

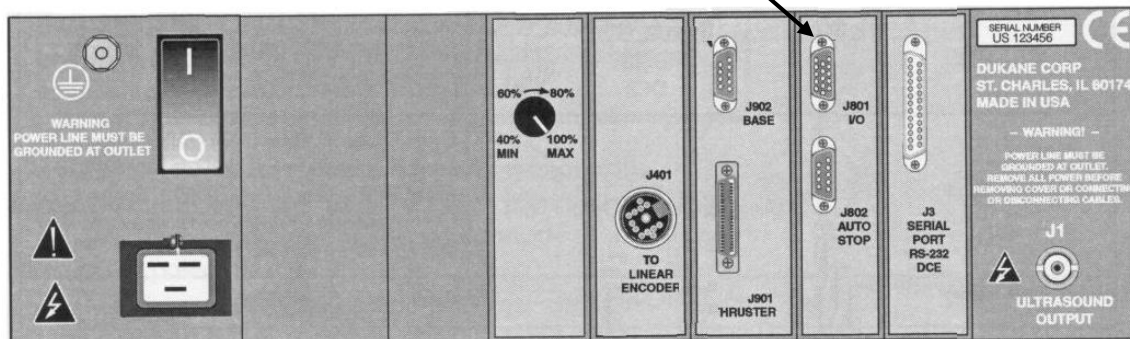
Automation Interface Requirements for J801 I/O Interface of a DPC III Welding System

The DPC III welding system offers several features that are intended to communicate with automation. These features allow the automation to control and respond to events that occur during the welding process. This document will provide guidelines that will help you interface automation to a DPC welding system per Dukane Corporation's requirements. Information within this document is intended to supplement the information in the DPC III manual (Dukane part # 403-541).

Application Note Topics:

- The J801 Pin assignments
- The 200-1203 Basic Interface Cable
- Status Output Signal Descriptions
- Status Output Interface Examples
- System Input Signal Descriptions
- System Input Interface Examples

J801 I/O Interface



J801 User Interface Connector

The J801 User Interface connector is the primary communications link between the DPC III and user automation equipment. This connector provides status signals that can be used to monitor DPC weld data analysis results as well as timing issues related to the processing of the weld sequence. It also provides the automation with dedicated communication lines that allow the automation to control the beginning and the end of a welding sequence.

Pin Number	DPC Signal Name	DPC Signal Type
1	Power Supply	+22 VDC (0.5 amp max)
2	Ground	Power Supply Return
3	Bad Part	Output
4	Suspect Part	Output
5	Good Part (see note #1)	Output
6	Ready (see note #2)	Output
7	Isolated Output Common	Common Pin for Output Signals
8	Automation Input	Input
9	Remote Setup Bit 0	Input
10	Cycle Stop	Input
11	Hand Probe Press Inhibit	Input
12	Input Common	Common Pin for Input Signals
13	Remote Setup Bit 1	Input
14	Remote Setup Bit 2	Input
15	Ground Detect	Input

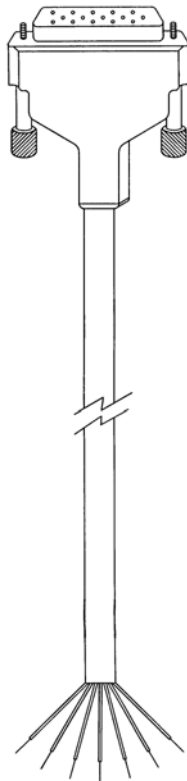
Note #1: This input can be reconfigured in the DPC III menu choices to activate during the following weld sequence event:

In Dwell (In Hold)
 In Cycle
 Sonics On

Note #2: This input can be reconfigured in the DPC III menu choices to activate during the following weld sequence event:

Good Part
 In Cycle
 Sonics On

Note: Please refer to the Communication section of the DPC III manual for details on reconfiguring pin 5 or pin 6 to the required status output signal.



Pin #	Conductor Color
1	Red
2	Black
3	Blue / Black
4	Green / White
5	Blue / White
6	Red / Black
7	White / Black
8	White
9	Orange
10	Blue
11	Orange / Black
12	Red / White
13	Green Black
14	Black / White
15	Green

Part Number	Length
200-1203	10 FT
200-1203-15	15 FT
200-1203-20	20 FT
200-1203-25	25 FT
200-1203-30	30 FT

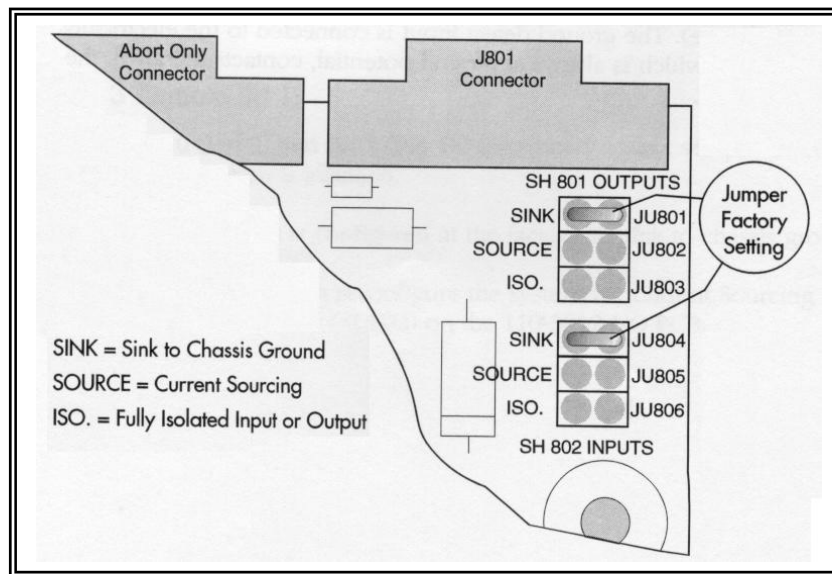
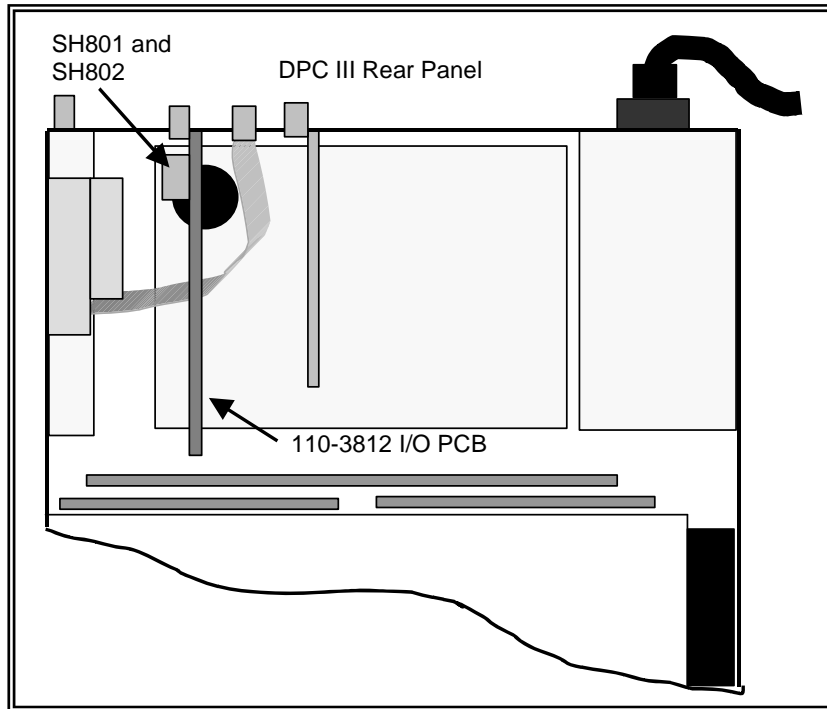
Configuring J801 system inputs and outputs to accommodate automation equipment requirements:

There are four status output signals available on the J801 connector. Each of these outputs are driven by a solid state relay that creates a switch closure between the specified output pin and the Output Common pin. These pins can be configured within the DPC software menus to provide a signal that accommodates the requirements of most automation interface equipment. The activation duration of these outputs can be defined within the DPC III software:

- Maintained Outputs - This setting will produce an output signal that is maintained from the completion of a welding cycle until the beginning of the next welding cycle activation. *(Factory default setting)*
- Pulsed Outputs - This setting will produce an output signal that is pulsed a single time for 100 mS as the end of the welding cycle.

Note: Please refer to the Communications section of the DPC III manual for further information on this feature.

The system input and status output pins of J801 can also be configured to accommodate communications with external equipment that may require sourced signals, sinking signals (*factory default*), or signals with isolation. SH802 configures the system input signals and SH801 configures the status output signals. The location of these configuration shunts and the jumper position information is indicated in the diagrams below. Please review connection diagram examples within this document to confirm recommended connections for the SH801 and SH802 settings that are selected.



Status Output Signal Descriptions:

Bad Part Output – (J801 pin 3) This status output will activate when the data acquired during the welding sequence exceeds one of the user defined boundaries within the Bad Part Limits portion of the user setup. Please refer to the Process Limits section of the DPC III manual for further details on selecting and setting up a Bad Part Limit window.

Suspect Part Output - (J801 pin 4) This status output will activate when the data acquired during the welding sequence exceeds one of the user defined boundaries within the Suspect Part Limits portion of the user setup. Please refer to the Process Limits section of the DPC III manual for further details on selecting and setting up a Suspect Part Limit window.

Good Part Output - (J801 pin 5) This status output will activate when the data acquired during the welding sequence does not exceed any of the user defined boundaries within the Bad Part or Suspect Part Limits portion of the user setup. Please refer to the Process Limits section of the DPC III manual for further details on selecting and setting up a Process Limit window.

In Dwell (In Hold) (J801 pin 5 redefined) – This status output will activate when the DPC is processing the Hold portion of the welding cycle. Please refer to the Communications section of the DPC III manual for further details on redefining J801 pin 5.

In Cycle (J801 pin 5 redefined) - This status output will activate when the welding cycle begins. If the status outputs have been set for maintained, In Cycle will deactivate when the Hold portion of the welding cycle has completed. Please refer to the Communications section of the DPC III manual for further details on redefining J801 pin 5.

Sonics On (J801 pin 5 redefined) – This status output will activate when the DPC produces the ultrasound welding signal that creates motion in the transducer stack assembly. Activation of this signal will occur during the Weld, Scrub, and Afterburst portions of the weld cycle. Please refer to the Communications section of the DPC III manual for further details on redefining J801 pin 5.

Ready Output - (J801 pin 6) This status output will activate at the completion of the Hold portion of the welding sequence. It should be noted that the activation of the Afterburst feature and the return of the pneumatic press to the home position will occur after the activation of the Ready Output status signal. Please refer to the Process Control section of the DPC III manual for further information on the activation and use of the Afterburst feature. In addition please refer to the Communications section of the DPC III manual for further details on redefining J801 pin 6.

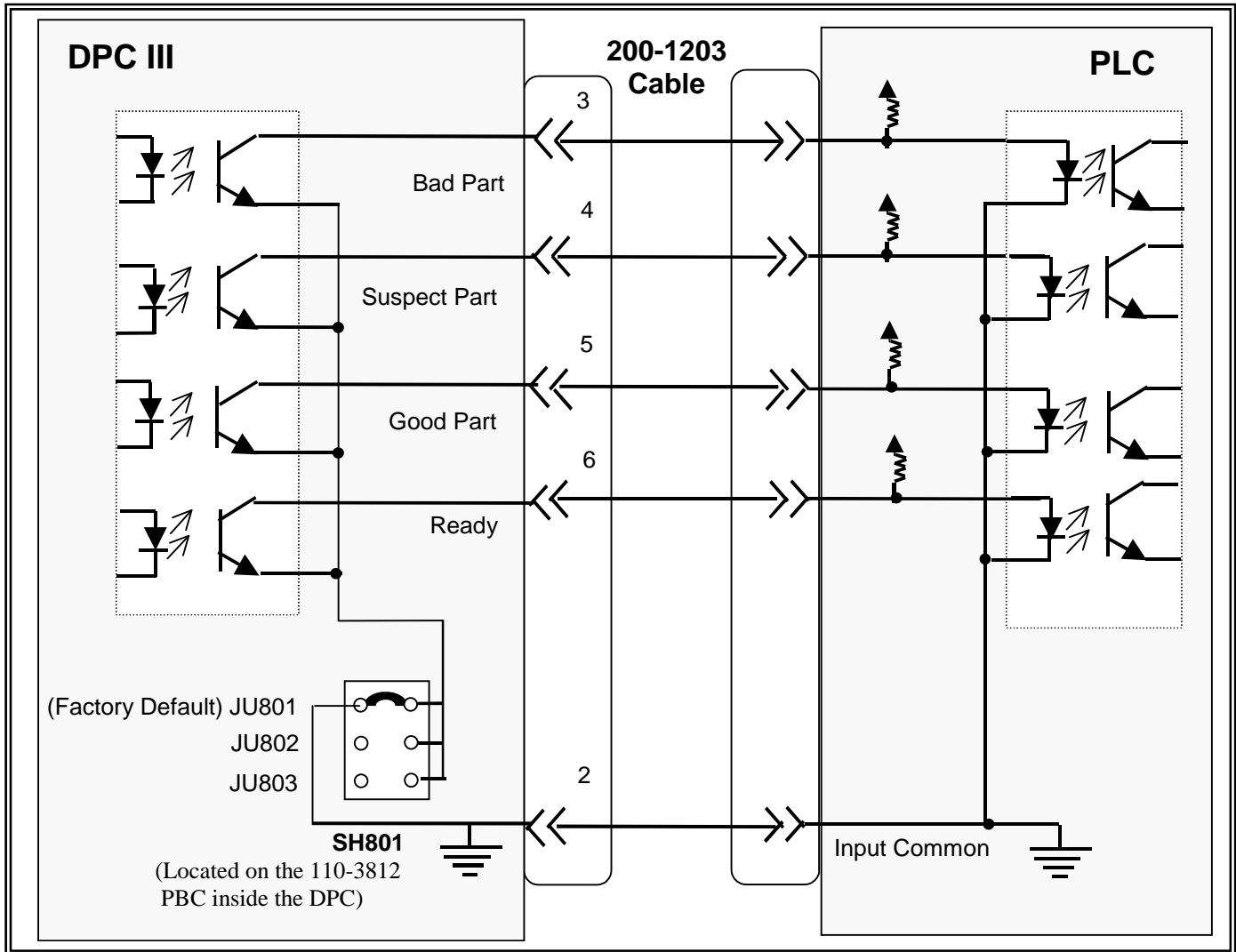
In Cycle (J801 pin 6 redefined) - This status output will activate when the welding cycle begins. If the status outputs have been set for maintained, In Cycle will deactivate when the Hold portion of the welding cycle has completed. Please refer to the Communications section of the DPC III manual for further details on redefining J801 pin 6.

Sonics On (J801 pin 6 redefined) – This status output will activate when the DPC produces the ultrasound welding signal that creates motion in the transducer stack assembly. Activation of this signal will occur during the Weld, Scrub, and Afterburst portions of the weld cycle. Please refer to the Communications section of the DPC III manual for further details on redefining J801 pin 6.

DPC III status output interface examples:

The ratings for the DPC Status output pins are:

Maximum Voltage Rating = +24 VDC
 Maximum Current Rating = 100 mA

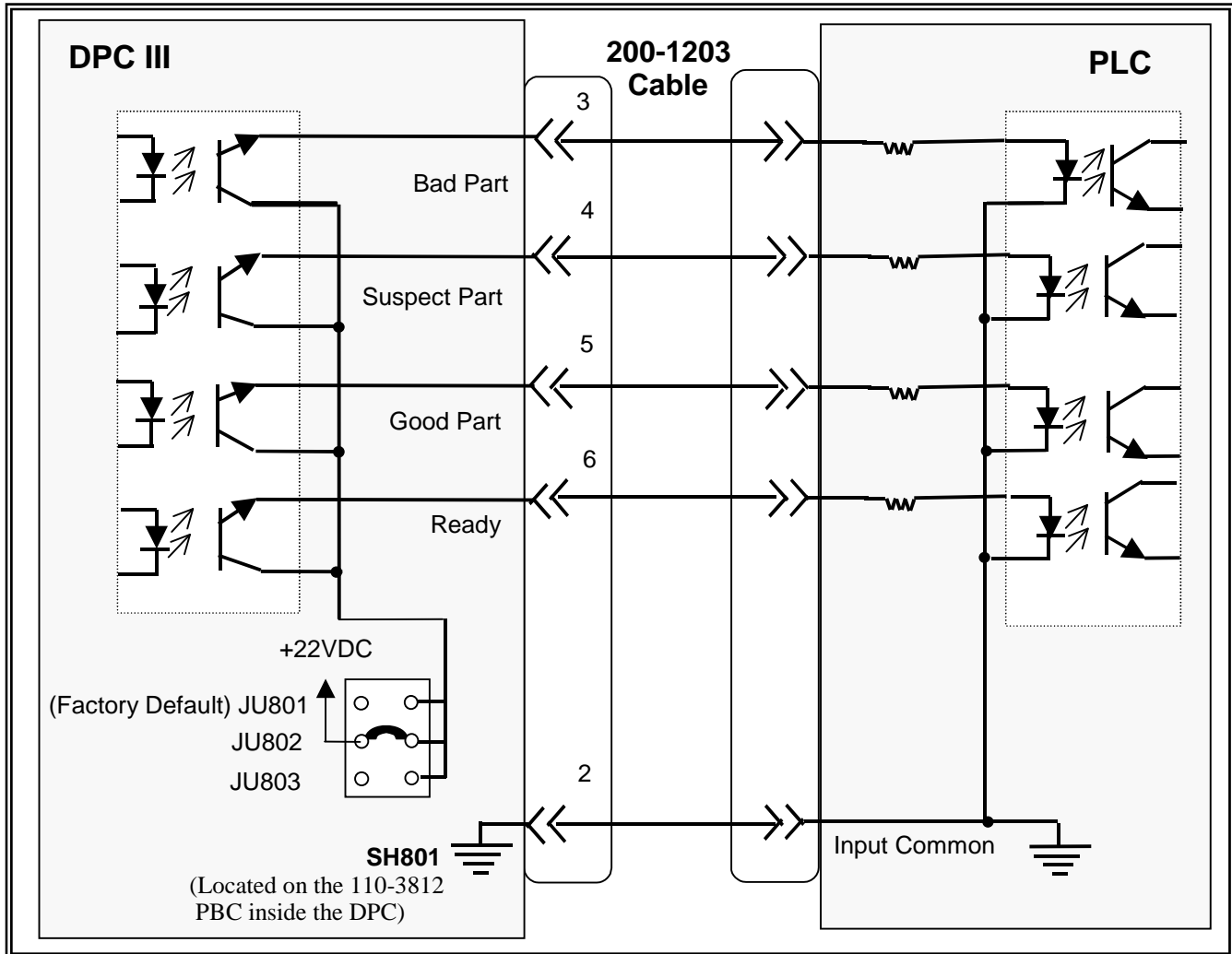


Note: This diagram provides a simplified representation of the DPC III output device for the purpose of demonstrating circuit functionality.

DPC III status output configuration for use with a PLC requiring sinking inputs.

The ratings for the DPC Status output pins are:

Maximum Voltage Rating = +24 VDC
 Maximum Current Rating = 100 mA

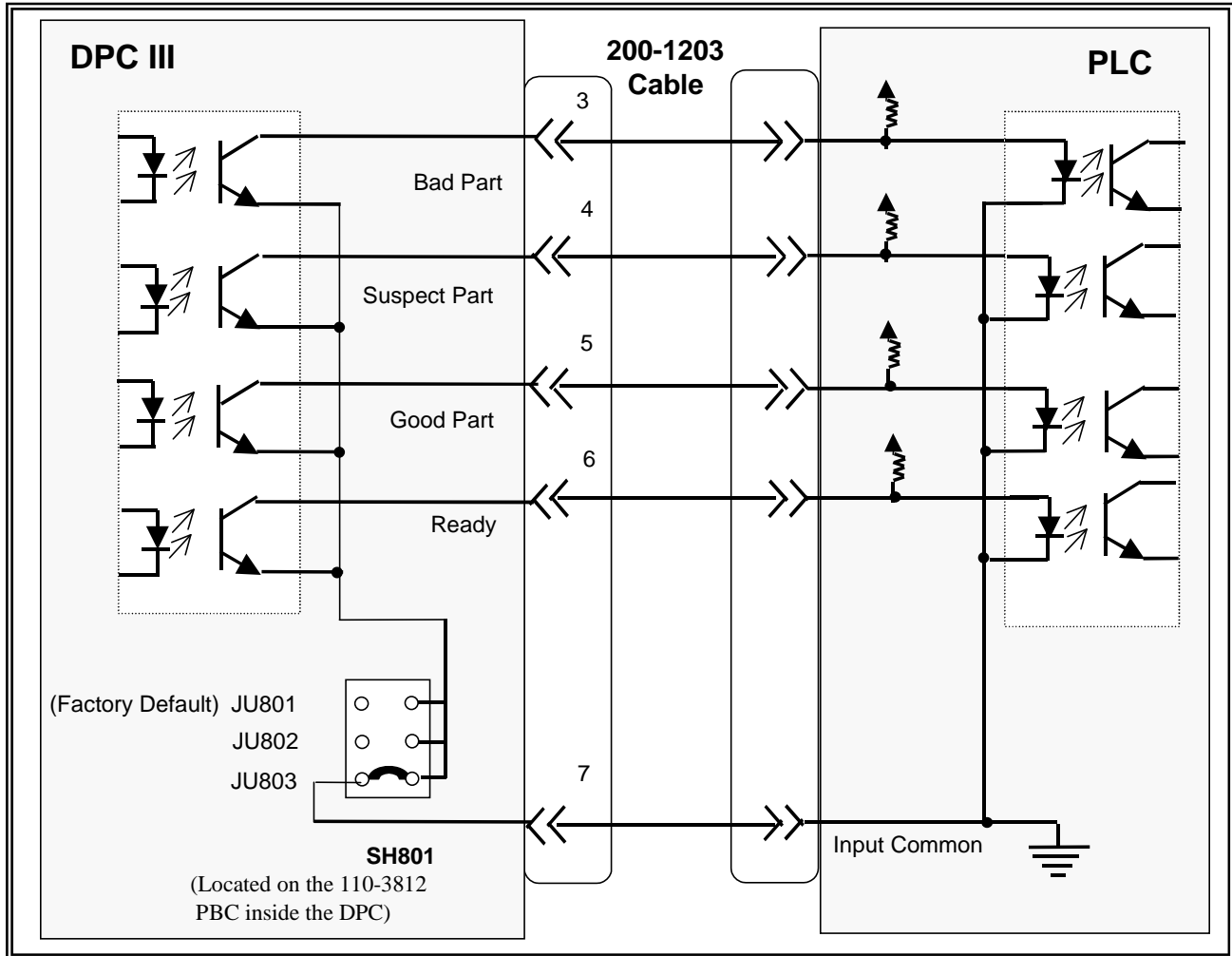


Note: This diagram provides a simplified representation of the DPC III output device for the purpose of demonstrating circuit functionality.

DPC III status output configuration for use with a PLC requiring sourcing inputs.

The ratings for the DPC Status output pins are:

Maximum Voltage Rating = +24 VDC
 Maximum Current Rating = 100 mA



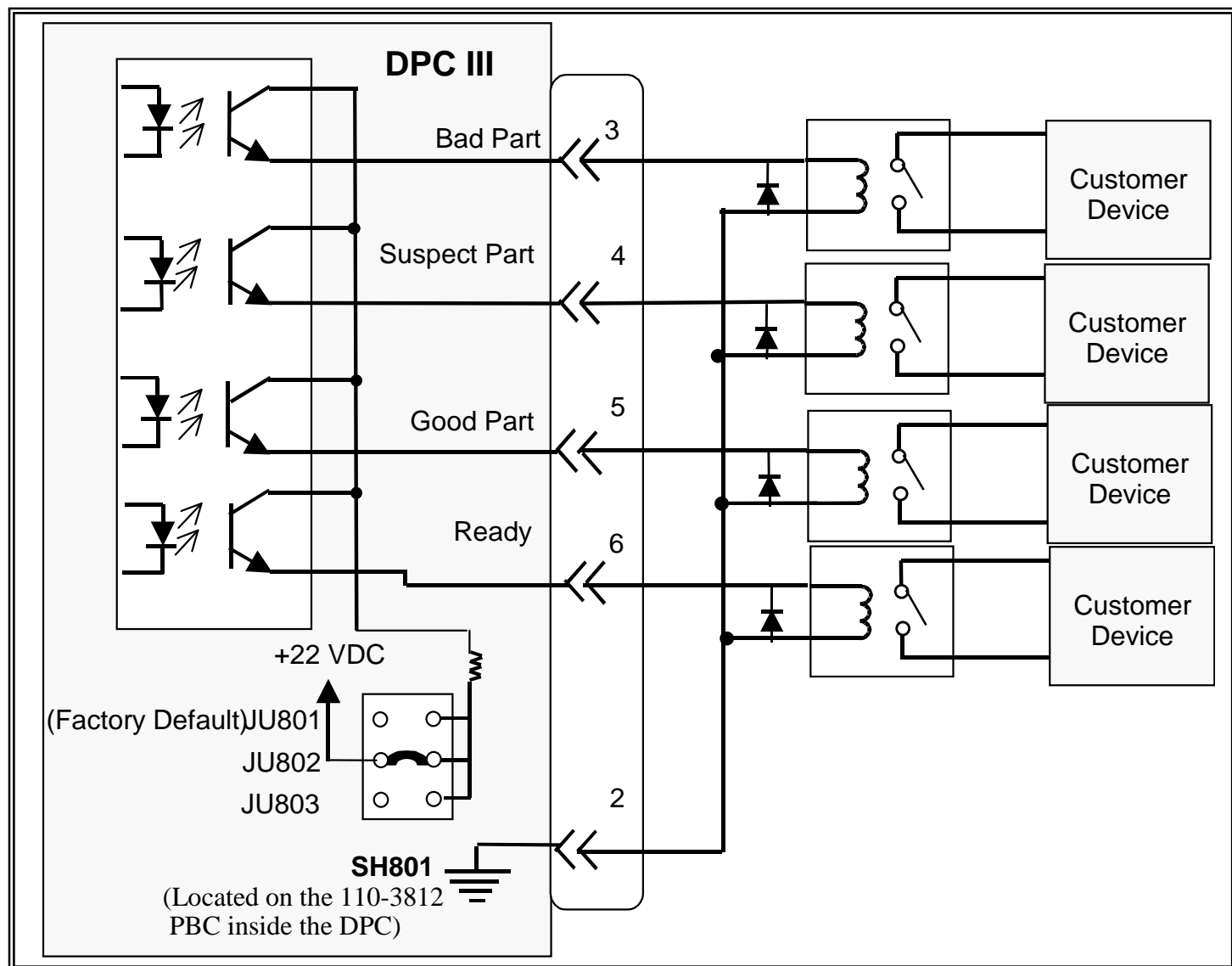
Note: This diagram provides a simplified representation of the DPC III output device for the purpose of demonstrating circuit functionality.

DPC III status output configuration for use with a PLC requiring isolated inputs.

The ratings for the DPC Status output pins are:

Maximum Voltage Rating = +24 VDC

Maximum Current Rating = 100 mA

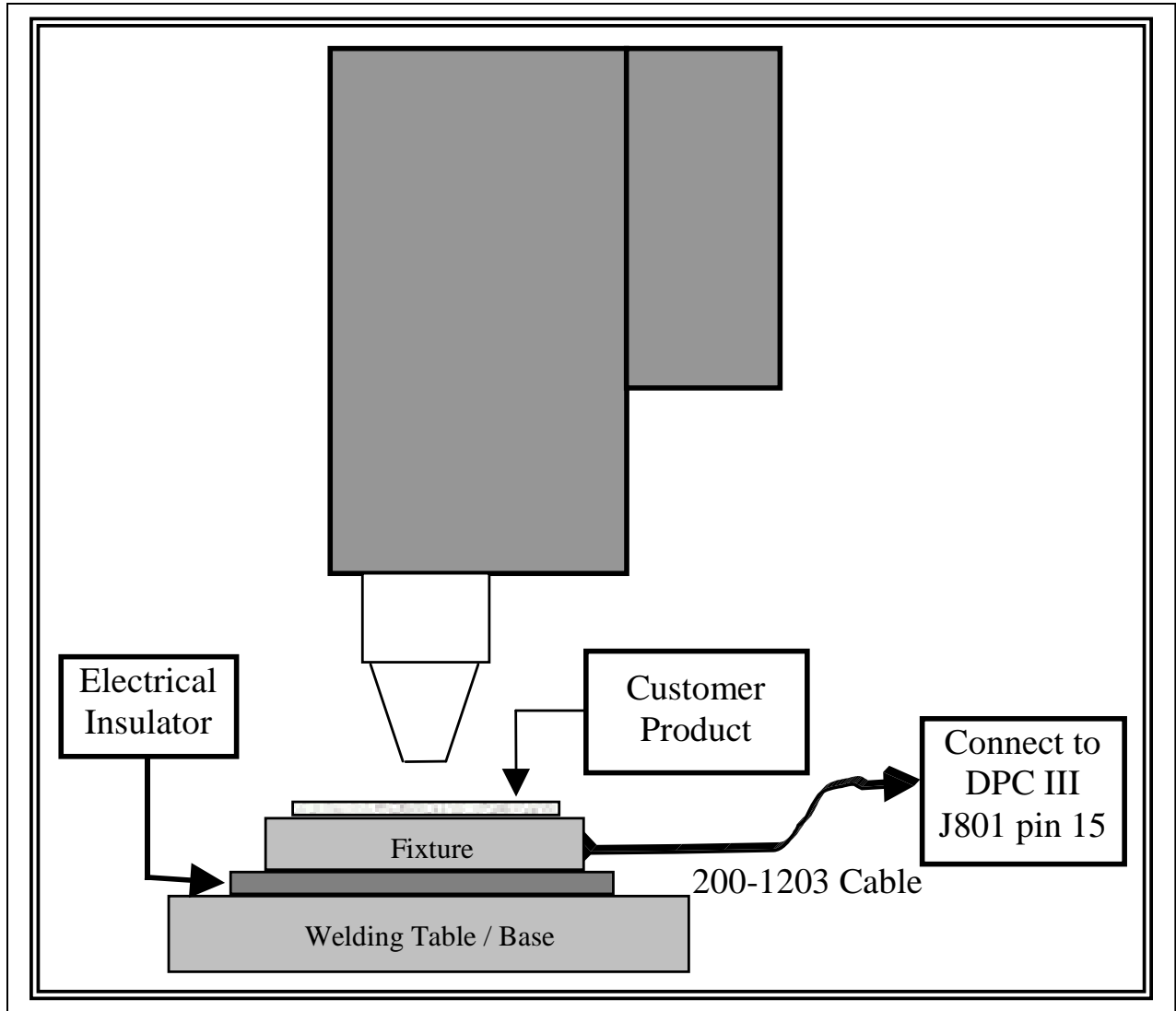


Note: This diagram provides a simplified representation of the DPC III output device for the purpose of demonstrating circuit functionality.

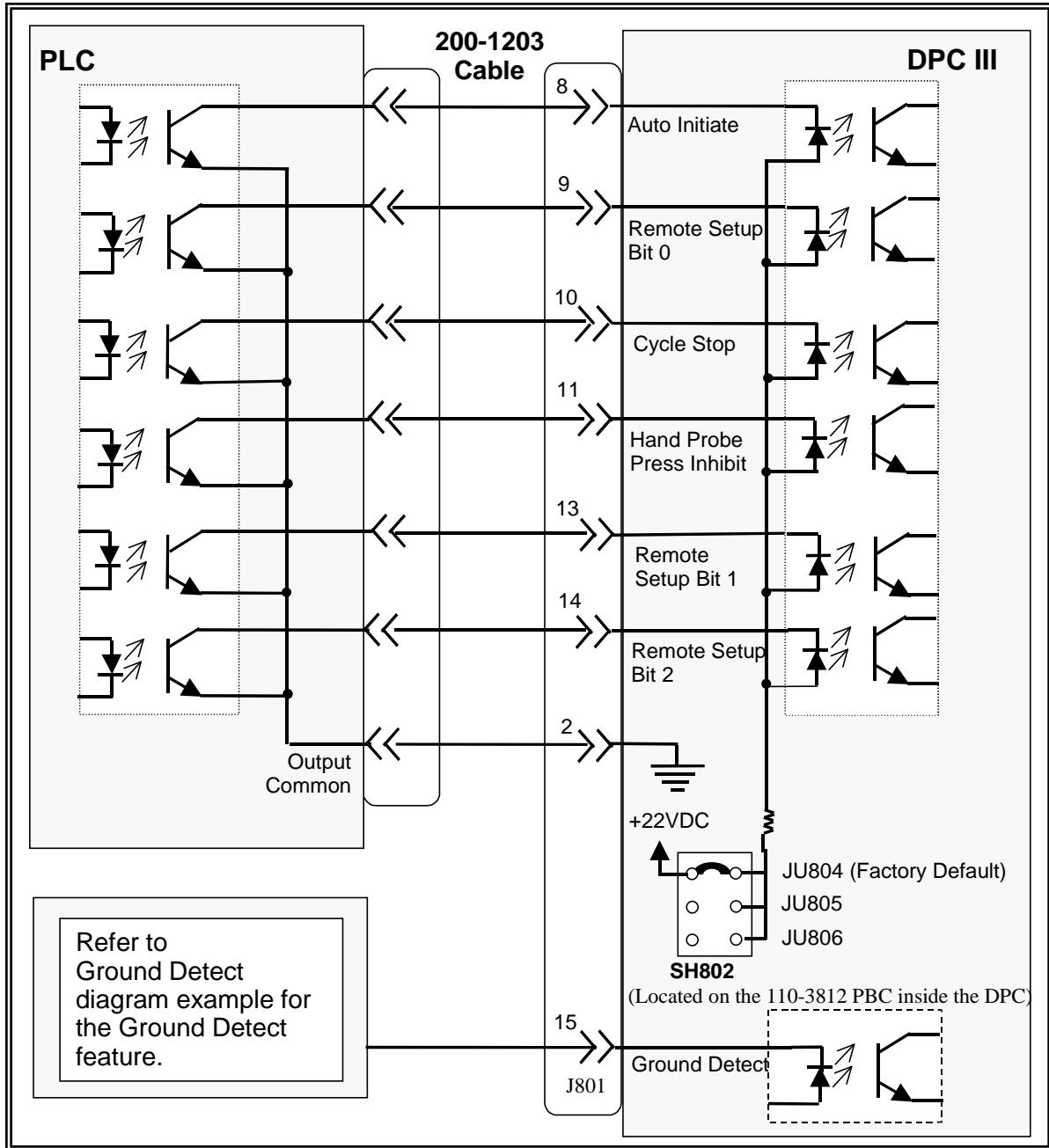
DPC III status output configuration for use with Customer devices that exceed the maximum ratings of the DPC III status outputs.

System Input Signal Descriptions:

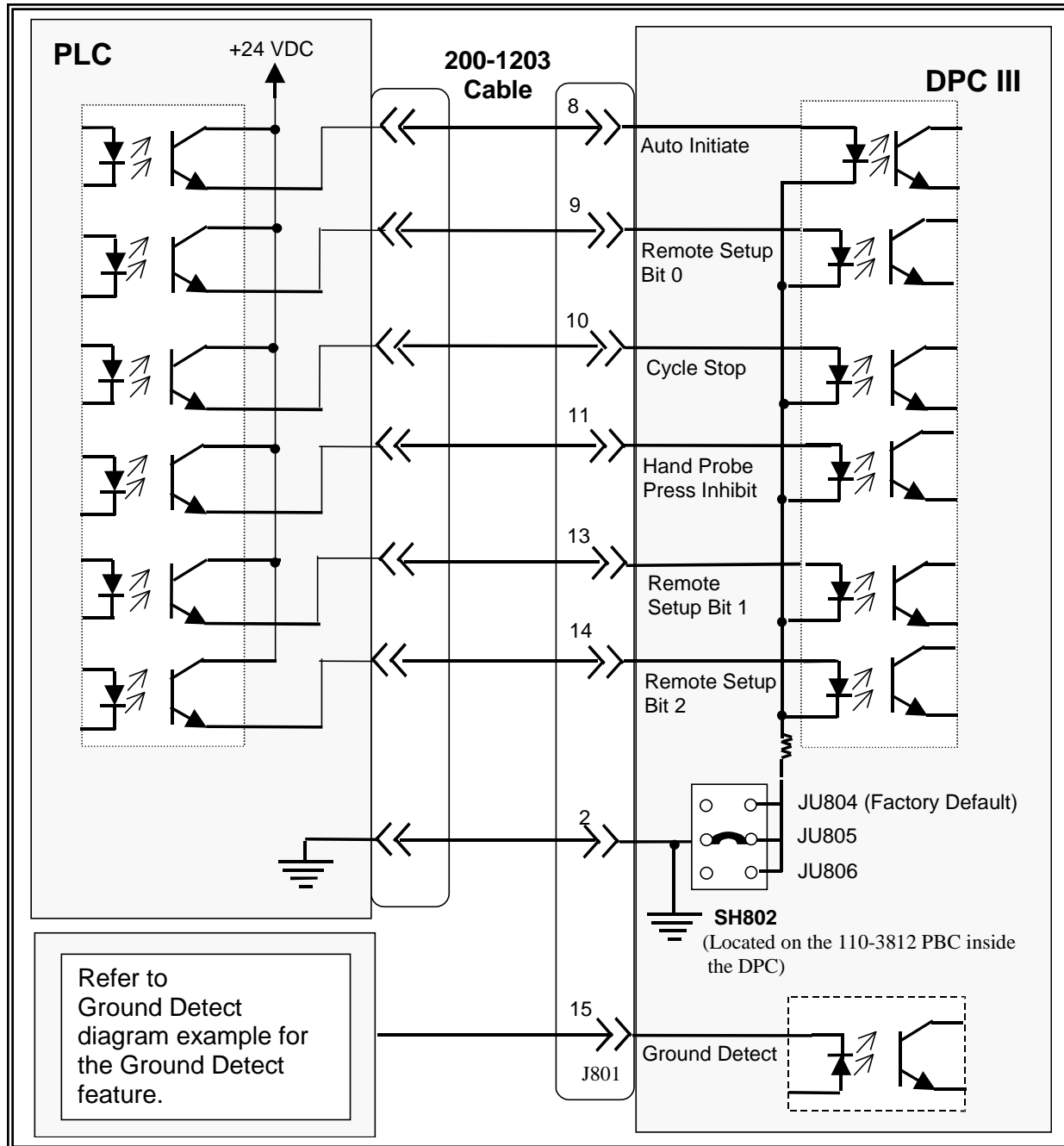
- Automation Input - (J801 pin 8) This system input signal is activated by an external dry contact closure to the DPC Ground pin on J801 pin 2. The minimum duration for the activation of this input is 100 mS. The maximum duration of this input is determined by the duration of the weld cycle. This input should be deactivated before the end of the weld cycle to avoid an error condition (Associated Error: # E06 Auto Active at Cycle Start). The Automation Input pin can be reconfigured to accommodate sourced and isolated signals as described in the J801 pin configuration section of this document. Please refer to the Initiate Mode section of the DPC III manual for details on the activation and use of the Auto Initiate mode.
- Cycle Stop- (J801 pin 10) This system input signal is activated by an external dry contact closure to the DPC Ground pin on J801 pin 2. The minimum duration for the activation of this input is 100 mS. Activation of this input will end the welding cycle and return the welding system to its home position. This input must be deactivated at the beginning of a weld cycle. The Cycle Stop Input pin can be reconfigured to accommodate sourced and isolated signals as described in the J801 pin configuration section of this document.
- Remote Setup Bit 0,1, 2 - (J801 pin 9, 13, and 14) These system input signals are activated by an external dry contact closure to the DPC Ground pin on J801 pin 2. The minimum duration for the activation of this input is 100 mS. The binary combination produced by the three inputs will be used by the Remote Setup selection feature of the DPC III. This is an optional feature which requires supporting DPC III components. The Remote Setup Input pins can be reconfigured to accommodate sourced and isolated signals as described in the J801 pin configuration section of this document. Please refer to Appendix A and the Sequencing section of the DPC III manual for details on the activation and use of the Remote Setup feature.
- Hand Probe Press Inhibit – (J801 pin 11) This system input is activated by an external dry contact closure to the DPC Ground pin on J801 pin 2. The minimum duration for the activation of this input is 100 mS. Activation of this input is intended to configure the DPC for probe system functionality. It will deactivate all valves for the press during a welding cycle. This system response will continue until the contact closure to the DPC ground is removed.
- Ground Detect - (J801 pin 15) This system input is activated by an external dry contact closure to ground. This feature is intended for use with cutting applications. Activation of this feature indicates that the cutting edge of the horn has cut through the product. When this signal is detected, the weld portion of the cycle will be terminated. This input must be deactivated to initiate a weld cycle. Please refer to the Ground Detect and Scrub features of the DPC III manual for details on the activation and use of the Ground Detect feature. A connection example has been provided within this document for this feature.



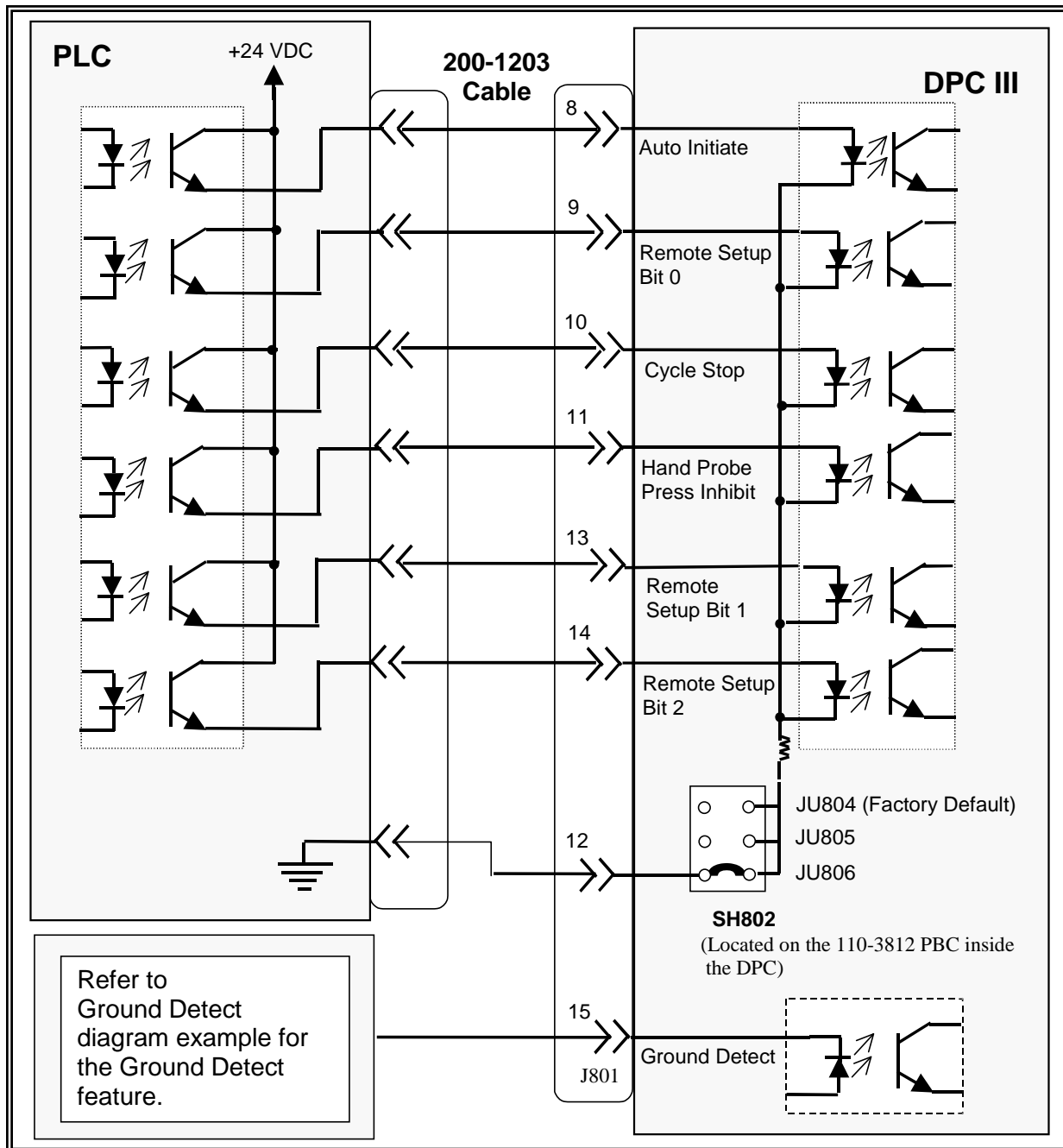
DPC III system input configuration for the Ground Detect feature.



DPC III system inputs for use with a PLC equipped with sinking outputs.



DPC III system input configuration for use with a PLC equipped with a sourcing output.



DPC III system input configuration for use with a PLC requiring isolation.