ABSTRACT

One device that is a form of application of *photoplethysmography (PPG)* is the *pulse oximeter*. *Pulse oximeter* is a medical device used to measure blood oxygen levels through the pulse generated from the optical sensor. Generally, *pulse oximeter* has a sensor that is close to the screen display or even become one with the screen. So to find out the measurement results, the user must be close to the *pulse oximeter* and the measurement object.

To make the job of medical experts become easier and more efficient in controlling the patient's medical condition, particularly in measuring oxygen level in the patient's body, *embedded Ethernet* technology can be applied to the *pulse oximeter*. Application of *embedded Ethernet* technology in *pulse oximeter* is also intended to support the development of *telemedicine* today.

Therefore, *embedded Ethernet pulse oximeter* based on microcontroller AVR ATMega8535 will be made in this final assignment. Microcontroller AVR ATMega8535 is used as ADC with the analog signal produced by optical sensor which has been amplified and filtered as its input, as data processor and as parallel data to serial converter. Then the data is sent to the server computer via WIZ110SR module which has a function as serial protocol to TCP/IP converter. In other words, the *pulse oximeter* will be the client that will send data to a computer server in TCP/IP format. In server computer, an application will be made to display the *PPG* signal and the value of oxygen level in the patient's body. So the medical experts do no longer need to visit the patient to monitor oxygen level in his body.

Key words: *photoplethysmograph* (PPG), *pulse oximeter*, *embedded ethernet*, *telemedicine*