Developing a Simple Sensor Application using Crossbow Devices and Xserve

a) Learning objectives:
To develop a simple sensing application (MyApp_Sensor) that samples the temperature on a sensor board and sends the message packet over a RS-232 serial connection or a USB connection to the monitoring terminal using a Programming board/Gateway interface.

Students will learn:
- How to create a simple Mote firmware application that reads the temperature sensor data from the sensor board.
- How to program the Mote with a Programming board using the Programmer’s Notepad.
- How to use the X-serve application to display the sensor data at the Monitoring Terminal

b) Tools Utilized:
- MICA2 Mote: Standard edition of MICA2
- One Sensor or Data acquisition board: MTS 310
- One Gateway/Programming board: MIB510/MIB 520
- A Windows PC with MoteWorks platform installed

NOTE: The configuration of the devices and their relationships with the programmer’s station is depicted in Figure 1. Illustrated in Figure 2 are the procedure and the configuration of various components used in developing a sensor application.
Figure 2. Configuration and Procedure for Developing a Sensor Application

c) Observation:
- By successful execution of the simple sensing application the Monitoring Terminal receives the sensor data.
- To display the sensor reading we use the Xserve application in the Cygwin command prompt window.
- In default, Xserve displays the updated sensor data every second.
Figure 3. Snapshot of Programmer’s Notepad and MoteConfig Interface
Figure 4. Snapshot of output from a Cygwin based Xserve interface

d) **Application classification:** The application can be classified as a study experiment because it involves some programming of Motes.

e) **How it may be implemented in the lab:**

By using the required Crossbow Devices and a PC that has the Crossbow MoteWorks development platform installed on it.

Also follow the detailed instructions that are provided in the MoteWorks Getting Started Guide available at [http://www.xbow.com/Support/wUserManuals.aspx](http://www.xbow.com/Support/wUserManuals.aspx)

f) **Level of difficulty:** The level of difficulty of the project is easy.