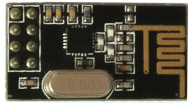
WIRELESS SENSOR COMMUNICATION SYSTEM

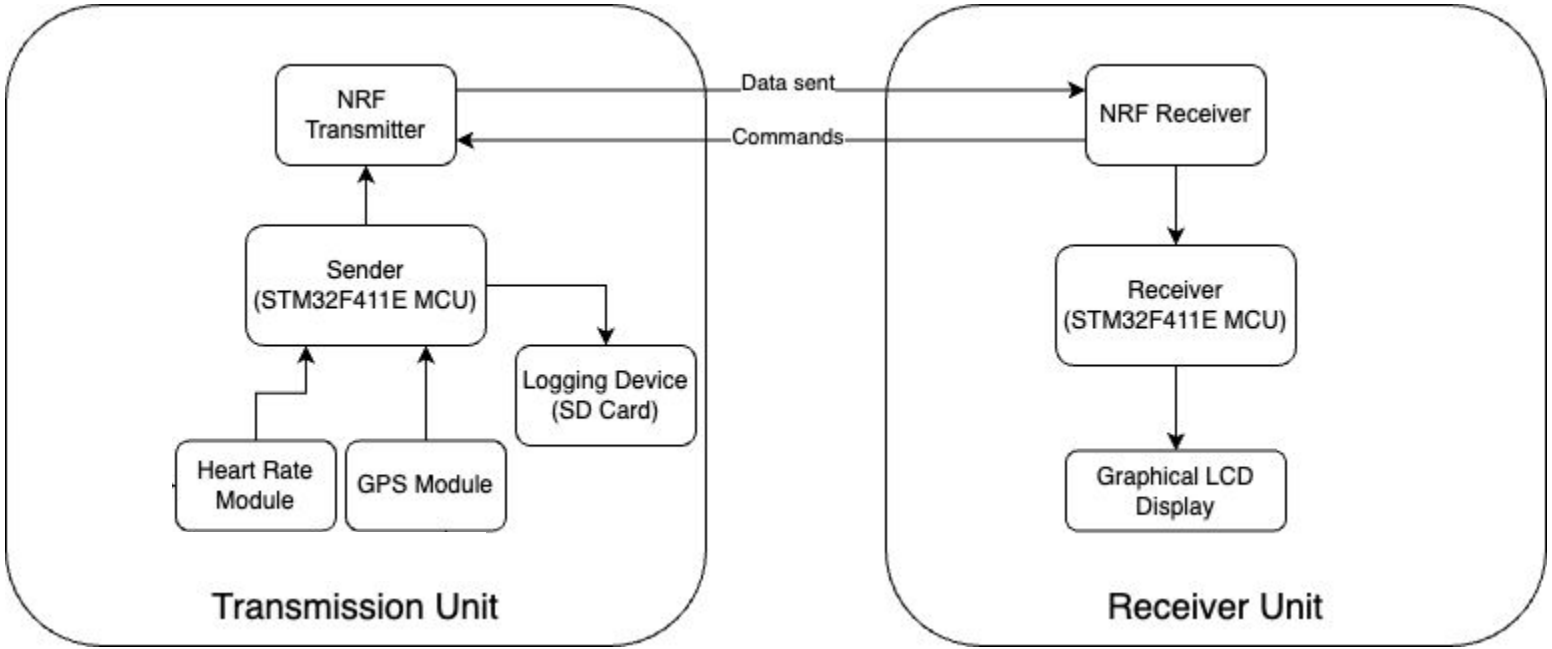
Team Members - Abhirath Koushik and Nalin Saxena

ECEN 5613 - Embedded System Design

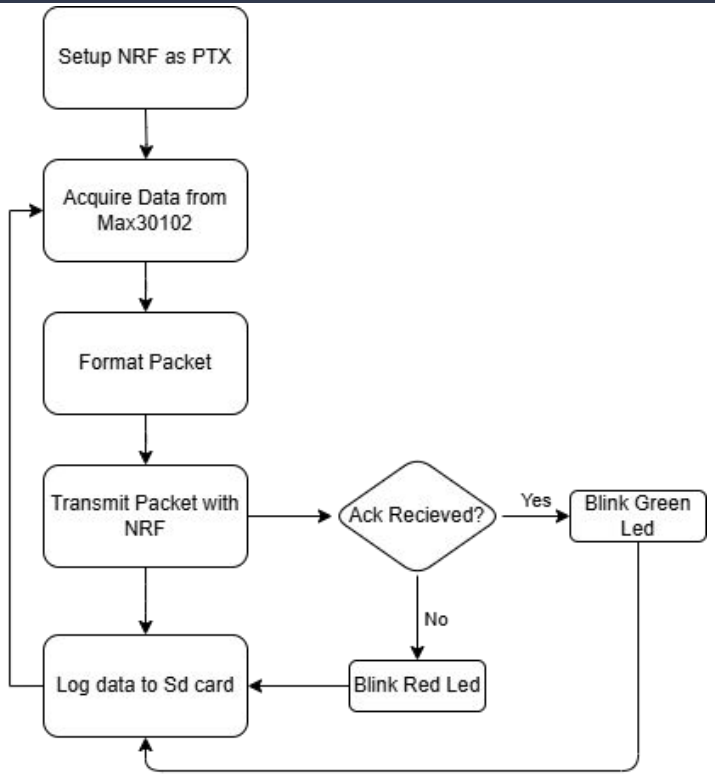
Hardware Elements

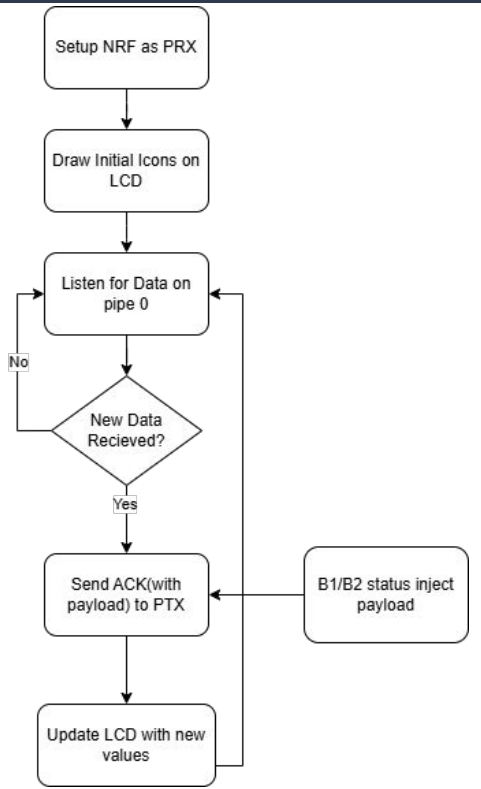
MODULE NAME	INTERFACE	REFERENCE IMAGE
NRF24L01 Transceiver	SPI	
MAX30102 Heart Rate / Spo2 Sensor	I2C	
GY-NEO6MV2 GPS Module	UART	
SD Card Module	SPI	
Graphical LCD Module (ST7789V)	SPI	

Overview Block Diagram



Program Flowchart





Challenges

1. Implementing Acknowledgement with payload feature on NRF to get bidirectional communication. I was able to utilize Nordic forums to get help with an application note.

   Hello,

   We do not provide support any longer on the nRF24L series, please get yourself for instance an nRF52-DK (with nRF52832). That said, I do believe we should have an example in this one (it's only 16 years old :))

   devzone.nordicsemi.com/.../nAN24_2D00_12SW_5F00_ORG.zip

2. Trouble with I2C communication, used logic analyzer to trouble and realized an improper double stop condition was getting sent every time read operation was taking place on the MAX30102.

3. Faced issues in parsing the raw data from the GPS Module. Was then able to identify the NMEA format and used that to parse the data.

4. Faced issues in SPI1 while using the SD card module (SD card was not mounting). Hence, used SPI2 for this module.

Thank You