Sump Pump Failure Warning System

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Abstract

The Sump Pump Failure Warning System is a GSM enabled IoT system that can communicate with its user anywhere in the world. It can inform the user to rising or falling water levels, monitor multiple locations within a property for power failures, diagnose pump switch failures, and keep track of warranty information regarding the pump itself. Moreover, its battery backup system allows for automatic and permanent battery maintenance and several days of independent operation.

Introduction

Unfortunately, severe weather events are when a sump pump is needed most but are also when a sump pump is most likely to lose power due to outages. Even if a generator backup is available, the homeowner must be aware of the failure in order to act. This fact is the motivation for this device, something that can allow the user to monitor their sump system remotely and will continue to function if the power to the house is lost. With a system like this, if power is lost or pumps are running abnormally, the homeowner will know about it no matter where they are.

Methods and Materials

Overall System Design:

This package contains two modules and two external sensors. The Sensor Module will be strapped to the pump’s pipe and connect directly to the water and current sensors. If any threat is detected, it will radio a remote Communications Module which will in turn contact the user via GSM. Both modules carry audio warning systems for added coverage.

Discussion / Results

After the prototype was complete, four primary phases of testing took place. Phase one consisted of over twenty-six hours of testing and saw a 95% success rate. Software improvements were made and over the subsequent three testing phases totaling over one hundred hours and over one thousand simulated detections, not one failure occurred.

Conclusions

This system is reliable and most importantly it fills a need that many people experience. Further, development costs indicate that if this product were to be brought to market it could sell at a very reasonable price.

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