



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542



9940 572 462



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LoRa based Industrial Product Data Monitoring System of Spark Minda

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ABSTRACT: Everyone in this world wants to be safe and secured. The main purpose of this paper is to generate and transmit data wireless and secured manner. Before transferring the data, it is changed into an unreadable format by using some password code and then communicated, and the data is recovered by entering the right password codes at the receiving end so that it becomes user pleasant. The most efficient and reliable wireless communication is LoRa Technology. This technology has the benefit of allowing users to send messages in less time than they could using a mobile phone. The message is displayed in the LED using the microcontroller employed in the project work. For confirmation, the data that must be transferred is initially shown on the LED. The message is then triggered by pressing the enter key, quantized, and broadcast over the radio. The received data is decoded by another microcontroller unit on the receiver side, and then displayed on another LED connected to the controller. When the data receiver gets a new message, it is immediately enabled, and the code must be input to read the message.

KEYWORDS: Arduino uno, LoRa transmitter and receiver, P10 model(Display).

I. INTRODUCTION

Currently, files may be exchanged successfully within the range of a wireless network, with the exception that the base station has had certain issues that may lead the network to become paralysed. Because LoRa Technology employs a Gateway node to allow other nodes to join its network directly or in a multi-hop manner, it may be able to avoid this difficulty. This study provides a file-transfer system based on LoRa Technology in order to satisfy the cost-cutting criteria. Despite the fact that LoRa Technology has various flaws, such as low bandwidth and transmission rate, a file with a little data quantity may be sent successfully in this network.

II. RELATED WORK

Input is PDF file generated in industry. Data wrangling is the process of unifying complex data sets for easy access and analysis. This analyzed file is then sent to LoRa Module.

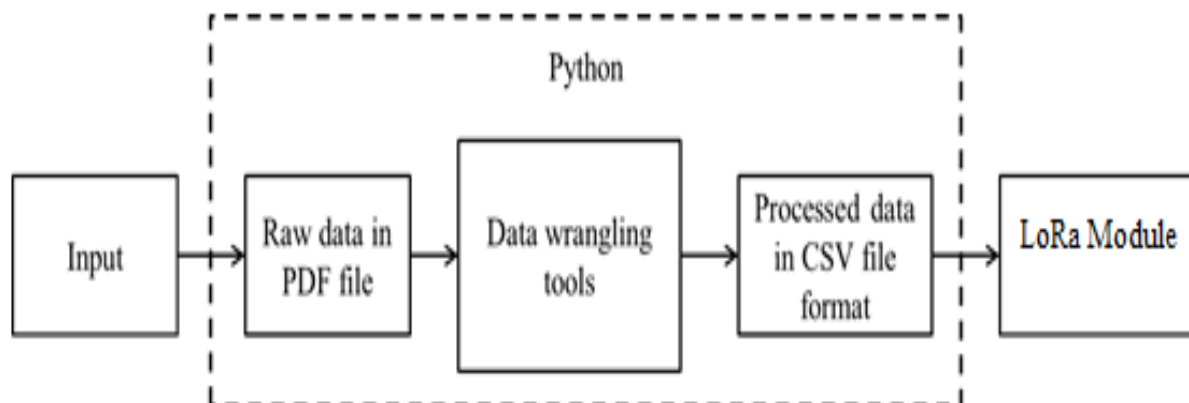


Fig 1: Block diagram of transmitter side

The receiver side consist of LoRa Module receiver, Arduino Uno and Display module. Arduino is program in Arduino IDE, it receive data from LoRa Module and display on P10 display module

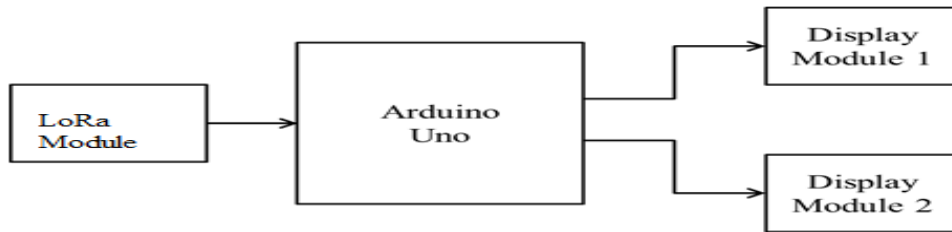


Fig 2: Block diagram of receiver side

III. METHODOLOGY

Transmitter

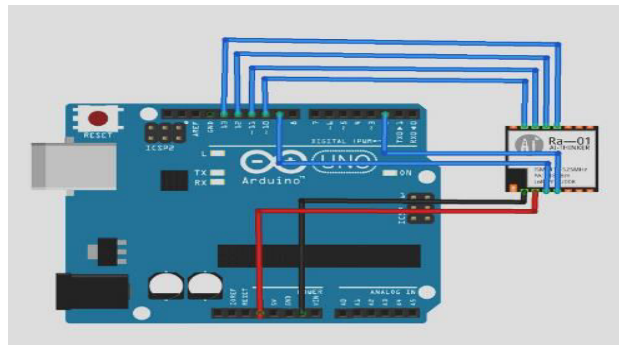


Fig 3 : Circuit diagram of Transmitter Side

The LoRa module consists of 16 pins, out of these six pins are GPIO pins, and four are Ground pins. This LoRa module operates at 3.3V, and so the 3.3V pin on LoRa is connected to the 3.3v pin on the Arduino UNO board. Complete connections are given in below table

LoRa Transmitter Module	Arduino UNO
3.3V	3.3V
GND	GND
NSS	D10
DIO0	D2
SCK	D13
MISO	D12
MOSI	D11
RST	D9

Table 1 : Connection between Arduino Uno and LoRa transmitter

And then connect this transmitter part to PC through USB cable for input which is pdf of industrial product data.

Receiver

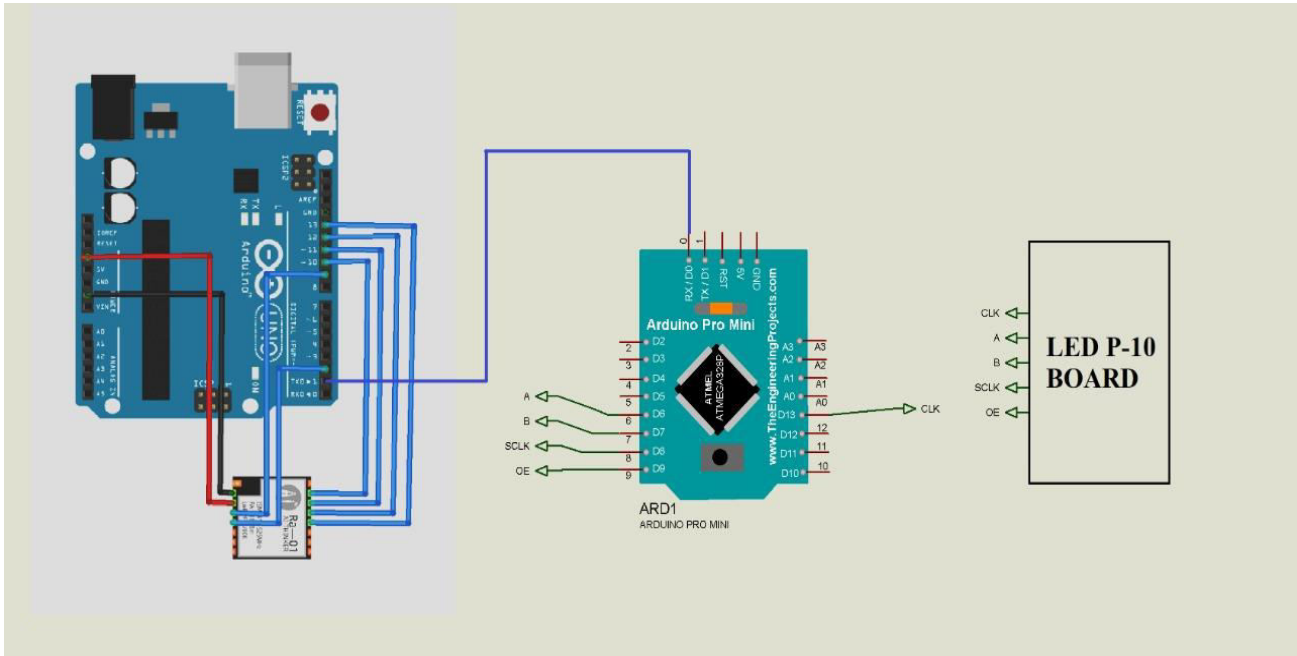


Fig 4 : Circuit diagram of receiver side

The connections between Arduino and LoRa receiver are the same as Transmitter as shown table 1. Then Connection between Arduino pro mini and P10 display is in serial communication. On the back side of the P10 board, there are two sets of ports. The data input and output port for cascading. The DS3231 is the real time clock (RTC). It is used to show date and time. Make the connections between Arduino pro mini and LED P10 Board as shown in Fig 4.

P10 Model	Arduino
CLK	D13
A	D6
B	D7
SCLK	D8
OE	D9

Table 2 : Connections between P10 model and Arduino

And Connet that circuit to P10 Model using 16 pinFRC connector ribbon cable.

In simple way, the connection of receiver part is –

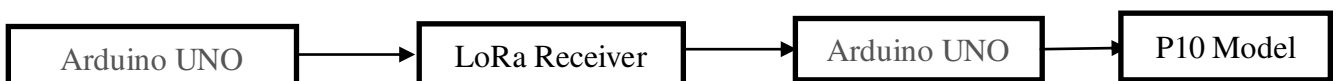


Fig 5 : Flow of Receiver part

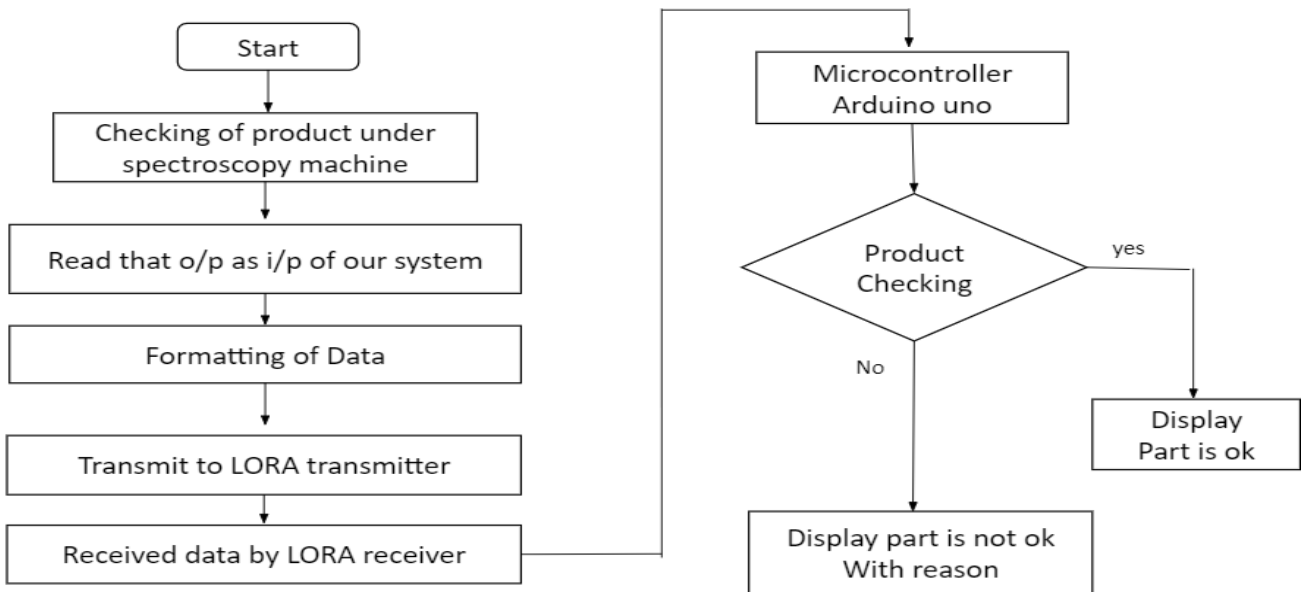
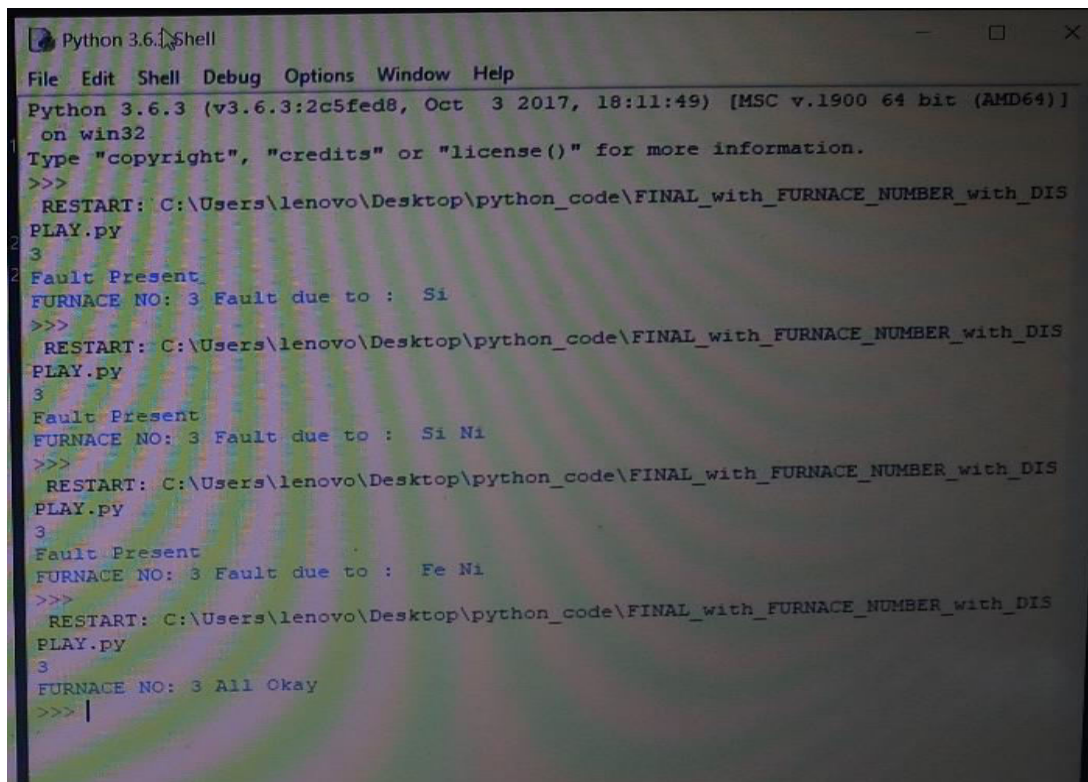


Fig 6 : Flow chart of a System

IV. EXPERIMENTAL RESULTS

Software Result :



```

Python 3.6.3 Shell
File Edit Shell Debug Options Window Help
Python 3.6.3 (v3.6.3:2c5fed8, Oct 3 2017, 18:11:49) [MSC v.1900 64 bit (AMD64)]
on win32
Type "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\lenovo\Desktop\python_code\FINAL_with_FURNACE_NUMBER_with_DISPLAY.py
3
Fault Present
FURNACE NO: 3 Fault due to : Si
>>>
RESTART: C:\Users\lenovo\Desktop\python_code\FINAL_with_FURNACE_NUMBER_with_DISPLAY.py
3
Fault Present
FURNACE NO: 3 Fault due to : Si Ni
>>>
RESTART: C:\Users\lenovo\Desktop\python_code\FINAL_with_FURNACE_NUMBER_with_DISPLAY.py
3
Fault Present
FURNACE NO: 3 Fault due to : Fe Ni
>>>
RESTART: C:\Users\lenovo\Desktop\python_code\FINAL_with_FURNACE_NUMBER_with_DISPLAY.py
3
FURNACE NO: 3 All Okay
>>> |
  
```

Fig. 7 : Software Result

Hardware Result :

Test case : check overall functioning (interaction between PC, controller, display unit and wireless transceiver)

- Test case procedure: To analyze how system works if pdf file shows 5 faulty and 6 no-faulty products.
- Data: real-time data.
- Input: input to PC.
- Procedure: PDF file generated by manufacturing unit is work as input to python, python read and interpret it and send it to Arduino via wireless communication.
- Expected Output : P10 display module should display first furnace number (1,2,3,4 or 5) and then product status that is “faulty products: with the name of elements or Non-faulty products”
- Actual Output: output on LED display unit is as follows:
 - Faulty products: (With name of element) or
 - Non-faulty products.

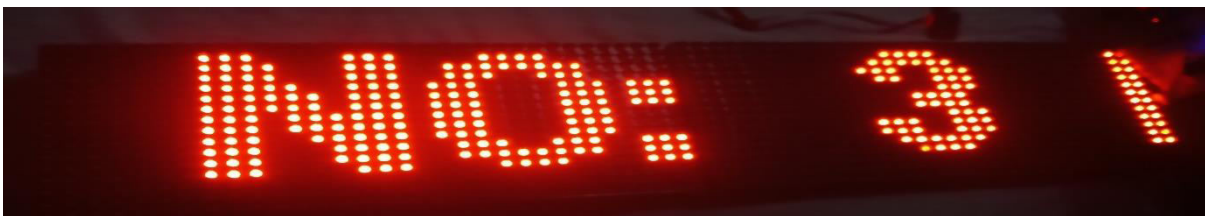


Fig 8 : Hardware Result

V. CONCLUSION

This project work finds its application in not only personal communications but also in different areas such as it can be used as remote controlled notice boards in multinational companies where manager can display some messages to their employees. The main advantage of this system is that it is as simple as that. The whole system of data generating and transmitting can be installed in manager's cabin and from there he/she can control the system. This way it has many more application in our day to day life which makes our tasks very safe and secured. It also provides a secured system for secret messages communication over long and short distances. The capacity of hiding the content is also very high in the proposed work.

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