

SYNOPSIS

Project Group No: 1

Register No:

1. 124004308

Name:

Srinath.R

Project Title: Implementation of SDR-based Receiver using STM32 and nRF24L01

Name of the Guide: James A. Baskaradas / Associate Professor

Abstract

The Project mainly focuses on designing & creating a Dongle using the STM32 microcontroller chip and the nRF24L01 transceiver chip for 2.4GHz communication with a USB connector. The STM32 microcontroller manages data processing to ensure reliable communication. The nRF24L01 Transceiver chip enables us to transmit and demodulate the receiver data at a low data rate at an S-Band frequency of 2.4GHz. An omnidirectional patch antenna optimizes the signal reception from all directions and is fabricated at a frequency of 2.4 – 2.5 GHz and a matching impedance of 50 ohms. The Hardware Dongle is connected with a USB connector which enables us to integrate it with various devices. The designing of the Dongle and the omnidirectional patch antenna is accomplished in KiCad and ADS (Keysight). The project was conducted on a single frequency due to its practicality and cost-effectiveness. However, the flexibility exists to extend the project to accommodate a spectrum of frequencies, contingent upon the capabilities of the transceiver chip.

Specific Contribution

- On Omnidirectional Patch Antenna Designing, Fabricating & Testing it for a specific frequency of 2.4GHz
- On Interfacing the STM32 & nRF24L01 by employing embedded C on receiver side

Specific Learning

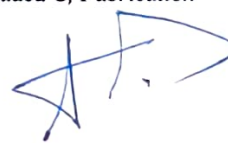
- Antenna Designing, Fabrication & Testing
- Embedded C

Technical Limitations & Ethical Challenges Faced

- Coding SPI Interface for nRF24L01
- Antenna Fabricating

Keywords: SPI Interface, nRF24L01, Patch Antenna, STM32, Dongle, Embedded C, Fabrication


Signature of the Student


Signature of Guide

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