

Monitoring of vibrating machinery

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An AmbioMote-based wireless sensor is powered by vibration created by a running AC motor of a desktop drill press.

To show feasibility of using energy harvesting for monitoring of vibrating machinery we performed this simple experiment.

A piezoelectric element was mounted in cantilever beam configuration and tuned to 60Hz operating frequency. The output of the harvester was connected to an AmbioMote-24A configured to take temperature measurements. The box containing the harvester and AmbioMote assembly was left on top of an idling bench-top drill press. Vibration created by the running motor excited the harvester and powered the sensor.

The following short video shows the sensor producing about 4 reading per minute in this configuration. We expect that clamping the harvester directly on the motor vs. the top of the shield would produce better results and higher frequency of sensor updates. To interpret this low-resolution video: a short line on computer screen is a ping by the receiver indicating normal operation. The ping is produced every 30 seconds so it may serve as a time reference. Each long line appearing on the screen is an actual sensor reading sent from the self-powered sensor.

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