

ABSTRACT

The weather changes can influence our geographical condition, especially for the upper river. The upper river is the highest part of the river flow which can be used as a reference for the condition of middle state and downstream river. By monitoring the situation of upper river, it can be very beneficial for the area around the river.

This final project examined about design of a telemetry system for rainfall, wind direction, and wind speed around the upper river. This monitoring system has built by using microcontroller ATMEGA16, and RF Module 2.4 GHz as the main component

The rainfall measurement is done by using a tipping bucket which can be updated the data every hour. The minimum value which can be measured by rain gauge is 0.06694 mm/hour. Wind speed sensor has been built by using an optical encoder which work by counting the number of pulses generated every second. The minimum value which can be measured by *wind speed gauge* is 0,0044 km/hour. Wind direction sensor has been built by using *infrared* and *phototransistor* circuit plate, which read one of the eight sources of wind direction. These data will be sent in wireless media using RF Module which works at 2.4 GHz band frequency. *RF Module* is set by X-CTU software. After the data received, the data will be displayed in PC for easily accessible information.

Key Words: rainfall, wind speed, wind direction, ATMEGA16, *optical encoder*, *RF Module* 2.4 GHz, tipping bucket, infrared, phototransistor.