WIRELESS OPTICAL USB MOUSE

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Introduction

The wireless optical USB mouse is a computer pointing device that offers more freedom and added precision in comparison to the typical corded, mechanical mouse. The operation of the mouse will be exactly the same as a standard two button mouse. Communication with the computer is established with a USB receiver.

Hardware

The wireless optical USB mouse hardware block diagram is shown in figure 1. The hardware can be broken down into two major parts: the mouse transmitter, and the USB receiver. The parts lists for the transmitter and receiver project are shown in tables 1 and 2, respectively.

![Figure 1: Wireless Optical Mouse Hardware Block Diagram](image-url)
**Transmitter**

The schematic of the mouse transmitter is appended to this document. The main parts of the transmitter hardware are the 9S12C32 microcontroller, the ADNS-2051 optical motion sensor (U2), the TXM-916-ES RF transmitter (U3), and the power supply (U4).

**Power Supply**

The power supply for the mouse transmitter side consists of two AAA alkaline batteries, and a MAX682 charge pump IC. The input from the two batteries will be about 3 volts. The Maxim charge pump will output a regulated 5 volts, which is needed to power the Microcontroller, the RF transmitter, and the optical movement sensor.

**MC9S12C32 Microcontroller**

The 9S12C32 microcontroller will receive input from the optical sensor through the serial peripheral interface (SPI). The two mouse buttons are connected to Port AD (PAD4-3) of the 9S12C32.

The ADNS-2051 optical sensor is the device which detects the magnitude and direction of the mouse movement. It will send data to the 9S12C32 by means of the serial peripheral interface (SPI). The power down pin of the optical sensor, which is used to put the sensor into lower power states during times of no movement, is connected to PAD7 on the microcontroller.

**Receiver**

The schematic of the USB receiver is appended to this document as well. The main parts of the receiver hardware are the RXM-916-ES RF receiver (U4), and the USB232M USB – Serial interface module (U1).

The RXM-916-ES RF receiver is powered by 5 volts from the USB port. It simply reproduces and outputs the signal sent from the mouse transmitter. The only supporting circuitry for the RF receiver is a very small whip antenna.

The USB232M module is connected to the DATA pin of the RXM-916-ES, which is the reproduced signal from the transmitter. This device will allow the mouse receiver to be connected to the host computer via the USB port.