University of Toronto

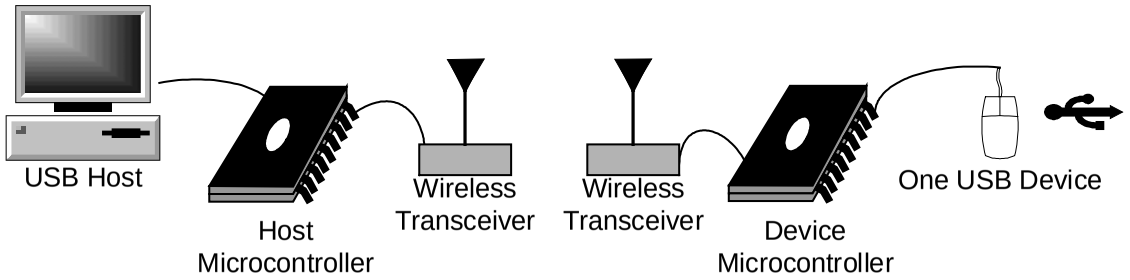
Edward S. Rogers Sr. Department of Electrical and Computer Engineering

Fourth Year Design Project (ECE 496Y)

Generic Wireless RF USB Interface

GOALS

- Make currently available Wired USB 1.1 Low Speed Devices Operate Wirelessly
- RF Technology, Thus Line of Sight Not Required!
- Interface to be transparent to the user and the host computer, no additional software drivers necessary!
- Self Powered using Commercial Power Supplies



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Supervisor: Professor Khoman Phang

Generic Wireless RF USB Interface

EXECUTIVE SUMMARY

This design project will involve designing, building, and testing a Generic Wireless Radio Frequency (RF) Universal Serial Bus (USB) Interface. USB is an industry standard that provides a simple and low cost mechanism to connect many different peripherals to a computer via cable. Current wireless technology involves specialized adapters and some also use infrared transmission technology that requires line of sight. The goal of this design project is to improve upon current USB and wireless technology by fusing them together into one integrated product, a Generic Wireless RF USB Interface. This interface would allow almost any currently available wired USB device to connect wirelessly to a computer without relying on line of sight.

The interface will replace an existing wired connection between a USB device and the computer with a wireless RF connection. The wireless connection will be implemented with a pair of wireless RF transceivers and micro-controllers. One USB device would be plugged into one transceiver – micro-controller pair and the other transceiver – micro-controller pair would be connected to the computer.

The requirements for this interface are as follows: it must be generic to work with most current wired USB peripherals that facilitate human input, e.g. mouse, keyboard, and it must also be self-powered and transparent to the end user, i.e. no operating system driver modifications necessary and remain plug and play compliant.

There are two team members for this design project, Frank Liu and Edward Chan. Frank will be primarily responsible for the micro-controller interface between the RF transceivers and the USB protocols, and integrating the hardware and software components. Edward will be responsible for the design of the hardware implementation of the interface (e.g., RF transceivers, printed circuit board design, and power circuitry), and also interpreting USB protocols via software.

It is anticipated that the project will cost $400. The starting point of the project is September 2003, and the expected completion date is April 2004.

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