ABSTRACT

In today's digital telecommunication technology, data is transmitted through wireless technology. Institute of Electrical and Electronics Engineering (IEEE) has issued specification of Worldwide Interoperability for Microwave Access (WiMAX), which is 802.16.WiMAX contain blocks named forward error correction (FEC). Inside FEC, there is a convolutional encoder and viterbi decoder that works to address and correct errors that occur in the data information.

The method used in this design are viterbi decoding algorithm at the receiver side and convolutional coding on the sender side. The advantage of this method is more efficient to obtain maximum likelihood estimates of the optimal sequence that has been encoded. But the level of difficulty increases exponentially viterbi decoding with increasing length restrictions. In this final project will be implemented convolutional encoder and viterbi decoder on 802.16e WiMAX technology using Field Programmable Array (FPGA) and language Very High Speed Integrated Circuit Hardware Description Language (VHDL). Stages of design conducted that make a design with VHDL language and implemented into the FPGA.

The results of this final project of the design is implemented on the FPGA and the proven ability convolutional encoder and viterbi decoder to address and correct errors when information signal transmitted, and compare the results of both software and hardware simulation. In the test system can be proven capability of convolutional encoder and viterbi decoder can address and correct errors up to 6 bits, given sequentially every 2 bits, and 3 bits of a given sequence every 4 bits.

Keywords: *Convolutional Encoder, Viterbi Decoder*, WiMAX, FPGA, VHDL.