

Roboduino™ Manual (#ci0245 kit, #ci0246 pre-assembled)

The Roboduino™ is an arduino-compatible microcontroller board designed for robotics. It has headers that make it convenient to attach battery packs, servos, sensors and serial devices.

Specs:

- 100% arduino-software compatible (inside header pins rows also match)
- 6 pwm outs with neighboring unregulated power straight from battery
- 6 analog ins and 14 digital I/O pins (including pwms) with neighboring power and gnd pins
- dedicated 3 pin UART and Power-In headers
- 3A continuous to pwm power pins (5A v1.17 and higher)
- USB power to 500mA

Building the Kit: (If you bought a pre-built version, skip ahead to “Software”.)

Use the following table to place and solder components, including the 28 position socket for the ATMEGA168 IC. If anything is missing or damaged, email support@curiousinventor.com for replacements.

Roboduino v1.15 -v1.18 parts list

qty	marker	description
1	IC1	FT232RL (pre-installed)
1	Vin	2.1mmx5.5mm power jack, fat legs
1	IC2 preinstalled	5V reg. DPAK LDO (pre-installed)
1	D1	schottky, 1A
1	F1 (rectangle below c10)	60V .4A Resettable PTC fuse (yellow)
1	Q1	16MHz crystal
1	RESET	6x6 flat tactile switch, thru hole
2	C6, C7 (330uF in v1.18)	330uF cap, (47uF on previous versions)
1		USB female type B
1	R1	10k 1/4 W, short body (brown black orange)
2	R2,R3 – not included, add for pull-up I2C communication	4.7K 1/4 short body
5	R7, R9, R10, R11, R12	1k 1/4 short body (brown black red)
1	R8	330 ohms, 1/4W short body (orange orange brown)
1	Install 28 pin socket first	ATMEGA168
8	all except 22pF spots	.1uF caps, 5mm lead spacing
2	C2, C3	22pF
1	ATMEGA168	28 pin .3 IC socket
3	By digital pins	1x8 header
3	By digital pins	1x5 header
4	By RX/TX, USB, Vin, and AREF	1x3 header
1	ICSP	2x3 for ISP
6	By Analog and reset pins	1x6 header
1	covers 2 of the three pins near the USB connector. Closer to USB means powered by USB, closer to barrel jack powers board from power.	jumper shunt
2	RX and 13 (note: longer lead goes into round side, or the side closest to the ATMEGA168)	3mm led red
2	PWR and TX (or how you like)	3mm led green
1		pcb
1	C11 (on bottom) (pre-installed)	.1uF cap 1206

Software:

Go to <http://arduino.cc/en/Guide/HomePage> to download the arduino software and USB drivers. Instructions on that site will guide you through installation on your particular OS.

- Start the arduino program, plug in the USB cable, and select USB power by making sure the jumper /shunt bridges the two pins closest to the USB jack.
- Select the correct serial port through Tools → Serial Port → <your port>. See the arduino site for tips on which port to choose.
- Select Tools → Board → Arduino Diecimila
- Open a LED blink example program through File → Sketchbook → Examples → digital → blink.
- Upload the program (right arrow button). This also compiles the code. You should see a LED blink on and off each second.

To use servos, you need to add external power through the barrel jack or power header. Make sure the voltage is appropriate for your servos (typically around 6V).

- Plug a servo in PWM.
- Load: File → Sketchbook → Examples → Library-servo → sweep
- Upload the program.

A note about servos and the built-in Servo library: Only pins PWM 9 and PWM 10 work with the Servo Library, which utilizes the 16 bit Timer1 on the ATMEGA168. You can use more servos with a software library: <http://www.arduino.cc/playground/ComponentLib/Servo> (less precise 8 bit timers). The Digital pins marked PWM have power straight from the battery, whereas other digitals have neighboring 5V.

