

SDDEC20-06 General Project Plans

The project we will be working on for the duration of senior design is titled the "Batteryless, Encapsulated Hydrometer."

This device is for use in a number of applications where a process will involve knowing the specific gravity of a fluid such as brewing or some other chemical process. This will be achieved by having a free-floating device in the fluid that is capable of wirelessly transmitting the data out of a closed system.

An issue in existing wireless systems is the need to replace the battery when it dies. This can lead to a time period in which information is not gathered because the battery may have died overnight. Our solution will utilize energy harvesting to power the device. The operator will only be required to turn on the PowerCast transmitter and the hydrometer will begin to charge until it has received enough energy, at which point it will calculate the specific gravity and transmit it to a base station outside of the tank. Since there is no battery in our design, the device will always work so long as the PowerCast transmitter is active.

Our device will utilize a connection-less Bluetooth 5 Beacon to transmit the data outside of the tank. This is a widely available option with plenty of documentation and support online for development. It is also low energy and at the 2.4 GHz transmission frequency will be able to transfer our data quickly.