

# **Linux based instrumentation and control hardware and software using Linux Kit**

## **Abstract**

This project is to design and implement Linux based data acquisition system (DAQ) by using serial RS-232, SPI and I2C communication protocols. The Linux interface for data acquisition is the Control and Measurement Device Interface. Embedded Linux OS offers a single chip solution with processor, peripherals such as ADC interface controller, Ethernet controller, memory controller amongst other peripherals. The developed DAQ system should be able to acquire both analog signals as well as digital signals. The system converts the analog signals into digital data and sends the data into the computer using RS-232 serial communication for further processing. The development of the system has been divided into three parts. The first part is to the design of SPI interface, while the second part is to the design of RS-232 interface and third part is to design of I2C bus. The SPI interface deals with the ADC and amplifier communication with Linux and the RS-232 interface deals with the communication between PC. The SPI or I2C and RS-232 communication protocol have been developed using C or Python programming language and implemented in Raspberry-pi board or equivalent Linux kit.

In addition Ethernet communication shall be established between Linux kit and computer to display and storage of data.

### **Work Includes:**

1. Understanding hardware and Linux kit structure
2. Hardware development
3. Test routine development in python or C language
4. Testing and Application development

Relevant references [Publications, web links etc.]:

**Eligibility: Only students of M. E. / M. Tech** in Electronics & Communication, Embedded systems, Communication Engg., Instrumentation and Computer Engineering, MCA **branch can submit their application at**

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