Prelab 7: Asynchronous Serial Communications

# Goal and Background Information

The goal of lab 7 is to implement an asynchronous serial communications using the UART or Universal Asynchronous Receiver-Transmitter that is mounted on the PIC32. This will be combined with the code created in lab 5 and 6 to make a mock factory. The stepper motor will be operated by both a person on the floor and a person sitting at a terminal communicating with the PIC32. The stepper ‘operator’ can change the stepper behavior by pressing buttons while the person using the terminal needs to input commands. The PIC32 and the terminal used will be communicating at a rate of 19.2 kbaud using RS232.

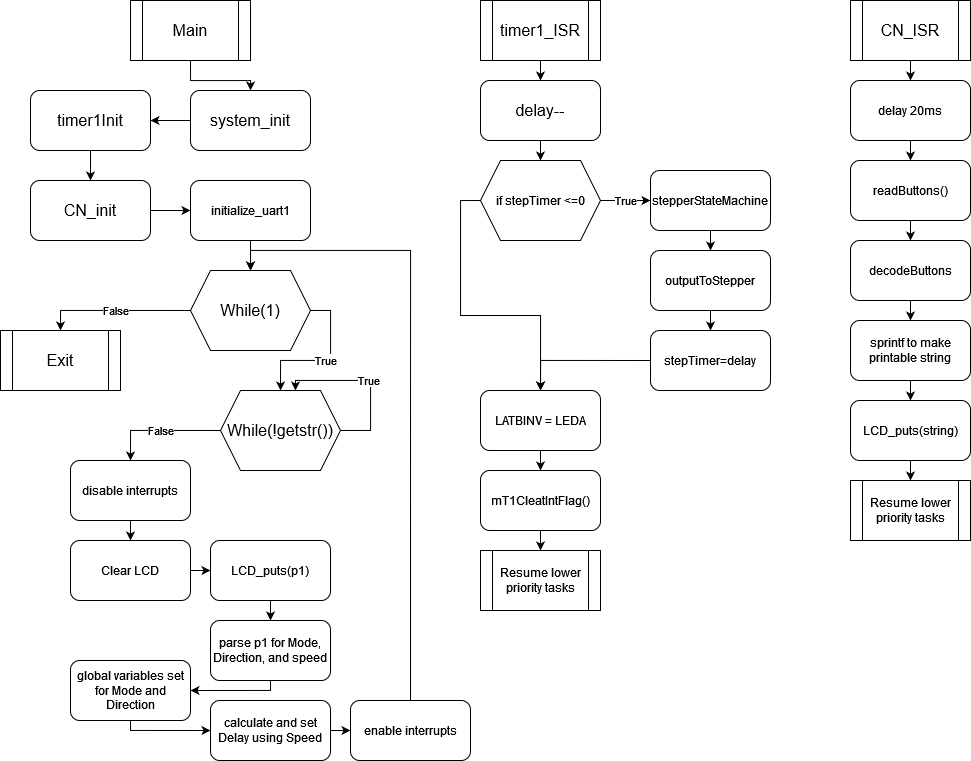
The UART is a type of microprocessor that translates data between serial and parallel forms, usually between two devices that need to communicate. The UART that will be used in this lab is capable of full duplex communications. The Cerebot MX7CK board in the lab can host up to two UARTs at a time. The UART will use a communication standard called RS232 that has standard pins, data rates, and voltage levels. More recently, RS232 has been made so that there are lower voltage thresholds than when RS232 was originally made. This allows for 5-volt powered logic to be able to control RS232 communications directly. RS232 is useful for one-to-many communications and for where there are only a few devices connected (like this lab). RS232 is not useful when there are many devices talking to many other devices on a single line. It should be noted that the Cerebot board will not be using the standard DB9 connector for RS232 but will be using USB connectors instead.

**Data Flow Diagram**

**Diagram

Description automatically generated**

**Control Flow Diagram**

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