

Trouble-shooting

This chapter provides basic trouble-shooting procedures for the Digital Environ cabinet. It does not provide comprehensive maintenance data, but allows you to solve simple problems which may occur, and helps to provide Strand Lighting with initial data when these procedures are not effective.

For best system operation, do a routine check and cleaning once each year unless the operating environment is unusually harsh or dirty. Please consult Strand Lighting field Service if you are in doubt about the frequency of maintenance required for your system. Service and maintenance operations other than this cleaning are seldom required. In case of problems, and in order to save time and aggravation, follow the procedures outlined here before calling Strand Lighting. Observe what happens at each step. These steps answer the first questions a Strand Lighting Service Representative will ask. The person actually doing the tests should call Strand Lighting in order to avoid miscommunication. All service except dimmer and mechanical components should be performed by subassembly replacement.

This chapter contains the following main sections:

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Understanding the Control Signal Path

The following diagram illustrates the control signal flow throughout the Digital Environ cabinet. It is included here to show how each of the programmable settings interrelates.

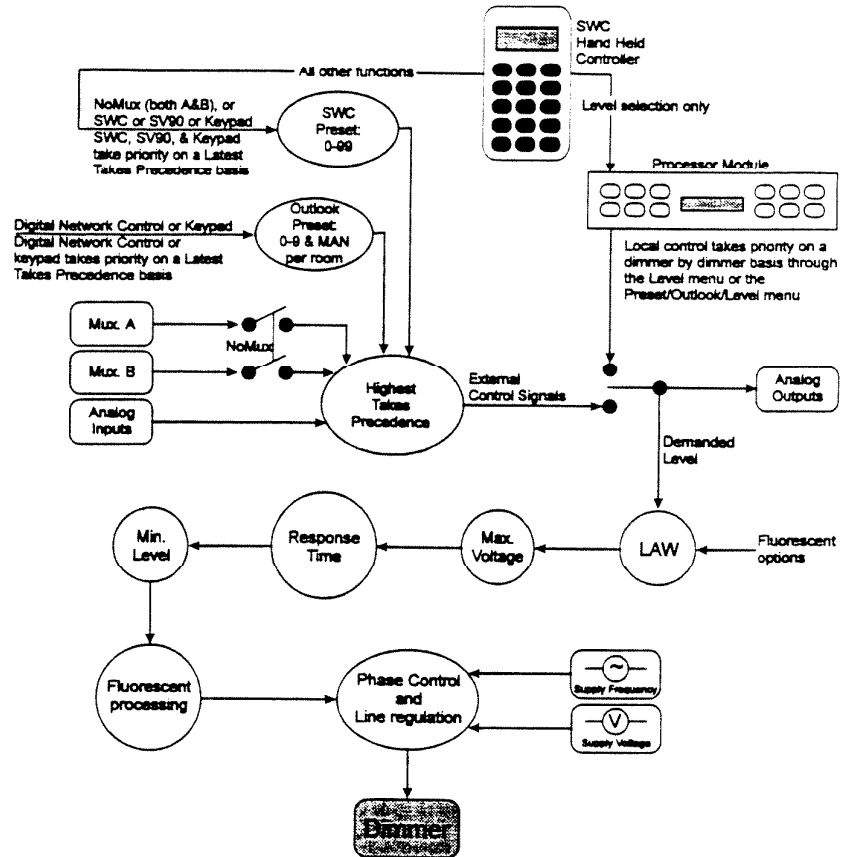


Figure 14. Control Signal Path Diagram

There are several important features of the above diagram:

1. The Outlook presets, SWC presets, Mux A, Mux B, and analog inputs are active on a highest takes precedence basis. You can have signals from all 5 sources contributing to the output.
2. If a NoMux preset is assigned, and your only source of levels is from the SWC presets, the system will fade to black if there is no Mux A or Mux B signal.
3. The local cabinet keypad overrides all external control signals.
4. The Analog outputs are independent of the law, max. voltage, response time, min level, and fluorescent functions. It is assumed that the external dimmer will perform these functions.
5. The cycle-by-cycle voltage and frequency compensation built into the system software.

Replacing Major Parts

Dimmers can easily be repaired in the field. The Digital Environ processor module is a field replaceable subassembly, though you must remove the front panel of the cabinet to replace it. You should not attempt to repair the processor module in the field.

Servicing Power Modules

Power modules can be serviced by turning power OFF to their cabinet and removing them from the cabinet. Power module components can easily be replaced in the field. To maximize SSR service life, use a heat transfer compound between the SSR and heat sink when replacing SSRs.

Warning



Always turn power to the cabinet OFF before removing or installing power modules.

Replacing the Processor Module

The processor module can be replaced or upgraded to new software in the field if necessary.

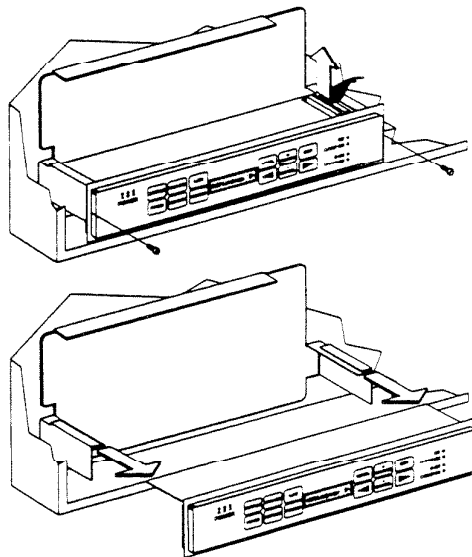
Removing the Processor Module

Warning



Always turn power to the cabinet OFF before removing or installing a processor module.

1. Turn power to the cabinet OFF.
2. Remove the hinged door and the front panel of the cabinet.
3. Remove two flat head screws on the front of the processor module.
4. Disconnect any analog wiring by unplugging the terminal strip from the processor module.
5. Slide the processor module straight out from the chassis about 3" (75mm), giving you enough space to disconnect the control signal cables, the 3-phase power cable, and the power block cables.
6. Note the positions of all connectors and disconnect them from the processor module.
7. Slide the processor module the rest of the way out of the cabinet.



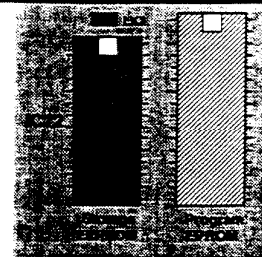
Reconfiguring the Processor Module

All programmable parameters are held in a non-volatile memory device (EEPROM), IC 12, on the Processor Unit PCB. Since this device is socketed, you can "transplant" it into an exchange unit and avoid reconfiguring the unit manually.

The memory device is Static Sensitive. Do not attempt removal and replacement without using proven anti-static precautions, such as an earthed wrist strap and earthed anti-static working surface. If you are in any doubt, do not proceed.

1. Ensure anti-static precautions have been taken.
2. Gently lever out EEPROM, IC12
3. Repeat above two steps with exchange unit.
4. Swap devices over. Make sure that the device is oriented correctly, see left.

Front of Processor Unit



The replacement unit will now have the "personality" of the previous one, and will require no setting up.

The operating program is stored in the EPROM, IC16 next to the EEPROM, IC12. You can upgrade the software by swapping this device. Refer to the Issue Notes supplied for any compatibility issues.

Replacing the Processor Module

Replacement of the processor module is the reverse of removal.

1. Carefully position the processor module in the guides and slide it halfway back into the cabinet.
2. Connect all cables except the analog inputs to the correct plugs.
3. Slide the processor module the remainder of the way into the cabinet and gently press it into the Distribution board connectors.
4. Connect any analog input connectors you removed.
5. Replace the two flat head screws on the front of the processor module.
6. Replace the front panel of the dimmer cabinet
7. Turn power to the cabinet back ON.

Isolating Parts

In case of failures in the system, you can expedite fault isolation by considering the following categories of malfunctions:

- Major system problems common to all dimmers or to a whole phase.
- Dimmer problems common to a single processor module.
- Dimmer problems not related by phase or processor module.

Establish fault location by interchanging processor modules or Power modules as required. You can swap modules between cabinets or within a cabinet. Correct the problem by module replacement once you have identified the defective component.

Warning



The dimmer cabinet must be powered down before removing or inserting processor modules. See under "Processor Module Replacement" earlier in this chapter for removal and installation procedures.

System Problems *None of the lights will come ON throughout the system.*

- Cabinet power is turned OFF.
- Cabinet is in OverTemp shutdown mode.
- If power is ON and no MUX OK light is ON in any cabinet the Mux cable is probably at fault. Check the connectors at each end, and, using a ohmmeter, check that the signal(s) and shield are not shorted. If they are not shorted, then the most likely cause is an open circuit somewhere along the line.
- Make sure that the Mux protocol has been selected correctly
- Make sure that the Mux start number and patch are correct

Some lights can't be turned off.

Since Digital Environ dimmers take their level control signal from multiple locations, you need to make sure that none of the control signals are present. Some possible control sources follow:

- The PANIC switch is ON.
- Presets are being called up from a handheld control or wall station.
- Dimmer level has been set from a handheld control or from the processor keyboard.
- The NoMux preset is being called up because the cabinets have not detected MUX (wiring fault etc.).
- A preset may be ON via the PRESET VIEW facility.
- MIN LEVEL may be set for a particular dimmer. There is no way to turn OFF a dimmer with a min level set.

If all control signals appear to be OFF the problem may be a bad SSR in a power module. Swap the power module or SSR to verify the problem.

The lights flash or become erratic. The MUX OK LED goes ON and OFF erratically.

This problem may be caused by one Mux signal wire being loose or disconnected. It is most often seen with DMX512 installations. Both DMX512 signal connections and ground (screen) must be connected to all dimmer cabinets and the control desk. A common installation fault with DMX512 is the reversal of the two signal connections, or a signal connection and screen. Check that all cables have the correct wiring.

An additional problem can be caused by either over terminating the line, or not terminating the line at all. Make sure that the cabinet farthest away from the console (and only this cabinet) is terminated. The termination jumpers are located at the top edge of the Distribution board.

- The termination jumper for Mux A is jumper LK3.
- The termination jumper for Mux B is jumper LK2.

The lights very occasionally flash or misbehave.

This may be caused by interaction with other systems. Try to isolate the occurrence of the problem and tie it in with activity in other parts of the building. Arc welding or unsuppressed motors (lifts etc.) can cause mains disturbances or corruption of control signals. The Digital Environ processor module is highly immune to such problems, but in extreme cases interference can occur.

If time is available, use the Level menu to set ALL dimmers to a given (low) level from the processor module keypad. This isolates the control signals and allows observation of the dimmers alone. If the problem still occurs, then it is a mains-borne interference. The solution will be to re-route the feeder cables to another supply (if at all possible), or suppress the offending equipment. If, however, the problem goes away, then it may be in the signal wiring (see above), the routing of the wiring (make sure it is not near noisy equipment), or a fault in the control desk.

The handheld control or wall station operates erratically.

The wiring between the dimmer cabinets and control system is similar to the handheld or wall station wiring. The same rules as above apply.

PANIC is not working.

- No DIP switches are in the "ON" position. Turn ON the appropriate DIP switches.
- Improper Panic station wiring. Check wiring from Panic station.

Cooling fan is not working.

- No dimmers are activated by a control station. Bring up at least one dimmer or turn the cooling fan ON.

Cannot control dimmers, but PANIC is working.

- Incorrectly seated processor module. Reseat the processor module.
- Possible bent pin on the processor module rear connectors if unit has been removed or replaced.
- Defective processor module. Replace the processor module.

Cannot control dimmers from a single control station.

- Incorrectly wired control station. Check wiring from control station to cabinet
- Defective control station. Swap control station with a known good control station to verify problem. Replace the defective station.
- Defective processor module. Replace the processor module.

One cabinet doesn't work properly, the others do.

This can be caused by the wiring faults as described above. It may also be caused by incorrect programming. It is quite easy to set a dimmer to a LEVEL from the keypad, and in so doing disable Mux control. The dimmer reverts to normal control at power up, thus power cycling is a quick way to check. Equally, setting the level from the keypad verifies electrical operation of the dimmer regardless of control system.

An extreme example of a wiring fault is a loose power connection to the cabinet. Loose neutral connections in particular cause havoc!

Some dimmers don't appear to work.

Use the LEVEL key to check dimmer operation.

- If the dimmer fails to work, and all load wiring and connected load has been tested, then the power module will require service.
- If the dimmer works from the keypad, but not from the control desk, check that the START NUMBER or PATCH are set correctly.

Check the dimmer patch in the control desk if applicable.

Make sure that the *Module Map* in the *Set menu is correct.

Lights don't appear to track each other in fades.

This can be caused by using different dimming curves on each dimmer or setting dimmers to different max. output voltages. The keypad can be used to set ALL dimmers in a cabinet to the same curve and voltage (see above) to rectify the problem.

Lights don't reach 100% intensity.

MaxVoltage is set incorrectly. Please see page 84 for how to change this setting.

Individual Dimmer Problems

Problems related to individual dimmers are due to one of the following:

- Dimmer Circuit Breaker is OFF
- Burned out lamp in fixture.
- Defective or disconnected load wiring.
- Defective dimmer (probably the SSR)
- Defective processor module (probably the output driver section)

Make sure that the problem is not in the load or load wiring by shifting the load to another dimmer.

Check for a bad dimmer by setting all panic enable switches OFF except for the suspect dimmer. Then enable panic. This puts 12VDC directly to the SSR input of the dimmer. If the dimmer stays OFF, it is probably bad.

Verify the bad power module by swapping it with an identical known good unit. If the problem moves, replace or repair the power module.

Make sure that all of the connectors between the dimmer cabinet and the processor module are seated correctly.

Check for a bent pin on the rear connectors of the processor module. Straighten if necessary.

Check for problems in any external analog circuitry by measuring the DC voltage from the suspected analog input to COM. When the dimmer is supposed to be at 100%, this voltage should be about +10VDC (subject to the calibration programmed for that input).

Fluorescent Dimmer Problems

Before trouble-shooting for specific troubles which may be encountered with fluorescent circuits, all other power module problem categories should be investigated.

Fluorescent lamps operate best when the dimmer response is set to "Slow" (see page 79).

For any additional information on fluorescent dimming, please refer to the Strand Lighting fact sheet *A Guide to Fluorescent Dimming*.

Parts Drawings

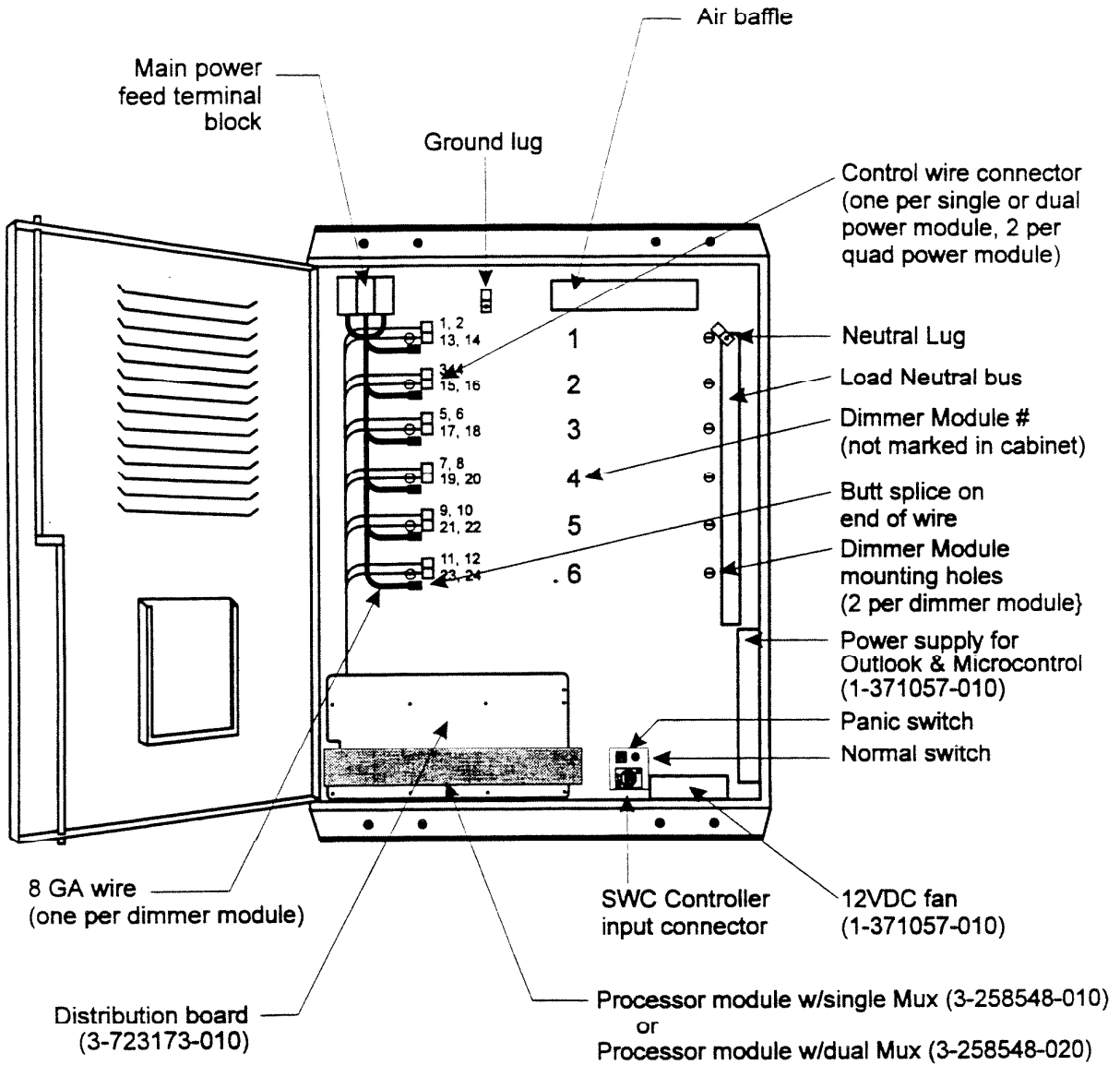


Figure 15. Digital Environ--Small Cabinet

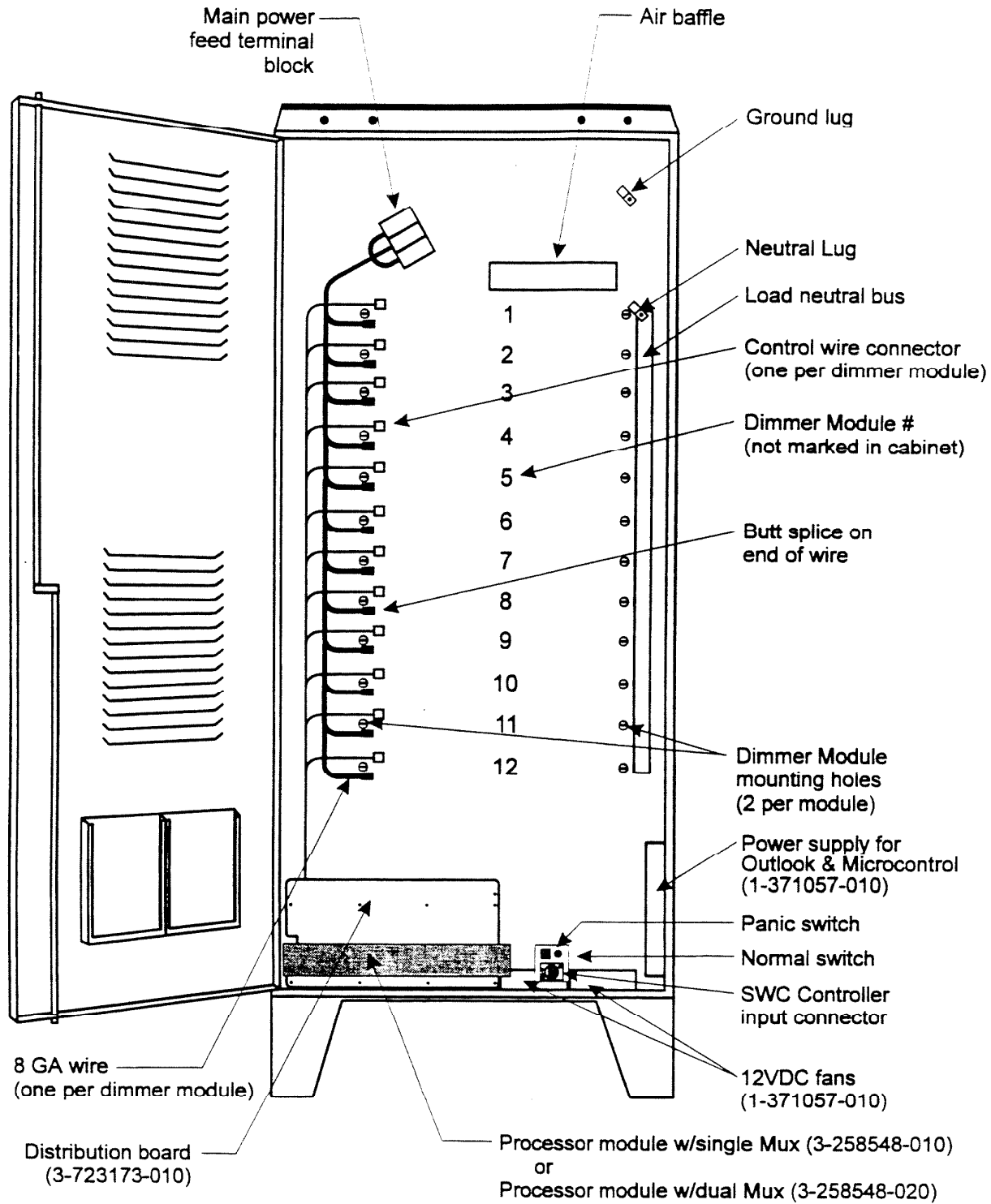


Figure 16. Digital Environ—Large Cabinet

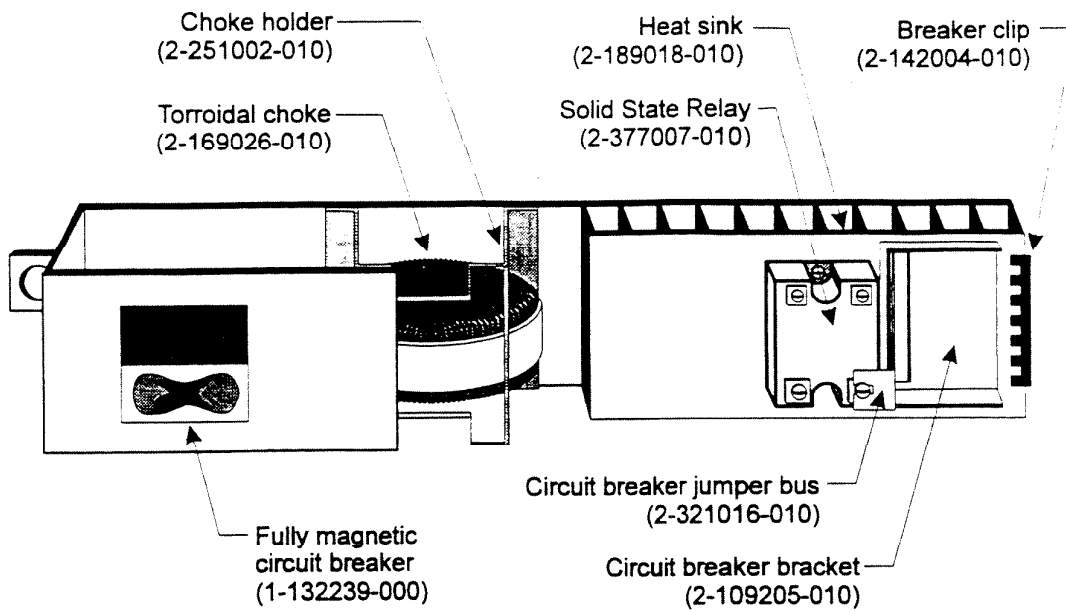


Figure 17. 6.0 Kw Power Module

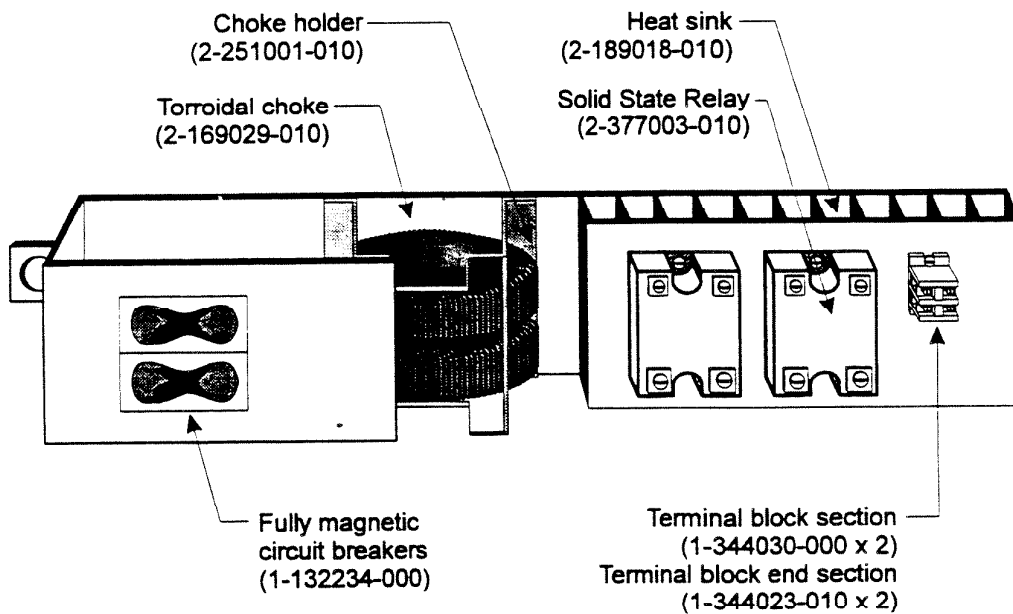


Figure 18. 2.4Kw Power Module

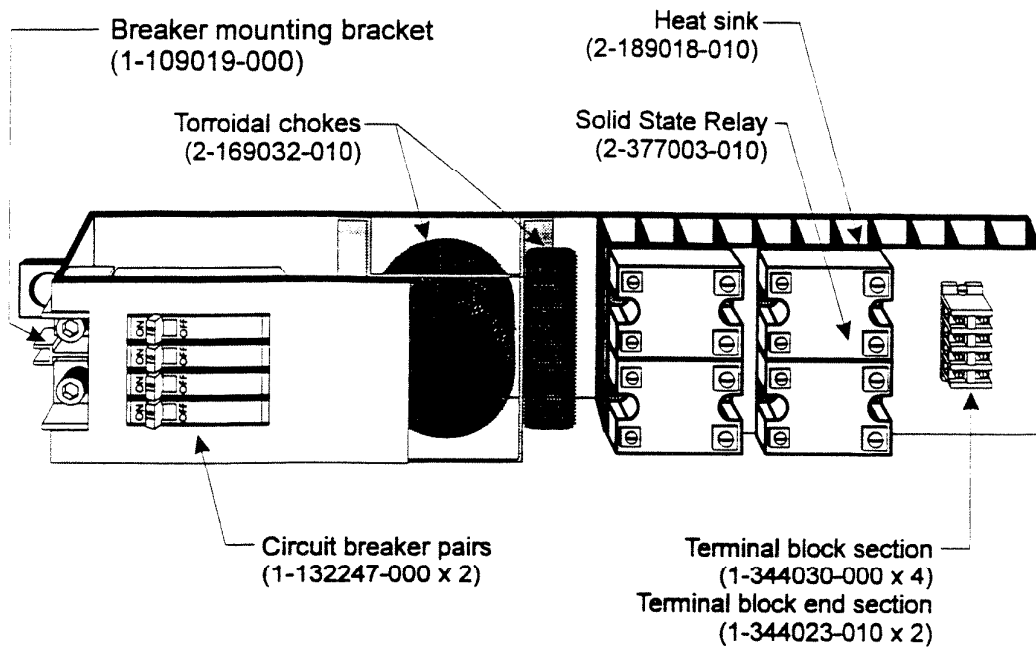


Figure 19. Quad Power Module

Periodic Maintenance

Periodic maintenance should be done every six (6) to twelve (12) months, depending on the environmental conditions. Although a detailed discussion of this procedure is beyond the scope of this manual, basic checklists are provided to show what is involved. Users wishing to do these procedures on their own should consult Strand Lighting Field Service.

1. Disconnect the dimmer cabinet from power or turn power to the dimmer cabinet OFF.
2. Inspect the dimmer cabinet for loose connections and build-up of dust which may impede air flow. Tighten any loose connections found at this time.
3. Vacuum out any excessive dust build-up in the dimmer cabinet while power to the cabinet is shut down.
4. Reconnect the cabinet, turn power to the system ON, and make sure all dimmers work correctly. Check the Panic switches in the cabinets to make sure they turn ON the selected dimmers.
5. Make certain that the fan(s) are operational. If not, trouble-shoot as necessary and replace or repair the defective fan or electronics.
6. Make certain that ventilation to the cabinet has not been blocked. Fully loaded dimmers produce 2%-4% of their rated capacity as waste heat while in operation. If the dimmer cabinet overheats, the OVERTEMP sensor will shut the system down, leaving all rooms controlled by the overheated cabinet in the dark.
7. Exercise all circuit breakers by turning them ON and OFF several times. The arc produced when the circuit breakers engage and disengage will clean corrosion and dust off of the contacts.

For best effect the lights for the dimmers should be ON when you do this.