**User Requirement Specification**

**Project: Serial Port Monitoring**

**1-Objectives of the Project:**

The project is intended for a engineer/technician dealing with serial port [RS232]. It will able him to do the following function,

1. **Waveform View mode:**

The data from serial port will be recorded using a analog input port for a period of time and transferred to host [Smart phone or a PC] for display.

1. **Baud Rate Measurement/Estimation:**

The data from serial port will be recorded/observed for a considerable period of time and baud rate will be determined after due processing. Moreover, it will be checked that is there any variation in baud rate or it is consistent.

1. **Determination of Protocol(Protocol Discovery):**

The protocol used for data transmission will be determined by processing of data and it will be determined that what type of data is received (text or some other data type). The system will maintain a library of standard and custom protocols from which it will be tried to match and detect the current communication protocol.

1. **Data Recognition using a custom protocol (View Mode):**

The data will be extracted from packet assuming that a specific protocol was used for communication and various segments of data packet will be recovered. The user will be able to select a protocol in its library for data view. User can be able to add his own protocols in library.

**Implementation:**

The implementationof project will be done by using ARM microcontrollers. The baseline system will be implemented in ARM Discovery development board. The basic software development and testing will accurately determine the capability of the system and the speed of the detection. Later on the code maybe ported on an FPGA platform for speed enhancement.The development will be done using Coocox IDE as it is open source and have powerful tools for debugging.

**Platform:**

An experiment setup will be made consisting of transmitting data at different baud rate in a serial port. A known transmitting data attributes will help in fine tuning the code at the detector end.

**Software Development Standard:**

ISO 12207 will be followed to as much extent as possible without compromising project time line.

**Communication and Software Sharing/Monitoring:**

GITHUB will be used for source code sharing and discussion/comments to engage with the team effectively.

**Project Phases:**

1. Finalized URS.
2. Setup development platform [Coocox].
3. GITHUB configuration.
4. Run sample codes on ARM development board.
5. Data transmitting setup.
6. Baud rate estimation.
7. Packet detection.
8. Protocol detection.