DUKANE

iQ Series

ULTRASONIC POWER SUPPLY

Auto-Plus

AUTOMATED HAND PROBE PRESS

Automation Interface Guidelines

Application Note AN514

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Index

System Inputs/Outputs Connector P1 Pinouts

Pin	Description
P1-1	Enable Out (+22VDC Current Limited Output)
P1-2	Enable In (Jumper to Pin 1, without E-Stop switch)
P1-3	Overload Out
P1-4	Ready Out
P1-5	Any Fault Out
P1-6	U/S Status Out
P1-7	Output Common (Isolated)
P1-8	Remote Setup 0 Input
P1-9	Remote Setup 1 Input
P1-10	Remote Setup 2 Input
P1-11	Remote Setup 3 Input
P1-12	Remote Common (Isolated)
P1-13	U/S Activate
P1-14	U/S Common (Isolated)

Table 1

Pin 1 (Enable Output)

This is a current limited +22VDC voltage source output intended to connect to an E-Stop circuit. If an E-STOP circuit is not used, Pin 1 must be jumpered to Pin 2 for ultrasound operation to be enabled.

Pin 2 (Enable In)

The output from the E-STOP circuit is connected to this pin when an E-STOP circuit is used. Otherwise, this pin must be jumpered to Pin 1 for ultrasound operation to be enabled. See Figure 6-5 for E-STOP circuit wiring examples.

Pin 3 (Overload Out)

Pin 3 is an isolated digital NPN/PNP status output that activates when an output overload condition is tripped. This output will be an open circuit if an output overload condition is not tripped. This output will remain latched ON until the U/S Activate input is switched OFF and then ON again.

Pin 4 (Ready Out)

Pin 4 is an isolated digital NPN/PNP status output signal. The signal will activate when the system is ready to begin a weld cycle. This output will be an open circuit when the welding process controller determines that the next welding cycle cannot be started. This will occur if the system is in cycle, a system fault is active, or the system is in E-STOP, but not as a result of a process fault like Overload.

When an MPC module is connected, this output will also be an open circuit when the MPC system is not ready for a weld cycle to begin. This status output signal will also be open if a fault condition is detected inside the MPC system. If this status output will not activate when using an MPC module, check for a RED fault status indication (SYSTEM STATUS LED) on the front panel of the MPC module.

Pin 5 (Any Fault Out)

Pin 5 is an isolated digital NPN/PNP status output that activates whenever any fault condition is detected that inhibits ultrasound output and normal system operation. This output will be an open circuit when no system fault conditions are active.

Pin 6 (U/S Status Out)

Pin 6 is a digital NPN/PNP status output that activates when the system is delivering ultrasonic power to the load attached to the ultrasound output connector. This output will be an open circuit when the ultrasound output is off.

Pin 7 (Output Common)

Pin 7 is electrically isolated from chassis ground. This common line should be connected to the negative output of a user-provided isolated 24VDC power supply for a PLC sourcing input card. For a PLC Sinking input card this line is connected to the positive output of the isolated 24VDC power supply.

Pin 8 (Remote Setup Selection Bit 1 Input)

Pin 8 represents Setup Bit 0. This is the least significant bit used to select different probe channels when a Multi-Probe Control (MPC) Interface is used. This MPC control bit is used on all MPC systems.

Pin 9 (Remote Setup Selection Bit 2 Input)

Pin 9 represents Setup Bit 1. This is the second least significant bit used to select different probe channels when a MPC Interface is used. This MPC control bit is used on MPC systems with three or more channels.

Pin 10 (Remote Setup Selection Bit 3 Input)

Pin 10 represents Setup Bit 2. This is the third least significant bit used to select different probe channels when a MPC Interface is used. This MPC control bit is used on MPC systems with five or more channels.

Pin 11 (Remote Setup Selection Bit 4 Input)

Pin 11 represents Setup Bit 3. This is the second most significant bit used to select different probe channels when a MPC Interface is used. This MPC control bit is used on MPC systems with nine or more channels.

Pin 12 (Remote Common)

Pin 12 is electrically isolated from chassis ground. Using sourcing (PNP) output drivers, this common line would be connected to the automation system ground potential. Using sinking (NPN) output drivers, this common line would be connected to the automation system positive supply voltage output. Refer to Section 5 for wiring examples to connect input signals.

Pin 13 (U/S Activate)

Pin 13 is used to activate the generator ultrasound output. Activation of this control input will switch the ultrasound output ON, and deactivating this signal will switch ultrasound OFF. This input signal will also function as a cycle start input, where the ultrasound activation and timing are completely under the control of the process controller. Depending on the welding process controller setup, this input signal could be activated momentarily to start a welding cycle.

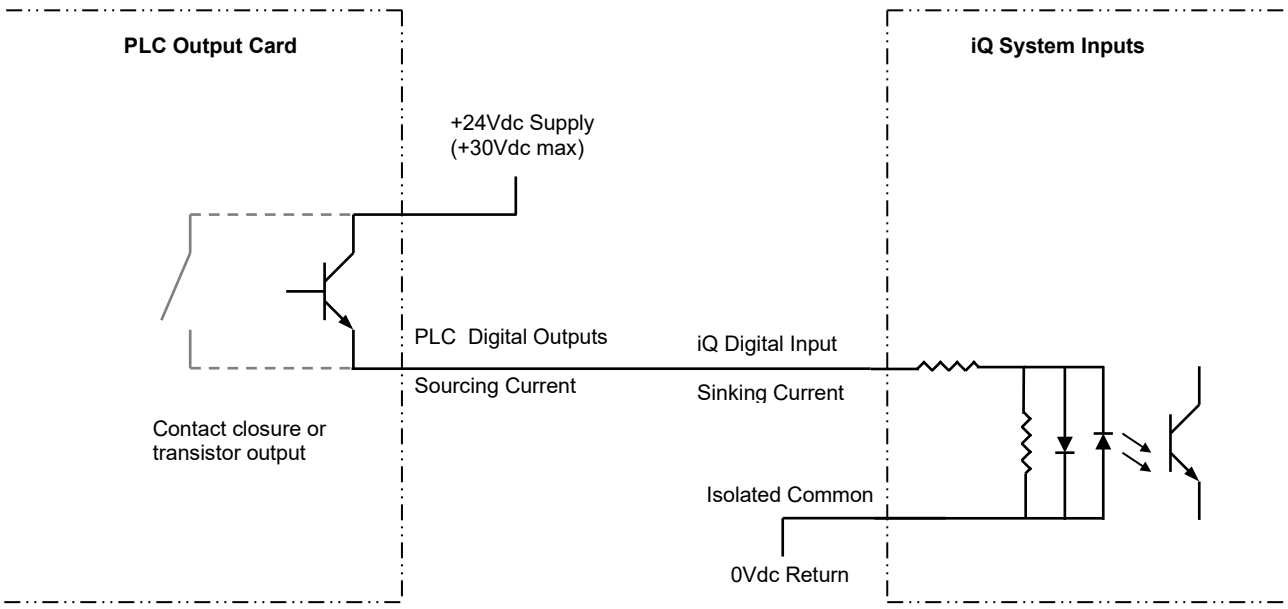
Pin 14 (U/S Common)

Pin 14 is electrically isolated from chassis ground. Using sourcing (PNP) output drivers, this common line would be connected to the automation system ground potential. Using sinking (NPN) output drivers, this common line would be connected to the automation system positive supply voltage output. Refer to Section 5 for wiring examples to connect input signals.

Connecting System Inputs

Connecting an Input to a PLC Sourcing Output Card

All System Inputs are optically isolated from the internal circuits and can be connected to sinking or sourcing PLC output cards. The inputs will draw approximately 10mA with a 24Vdc supply. The Systems Inputs can also be configured for a contact closure if necessary.



Note: Remote Setup Selection Inputs share the same Isolated Common (P1 pin 12). U/S Activate Input has a separate Isolated Common (P1 pin 14). See Table 1. It is critical that the REMOTE and US Commons are connected to either positive supply or ground.

Warning: Any connection to the U/S Activate Input should be disabled during an emergency stop condition.

Connecting a Relay Contact Closure

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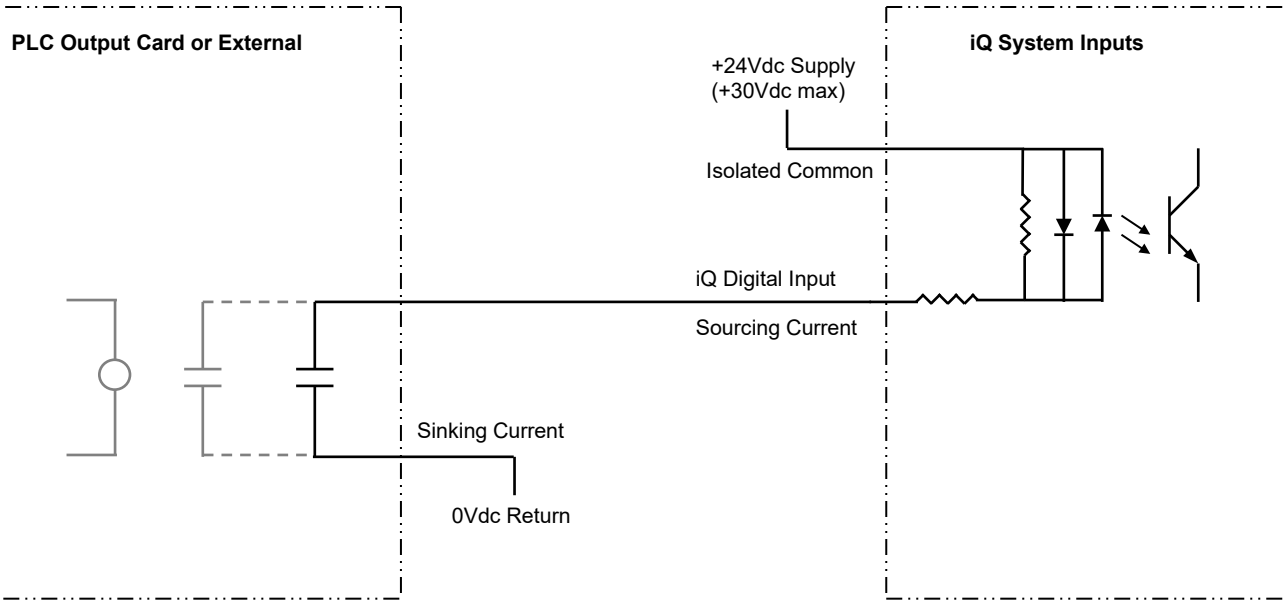
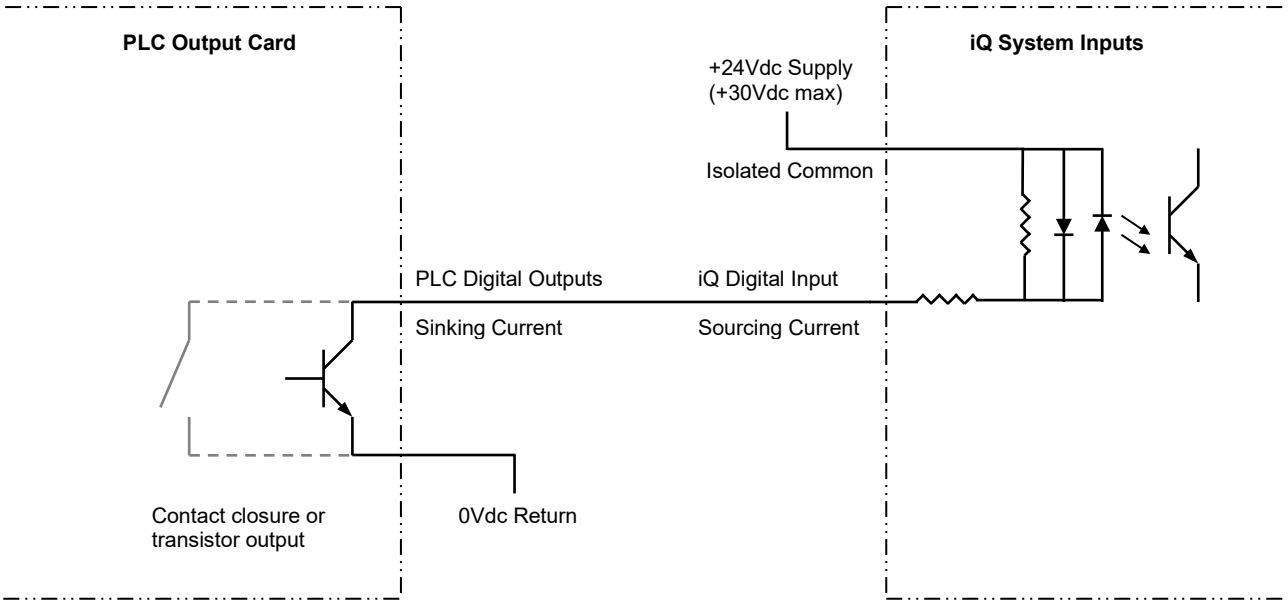


Note: Remote Setup Selection Inputs share the same Isolated Common (P1 pin 12). U/S Activate Input has a separate Isolated Common (P1 pin 14). See Table 1. It is critical that the REMOTE and US Commons are connected to either positive supply or ground.

Warning: Any connection to the U/S Activate Input should be disabled during an emergency stop condition.

Connecting System Outputs

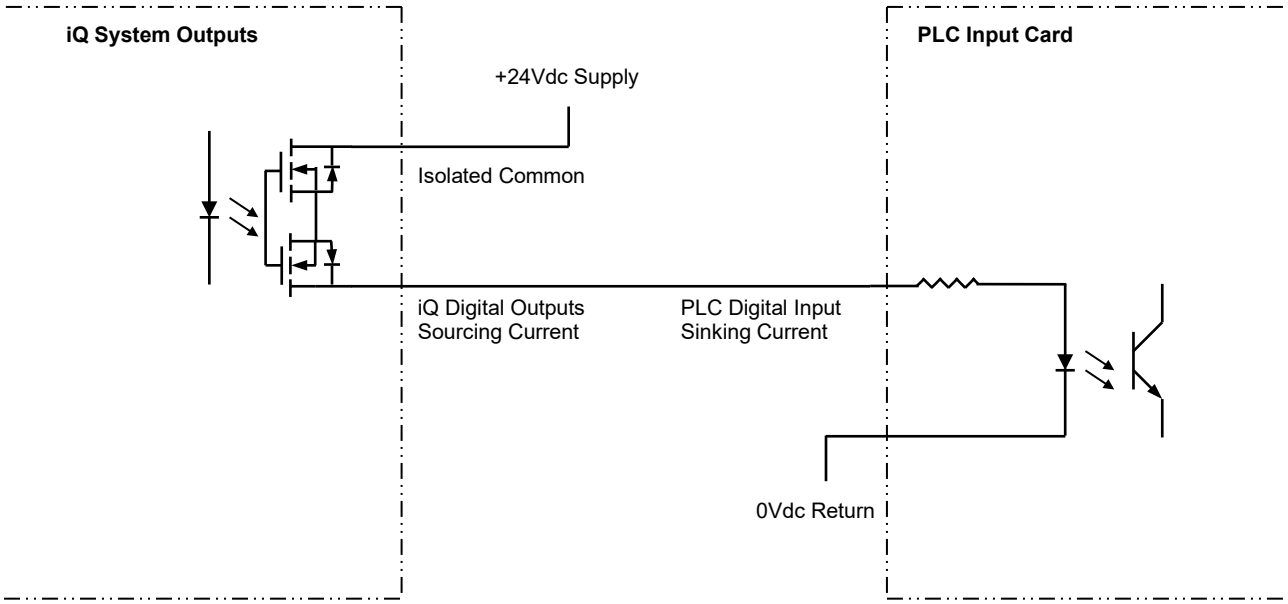
Connecting an Output to a PLC Sourcing Input Card



Note: Remote Setup Selection Inputs share the same Isolated Common (P1 pin 12). U/S Activate Input has a separate Isolated common (P1 pin 14). See Table 1. It is critical that the REMOTE and US Commons are connected to either positive supply or ground.

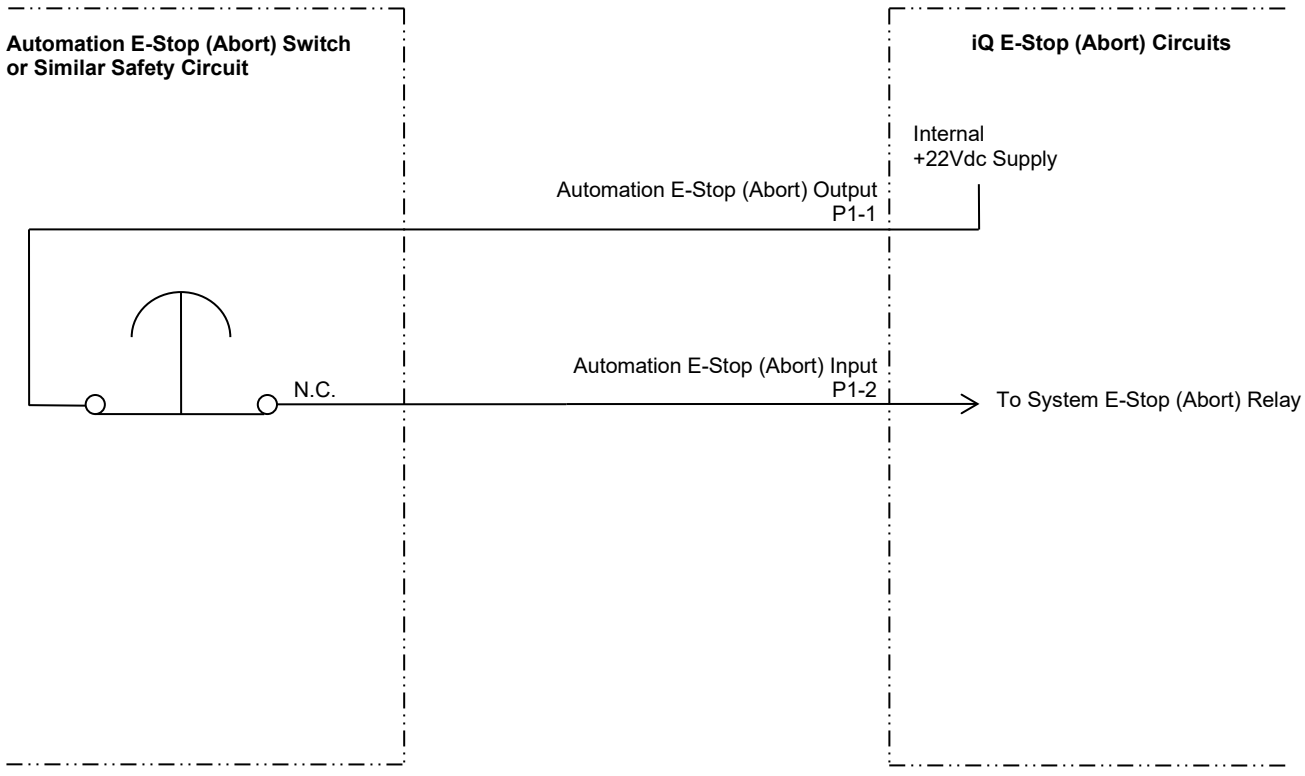
Warning: Any connection to the U/S Activate Input should be disabled during an emergency stop condition. It is critical that the REMOTE and US Commons are connected to either positive supply or ground.

Connecting an Output to a PLC Sinking Input Card



Connecting an Automation Safety Circuit

WARNING: Consult the appropriate local regulatory agency (OSHA, UL, CE, etc.) regarding all of the safety requirements for your automated machine. Dukane is not responsible for injuries related to improper safety circuits or safety guarding used in an automated machine. EN 12100-1/-2 and EN 60204-1 safety standards are recommended.



Notes:

1. To operate the iQ Auto-Plus Generator, P1 pins 1 and 2 must be maintained in a closed connection.
2. If the connection between P1 pins 1 and 2 is opened, the ultrasonic output will be disabled.

Remote Setup Switching

These system inputs receive a Binary code from the automation that is used to select a setup to be used for the next welding cycle. An external +24VDC supply is used to use the remote setup bits.

Bit 3	Bit 2	Bit 1	Bit 0	Setup Selected
0	0	0	0	1
0	0	0	1	2
0	0	1	0	3
0	0	1	1	4
0	1	0	0	5
0	1	0	1	6
0	1	1	0	7
0	1	1	1	8
1	0	0	0	9
1	0	0	1	10
1	0	1	0	11
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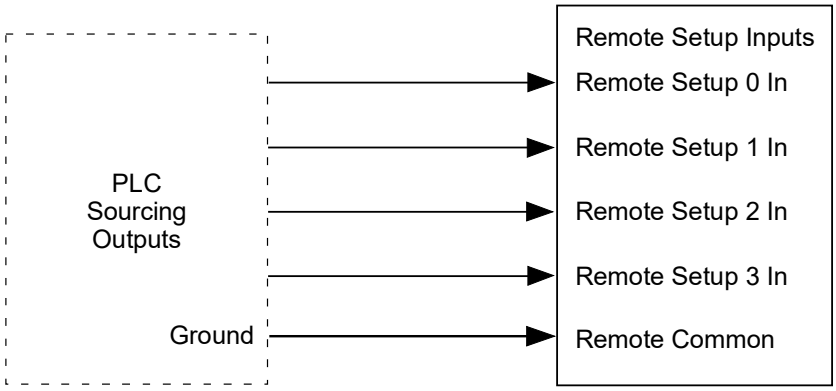
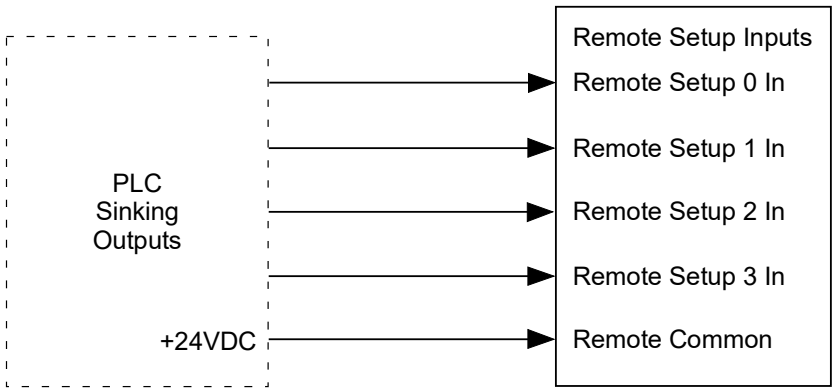
1	1	0	0	13
1	1	0	1	14
1	1	1	0	15
1	1	1	1	16





Contacting Dukane

Identify Equipment

When contacting Dukane about a service–related problem, be prepared to give the following information:

- Model number, line voltage and serial number.
- Alarm/Fault indicators from the display.
- Software version (Press **INFO**. With selection indicators at **System Information**, press **ENTER** to get this data).
- Problem description and steps taken to resolve it.

Many problems can be solved over the telephone, so it is best to call from a telephone located near the equipment.

Mailing Address:

Dukane IAS

2900 Dukane Drive

St. Charles, IL 60174 USA

Phone: (630) 797–4900

E-mail: *ussales@dukane.com*

Website

The website has information about our products, processes, solutions, and technical data. Downloads are available for many kinds of literature.

This is the address for the main website:
www.dukane.com

Application Support

You can get application support at the following link below:
https://www.dukane.com/support/#application-support

Local Representative

You can locate your local representative at:
www.dukane.com/contact-us

Please refer to our website at:

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to locate your local representative.