

MAINTENANCE

GENERAL

1. Always make sure the power supply has adequate ventilation by keeping sufficient space around the assembly.
2. Periodically check the ventilation grilles and clean as necessary.

REPAIRS / SERVICE

If problems are encountered, contact our Service Department at 1-800-745-1105.

It is suggested that a system in need of repair be sent back to the factory with a written description pertaining to the nature of the problem.

Always contact the factory for return authorization before shipping any instrument. Include date of purchase, model number, and serial number. For units not covered by the warranty, a purchase order should be forwarded to avoid unnecessary delay. Care should be exercised to provide adequate packing to insure against possible damage in shipment. The system should be sent with all transportation charges prepaid and return method of shipment indicated.



NOTE: If packing unit for return shipment, **DO NOT** use styrofoam "peanuts."

WARRANTY

Sonics & Materials, Inc., hereinafter referred to as "Sonics", warrants its products for a period of one year from the date of original shipment against defects in materials and workmanship under normal installation, use and maintenance as described in the operating instructions which accompany such equipment. During the warranty period, Sonics will, at its option, as the exclusive remedy, either repair or replace without charge for material and labor, the part(s) which prove upon our examination to be defective, provided the defective unit is returned to us properly packed with all transportation charges F.O.B. Sonics dock, Newtown, CT. Warranty period on equipment rentals that are converted to purchase are deemed to have commenced on the date of original rental equipment shipment.

Ultrasonic plastics welding horns constructed of titanium or aluminum are guaranteed against defects for a period of one year from date of shipment. Sonics will repair or replace a cracked or defective horn once without charge, if failure occurs within the warranty period.

Ultrasonic plastics welding horns constructed of steel are guaranteed against defects for a period of ninety days from date of shipment. Sonics will repair or replace a cracked or defective steel horn once at a charge of 50% of the original purchase price, if failure occurs within the warranty period.

Ultrasonic metal welding horns constructed of titanium or steel are guaranteed against defects for a period of one year from date of shipment. Sonics will repair or replace a cracked or defective horn once without charge, if failure occurs within the warranty period.

Sonics warrants its ultrasonic converters for a period of one year from date of shipment with a one-time replacement if a converter proves to be non-repairable.

When customer site service is required, all travel, living and related expenses will be billed at cost. In-warranty service labor time (including travel time) at the customers facility is provided Monday through Friday (excluding holidays) from 8:00 am to 5:00 pm. Any in-warranty service time requested outside of these days and hours will be billed at 150% of Sonics current rate per hour for such site service work.

LIMITATION OF WARRANTY

This warranty does not apply to items subject to normal wear and tear or, to equipment or tooling which has been subject to unauthorized repair, misuse, abuse, negligence or accident. Misuse includes operation of equipment with tooling that is not qualified for the equipment or tooling not properly installed on the equipment.

Equipment which, in our judgment, shows evidence of having been used in violation of operating instructions, or which has had the serial number altered or removed, will be ineligible for service under this warranty.

For components and parts not manufactured by Sonics but included in Sonics manufactured equipment, this warranty shall be limited to the warranty as given to Sonics by said original component or part manufacturer.

Ultrasonic horns supplied by Sonics are manufactured to exacting specifications and are tuned to vibrate at a specific frequency. Using an out-of-tune horn will cause damage to the equipment and may result in warranty nullification. Sonics assumes no responsibility for converters, horns or fixtures not supplied by Sonics or for consequential damages resulting from their usage.

Ultrasonic converters showing signs of excessive heat or contamination, such as but not limited to, oils and moisture, are not covered by this warranty.

Warranty does not apply to ultrasonic horns quoted as prototype, experimental or of unusual design which, in our judgment are more likely to fail in use.

Warranty does not apply to re-sharpening of ultrasonic blade type cutting or slitting horns.

Warranty does not apply to knurl pattern wear on ultrasonic plastics and metal welding horns and tips.

Warranty does not apply to ultrasonic horn or tip face wear when used with plastics that are molded with fillers, such as but not limited to, glass or talc.

This warranty does not apply to ultrasonic plastics welding equipment, horns or fixtures where metal-to-metal tooling contact time is in excess of 250 milliseconds.

This warranty does not apply to used or re-built equipment.

This warranty is non-transferable.

Data supplied in Sonics instruction manuals has been verified and validated and is believed adequate for the intended use of the equipment. If the equipment or procedures are used for purposes other than those specified herein, confirmation of their validity and suitability should be obtained in writing from Sonics. Otherwise Sonics does not guarantee results and assumes no obligation or liability.

This warranty is in lieu of any other warranties, either express, implied, or statutory. Sonics neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale of its products. Sonics hereby disclaims any warranty or merchantability or fitness for a particular purpose. No person or company is authorized to change, modify, or amend the terms of this warranty in any manner or fashion whatsoever. Under no circumstances shall Sonics be liable to the purchaser or to any other person for any incidental or consequential damages or loss of profit or product resulting from any malfunction or failure of this Sonics product.

APPENDIX

PRINT LINE OUTPUT DATA ITEMS

Item 1: Using the first line of the sample listing above, item 1 is the “Customer Resettable Counter” (CRC). It is located at position 1 through position 6 so the value of 005647 indicates that the last cycle was weld number 5647 since the last time it was reset to 0 (see page 18).

```
005647 00.48 sec 0.025 in 000130 J 045 %Pmax Alarms T:-- D:-- E:-- J06 -----
```

Item 2: The second item sent is the actual weld time from the last cycle – the time that the ultrasonic generator was running. So 00.48 means that the generator was ON for .48 seconds. If the weld cycle finished its programmed weld time, then the following “sec” would have been transmitted as upper case letters or “SEC.” The “sec” is lower case so the weld cycle was terminated through some other parameter. The time data is located at positions 8 through 12 and includes the “.” at position 10. The “sec” label is located at position 14 through position 16. Space characters are located at positions 7, 13 and 17.

```
005647 00.48 sec 0.025 in 000130 J 045 %Pmax Alarms T:-- D:-- E:-- J06 -----
```

Item 3: Next is the distance data. Distance controls are not available on Model GXT, so the Distance data will always appear as 0.000 in or 00.00 mm.

```
005647 00.48 sec 0.000 in 000130 J 045 %Pmax Alarms T:-- D:-- E:-- J06 -----
```

Item 4: Next is the energy data. Energy controls are not available on Model GXT, so the Energy data will always appear as 000000J.

```
005647 00.48 sec 0.025 in 000000 J 045 %Pmax Alarms T:-- D:-- E:-- J06 -----
```

Item 5: The maximum percent power number is next in line at positions 36 through 38 with a space at 39. This number is the maximum percent of power developed during the last weld cycle. The label “%Pmax” does not change case as the control items can for time, distance (Model GXL only) and energy. It is not a control parameter, just a label for text readability.

```
005647 00.48 sec 0.025 in 000130 J 045 %Pmax Alarms T:-- D:-- E:-- J06 -----
```

Item 6: Any alarm violations for time, distance (Model GXL only) or energy (Model GXE only) will be sent in the following positions as L or H in place of the "--" shown in the sample line. The dashes are used to hold the place when there are no alarm items so the "T:-- D:-- E:--" reading indicates that there were no alarms during the last weld cycle. (Distance and Energy controls are not available on Model GXT so those alarms will always print as "D:-- and E:--.") The low alarm, high alarm order is always the same for time, distance and energy (examples: T:L- T:-H or T:LH). Time alarms are at positions 57 and 58; distance at positions 62 and 63; and energy at positions 67 and 68. Note that it is possible for a weld cycle to have both high and low alarms at the same time depending on the alarm settings (see page 17). High and Low alarms are set and examined independently.

005647 00.48 sec 0.025 in 000130 J 045 %Pmax Alarms T:-- D:-- E:-- J06 -----

Item 7: The next item represents the last job number that was saved or recalled from the job storage memory. There are 15 jobs numbered 1 through 15 so this item is transmitted as 01 through 15 or "--" if job data has not been set (first power up). The "J" label is used for readability of the job data number. When an automation system is using the remote job change option between weld cycles, the print line can be used as verification of the recalled job for the last weld cycle. The job data number is located at position 71 through 72.

005647 00.48 sec 0.025 in 000130 J 045 %Pmax Alarms T:-- D:-- E:-- J06 -----

Item 8: The last printable item on the line is a comment position used to indicate that a weld cycle was terminated by one of several external causes. Dashes in these positions will be the normal output when the weld cycle is controlled by weld parameter settings. Four external conditions may be indicated at the end of the line in positions 74 through 78: "Xstop" indicates an external stop signal was received (the cutoff command), "MnClr" when the cycle is stopped because the operator pressed the Clear key during the weld; "Ovrld" if the system aborts due to ultrasonic overload; and "CkLim" if the cycle has aborted because the preweld limits failed to find the parts at the proper position. CkLim will only apply when the distance control is ON (system was purchased with the distance encoder option – Model GXL).

Speed Consideration: If ultimate speed is more important to an application or the system is not using the print line output, it may be turned off with a switch on the internal processor board behind the front panel. Switch 5 is normally set OFF, to prevent the system from sending the print line (the factory default setting). Turn switch 5 ON to have the print line transmitted after each cycle. The system will respond to the automation start command (impulse) more quickly with the print line OFF because the message line will not be compiled or transmitted in this case.

AUTOMATION INTERFACE & I/O CONTROLS

SOURCE/SINK INPUTS AND OUTPUTS

Vendor terminology and specifications can be confusing as the reference is easily misinterpreted. Does the vendor send a “Sourcing” signal or do they mean that an input is ready to receive (or sink) current from an external source? Some PLC vendors seem to contradict others and the applications engineer ends up with a bank of relays or pull up/down resistors to switch the signal type.

When the optical IC is placed into socket U42, the G series outputs (Ready, Good Part, Bad Part, and the Spare DO) are configured as “Sourcing.” The isolated transistor collectors must be connected to an external loop supply (all 4 collectors are connected together; signal name +VDC Source (Input); pin 18 on I/O Connector J3; cable wire – orn/red). Some PLC’s provide a DC supply for this purpose, some applications will require a separate supply.

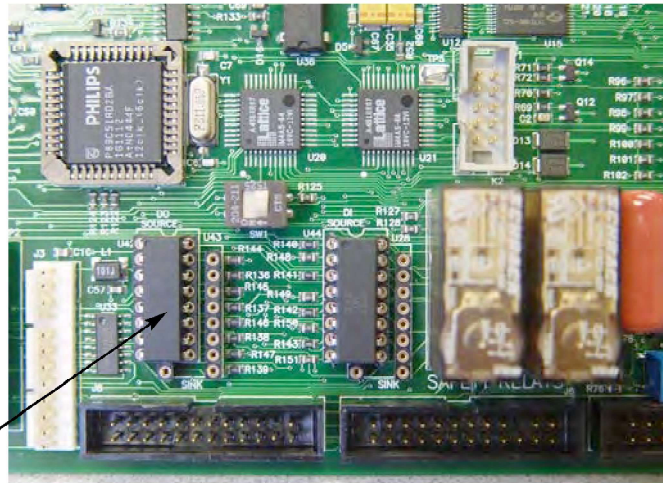
When the G series output is true or ON, current from the loop supply is conducted through the output transistor and limiting 100 ohm resistor to the PLC input card which returns to the loop supply. The PLC input will be ON if the current is flowing and OFF if the G series output is false or OFF.

Inputs (DI1-DI4) also set for "Source" as factory default.

See schematic drawing on page 40 for more detail.

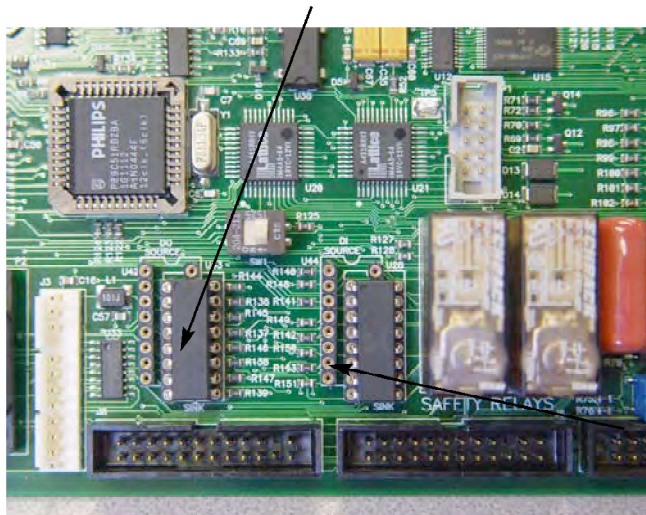
SOURCE/SINK DIGITAL I/O CONFIGURATION

The digital inputs and outputs are configured by moving two IC's on the control circuit board located directly behind the front panel. Be sure that the power is OFF and then remove the top cover. The components may be moved using a small screwdriver to pry the IC's from the socket strips. Select the "Source" or "Sink" location and reinstall the components. They are not required to be set the same – one may be "Source" and the other "Sink" to best match the required interface signals.



The optical isolator for the Digital Outputs (DO) is shown in the default "Source" configuration.

The outputs may be switched to "Sink" by moving this IC to the alternate location as shown below.



The digital inputs may be reconfigured in the same manner. They are also set for "Source" as the factory default as shown above.

Digital Inputs shown configured for "Sink."

SINKING OUTPUT TO PLC INPUT DIAGRAM

When the optical IC is placed into socket U43, the G series outputs are configured as “Sinking.” The isolated transistor emitters must be connected to the return line of the loop supply (all 4 emitters are connected together; signal name Voltage Sink Return (output); pin 19 on I/O Connector J3; cable wire – blu/red).

When the G series output is true or ON, current from the loop supply is conducted through the PLC input card, the G series output transistor and 100 ohm limiting resistor to the loop supply return line.

See schematic drawing on page 41 for more detail.

PLC OUTPUT TO SINKING INPUT DIAGRAM

When the optical IC for input configuration is placed into socket U28, the G series inputs (DI1, DI2, DI3, DI4) are configured to receive a “Sinking” input, a pull down transistor or relay contact to the loop return. The anodes of the input LEDs must be connected to a user supplied loop supply; +30 VDC max (all 4 LED anodes are connected together; signal name +VDC Sink-Input; pin 12 on I/O Connector J3; cable wire – black/white).

When the PLC output is true or ON, current from the loop supply is conducted through the G series opto LED and 2.4 kohm limiting resistor to the PLC output card which returns to the loop supply. If the PLC output is ON (conducting), the current is returned to the loop return line and the input is true or ON. If the PLC output is OFF the G series input is false or OFF.

See schematic drawing on page 42 for more detail.

PLC OUTPUT TO SOURCING INPUT DIAGRAM

When the optical IC for input configuration is placed into socket U44, the G series inputs are configured to receive a “Sourcing” input, a high side transistor or relay contact to the positive loop supply. The cathode side of the input LEDs must be connected to the return line of the loop supply (all 4 cathodes are connected together; signal name Voltage Source Return – input; pin 13 on I/O Connector J3; cable wire – red/white).

When the PLC output is true or ON, current from the loop supply is conducted through the PLC output element to the G series input opto LED and limiting 2.4 kohm resistor to the return of the loop supply. If the PLC output is ON (conducting) the G series input is true or ON. If the PLC output is OFF the G series input is false or OFF.

See schematic drawing on page 43 for more detail.

TWO ISOLATED LOOP SUPPLIES

Two isolated non-regulated 24 VDC supplies (50 ma max) are available on the digital I/O connector and may be used for the I/O loop power. These are low level supplies and cannot be used to power relay inputs or outputs! They should be used for LED indicators or transistor type input cards if the PLC does not provide low level DC power for this purpose.

The first supply is available on connector J3 pin 1 (+24 VDC isolated supply #1; cable wire – black) and J3 pin 2 (+24 VDC isolated supply return #1; cable wire – white). The second supply is on J3 pin 3 (+24 VDC isolated supply #2; cable wire – red) and J3 pin 4 (+24 VDC isolated supply return #2; cable wire – green).

See schematic drawing on page 44 for more detail.

I/O TIMING DIAGRAM – AUTOMATION CONTROLS

The cycle begins with the impulse contact to start a cycle (note that the impulse signal is not part of the configurable inputs and outputs for compatibility with existing product lines). If the system is using external job selection, the job address lines must be stable 50 ms prior to the impulse contact and remain stable until the cycle is underway as indicated by Ready going low (false). The Good Part/Bad Part lines are also cleared as the cycle begins.

When the weld cycle is complete, the Good or Bad part signal is set prior to the system returning to the ready condition. The impulse (and Palm Button signals) must all be released to complete a cycle and return the Ready Signal.

See schematic drawing on page 45 for more detail.