PLC4000 POWER SUPPLY
APPLICATIONS MANUAL

GENERAL THEORY OF OPERATION

The Intronics PLC4000 series Power Supplies are designed to safely and completely power a fully loaded Allen Bradley 1771 PLC rack system. The units are designed to be operated in either "Stand Alone" or "Redundant Mode Operation" to minimize the probability of interruption of a running 1771. The units are mechanically configured for mounting outside the 1771 rack to maximize the available slots for other data and I/O cards. Each unit is capable of providing up to 24 amps output current in either mode of operation. In redundant mode, the total system requirements must not exceed 24A in order to insure full redundancy. This power level is sufficient to operate most standard rack configurations between 12 and 16 slots. Each unit is fused.

The units are configured to be operated in all major market applications. The design of the units makes them compatible to the Allen Bradley 1771 PLC and can be used in all applications such as Telecom, Transportation, Utilities, Material Handling, etc. The units contain all the appropriate monitoring and alarm circuitry to interface with the 1771 chassis, and provide continuous monitoring of the system. In the event of an input power failure, the unit has sufficient Hold-Up time for an orderly system shutdown.

TECHNICAL FEATURES

INPUT STAGE

Input Voltage Operating Range

All units are designed to meet industry standard input power requirements.

Model # PLC4024	20 - 32 Vdc	(24 Vdc Nom)
Model # PLC4048	40 - 62 Vdc	(48 Vdc Nom)
Model # PLC4125	90 - 145 Vdc	(125 Vdc Nom)

Input to output and input to case are isolated;
750 Vdc for 1 minute, 850 Vdc for 1 second

** Note: Please consult factory for optional input voltage ranges

Reverse Polarity Protection / Input Transient Protection

The unit is designed with input protection circuitry in the event of an input voltage reversal or transient. All units contain a user accessible fuse which can be replaced if the unit is installed improperly. Unit will not turn on in the event of reverse voltage being applied to the input.

FUSE RATINGS MODEL

Model # PLC4024	15 amp 3AB slow blow
Model # PLC4048	10 amp 3AB slow blow
Model # PLC4125	5 amp 3AB slow blow

** IMPORTANT NOTE: Use only the above recommended fuse value. Use of improper value fuses could significantly damage the Power Supply or cause a hazardous condition. In hazardous environments, turn power off at the mains to maintain safe conditions.

Powering On Units

All output connections must be made prior to applying power to the unit(s). If power is applied prior to completing all output connections, the power supply may invoke the output overvoltage protection circuitry and shut the unit(s) down.

Hot Swapping

All models are designed to be installed into a powered up system if need be. The unit will self delay the turn on of the supply for approximately 4 (four) seconds to prevent any damage to the connectors caused by "Arcing" of the input voltage. Connect all output cables prior to applying power to the unit(s)

****WARNING: For swapping in a hazardous environment, power must be turned off at the mains to maintain safe conditions.**

Input Voltage Monitoring! Alarms & Hold Up Time

All PLC4000 models are designed to monitor input voltage for the specified voltage levels. In the event of a sudden loss of voltage or a voltage which is not within the specified ranges, the unit is designed to begin an automatic shutdown procedure according to the following sequence:

1) System alarm signals through either the Status or PE alarm circuitry.

2) Hold-Up Time of > 20 ms will keep the output voltage of the unit operating long enough to download critical data.

3) Automatic shutdown of the power supply which turns off the PLC.

Input Wire Gauge

When installing the PLC4000 units into the system configuration, proper care must be given to the wire gauge chosen to prevent voltage losses due to wire resistance and length of wire. The input voltage specification is defined as the voltage measured at the input connector of the unit.

** NOTE: All models must use a minimum of 12 AWG wire size.

OUTPUT STAGE

Output Voltage / Remote Sense

All units are internally programmed to provide the correct output voltage to the 1771 rack, (4.87 - 5.25 Vdc). Each unit is designed with remote sense lines that will keep the voltage at the rack at the specified levels. This feature compensates for any voltage losses in the output cable between the power supply and the 1771 rack when used with the recommended cable.

****IMPORTANT NOTE: Maximum recommended output cable length is 4 (four) feet between the power supply and the 1771 rack. Minimum wire gauge recommended is 14 AWG of shielded cable.**

** Please consult factory for ordering input, output, and current share cables

Output Current Rating

The power supply is capable of providing the following output currents to the 1771 chassis:

Minimum output current needed for specified operation 2.0A Maximum output current 24.0A

- Minimum system load required for current sharing (redundant mode) 4.0 amps
- Output voltage will remain in tolerance after removal of all load current once the unit has started
- Units are designed to stay within specified limits for transient load changes up to 25% maximum. Load changes greater than 25% may result in automatic unit shutdown which will require the input power to be re-cycled.

Output Overvoltage/Overcurrent

All models are designed with self protection by means of automatic shutdown if either of the following conditions is seen by the power supply:

1) Output Voltage greater than 5.5 - 6.0 Vdc
2) Output Current greater than 110% of the rated maximum

Status cable provides a closed relay contact when the output voltage is within specified range.

NOTE: An automatic shutdown requires a turn off of the input power switch and a 10 - 15 second delay prior to re-cycle and turn on.

Indicator LED

The green LED indicator light signifies all input and output voltages are within the proper tolerance ranges as described in the Technical Specification Sheet.

Status

Dry contact normally open. Closed indicates power supply active while open indicates output voltage is below specified range.

PE

See Allen Bradley application notes for complete description

Non Redundant Operation

All PLC4000 units can be used as a single stand alone power supply that plugs directly into the PLC to provide the necessary power requirements for the 1771.
Refer to Figure 1 for non-redundant interfacing

Redundant Operation / Current Sharing

All PLC4000 models are capable of being operated in the "Redundant" mode configuration. All models are supplied with the redundant " ORing" diode built into the unit itself. In the redundant configuration, units are designed to share the output load current with proper installation of the "Current Sharing Cable".
Refer to Figure 2 for redundant system interfacing

****IMPORTANT NOTE:**
When installing units in a redundant mode configuration, the total system power being drawn cannot exceed the rated specification of 24 amps. This limit will insure proper operation and transition of the current sharing function in the event of a failure during system operation.

Thermal

Baseplate of the power supply must be maintained < 75°C to insure proper operation and reliability.

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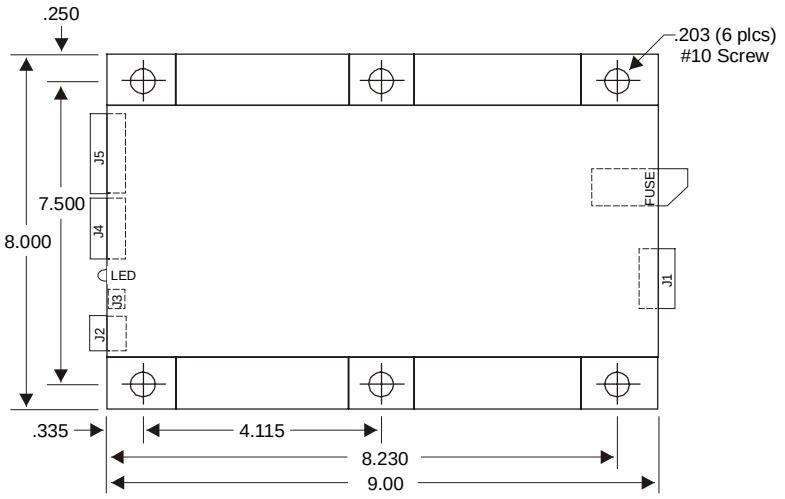
MECHANICAL DIMENSIONS PLC4000 SERIES

FIGURE 1

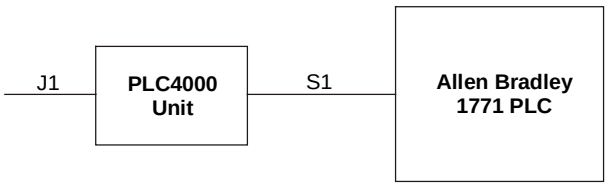


Pin Connections & Description			
Pin	Description	Pin	Description
J1-1	+V in	J5-A1	+5Vdc out
J1-2	-V in	J5-1	N/C
J1-3	Chassis Gnd	J5-2	P/E
J2-1	- Status	J5-3	+Sense
J2-2	+ Status	J5-4	-Sense
J3-1	+V out	J5-A2	+5Vdc Return
J3-2	+V out 2	Case	Chassis Gnd
J3-3	Share out		
J3-4	Share in		
J3-5	Blank 2		
J3-6	Blank		
J3-7	Share Return		
J3-8	N/C		
J3-9	Shield		
Case	Chassis Gnd		

N/C = No Connect

SINGLE UNIT CONFIGURATION

FIGURE 2



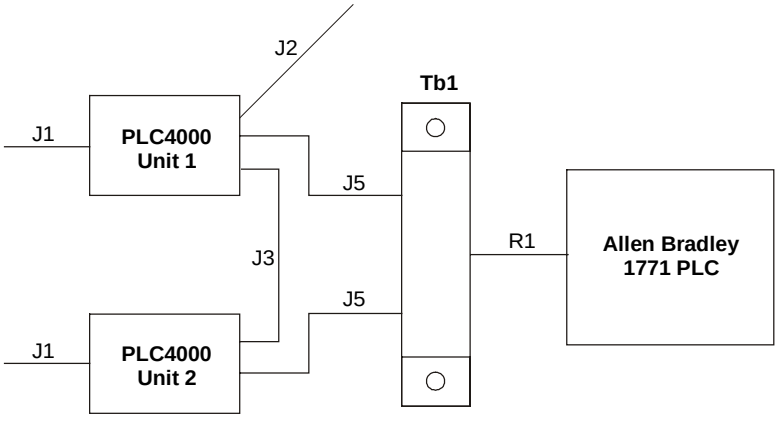
All Input, Output, and Current Share cables should be ordered as separate items.

CK1 – Single unit cable kit

CK2 – Redundant unit cable kit

REDUNDANT UNIT CONFIGURATION

FIGURE 3



Cables	Interface	Length
Input Voltage	J1	6’
Status Line	J2	5’
Single PLC	S1	4’
Redundant Cables		
Output	J5	2’
Current Share	J3	2’
Redundant PLC	R1	2’

Note: Due to ongoing product improvements, specifications are subject to change

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