Enable	Energy Comp	N/A	0	1
52	Energy_Comp_ML	Energy Min	J	1	45000
55	Energy_Comp_PL	Energy Max	J	1	45000
84	Peak_Power_Cutoff	Pk Pwr Cut	%	1.0	100.0
36	Col_Cutoff_Enable	ColCut	N/A	0	1
Main Menu - System Configuration					
32	Act_Assembly_Number	Actuator Assembly	N/A	N/A	N/A
33	PS_Assembly_Number	P/S Assembly	N/A	N/A	N/A
34	Stack_Assembly_Number	Stack Assembly	N/A	N/A	N/A
1140	Basic_Mode_Enable	Basic Mode	N/A	0	1
1141	Horn_Clamp_Enable	Horn Clamp	N/A	0	1
1142	UDI_Scan_Enable	UDI Scan	N/A	0	1
1143	Automation_Mode_Enable	Automation Mode	N/A	0	1
1144	Mem_Full_Continue_Enable	Memory Full Continue	N/A	0	1
1146	Authority_Check_Enable	Authority Check	N/A	0	1
1147	Barcode_Start_Char	Barcode Start	N/A	1	1
1148	Assembly_Num_Stack	Assembly Number - Stack	N/A	0	11
1149	Assembly_Num_Act	Assembly Number - Actuator	N/A	0	11
1150	Assembly_Num_PS	Assembly Number - Power Supply	N/A	0	11
1151	Verify_Hardware	Verify Hardware	N/A	1	7
1153	Beeper_On_Estop	Beeper On Estop	N/A	0	1
1155	Idle_Time_Logout	Idle Time Logout	N/A	2	99999
1159	Digital_Tune_Freq	Digital Tune Frequency	N/A	N/A	N/A
1160	PS_Frequency	Power Supply Frequency	N/A	N/A	N/A
1163	Time_Of_Day	Time of Day	Time	hh:mm	

Table D.2 Parameter IDs

ID	JSON Description	Description	Unit	Min Value	Max Value
1164	Date	Date	Date	mm/dd/yy	
1165	Operator_Authority	Operator Authority	N/A	0	31

D.4.2 Weld History IDs

Table D.3 Weld History IDs

ID	Description	ID	Description
1	Cycle Count	20	Reserved
2	User ID	21	Reserved
3	Part-ID	22	Force B
4	Preset #	23	Force A
5	Preset Rev	24	Pressure
6	Preset Validated	25	Frequency Min
7	Actuator Assembly	26	Frequency Max
8	Power Supply Assembly	27	Frequency Start
9	Stack Assembly	28	Frequency End
10	Weld Time	29	Frequency Change
11	Peak Power	30	Cycle Time
12	Energy	31	Hold Force
13	Reserved	32	Trigger Force
14	Downspeed	33	Power Supply Serial #
15	Weld Absolute	34	Actuator Serial #
16	Total Absolute	35	Time
17	Weld Collapse	36	Date
18	Total Collapse	37	Preset Name
19	Amplitude Start	38*	Alarm Info

NOTICE	
	*Alarm Info will only be populated with data in the return string if the associated weld had an alarm. Otherwise this field will be empty.

D.4.3 Event History IDs

Table D.4 Event History IDs

ID	Description
1	Event #
2	Preset #
3	Preset Rev
4	User ID
5	Event ID
6	Serial #
7	Date/Time
8	Event Reason
9	Event Description

D.4.4 Alarm Log IDs

Table D.5 Alarm Log IDs

ID	Description
1	Alarm #
2	Cycle #
3	Preset Rev
4	Preset #
5	Alarm ID
6	User ID
7	Actuator Assembly
8	Power Supply Assembly
9	Date/Time

D.4.5 User ID Table IDs

Table D.6 User ID Table IDS

ID	Description
1	User ID
2	Password
3	User Level
4	Status
5	Password Expire Time
6	First Time Login
7	Date/Time

D.4.6 User Level IDs

Table D.7 User Level IDs

ID	Description
0	Operator
1	Technician
2	Supervisor
3	Executive

D.4.7 Operator Authority IDs

Table D.8 Operator Authority IDs

ID	Description
1	Reset Alarm
2	Run Invalidated Preset
4	Recall Preset
8	Run Calibration
16	Reset Batch Counter

NOTICE	
	For Setting more than one authority at once, add the values mentioned in Table D.8. Example: For giving Reset Alarm and Reset batch count authority at once, send (16 + 1) = 17.

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Original Instructions
4000590 - REV. 02

EMERSON



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