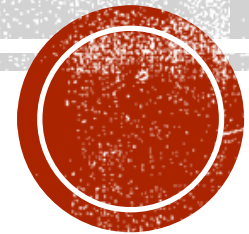


# Revolutionizing Sensor Data Transmission: Wireless System with Maintenance-Free Operation and Slipring Elimination

Project-Intern

Presented By:

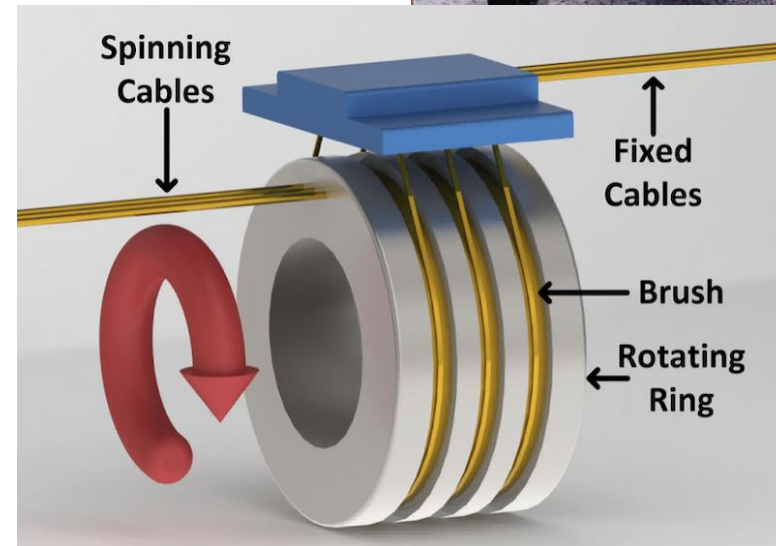
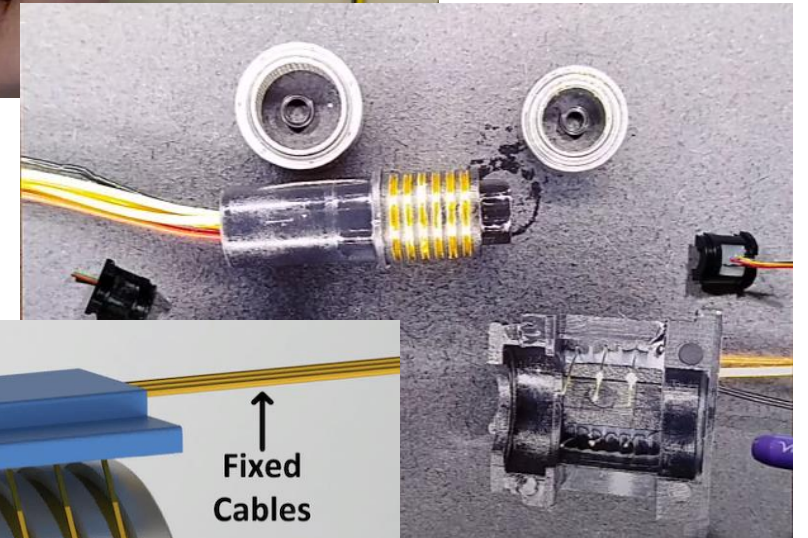
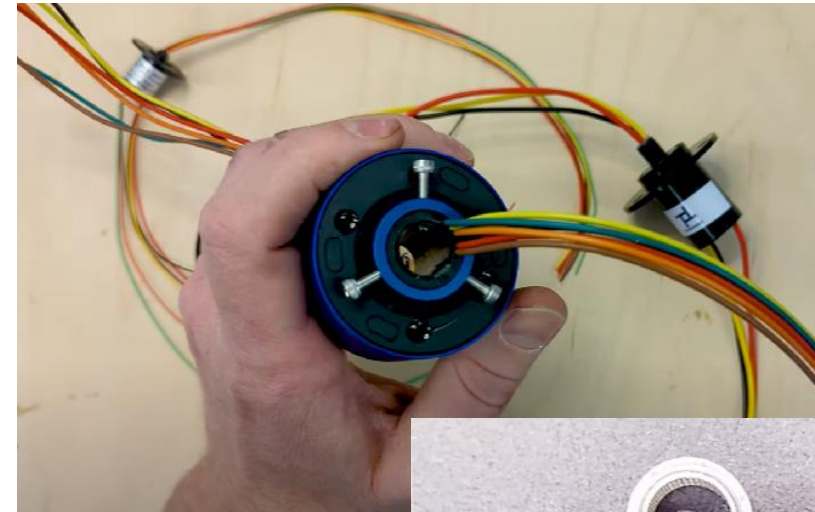
Shiva Narasimha K



# What is Slip ring ?

A slip ring, also known as a **rotary electrical joint**, is an electromechanical device that allows the transmission of power and electrical signals from a stationary to a rotating structure.

Slip rings consist of **two main components**: The **stationary part (stator)** and the **rotating part (rotor)**. The stator is attached to the stationary structure, while the rotor is attached to the rotating part. The rotor makes electrical contact with the stator through brushes or other contact methods, allowing electrical signals or power to be transmitted between the two parts while they rotate.





# Our approach!

To find the **power transmitted through the shaft** (without using slipring)

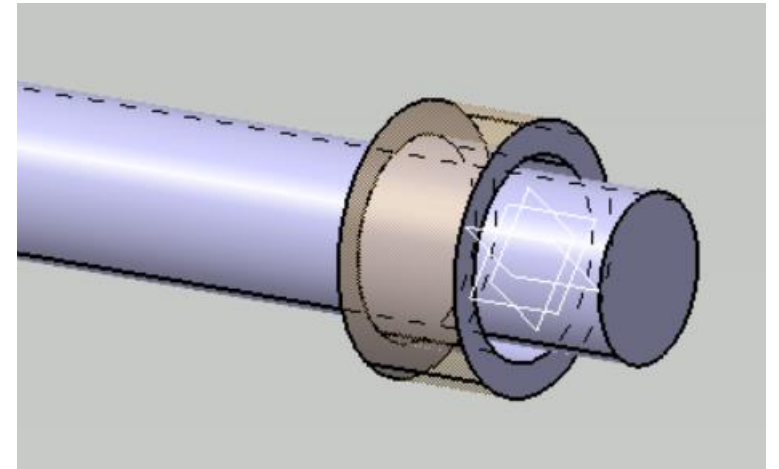
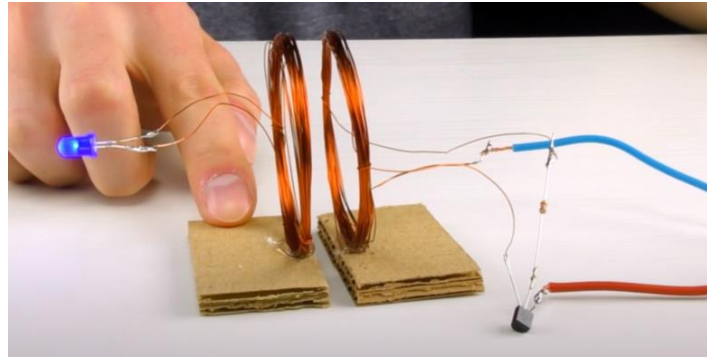
## Developed a **Wireless System**

By Wireless Power Transfer & Use of IOT Devices

**E**ntire Model was developed in PSIC LAB  
(Propulsion System Integration Centre) at NSTL-DRDO

# Wireless Power Transfer

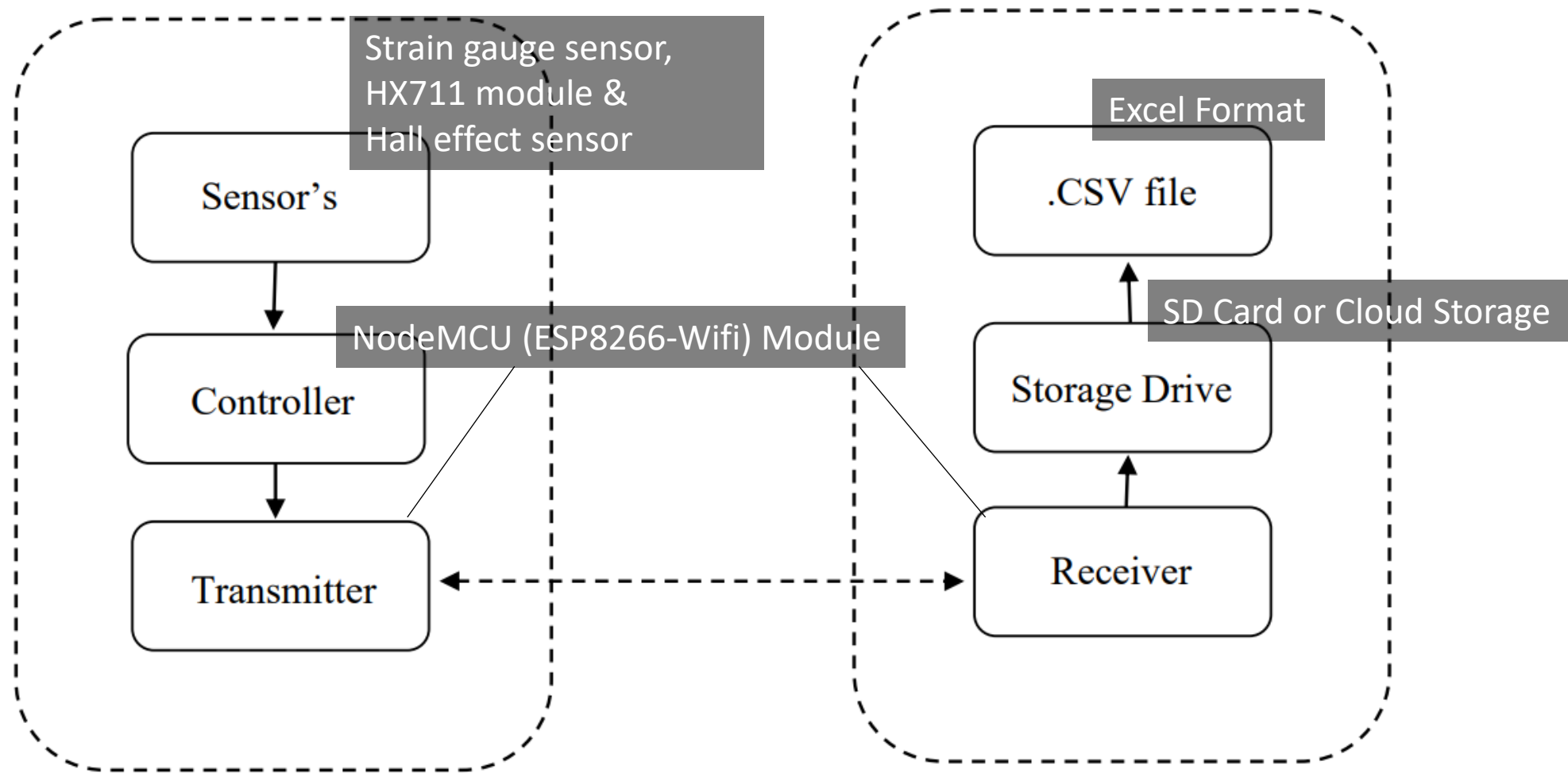
Sending **electrical energy from a power source to an electrical load without wires**. It can be done by using induction coils that create an electromagnetic field



Overall, wireless power transfer through a larger hollow circular coil acting as a transmitter and a smaller coil fitted inside as a receiver is based on the principles of electromagnetic induction and can enable the transfer of electrical energy without the need for physical connections.

Material Used to make Wireless power transfer are:

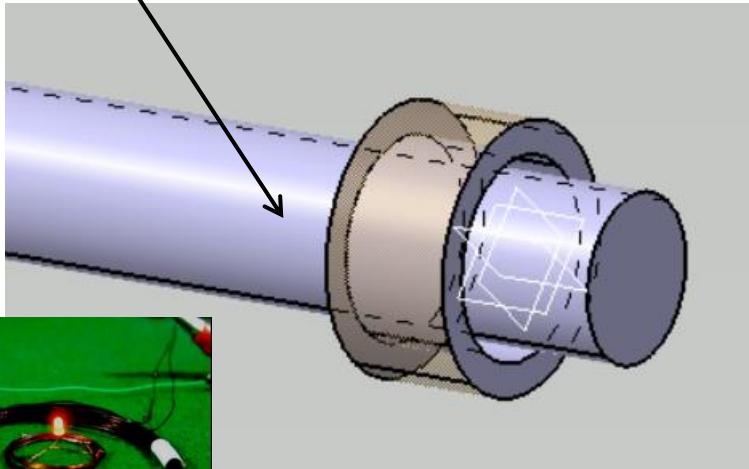
26-to-30-gauge copper wire, ttc5200 transistor and 2 resistors of 3.3 or 6.6 k ohm.





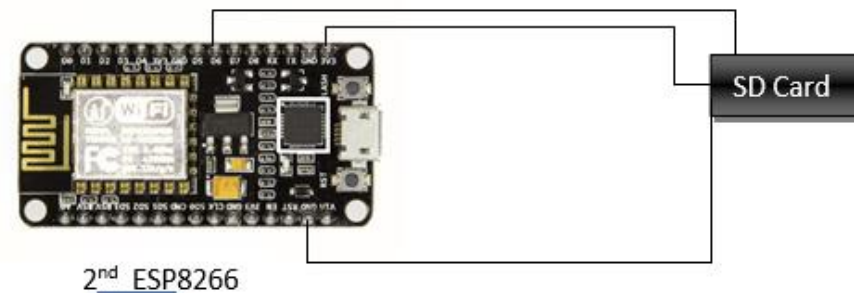
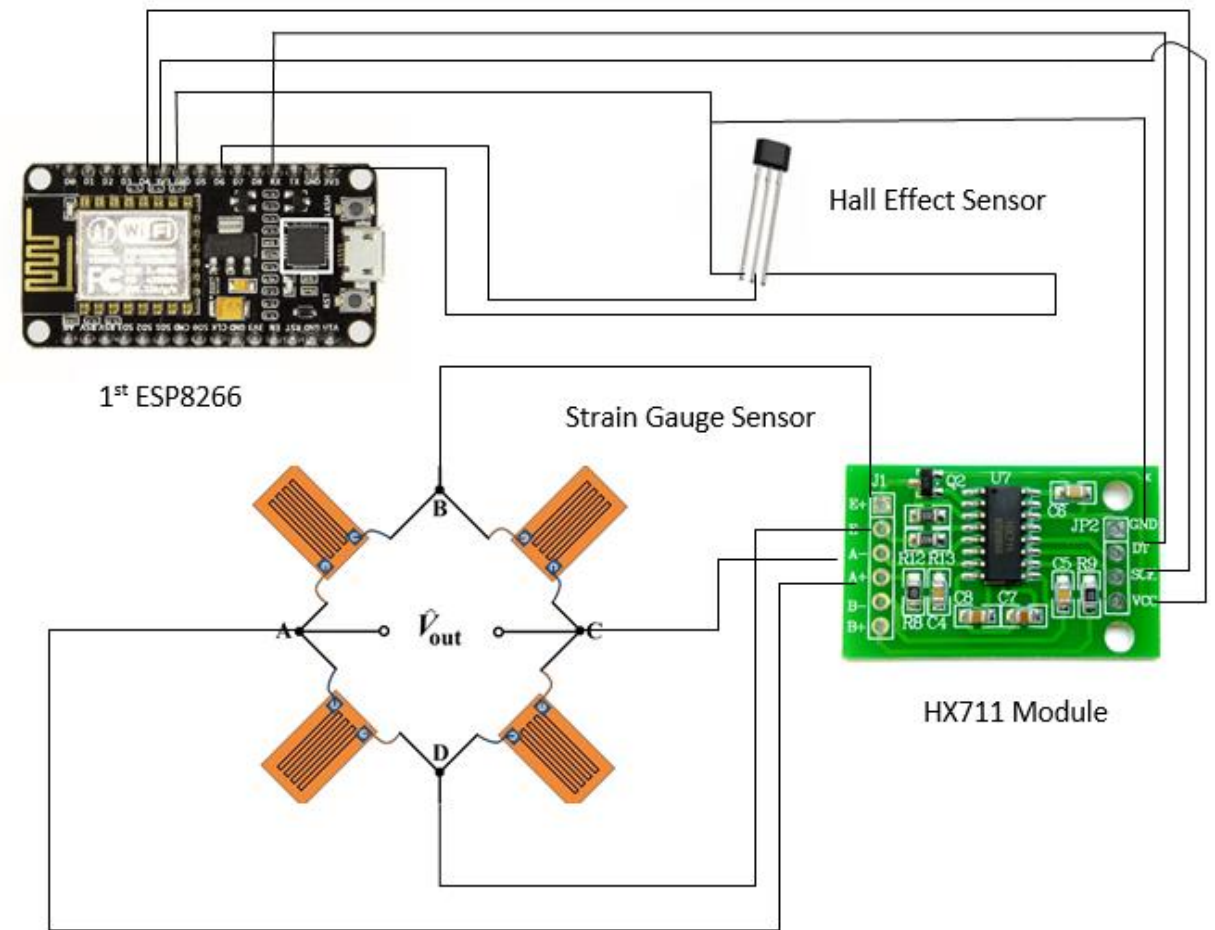
ESP8266 (Transmitter) Attached on to the shaft

HX711+Strain Sensor Hall effect Sensor



ESP8266 (Receiver) Connected outside

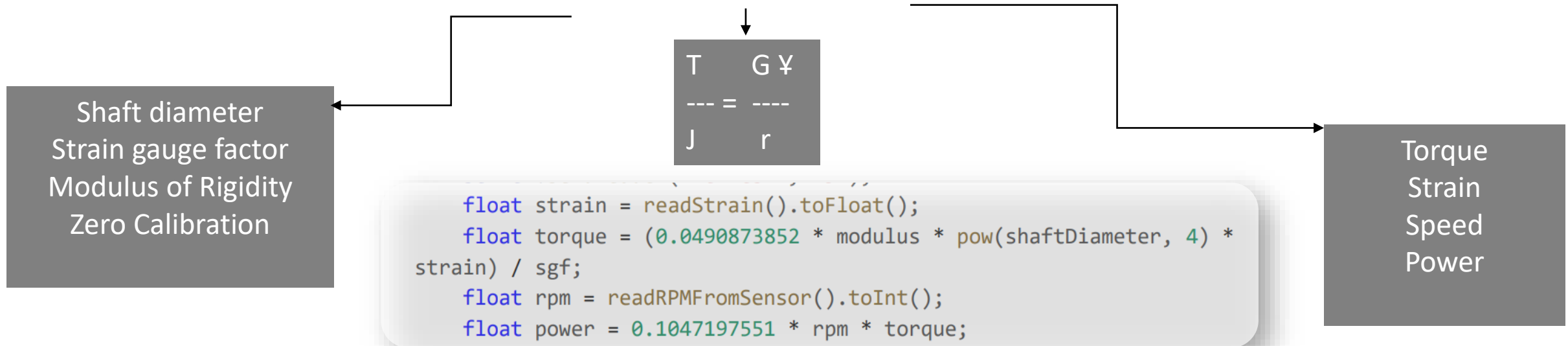
Stores the values in SD Card in .csv format (table)



**ESP (Transmitter)** = Hall effect (gives speed) + Strain gauge (strain Value) + HX711

- 1) Power comes to ESP through wireless (12V)
- 2) All the sensors are attached to the shaft and connected to the ESP
- 3) ESP will create its own WIFI to create 2 servers
- 4) These 2 servers hosts Input web page & Output web page
- 5) Input web Page can be accessed through [http://IP\\_address/input](http://IP_address/input)
- 6) After Input values are given, it will calculate and prints the output values in Output value page, [http://IP\\_address/output](http://IP_address/output)
- 7) This output page is updated every 5 minutes and sends data to another ESP

Creates Wifi -> Hosts Server -> Input web page -> calculations -> prints output values (5sec) -> sends data to ESP2



## Input Web Page

Here, the user can access the input page by connecting Wi-Fi and Typing IP address: <http://192.168.4.1/> in any browser.

6/19/23, 2:10 PM Website

**Wireless System to Determine the Power of Shaft**

Input Values

Shaft Diameter (mm):  
30.00

Strain Gauge Factor:  
2.00

Modulus of Rigidity (Gpa):  
76.00

Submit

Optional Input Values

Zero Calibration

Zero Calibration

Calibration

Calibration Factor:  
4742

Calibrate

## Output Web Page

192.168.4.1/submit

**Sign in to access this site**

Authorization required by http://192.168.4.1  
Your connection to this site is not secure

Username: admin

Password: .....

Sign in Cancel

Fig 8.2 Authentication Pop-up Window

Now, for accessing output page type the “IP\_address/output”

6/19/23, 2:10 PM 192.168.4.1/output1

**Output Values**

Torque:  
10017332.00

Strain:  
6.63

Speed:  
1110

Power:  
1164403968.00



**ESP (Receiver)** = SD Card/Cloud + .csv format

- 1) ESP 2 creates Hotspot to connect to ESP 1 Wifi then,
- 2) ESP receives the values for every 5 seconds
- 3) Updates those values in .csv format and saves to SD Card

Creates Hotspot -> Receiver data -> Store data in .csv

---

## Contributors:

- Head of the Department (HOD), [Mr N R Girish](#), Captain (Navy)
- [Mr Ashok Kumar](#), Scientist 'E'
- [Mr Arun Naskar](#), STA-B

For the guidance throughout the progress of this project

THANK YOU 😊

B.E/B.TECH. & M.E./M.TECH  
**STUDENTS PROJECT WORK COMPLETION REPORT**

1. Name of the Student : *Shiva Narasimha Kondeti*
2. Degree & present Semester : *B.Tech (Final Year) 7<sup>th</sup> Semester*
3. Branch of Specialization : *Mechanical Engineering Specialized in "Robotics"*
4. Name of College/University (with address) : *Gayatri Vidya Parishad, College of Engineering  
Madharavada, Visakhapatnam - 530048*
5. Title of Project (Enclose Abstract, if not submitted earlier) : *Wireless System to Determine Power transmitted through shaft (Category - Internet of Things)*
6. Duration of the Project : *22<sup>nd</sup> May to 17<sup>th</sup> June, 2023*
7. Any classified information : *— No —*  
Involved in the project report

Signature of TD (

*R. Srihar*  
19.06.2023

Date:

आर. श्रीहरी / R. SRIHARI  
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समूह निदेशक (उच्च टी. यू. डब्ल्यू. आर एवं सुरक्षा)  
कृते निदेशक / for DIRECTOR

Signature of the Guide

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Design: *Scientist-E*

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Defence Research & Development Organisation,  
नौसेना विज्ञान तथा प्रौद्योगिकी प्रयोगशाला,  
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NSTL/2533/HRD/PW/BTech/2023

Date : 26-06-2023

**CERTIFICATE**

This is to certify that **Mr. Shiva Narasimha Kondeti, B.Tech - IV Year - Seventh Semester (Mechanical Engineering - Robotics)** student of Gayatri Vidya Parishad, College of Engineering Visakhapatnam has successfully completed his project work on **"Wireless System to Determine Power transmitted through shaft (Category - Internet of Things)"** during 22-05-2023 to 17-06-2023.

*CH V Satya Srinivas*

(सी. वी. शत्य श्रीनिवास)  
(CH V SATYA SRINIVAS)  
वैज्ञानिक-जी / Scientist-G  
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कृते निदेशक / for Director

