

**Development of a USB port based data acquisition system for unmanned weather station**

H. A. P. K. Hettiarachchi and I. M. K. Fernando

*Department of Physics, University of Colombo, Colombo 3*

Collecting weather information is essential in many areas in science as well as in various day to day human activities. An unmanned weather station makes this process easier by collecting weather data with minimum interaction of a human being. The primary objective of the project is development of a USB port based data acquisition system for an unmanned weather station. By making use of USB to transfer data, it is intended to give features of the USB interface, like the ease of use and the speed, to the data acquisition system.

To find an optimum solution to the project an extensive study had been carried out on various sensors used in unmanned weather stations, existing systems, product manufacturers' datasheets and application notes. Then a solution to the project was identified based on primarily two modules; a microcontroller and a USB interfacing module. Various sensors and equipments of the unmanned weather stations are connected to the microcontroller. It sends collected data to the computer via the USB interfacing module. The USB interfacing module fulfils all the hardware requirements of the USB interface. The system completes with application software at the computer end which displays, logs and generates reports of collected weather data. In addition of achieving primary objective of the project successfully, the design has some extra benefits too. It has been designed as a generic high speed data acquisition system which can be easily extended or converted to a completely different application by altering only the firmware and software.

Throughout the project the best possible data acquisition techniques and programming techniques have been adopted. The result is a data acquisition system which not only acquires data, but does it in a highly optimized manner. This system serves as a guide for the average developer to make use of powerful, attractive and yet difficult to implement USB interface in their design. Thus the project is a starting point for moving on to high speed USB based data acquisition systems from traditional serial or parallel port based systems.