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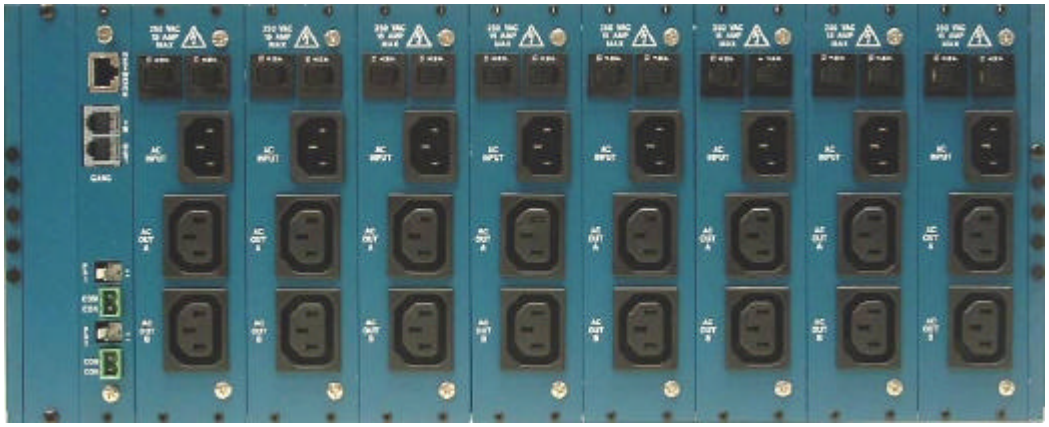
SecurePower® R6000 Series
Compact Ganged A/B & ON/OFF Switching System

Part Numbers

R6000 AC POWER SWITCH – 120 VAC	50-00751
R6000 AC POWER SWITCH – 240 VAC	50-00758
R6000 AC POWER SWITCH WITH NETWORKED REPORTING – 120 VAC	50-00756
R6000 AC POWER SWITCH WITH NETWORKED REPORTING – 240 VAC	50-00757



Contents

1. Specifications

Connectors:	(1) – IEC male for AC power entry, (2) – IEC female for AC power output
Indicators:	(2) – active port LED indicators
Switches:	(1) – momentary toggle switch, (1) – single position dipswitch, (2) – 8-position dipswitch
Power:	Standard: 12 VDC, 14 mA normal, additional 14 mA while switching With Processor: 12 VDC, 22 mA normal, additional 14 mA while switching
Max Operating Voltage:	250 VAC
Max Switching Current:	15 Amps at 250 VAC
Relay Contacts:	Resistive Load: 16 Amps at 250 VAC; Inductive Load: 8 Amps at 250 VAC
AC Line Protection:	(2) – 15 Amp, 250 VAC Thermal Circuit Breakers. One breaker in the HOT line, and one in the Neutral line. The thermal current rating varies with ambient temperature from approximately 121% at 0 ° C to approximately 70% at 60 ° C. The 15 Amp rating is at 25 ° C.
Operating Temperature:	0 to 60 ° C
Size:	7” H x 1.875” W x 7” D (including switches and connectors); occupies two card slots in 4U high rack.

2. Introduction

The R6000 AC Power Switch card is designed for use in the R6000 Automatic Switching System. The AC Power Switch Card switches AC power from a common AC input connector to one of two AC output connectors. The unit uses a low power, latching relay to switch the AC input voltage to the AC coil of the power relays. The power relays connect the AC input to either output A or output B, switching both the HOT and NEUTRAL AC lines. The de-energized state of the power relays connects the AC input to output A.

The AC Power Switch card is available in two versions. The standard version operates like any other A/B Switch card in the R6000 Automatic Switching System. The switch can be controlled individually with the toggle switch on the front of the card. It may be controlled as part of the rack or part of the system, by using the switches on the front of the A/B Switch Controller. It may also be controlled with RS-232 terminal or SNMP commands with the appropriate A/B Switch Controller.

The AC Power Switch with networked reporting has additional circuitry to detect AC power, and a processor to make that information available to a SNMP monitoring station. The AC detection circuit monitors the AC input power after the circuit breakers. In order to access this SNMP information, the AC Power Switch must be installed in a R6000 rack with a Processor Version of the A/B Switch Controller, and the first rack in the system must have an A/B Switch Controller with SNMP.

Please refer to the R6000 Automatic Switching System manual for more information on the A/B Switch Controller, and other A/B Switch cards.

The Power A/B Switch is designed for switching 120 or 240 VAC loads, up to 15 Amps. Contact the manufacturer for alternate loads.

3. Configuration

The AC Power Switch uses AC coil power relays, and therefore must be set as appropriate for 120 or 240 VAC. The AC voltage selection switch will be set at the factory prior to delivery. It should not be necessary to change the switch setting. The AC voltage selection switch is located in the center of the card, beneath a protective insulator. Using the AC Power Switch with the improper voltage may result in damage to the power relays. Remove all power connections prior to removing the AC Power Switch from the rack. See the installation section for procedures to install and remove the AC Power Switch cards from the rack.

Table 3.1 – AC Voltage Selection Switch SW4

Switch Position	Function
Toward AC Connectors	120 VAC operation
Away from AC Connectors	240 VAC operation

The R6000 Automatic Switching System is designed to accommodate up to 16 A/B switches. The standard A/B switch cards can be individually addressed with RS-232 terminal or SNMP commands. The switch card address is determined by the position in the rack, and the rack address, which is set on the controller card. Valid rack addresses range from 0x01 to 0xFF hex (1 to 255 decimal). Valid card addresses range from 1 to 4080. Cards 1 through 16 are in rack 1, and cards 17 through 32 are in rack 2 and so on. The controller card provides control and status information for all 16 cards in the rack. Since the AC Power Switch cards occupy two card slots, every other card slot will be unused. The status of an unused slot is B. The “rack” status will be A if any of the switch cards in the rack are at A, and will be B only if all the installed switch cards in the rack are at B.

On AC Power Switch cards with Networked Reporting, switch SW1 and positions 1 through 3 of switch SW2 are used to set the cards address. Valid card addresses range from 0x001 to 0x7FF hex (1 to 2047 decimal). Although the switch can be set to address 0x000, this address is invalid and must not be used. SW1 position 1 is the least significant bit, and SW2 position 3 is the most significant bit. As opposed to listing all 2047 possible addresses, the switch can be viewed as three hex digits, which are set according to the following table. Each AC Power Switch card in the system must have a unique address. The first card in the system should be assigned address 0x001, the next card address 0x002, and so on through 0x7FF.

Table 3.2 – Power A/B Switch Card, Switch SW1 and SW2 Address Settings

HEX Value	SW1-1 SW1-5 SW2-1	SW1-2 SW1-6 SW2-2	SW1-3 SW1-7 SW2-3	SW1-4 SW1-8
0	ON **	ON **	ON **	ON **
1	OFF	ON	ON	ON
2	ON	OFF	ON	ON
3	OFF	OFF	ON	ON
4	ON	ON	OFF	ON
5	OFF	ON	OFF	ON
6	ON	OFF	OFF	ON
7	OFF	OFF	OFF	ON
8	ON	ON	ON	OFF
9	OFF	ON	ON	OFF
A	ON	OFF	ON	OFF
B	OFF	OFF	ON	OFF
C	ON	ON	OFF	OFF
D	OFF	ON	OFF	OFF
E	ON	OFF	OFF	OFF
F	OFF *	OFF *	OFF *	OFF *

* The factory default card address is 0x7FF hex. The user must select a unique card address for each AC Power Switch card in the system.

** Address 0x000 is for factory test. The product will not function normally at address 0x000.

The 11-bit address consists of two 4-bit nibbles and a 3-bit upper address as follows:
Switch SW1 positions 1 through 4 make up the least significant 4-bits of the address (range 0 through F).
Switch SW1 positions 5 through 8 make up the next 4-bits of the address (range 0 through F).
Switch SW2 positions 1 through 3 make up the most significant 3-bits of the address (range 0 through 7).

Note: To access switches SW1 and SW2, the AC Power Switch must be removed from the rack. The switches are located at the top of the card, with position 1 toward the front of the card toward the LED indicators. Remove all power connections prior to removing the AC Power Switch from the rack.

Switch SW2 positions 4 through 8 are reserved for future product development, and should be left in the OFF position.

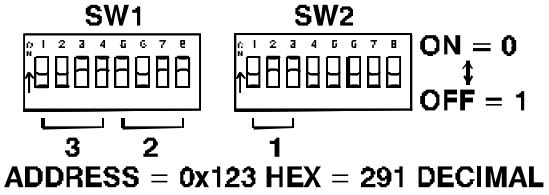


Figure 3.1 Example Address Setting

4. Installation

WARNING!

The AC Power Switch card presents a risk of electrical shock. Insulators have been installed to cover high voltage circuits, to minimize the risk of electrical shock. DO NOT place objects through card guide openings in the enclosure top and bottom.

4.1. Installation

4.1.1 Using the card guides, carefully slide the card into the rack. Use caution to guide the switches and LED indicators as they go through the holes in the front panel. Fully insert the card until it makes connection to the card edge connector on the rack backplane.

4.1.2 Secure the card to the rack at the top and bottom of the card, using the screws provided.

4.2 Removal

To minimize the risk of electric shock, remove all power cords from the card, prior to removing the card.

4.2.1 Pull the heads of the screws out approximately 1/16 to 1/8 inch.

4.2.2 If necessary, carefully use a small screwdriver to loosen the card from the rack. It should not take much force to loosen the card from the rack.

4.2.3 Carefully slide the card from the rack.

5. Operation

When power is applied to the R6000 Automatic Switching System, either the "A" LED or the "B" LED on each AC Power Switch should illuminate to indicate the currently connected port. When first energized, each switch should be cycled from A to B and back. It is possible for the latching relays to have changed state during shipping, and cycling the switch will assure that all relays on the card are in the same state.

The R6000 Automatic Switching System has a Key-Lock switch used to enable and disable the switches in the rack.

When the Key-Lock switch is OFF, the switches in the rack will be disabled. Note that the rack may still switch in response to a “system” switch command from the controller gang-in and gang-out connectors.

When the Key-Lock switch is ON, the switches in the rack function normally.

The Toggle Switch on the AC Power Switch card is used to switch only that card. Hold the switch in the “A” position to connect the AC Input to AC Output Port A. The “A” LED will illuminate when the switch operation has been completed. Release the switch when switching has finished. Hold the switch in the “B” position to connect the AC Input to AC Output Port B. The “B” LED will illuminate when the switch operation has been completed. Release the switch when switching has finished.

On the AC Power Switch Card, this switching action controls the AC voltage to the AC coils of the Power Relays. When de-energized, the Power Relays connect the AC Input to AC Output Port A. When energized, the Power Relays connect the AC Input to AC Output Port B.

The Toggle Switch on the A/B Switch Controller Card is used to switch all cards in the rack, and is operated in the same fashion as the individual toggle switches. To switch the entire system, hold the “system” push-button while operating the toggle switch on the controller card.

6. Troubleshooting

If the latching relay changes state, but the Power Relays do not follow, check the following.

1. Make sure that the unit is set for the appropriate voltage. It must be set for 120 VAC or 240 VAC. Applying 240 VAC to a unit set for 120 VAC will damage the Power Relays. Applying 120 VAC to a unit set for 240 VAC will not provide sufficient voltage to energize the Power Relays.
2. Make sure that AC input port is connected to a working AC outlet.
3. Make sure that both circuit breakers are not tripped. Push the button on the circuit breaker to reset any tripped circuit breakers.

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