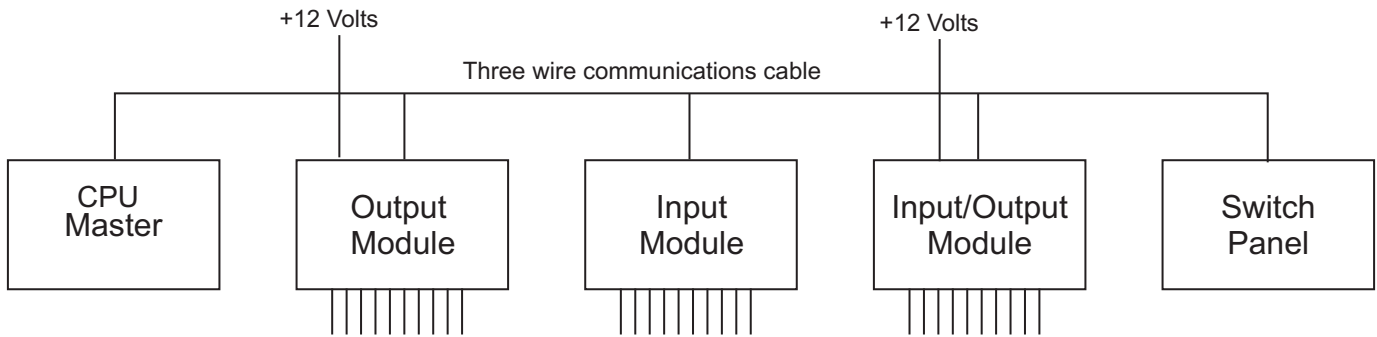


PMC/Multipoint Switching Systems

Post Delivery Trouble Shooting Guide

The PMC/Multiplex Switching Systems are different from conventional wiring systems, yet still fairly easy to trouble shoot, should the need arise. With these systems, the power is supplied to switching/output modules and controlled and distributed from them. The switching modules are signaled from the switch panels and/or the CPU (Central Processing Unit), instructing them to turn the loads on or off. **The following pages assume that the vehicle program, or Booleans have been tested and that the program has been downloaded to the CPU successfully.**



Typical System Configuration
Figure 1

Trouble shooting

IMPORTANT 1ST STEP

Many of the problems often associated with a Multiplex Systems are attributed to the battery being nearly dead, therefore the system is not performing as expected. **Before proceeding with any other diagnostic measure, check the condition of the battery by measuring the voltage on the system.** If the voltage is below 10 volts, or momentarily dips below 10 volts, recharge the battery. The voltage may measure greater than 10 volts and then dip below when loads are turned on. If this is the case, charge the battery. If the vehicle is a motor coach, connect the coach to shore power, or start the generator to be sure there is enough power for the loads. If the supply voltage is correct, define one of the following:

Symptoms

1. A single load is not operating properly.
2. All of the loads associated with a single output module are not functioning.
3. All outputs in the system are dead.
4. All outputs in the system are stuck ON.
5. None of the buttons or switches on a single switch panel operate.

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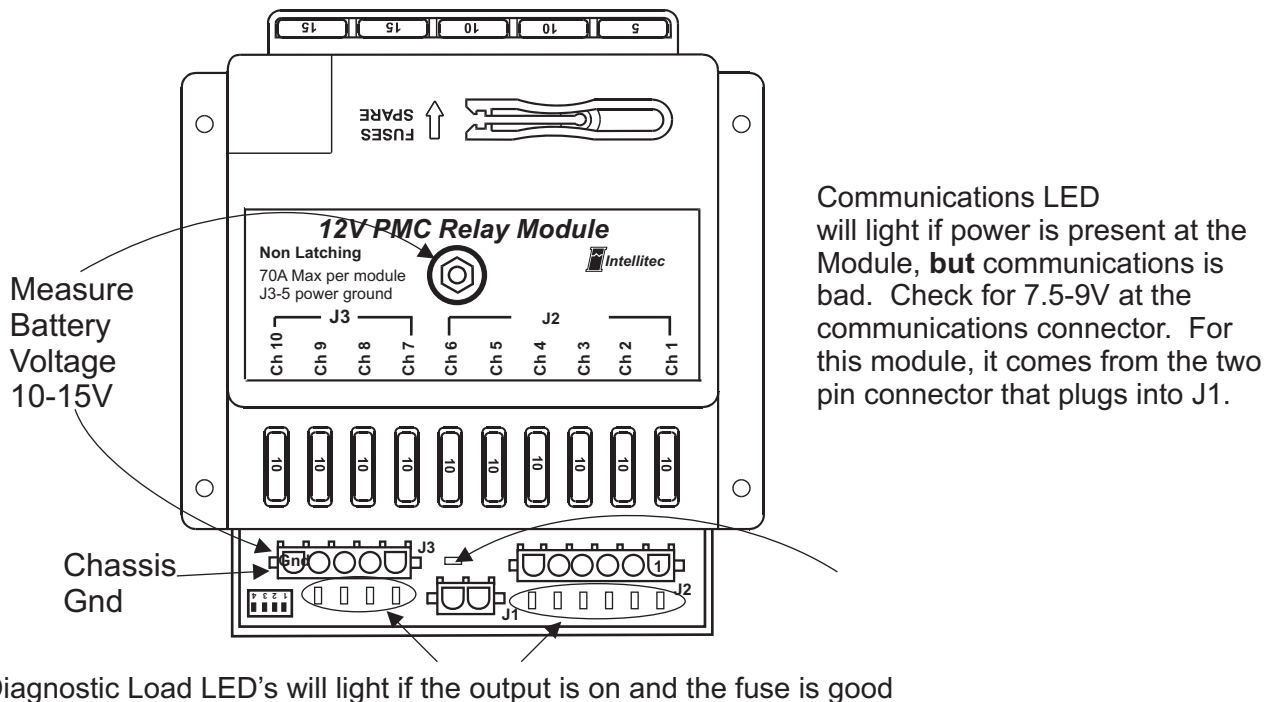


Figure 2

A SINGLE LOAD IS NOT OPERATING PROPERLY

If a single load is not operating properly, the first thing to do is to locate the Output Module feeding that load. Once located, observe the *green* diagnostic LED on the Module associated with that channel. Operate the switch to turn the load on and determine if the LED is on. (See figure 2) If it is ON, then the problem is with the load. Check the load and the wiring to it.

If the green LED is out, check the fuse associated with that load. This can be done with a test light or ohmmeter, or the fuse can be removed and checked visually. If the fuse is faulty, replace it and check for proper performance. If the fuse blows again, the problem is with the load or the wiring to it. Check both the load and the wiring to it and repair as necessary.

If the problem still exists, it may be with the switch panel and/or other inputs that are required by the programming. To determine if the switch panel is defective or whether inputs are present, a Module Simulator or a System Status Monitor (available from Intellitec) can be used to verify if the proper inputs are present. This requires knowledge of what inputs are needed to turn the output on. If the problem is still not corrected, assuming that the proper inputs are present, the problem may be with the Module. To check the Module, remove and replace it with another that is addressed with the same address as the one taken out. Depending upon the module, addresses are set with either a dip switch or jumpers.

Intellitec

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NONE OF THE LOADS OF ONE SWITCHING MODULE ARE PERFORMING PROPERLY OTHER MODULES are OK

If all of the loads on a switching Module are not performing properly, locate that Module and observe the Communications LED on that module. If the LED is out, check for 12 volt power on the power input stud located on the Module. If power is not available, locate the source of the power and correct the fault. Also check to be sure the Module has a good ground. This can be done by measuring the voltage on the ground pin of the Module relative to a known good ground. Consult the Module's data sheet to locate the ground pin. Data sheets are available at www.intellitecsve.com.

If this LED is ON, the Module is receiving power, but not receiving the communications signal. This problem can be caused by faulty wiring at the Module, at the point of signal origination, or points in between. To begin to localize the problem, using a voltmeter, measure the DC voltage between the communications signal wire and the signal ground wire. (Usually a two pin connector) This voltage should be approximately 7.0 to 9 volts DC. If it is not in this range, then the problem is with the wiring from the source of the signal. The problem might be either with the signal wire, or the signal ground wire. The source of this problem can be located using standard techniques to locate the fault. Substitution of the wires from the source to the output switch Module may help to verify that the module is operating properly and determine which wire is at fault.

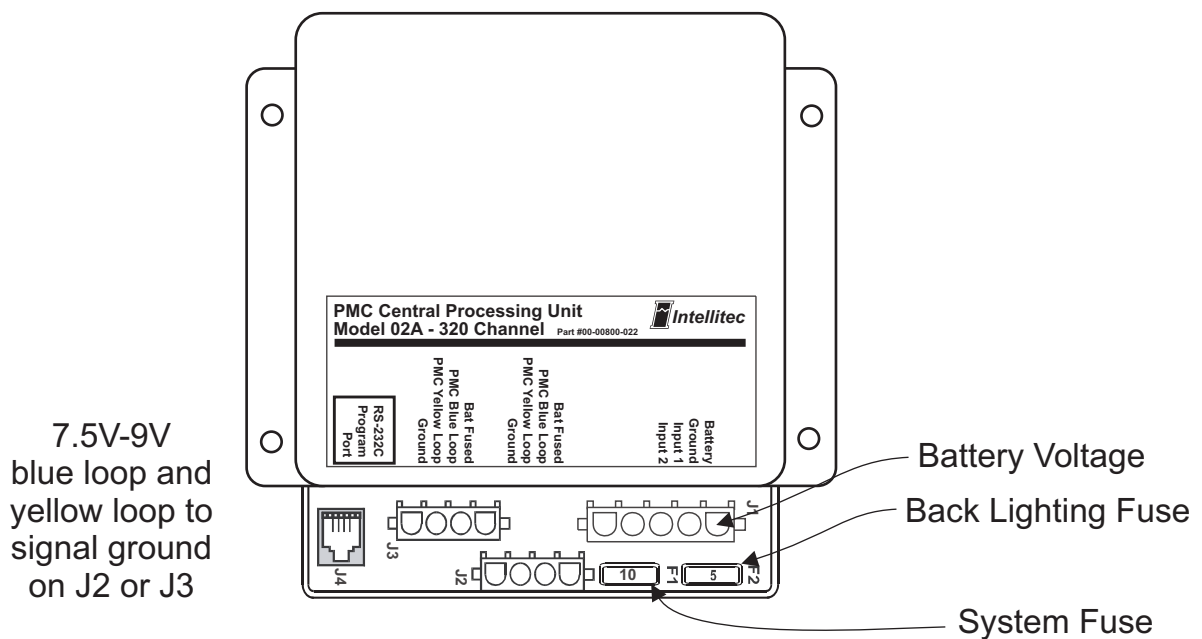


Figure 3

Data sheets are available at www.intellitecsve.com

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NONE OF THE SWITCHES OR BUTTONS OF ONE SWITCH PANEL WORK

Unplug the three-pin plug from the switch panel. Using a voltmeter, measure the voltage from pin 1 to pin 3. You should measure battery voltage. Measure the voltage from pin 2 to pin 3. You should measure the communication signal of 7.0-9 volts. If you do not, check the wiring. If you do, try replacing the switch panel. A push button switch panel that has not been programmed will not operate any of the outputs. (Push button switch panels must be programmed correctly at the factory) If you find that the push button switch panel operates the wrong functions, it is likely that the switch has been programmed with the wrong button allocations, or is the incorrect panel for that location. Rocker switch panels must have their address set correctly via the dip switch or jumpers.

ALL THE OUTPUTS OF THE SYSTEM ARE DEAD

If all the outputs of the system are dead, this indicates either the battery voltage may be low, or a problem with the communications wiring. **First, using a voltmeter, determine that power is being applied to all the Modules, and the system fuse (F1) and the fuse (F2) for back lighting on the CPU Module are good.** Check the voltage on the CPU Module to ensure that the 12 volt power to the Module is present and the 7.0-9V signal voltage is present. On the 160 channel CPU, the signal voltage is measured from pin 2 of the 3-pin connector to pin 3. On the 320 channel CPU, communications is measured on the 4-pin connectors from pin 2 to 4 and pin 3-4. If the signal voltage is not normal, *unplug all* the communications wires from the CPU and measure the power and signal voltages available at the CPU again. If the voltages on the communications plugs are still not normal with all the communications wires unplugged (12 volts for power and 7.0 to 9 volts for signal) and the fuses are good, replace the CPU module. Make sure that the replacement has been programmed.

If these voltages are normal, unplug the communications cables from all of the system Modules and reconnect them to the CPU. Measure the voltages at the CPU again. If the communications signal goes away, the communications wire in the harness is grounded and should be repaired. If you measure battery voltage on the communication wire, the harness is somehow connected to the battery; this fault should be corrected. In either case, communications is not working due to a problem in the harness.

If all the voltages check out, begin plugging the communications cables back into the Modules, one at a time, to determine which one loads the CPU. It is possible that one of the system modules is bad, or that one of the communications connectors to a module is pinned wrong. As you plug each Module in, you may notice that the system begins to work until the connector or module with the fault is plugged in. When the faulty Module or plug is identified, leave it disconnected and continue until all Modules are connected. It is likely that you will find that the system is functioning. Plug the suspect Module back in. If the system goes down, check the wiring at the plug to see if it is pinned wrong. If the wiring is ok, replace the faulty Module.

ONE OR NONE OF THE BUTTONS ON A SINGLE PUSH BUTTON SWITCH PANEL OPERATE THE LOADS

If one of the buttons on a single switch panel does not operate, a Module Simulator can be used to determine if the switch panel is putting out a signal. If it is not, replace the panel. If all of the buttons on a single switch panel do not operate, the wiring to the switch panel may be faulty. Check the voltages on the three wires to be sure the 12 volt supply, the signal voltage, and ground are present. If they are not, repair the wiring. If they are and the panel still doesn't work, replace the panel with one that has been programmed the same as the original. If the pushbutton panel operates the wrong loads, check the program in that panel.