


Ashan Perera

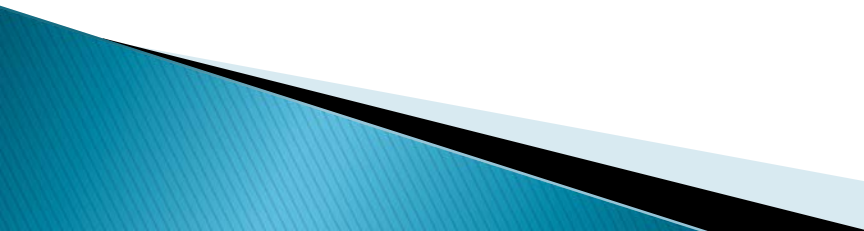
Senior Design

*Project - Electronic System for Remote
Water Quality Monitoring*

Overview

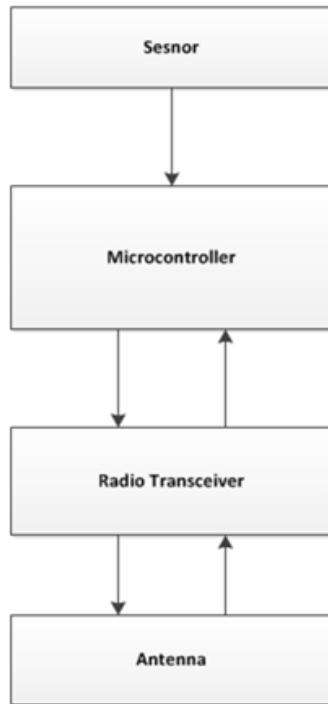
- Introduction
 - System block Diagram
 - Components
 - Circuits
 - UML Activity Diagrams
 - Power sources
 - Improvements
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Introduction

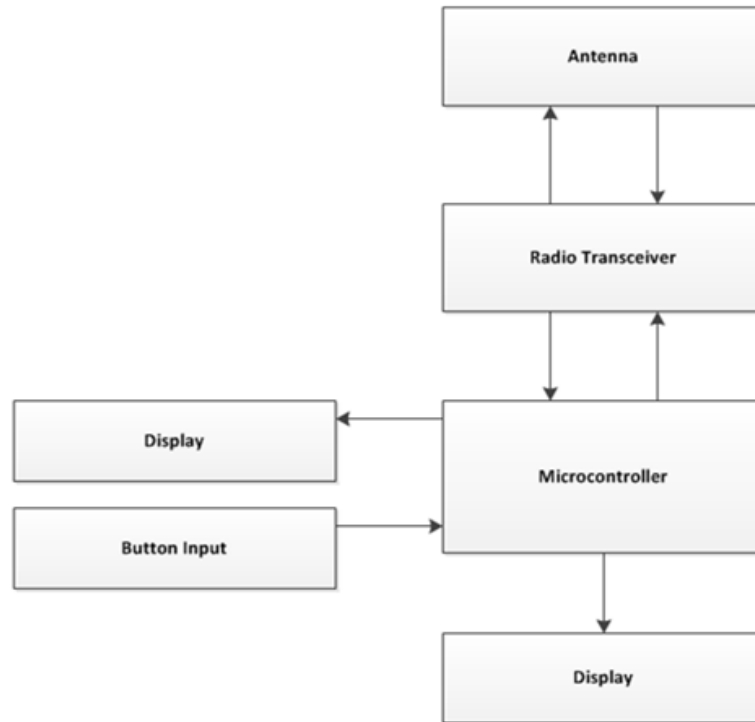
- Continuously monitors water quality in a remote location
 - Transmit back the data wirelessly to an Indoor base
 - Displays results on a LCD
 - User can request for additional data
- 

System Block diagram

Outdoor Components



Indoor Components



Components

Conductivity Probe from Vernier Software Technology



- **Input Power: +5VDC**
- **Sensor Output: 0-5V**
- **Range of Conductivity: 0 to 4400 $\mu\text{S}/\text{cm}$**
- **Response time is less than 5 seconds**

Communication

Industrial Radios from Free Wave



- **Frequency range: 900 MHz**
- **60 mile radius along with Yagi Antennas**
- **Operating Voltage: 6 and 12VDC**
- **RS-232 Interface to connect the Microcontroller**

Display

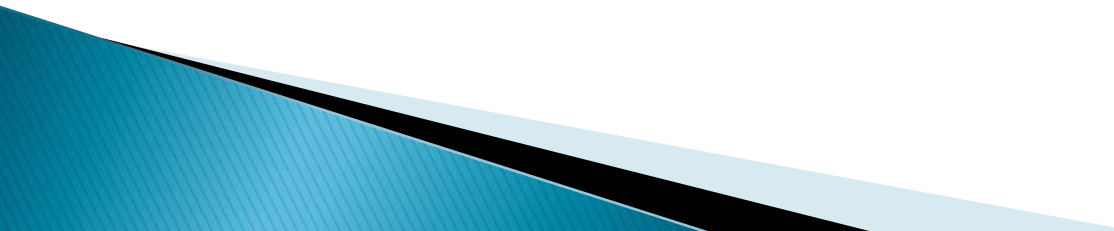
LCD Display from Hantronix

- **Character x Lines: 16 x 2**
- **Parallel**
- **Input Voltage: 5V @ 1.25mA**
- **Input Data: 8-bit**

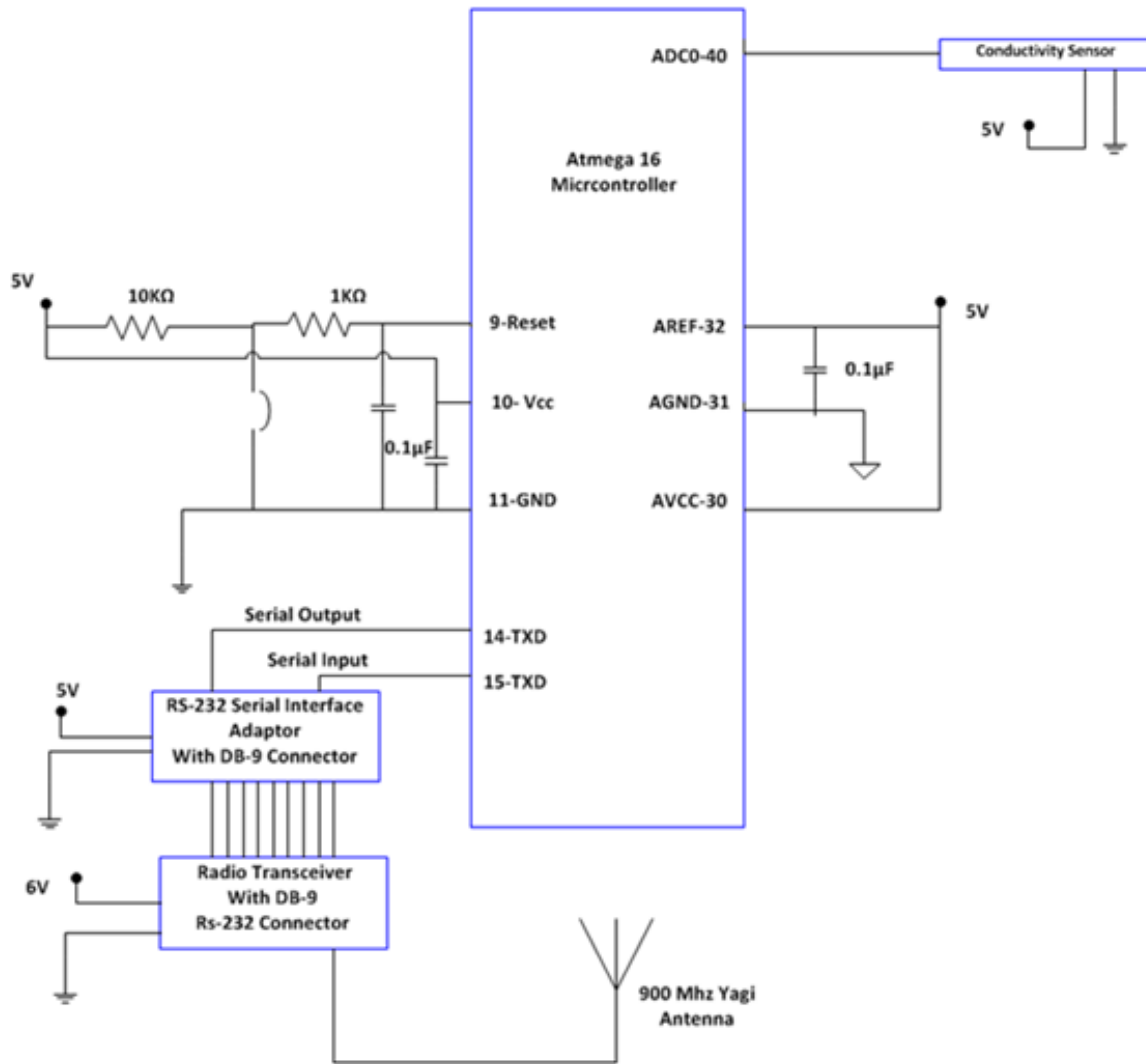


Microcontroller

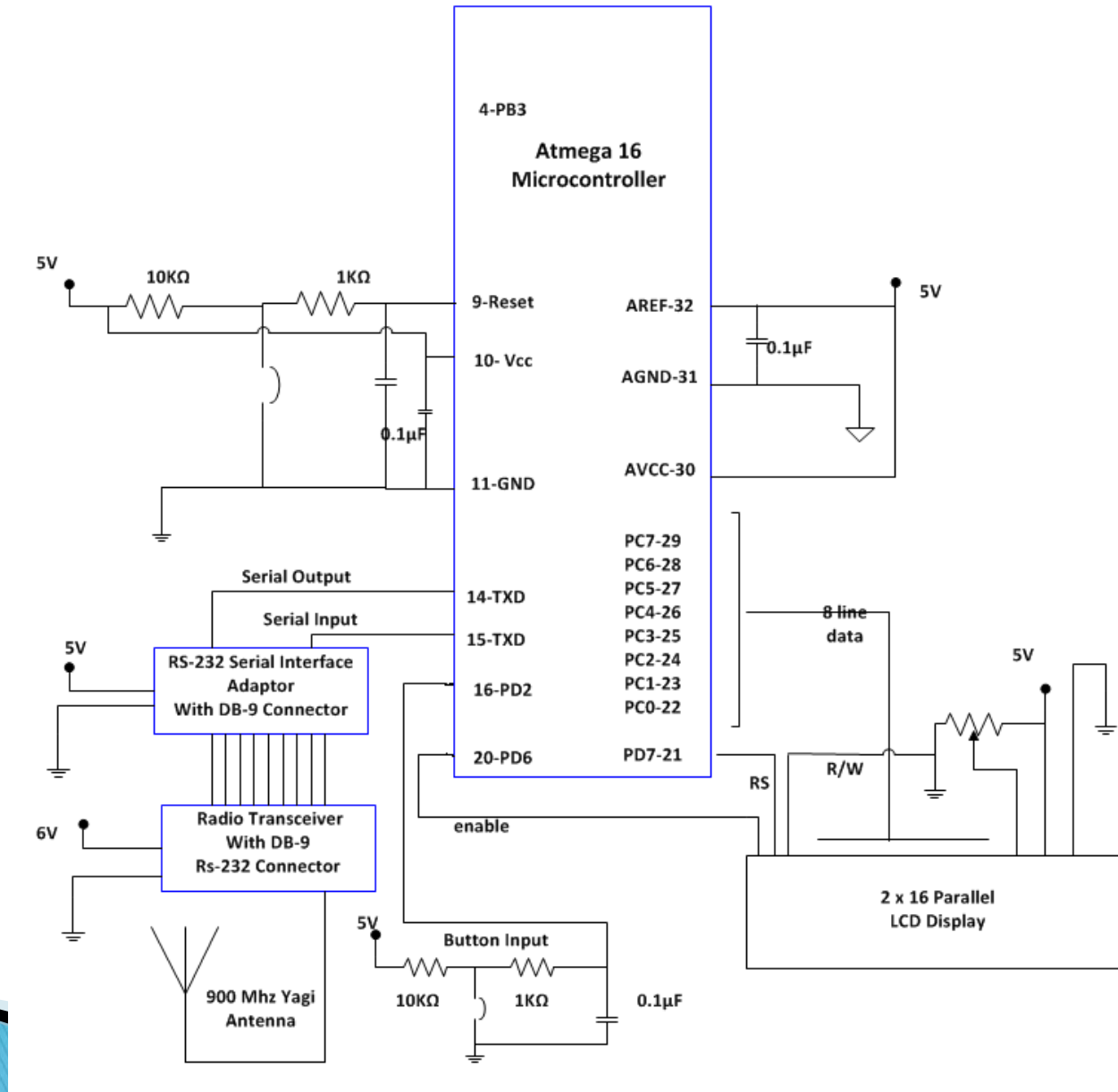
Amega16

- **Analog to Digital Converter**
 - **Serial Communication : USART**
 - **Interrupts Subsystem**
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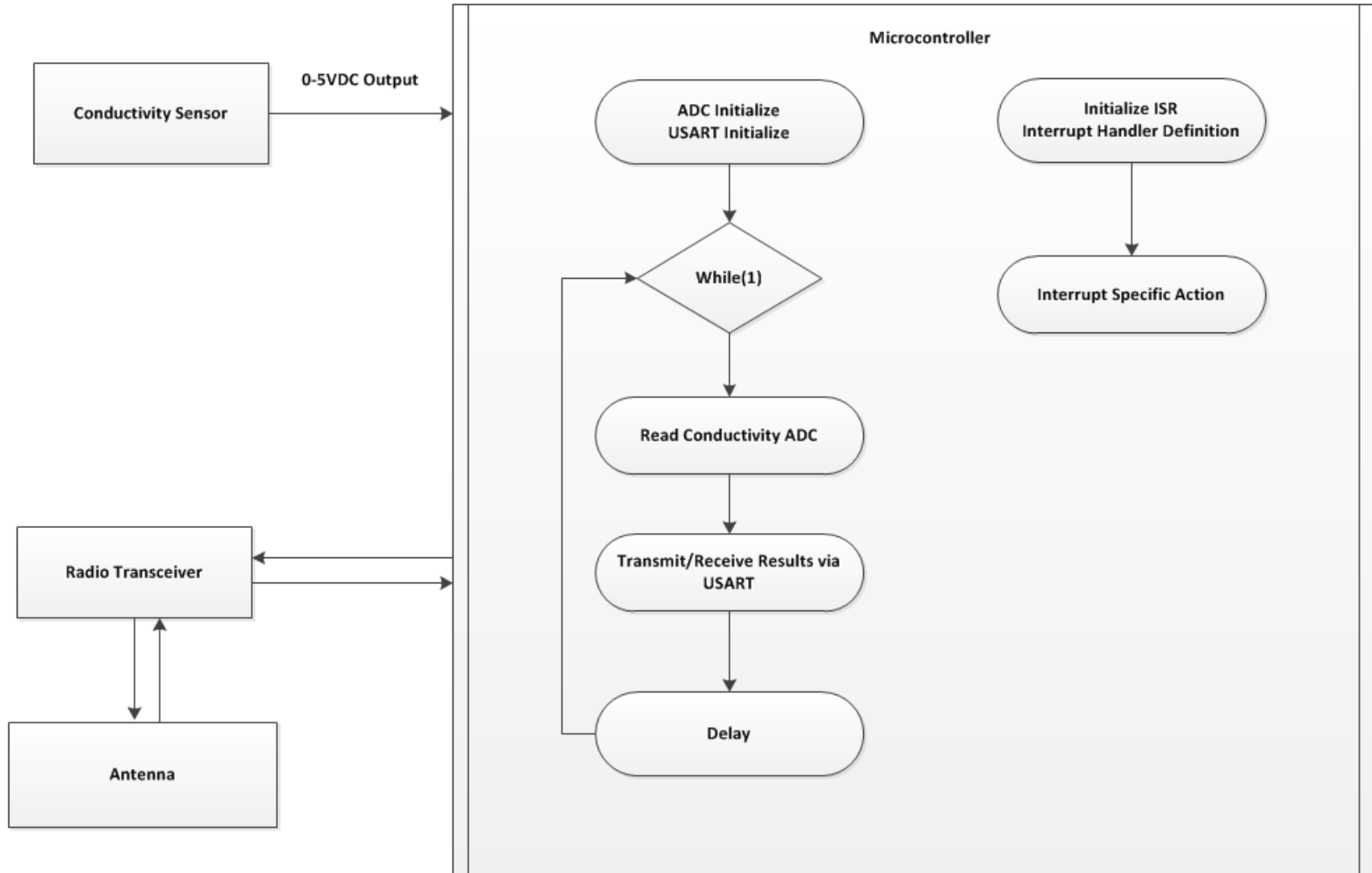
Outdoor Circuit



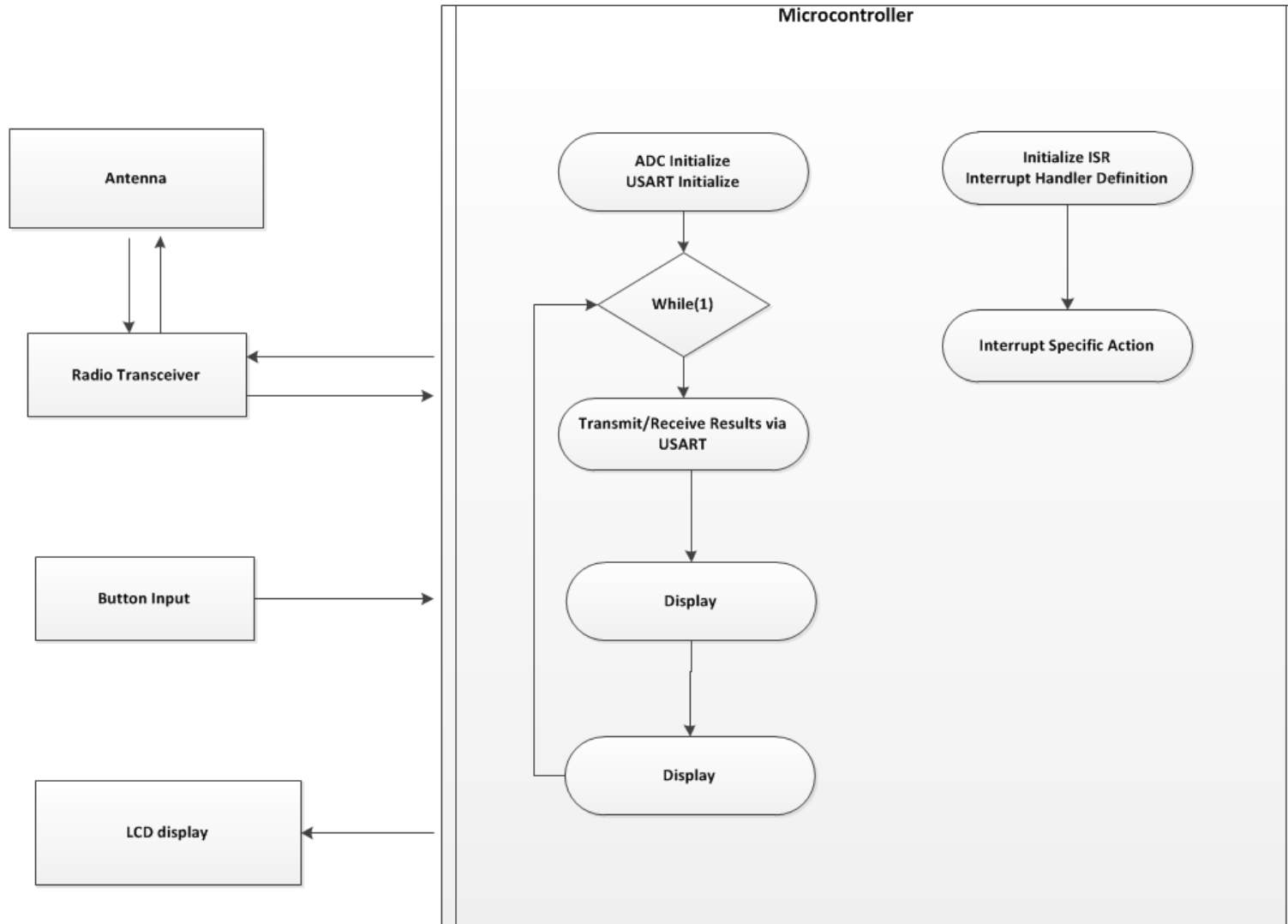
Indoor Circuit



Outdoor UML Activity Diagrams



Indoor UML Activity Diagrams

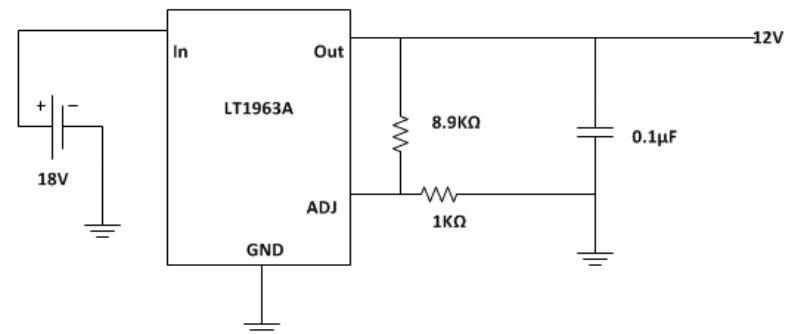
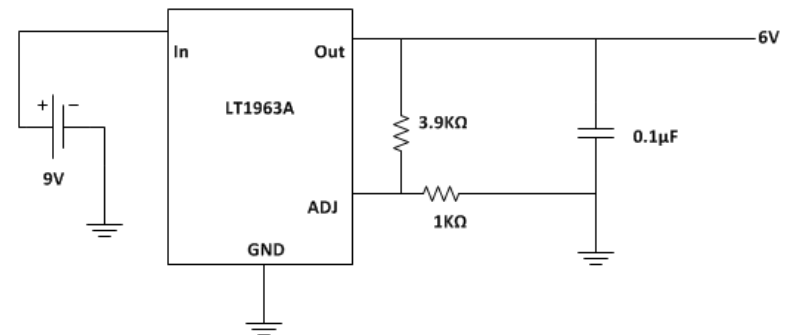
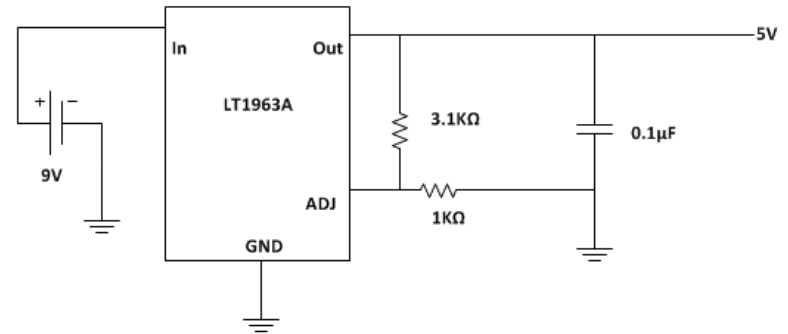


Power Sources

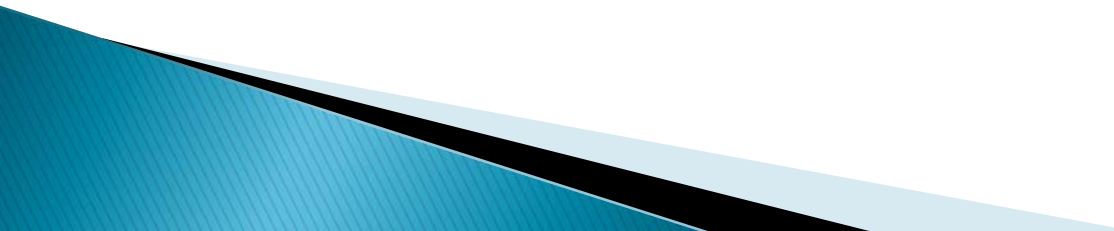
- Outdoor circuit: 9VDC
- Indoor circuit: 2 x 9VDC

Voltage Regulator

- LT1963A
- Dropout voltage of 340mV
- Adjustable output: 1.21-20V
- $V_{in} > 3V$



Improvements

- **Need more sensors to measure different Water Quality Parameters: Temperature, ph level, dissolved oxygen, redox.**
 - **A Renewable Power Source in Remote areas: Solar panels**
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Comments/Questions??

