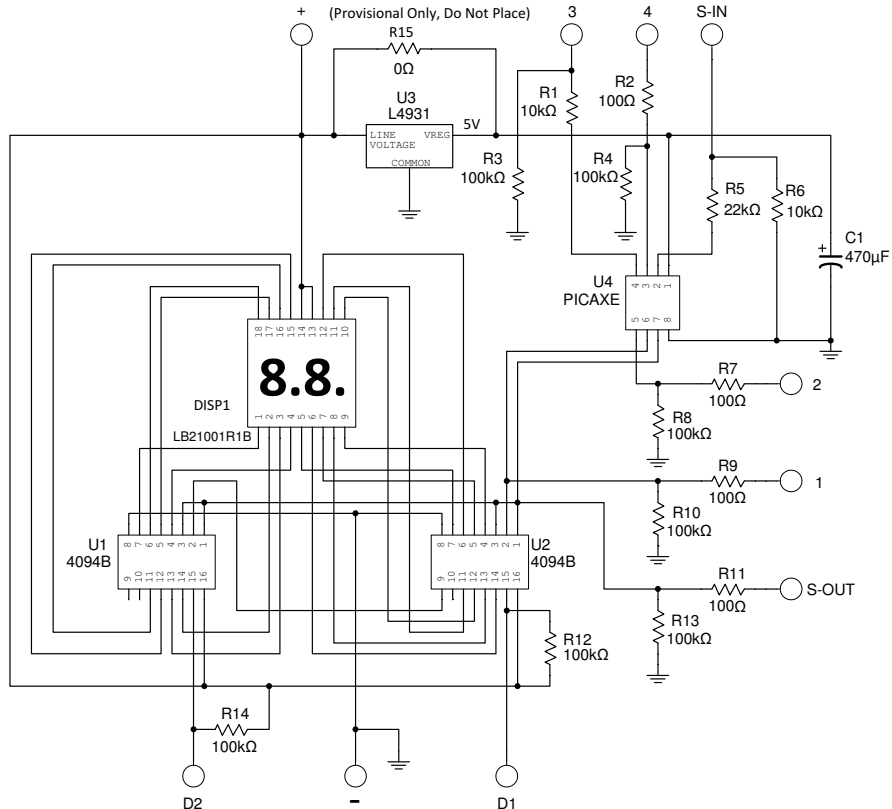


# LED MC (LED display & microcontroller, U29)

The LED MC module (only in SCA-200) has a dual 7-segment LED display, a microcontroller, and supporting parts. The microcontroller is a mini computer which can be programmed to perform different tasks, including monitoring things and making things happen. It is pre-programmed for use with the games projects. See project 17 in the SCA-200 (Snap Circuits® Arcade) for how to select games on it. Its schematic looks like this:



Its Snap Circuits® connections are like this:



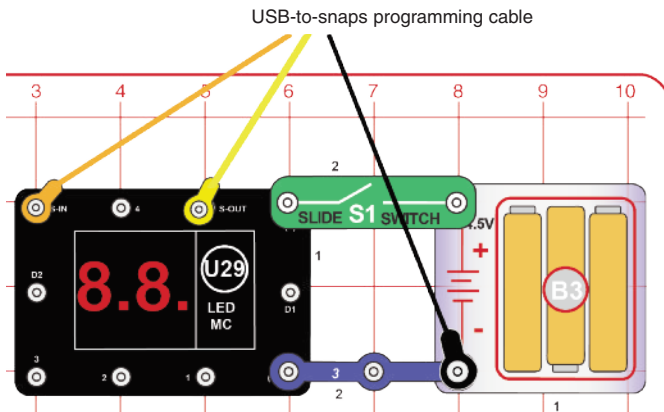
## LED MC (U29):

- (+) - Power from batteries
- (-) - Power return to batteries
- S-IN - Takes input from the selector (S8)
- S-OUT - An output, often connected to an LED
- 1 - An output, often connected to an LED
- 2 - An output, usually connected to the speaker
- 3 - Takes input from the selector (S8)
- 4 - An output, often connected to an LED
- D1 - Used to shut off the right LED display
- D2 - Used to shut off the left LED display

## RE-PROGRAMMING THE LED MC

You may modify the program in the LED MC or replace it with one you create (note that projects in the SCA-200 will not work if you change the program). To do this you must have a Snap Circuits® USB-to-snaps programming cable (9TLSCXP, which may be purchased at <http://cs-sales.net/causbtosn9tl.html>) and download PICAXE® programming software to your computer. The LED MC may be re-programmed in any circuit in the SCA-200, but it is suggested that you use the simple circuit below.

Simple programming circuit:

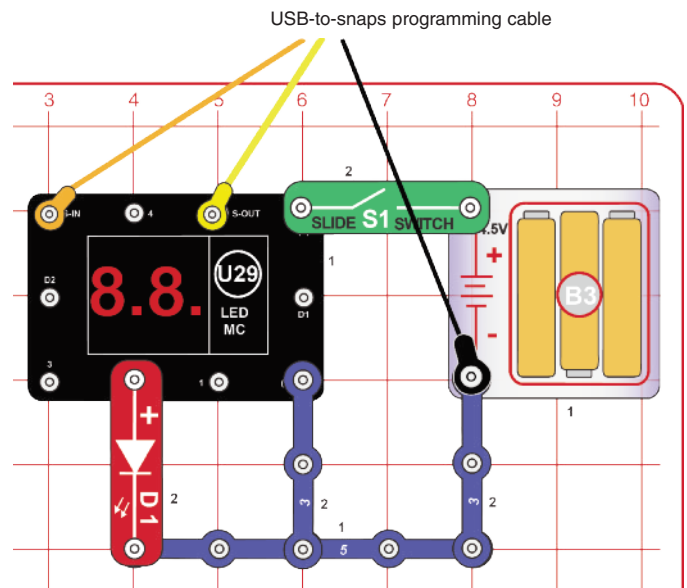


The microcontroller in the LED MC is the PICAXE® 08M2. You may download programming software for it for free from the manufacturer at [www.picaxe.com](http://www.picaxe.com) or [www.picaxe.com/Software](http://www.picaxe.com/Software). The manufacturer's website has extensive documentation about the PICAXE®.

The program that is loaded in the LED MC (and used by the SCA-200 projects) can be found online at [www.snapcircuits.net/sca200](http://www.snapcircuits.net/sca200). The PICAXE® software allows you to study or edit this program.

If you are not familiar with the PICAXE® then you may find their website confusing, so alternately you may follow the software download and programming instructions for our Snap Circuits® XP product. View or download the manual for this product at [http://www.elenco.com/admin\\_data/pdffiles/SCXP-50.pdf](http://www.elenco.com/admin_data/pdffiles/SCXP-50.pdf), then follow the instructions in project B1 on pages 29-33 to download customized programming software from our website, and to load a simple program into the PICAXE®. Our Snap Circuits® XP product has the PICAXE® mounted on a different snap platform (U21, instead of U29) and has a different parts set (compared to Arcade), but the explanations should be easy to understand. The Blinker circuit used in project B1 can be built using the LED MC with this arrangement:

Circuit for Blinker program:



Note that the LED display is connected to the PICAXE® internally as per the schematic (on the preceding page). The LED display will not affect your ability to use and re-program the PICAXE®, but the PICAXE® control signals are also connected to the LED display, so the display on it may appear random.

You may also find it useful to look through the other projects in the Snap Circuits® XP manual because they give a gradual introduction to the PICAXE® programming commands. Many of our XP circuits and programs can easily be adapted to be used with SCA-200, and the supporting snap components used in the XP circuits can be found in other sets or may be purchased at <http://www.cs-sales.net/sncirepa.html>. Part C on pages 59-61 of our XP manual has notes about some of the other features that the PICAXE® manufacturer has available.

Note that LED MC outputs cannot control motors directly, so an interface transistor must be used. LED MC outputs can control Snap Circuits® speakers and LEDs directly.