ABSTRACT

Power Line Communication (PLC) is a technology that utilizes the grid network to pass data and delivery information. The main advantage the use of PLC technology an already existing network of power lines on each house or building used as a physical transmission medium so that the use of the PLC will save cost and time network installation. One important element is the PLC modem device. This tool is used to condition and convert the signals to be sent and received well through the grid network. Modem is a combination of analog and digital circuit that can be decomposed into three blocks of the first AFE (analog front end) is an analog signal processing block that consists of filter and coupling.

Block part of the PLC consists of the modulator, demodulator, and power line channel. With the increasing variety of services that can be done in the PLC will need a more complex modulation techniques such as OFDM (orthogonal frequency division multiplexing). so the OFDM modulator is realized. OFDM has the advantage of high data rate in OFDM multiplexing technique using several frequencies (multicarrier) are mutually perpendicular (orthogonal). Each sub-carrier modulated with a conventional modulation technique at a low symbol rate. Use of this multiplexing technique because it will simplify the transmission line.

Final discusses the design and realization of OFDM modulator as well as measurement and simulation of OFDM blocks. The results of this study is good enough where the OFDM system can be implemented on an FPGA design to produce 64 output subcarrier modulated by modulating each sub carrier 4-QAM with a reasonable slice and can be transmitted to the PLC channel and the results obtained on the AFE block power amplifier voltage level signal modulator result is increased from 4 Vpp to 13.2 Vpp, magnetic coupling has a large attenuation, with average value of 6dB attenuation, the block DAC conversion time is slower than the FPGA output resulting in instability the conversion. Fore need to be implemented in the demodulator block in order to become a modem device is intact.

Keywords: PLC, AFE, ADC, DAC, modem, modulator, demodulator, PLC systems, OFDM, multiplexing, interface