The device that we have selected is the Dell 9RRC7 optical computer mouse. The reason this device was selected was to gain insight into how this commonly used device works. By taking the top cover off the mouse it reveals the Logitech circuit board. The most prominent component on the board is also the most important part of the mouse, which is the housing for the optical motion detection system. This system allows for the detection of motion by use of a small, low resolution camera that is able to detect minute differences in the pattern and/or texture of the surface the mouse has been placed on. When the mouse is moved the images are compared by the digital signal processor (DSP) to determine by what magnitude the mouse has been displaced. An LED is used to improve the accuracy of the image by lighting the surface thus allowing the camera to see much more detail.

This mouse also allows for user input via three separate buttons. The inputs on the circuit board for left and right click are labeled “SW1” and “SW2,” respectively. These detect when a user has clicked the mouse button. A third input, labelled SW3, is for clicking down on the scroll wheel. The clicking of the scroll wheel would change uses depending on the application, however the main use for the scroll wheel would be navigation. The scroll wheel works by using encoders to detect the speed and magnitude at which the wheel is being rotated. They do this by having an LED on one side of the wheel and a light sensor on the other. Since the wheel is not solid and has small, thin openings for the light to pass through the direction and speed of rotation can be detected. These encoders are like Vex encoders used on axels. These user inputs are sent to the computer digitally via USB. Upon reviewing the electrical and mechanical components of the mouse the biggest takeaway would be that even a device that has a task as simple as the one a computer mouse must execute has an unexpected level of complexity.