boxcom howto

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1 USB board

1.1 The front panel switch

Figure 1 shows how the front panel power switch should be wired.

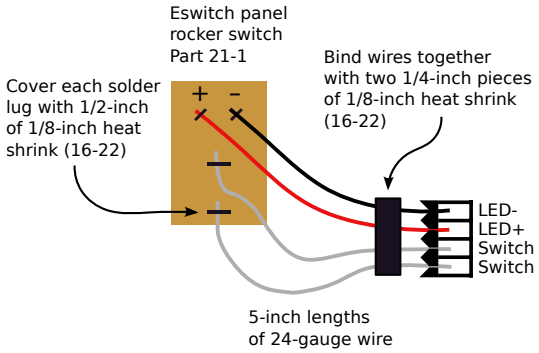

Figure 1: Panel switch wiring

1.2 Board checkout

1.2.1 Voltage rails

Use table 1 to keep track of voltage rails.

Net name	Test points	Acceptable	Actual
V_{bus}	TP100 vs. TP101	4.5V → 5.5V	
$+3.3V_{aux}$	TP400 vs. TP401	3.14V → 3.45V	
$+3.3V_{mon}$	TP500 vs. TP401	3.14V → 3.45V	

Table 1: Voltage rail checkout table for the USB board.

1.2.2 Current monitor

The current monitor output at J500 will have a fixed DC output, since the voltage regulator following it always draws at least 1mA. As illustrated in figure 2, the slope set in hardware should give $\Delta V_{out} = 1V$ for each additional 10mA of current draw from J501. Since the voltage output from J501 is controlled at 3.3V, a test load of 3.3kΩ should increase the voltage at J500 by 100mV.

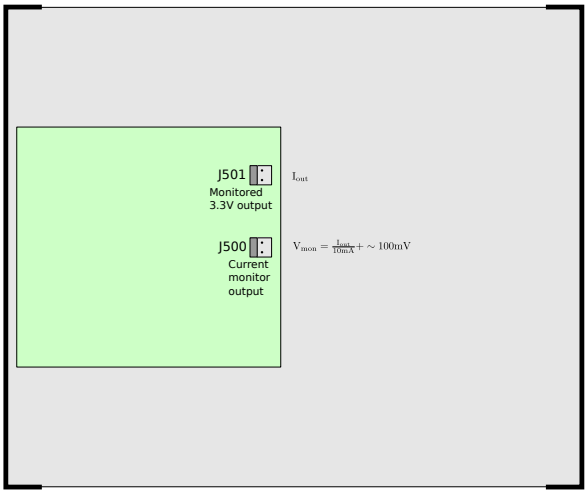

Figure 2: The output connectors used during the current monitor test.

Load applied to J501	Acceptable V_{out} at J500	Measured V_{out} at J500
Open	90mV → 110mV	$V_{out,o}$ =
3.3kΩ	$V_{out,o}$ + 100mV	

Table 2: Passing voltage measurements for the current monitor test.

1.2.3 Serial loopback

The serial loopback test is a basic test of the USB/serial interface and the RS-232 transceiver. Make the breakout cable shown in figure 3, then make connections to the board as shown in figure 4.

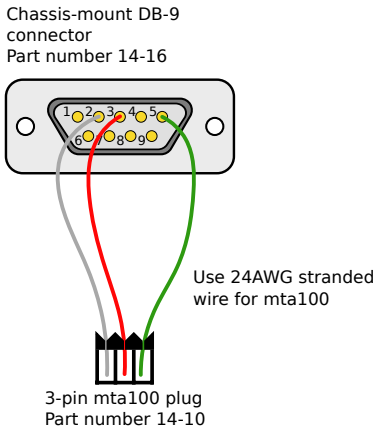

Figure 3: Wiring the DB9 breakout cable for the serial loopback test.

The serial loopback test script is:

`boxcom/implement/data/scripts/tty_loopback.py`

...and the test should pass at the speed listed in table 3.

Minimum passing baud	Measured passing baud
115200	

Table 3: Passing baud measurement for the serial loopback test. The usb board should be able to reliably pass the loopback test for data flowing in both directions at the minimum baud.

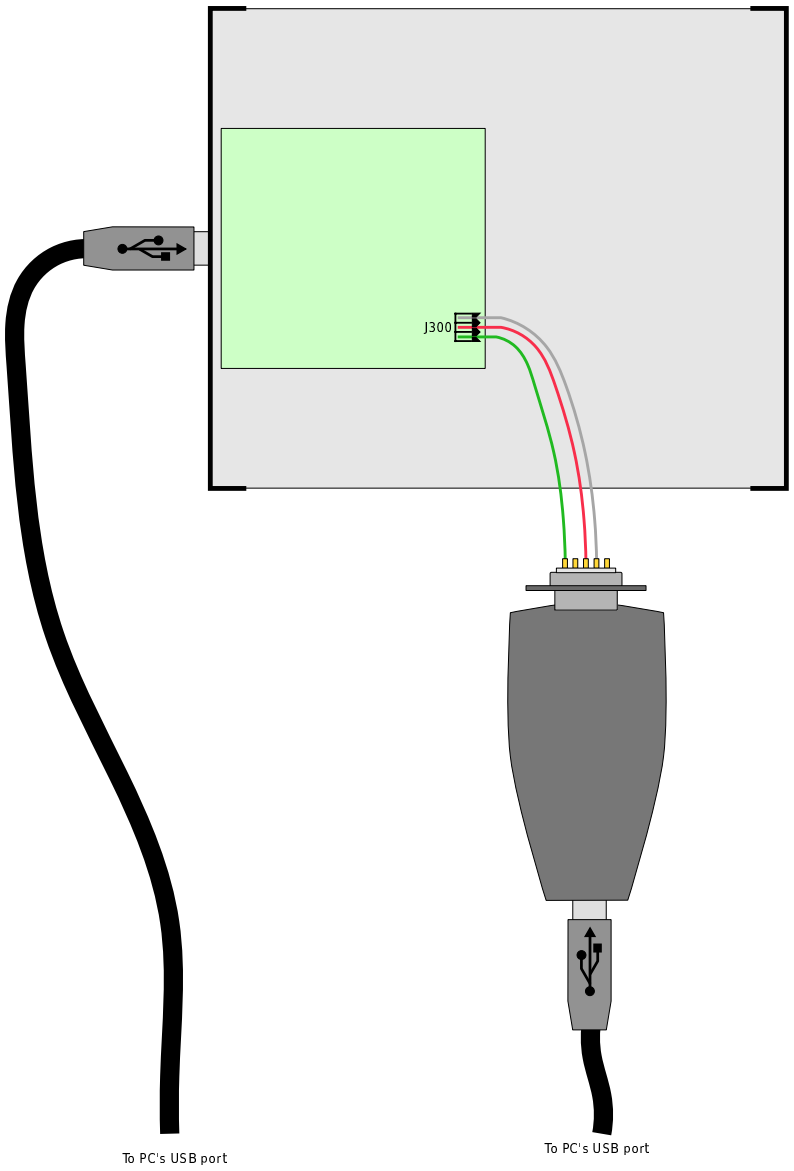

Figure 4: The setup for the serial loopback test.

2 Butterfly board

2.1 Making connections

Figure 5 shows the connections that should be made to the Butterfly board.

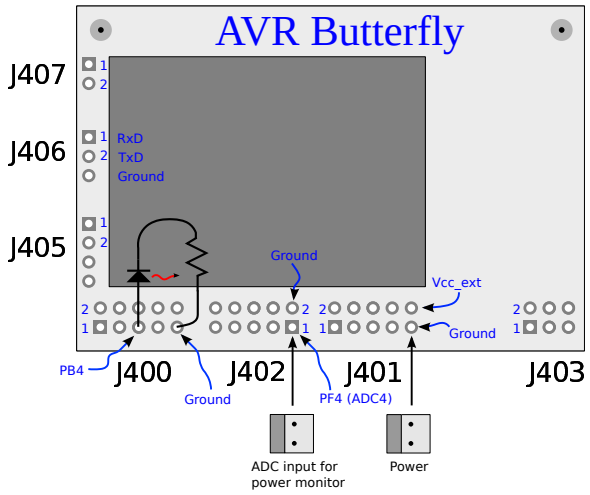

Figure 5: Connections to the AVR Butterfly

Figure 6 shows how the UART cable should be made.

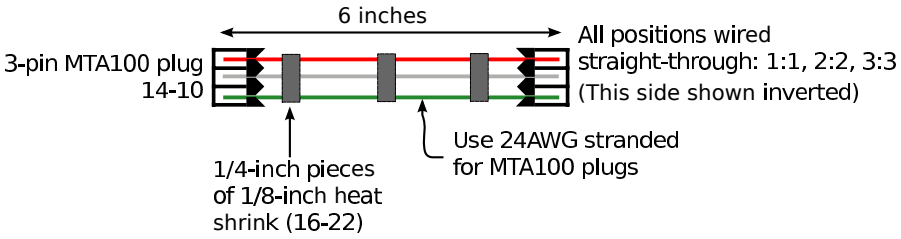

Figure 6: The UART cable connecting the Butterfly and USB boards.

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