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| Test Writer | | Kyle Harlow | | | | | |
| Test Case Name | | Backplane Integration Test | | | | Test ID# | B-IT-1 |
| Description | | Verify Voltage Outputs of Backplane and Connectivity of Power Board. Verify Voltage PWM of Backplane and Connectivity of Control Board | | | | Type | Black-Box |
| Test Information | | | | | | | |
| Name of Tester | |  | | | | Date |  |
| Hardware Version | | Backplane 1.0 | | | | Time |  |
| Setup | | Attach power supply, capable of providing up to 10A at 16V, to the high and ground terminals of the backplane. Set voltage output to 14.8V, the nominal voltage for the lithium ion batteries. Prepare multimeter to measure voltages up to 50V. Prepare oscilloscope to measure 5V PWM signals. Place Power Board in the Power Board slot on the Backplane. Place Control Board in the control board slot on the backplane. Connect USB to control board. Upload pwm output code. Set control board to send default 1.5ms PWM signals to all outputs. Turn on output of power supply. | | | | | |
| Step | Action | Expected Results | Pass | Fail | N/A | Comments | |
| 1 | Measure voltage output on the 5V output connector | Output measures 5.0V +/- 0.1V |  |  |  |  | |
| 2 | Measure voltage output on the 12V output connector | Output measures 12V +/- 0.1V |  |  |  |  | |
| 3 | Measure voltage output on the 19V output connector | Output measures 19V +/- 0.1V |  |  |  |  | |
| 4 | Measure voltage output on the 48V, 1A output connector | Output measures 48V +/- 3V |  |  |  |  | |
| 5 | Measure voltage output on the 48V, 0.5A output connector | Output measures 48V +/- 3V |  |  |  |  | |
| 6 | Turn off power supply. Set voltage output to 16V. Repeat tests 1-5. | Voltage outputs are within the same tolerance for the original test sequence |  |  |  |  | |
| 7 | Turn off power supply. Set voltage output to 12.5V. Repeat tests 1-5. | Voltage outputs are within the same tolerance for the original test sequence |  |  |  |  | |
| 8 | Measure voltage output on the 14.8V output connector | Output measures 14.8V +/- 2.8V |  |  |  |  | |
| 9 | Enable PWM (see code header main.h for control strings) | None |  |  |  |  | |
| 10 | Measure outputs of PWM (1-8) Header | Output measures PWM 1.5+/-0.02ms pulse width per header |  |  |  |  | |
| 11 | Turn off and disconnect power supply from the board. Turn off multimeter.  Remove Power Board from slot. Reset Control Board.Remove Control Board from slot. | None |  |  |  |  | |
| Overall Results | | |  |  |  |  | |