ABSTRACT

Nowadays, there's lot of ICs which support inter-integrated circuit bus (I2C-bus atau I2C). Alongside, I2C's usability became wider that it can be used for sensor, actuator, or even control network. Unfortunately, until now there's no practical solution for connecting I2C networks wirelessly.

This final task creating a wireless I2C network bridge as the practical solution to connects two I2C network wirelessly. This network bridge utilize AVR as its controller and nRF24L01+ as its wireless transceiver. Target specification of the network bridge are packet loss under 0.1%, BER less than 10^{-6}, and communication speed up to 1000Bps.

The results from tests show that the created network bridge was able to connect two I2C network with 7-bit addressing and 100kHz clock speed wirelessly. Packet loss and BER value not always directly proportional to distance and communication speed not always inversely proportional to distance. When sending data, system reached packet loss and BER target only at 5 meter distance. When receiving data, system can reach both target up to 75 meter distance. Communication speed at 1 byte data length unable to reach target. Average speed for sending and receiving data is 688,8Bps and 753,5Bps. By estimation, communication speed will pass the target if 4 byte or more data length was used in communication.

Keywords: network bridge, I2C, AVR, nRF24L01+, wireless communication.