



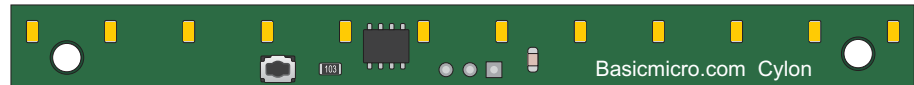
# BASIC MICRO

TECHNOLOGY AT WORK

B0019 - Cylon LED Display  
Data Sheet

## Feature Overview

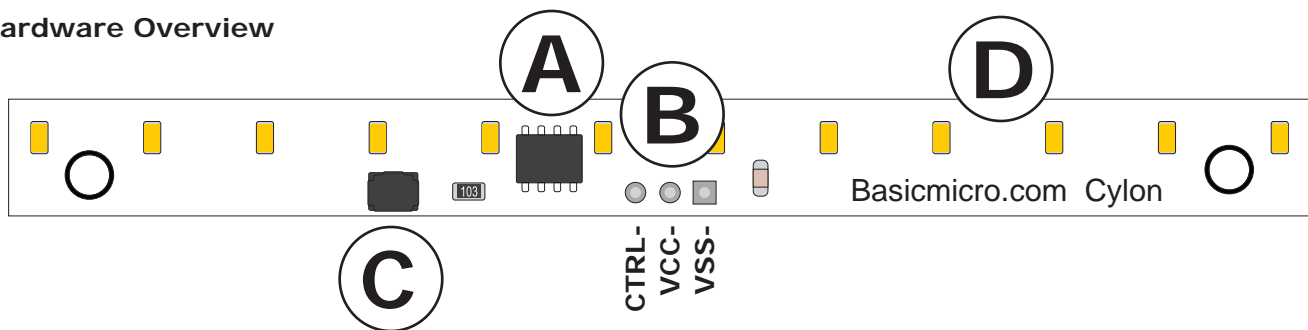
- Serial Mode
- TTL Input
- Can be Bussed
- Hobby RC Radio Compatible
- Comes in Red, Green or Blue LEDs
- 10 Pre-programmed Led Patterns
- Speed of Each Pattern is Programmable



## Basic Description

The Cylon LED Display is a 12 LED light sequencer with built in patterns. The Cylon can be controlled from a standard hobby RC receiver or a microcontroller using serial mode. In RC mode you can set the pattern displayed with the mode button. Each pattern has 4 speed settings. In this mode when a servo pulse is detected from the hobby radio controller the selected LED pattern will light. In serial mode, patterns and pattern speeds can be changed at will.

## Hardware Overview

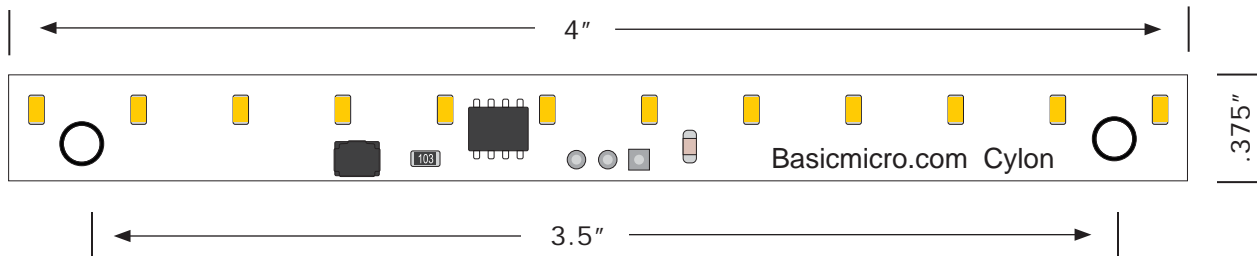


- A:** Microcontroller
- B:** Control header VSS, VCC and CTRL
- C:** Mode Button
- D:** LEDs

## Pin Name Assignment Overview

Pin Name	Description
VSS	Ground (GND)
VCC	Regulated 5VDC input.
CTRL	Control pin. Bidirectional I/O. Baud i38400. (Pin is floating)

## Mechanical Dimensions



Length: 4"

Width: 0.375"

Center to Center Mount Holes: 3.5"

Mount Hole Diameter: 0.125"

### Connections

The 3 pin header J1 is setup to be pin compatible with a standard servo connection VSS, VCC and CTRL. The 3 pin cable is included and comes attached. You can remove this cable and use your own.

### Patterns

The Cylon LED Display has 10 available patterns. The control button is used to change the pattern that is displayed by default. Each pattern has 4 speed settings. Once a new pattern is displayed it starts at normal speed. Pressing the control button 3 more times increases the pattern's speed. After 3 presses the next pattern is displayed. After a power cycle the last selected pattern is displayed.

### Modes

The Cylon has 2 different control modes. You can control the Cylon from a hobby radio receiver, high/low TTL from a microcontroller or serially.

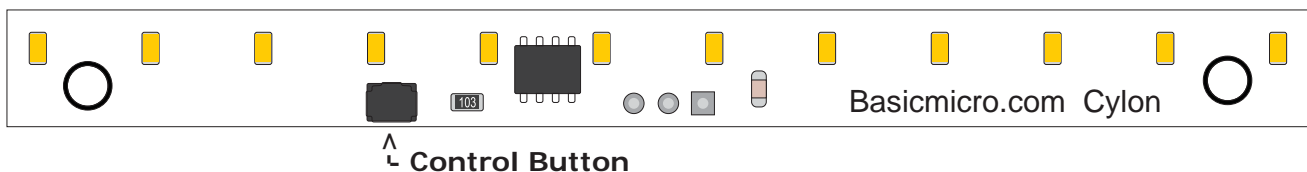
#### Mode 1

RC - The Cylon can be controlled from a standard hobby radio receiver or microcontroller using a TTL high / low signal in this mode. Servo pulses from 1.6ms to 2.5ms will turn the Cylon on. Servo pulses from .5ms to 1.5ms will turn the Cylon off.

#### Mode 2

Serial - A simple serial data format. The baud rate is 115200. The Cylons patterns and speeds can be controlled from a microcontroller in mode 2. The Cylon can be bussed which allows one I/O pin to control several displays.

All running patterns use mode 1. To serially control the Cylon LED Display you will need to switch it to mode 2. Connect the CTRL line to 5VDC (TTL High) this will turn the display on and start running the last selected pattern. Press the control button until the display stops. This will take about 40 presses. Once the display stops running it is now in mode 2 and awaits a serial command.



## Mode 2 Serial

Mode 2 consist of a simple serial communication format. The Cylon is set to a baud rate of 38400. If you are using a digital I/O pin from a microcontroller you would use inverted serial (i38400).

Controlling the Cylon from an I/O pin is very simple. The following code snippet will turn the first pattern on using P0 of the BasicATOM:

```
Serout P0, i38400, ["#A15",13] ;Display pattern 1
```

The pound (#) symbol from "#A15" is used to tell the Cylon to pay attention to the next command. The "A" is the default address for the Cylon. "1" tells the Cylon we want the first pattern on. The 5 in the string tells the Cylon we want a speed of 5 out of 0 to 9 and A to F. 13 is a standard carriage return and is used to tell the Cylon to execute the command string we just sent. If a carriage return is not received the Cylon will not execute the command string. In buss mode you can send several strings to several displays and execute all of them at the same time by send one carriage return (13).

## Bussed Cylon

You can run several Cylon's from one I/O. Each Cylon is addressable and ships with the default address "A". In order to buss the Cylon you will need to connect each one individually and set its address to something unique. The address range is anything from 0 to 255. The simplest method is to use a character such as A to Z. The following code will set the address using an BasicATOM, BasicATOM Pro or Nano with Basic Micro Studio terminal window.

```
;Reprograms the address of any Basic Micro serial devices

Temp Var Byte

Main
  Pause 500
  Serout s_out, i9600, ["Input New Address A to Z: "]
  Serin s_in, i9600, [Temp]
  serout s_out, i9600, [13, "Setting New Address to: ", Temp]
  Pause 100
  Serout P0, i38400, ["#", Temp, "S"]
  Pause 1000 ;Need time to save the new address
  Gosub Test
Goto Main

Test
  Serout s_out, i9600, [13, "Testing Address: ", Temp, 13, 13]
  Serout P0, i38400, ["#", Temp, "1",13]
  Pause 500
  Serout P0, i38400, ["#", Temp, "0",13]
  Pause 500
Return
```

### Example Program

The sample code below will cycle through all the patterns displaying each for 5 seconds including turning the display off for 5 seconds. Set terminal window to a baud rate of 38400.

```
Main
  Pause 500
  Serout s_out, i38400, [0, "Pattern: 1 Running",13]
  Serout P0, i38400, ["#A15",13] ;Display pattern 1
  Pause 5000

  Serout s_out, i38400, ["Pattern: 2 Running",13]
  Serout P0, i38400, ["#A25",13] ;Display pattern 2
  Pause 5000

  Serout s_out, i38400, ["Pattern: 3 Running",13]
  Serout P0, i38400, ["#A35",13] ;Display pattern 3
  Pause 5000

  Serout s_out, i38400, ["Pattern: 4 Running",13]
  Serout P0, i38400, ["#A45",13] ;Display pattern 4
  Pause 5000

  Serout s_out, i38400, ["Pattern: 5 Running",13]
  Serout P0, i38400, ["#A55",13] ;Display pattern 5
  Pause 5000

  Serout s_out, i38400, ["Pattern: 6 Running",13]
  Serout P0, i38400, ["#A65",13] ;Display pattern 6
  Pause 5000

  Serout s_out, i38400, ["Pattern: 7 Running",13]
  Serout P0, i38400, ["#A75",13] ;Display pattern 7
  Pause 5000

  Serout s_out, i38400, ["Pattern: 8 Running",13]
  Serout P0, i38400, ["#A85",13] ;Display pattern 8
  Pause 5000

  Serout s_out, i38400, ["Pattern: 9 Running",13]
  Serout P0, i38400, ["#A95",13] ;Display pattern 9
  Pause 5000

  Serout s_out, i38400, ["Pattern: 10 Running",13]
  Serout P0, i38400, ["#AA5",13] ;Display pattern 10
  Pause 5000

  Serout s_out, i38400, ["Display Off",13]
  Serout P0, i38400, ["#A00",13] ;Display off
  Pause 5000
Goto Main
```

**Electrical Characteristics**

<b>Characteristic</b>	<b>Value (Units)</b>
<b>VCC Range (min - max)</b>	4 - 6VDC
<b>Current Draw (Idle)</b>	20 mA
<b>Current Draw (maximum)</b>	80 mA
<b>I/O Voltages (Low / High)</b>	0.0 V / 5.0V
<b>I/O Logic</b>	TTL
<b>Tempature Range</b>	-40 to +125 C

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**Contacts**

Email: [sales@basicmicro.com](mailto:sales@basicmicro.com)  
Tech support: [support@basicmicro.com](mailto:support@basicmicro.com)  
Web: <http://www.basicmicro.com>

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