

## Light Play Arduino firmware commands for use with iPad

Version 0.2 of the Light Play hardware can control 3 rainbow lights and 1 motor. The board has two inputs for resistive sensors.

### Light Commands

**set** [all lights, light 1, light 2, light 3] **color to** [12-bit RGBW values]  
**off** [all lights, light 1, light 2, light 3]  
**fade** [all lights, light 1, light 2, light 3] **to** [12-bit RGBW values]  
**fade out** [all lights, light 1, light 2, light 3]  
**set brightness** [all lights, light 1, light 2, light 3] [8-bit value]  
**set fade speed** [8-bit value]

### Motor Commands

**on thisway**  
**on thatway**  
**off**  
**set motor speed** [8-bit value]

## Byte Codes

All light and motor commands are encoded in a single byte sent from Scratch to Arduino, according to the following scheme:

### Command format

[u u u x x y y y]

upper bits set command type:

001 = motor commands

010 = light commands

011 = other

### light commands

[0 1 0 x x y y y]

the x bits select which light:

0 0 = all lights

0 1 = light 1

1 0 = light 2

1 1 = light 3

the y bits select which light command:

0 0 0 = **set lightcolor to (RGBW values follow in next 8 bytes)**

0 0 1 = **turn off light**

0 1 0 = **fade lightcolor to (RGBW values follow in next 8 bytes)**

0 1 1 = **fade out light**

1 0 0 = **set brightness (divisor value follows in next byte)**

1 0 1 = **set fade speed (value in seconds follows in next byte)**

## Motor commands

[0 0 1 x x y y]

the x bits are set to zero (it's important to avoid sending byte 0x2B, which is ASCII '+', since this is used by the Adafruit BTLE UART to switch to command mode)

the y bits select which motor command:

0 0 0 = **turn on motor thisway**

0 0 1 = **turn on motor thatway**

0 1 0 = **motor off**

0 1 1 = **set motor speed (value follows in next byte)**

## Other commands

### *reset state variables*

[0 1 1 0 0 0 0]

### *stopfades (not in current use by iPad software)*

[0 1 1 x x 0 0 1] - **interrupt a light that is fading**

the x bits select which light:

0 0 = all lights

0 1 = light 1

1 0 = light 2

1 1 = light 3

### *report version number*

[0 1 1 0 0 0 1 0] - **send firmware version number**

(version number is X.Y format with X given by high nibble and Y given by low nibble)

## Sensor and fadedone reporting

Arduino streams sensor values at ~ 20 Hz using the following protocol: Transmitted bytes in the range 0-100 contain the value of sensor0 on a 0-100 scale. Transmitted bytes in the range 101-201 contain the value of sensor1 on a 0-100 scale. Transmitted bytes 253,254,255 indicate fade done on channels 1,2,3 respectively. Transmitted bytes 249,250,251 indicate fade interrupted on channels 1,2,3 respectively.