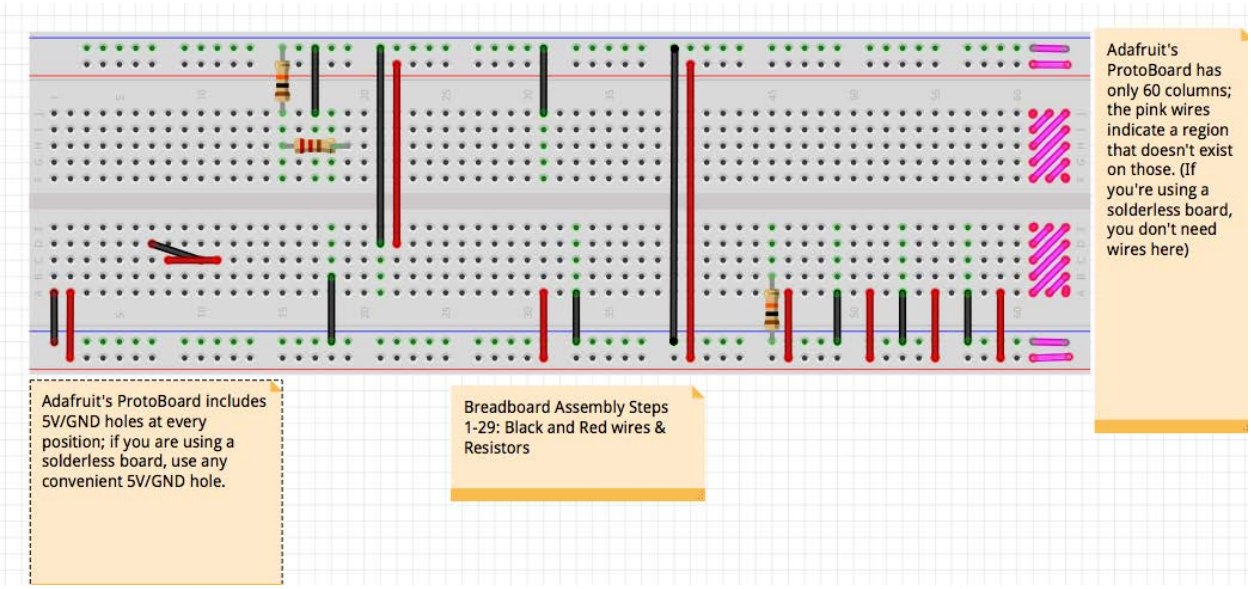
Step#	Component	From	To	Purpose	
Black & Red wires					
1	Black wire	A1	---	A4988 ground	
2	Black wire	D7	C10	A4988 Vmot-	
3	Black wire	B18	---	Laser power ground	
4	Black wire	J17	---	MOSFET source ground	
5	Black wire	D21	--- (top)	Slip ring ground	
6	Black wire	J31	---	Arduino ground (redundant)	
7	Black wire	A33	---	Arduino ground	
8	Black wire	--- 39	--- 39 (top)	connect both ground busses	
9	Black wire	A49	---	Trimpot 1 ground	
10	Black wire	A53	---	Trimpot 2 ground	
11	Black wire	A57	---	Trimpot 3 ground	
12	Red wire	A2	+++	A4988 +5V	
13	Red wire	C8	C11	A4988 Vmot+	
14	Red wire	D22	+++ (top)	Slip ring +5V	
15	Red wire	A31	+++	Arduino +5V	
16	Red wire	+++ 40	+++ 40 (top)	connect both +5V busses	
17	Red wire	A46	+++	CdS cell +5V	
18	Red wire	A51	+++	Trimpot 1 +5V	
19	Red wire	A55	+++	Trimpot 2 +5V	
20	Red wire	A59	+++	Trimpot 3 +5V	
Resistors					
21	Resistor 10kΩ	J15	---	MOSFET gate Grnd ensure full shutoff	brown-black-orange
22	Resistor 220Ω	H15	H18	MOSFET gate current limit	red-red-brown
23	Resistor 10kΩ	B45	---	CdS cell ground	brown-black-orange

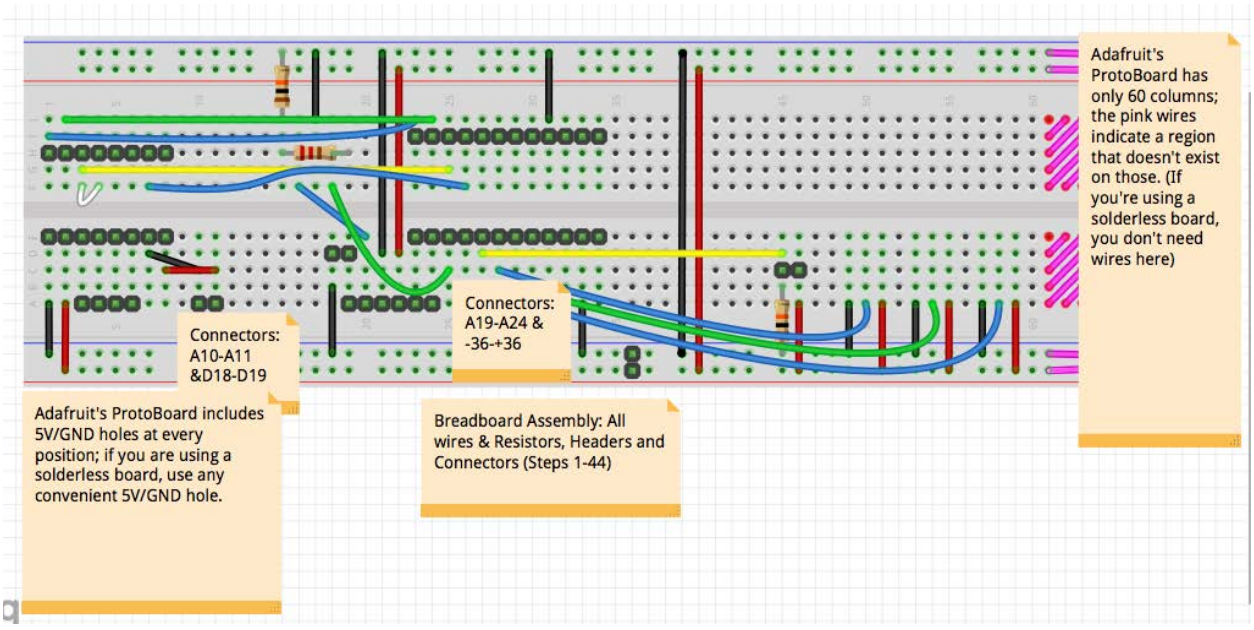


Connectors & Headers

24	XH2.54-2 pin connector	A10	A11	A4988 Vmot +12V connection
25	XH2.54-2 pin connector	D18	D19	Laser power +3.3V connection
26	XH2.54-6 pin connector	A19	A24	Slip ring connection
27	XH2.54-2 pin connector	--- 36	+++ 36 (bottom) Vcc(logic) +5.0Vconnection	
28	2.54mm 4-pin male header	A3	A6	Stepper motor connector
29	2.54mm 2-pin male header	C45	C46	CdS cell connection
30	2.54mm 8-pin female header	E1	E8	A4988 socket (lower)
31	2.54mm 8-pin female header	H1	H8	A4988 socket(upper)
32	2.54mm 12-pin female header	E23	E34	Arduino socket (lower)
33	2.54mm 12-pin female header	I23	I34	Arduino socket (upper)

Signal Wires

34	Blue wire	I1	J23	A4988 DIR from Arduino D9
35	Green wire	J2	J24	A4988 STEP from Arduino D8
36	White wire	F3	F4	A4988 RESET (from SLEEP)
37	Yellow wire	G3	G25	A4988 SLEEP from Arduino D7
38	Blue wire	F7	F26	A4988 MS1 from Arduino D6
39	Blue wire	F16	E20	MOSFET Drain from Slip ring (brown)
40	Green wire	F18	C25	MOSFET Gate from Arduino D14 (laser power control)
41	Yellow wire	D27	D45	Arduino A0 from CdS
42	Blue wire	C28	A50	Arduino A1 from Trimpot 1 sweep
43	Green wire	B29	A54	Arduino A2 from Trimpot 2 sweep
44	Blue wire	A30	A58	Arduino A3 from Trimpot 3 sweep



Discrete Components

45	Trimpot 1	D49	D51	light level control
46	Trimpot 2	D53	D55	stepper speed
47	Trimpot 3	D57	D59	servo range
48	Capacitor 100µF electrolytic	E10	E11	A4988 Vmot spike absorber
49	MOSFET RFP30N06LE w/ heat sink	I15	I17	Control laser diode