Chapter 1 – What Is an Arduino and What Can You Do With One in Model Railroading?

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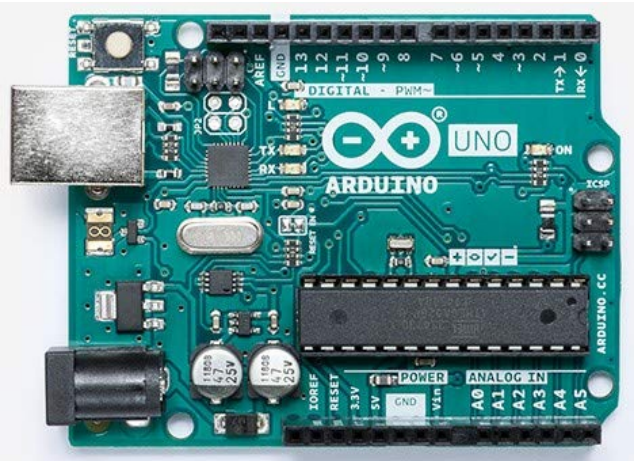
Turn on lights, play sounds, synchronize events, display results, coordinate signals, control motors, general animation; that's what you can do with an Arduino, basically synchronization and control.



But what is an "Arduino"? It is a small, inexpensive microprocessor, a computer. By small, I mean about the size of a credit card, and by inexpensive I mean under $11 each, in some cases a lot less than that. An Arduino has electrical contact points where you can connect electrical switches, photo resistors, motors, LEDs, alphanumeric displays, MP3 players and a variety of other sensors and devices. They can bring lighting, sound and movement to a layout. I use Arduino microprocessors for animations on my layout, the Baden, Vogt & DeSmet, and am now addicted. Interested? Read on!

My educational background is that of a Mechanical Engineer and a Computer Scientist, so I am comfortable with technology. Originally, I had an idea that I wanted to build a speedometer into a loop of my model railroad, and I thought that an Arduino might be the way to make it happen. I was successful, and subsequently I have created about half a dozen other model railroad Arduino animation effects that I want to share with others.

Arduinos power and synchronize actions using custom computer programs, or "sketches" as these are called in "Arduino Speak". These are written in a derivative of the "C" programming language; you can download sketches others have written or create them yourself, to suit your specific wants, needs and imagination. If you totally want to avoid computer coding, then Arduinos are probably not for you. Arduino sketches are built using a free program called the Arduino "Interactive Development Environment", of "IDE" for short. The IDE, which is similar to a word processor, helps you write sketches and download them to an Arduino via the USB port on your Personal Computer (I use a Windows based PC). Visit https://www.arduino.cc/en/Main/Software to download the IDE.

Suffice it to say that there are many ways to learn about Arduinos, including many excellent YouTube tutorials, and I am not inclined to duplicate their work. In particular, I like the YouTubes from Paul McWhorter and I STRONGLY encourage you to visit his channel (https://www.youtube.com/channel/UCfYfK0tzHZTpNFrc_NDKfTA) and start on his introductory lessons (https://www.youtube.com/watch?v=fJWR7dBuc18). Another good site is https://rudysarduinoprojects.wordpress.com. I also will not teach you electrical engineering, nor how to program in "C". I will teach you how to search for the components I have found useful for applying Arduinos to model railroading. I will provide you with other tutorials showing how these components can be integrated into a model railroad, as well as links to my YouTube project videos, and my Arduino sketches stored at https://daackm.github.io/.

If you are still interested in learning how this is done, read on.