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Application of Rotary encoder in Wind Turbine

Wind is a clean and renewable power source. To ensure safe operation of the Wind turbines, close monitoring is absolutely necessary. A wind turbine monitoring system is responsible for monitoring the tower, blades, shaft, gear box, generator and overall conditions in the generator compartment. This involves a variety of sensors e.g. accelerometers, encoders, temperature sensors, oil/liquid level sensors, particle counter, voltage, current and humidity sensors.

Accelerometers are used to monitor vibration from main bearing, gear box, generator, blades and tower for the purpose of preventing damage arose by destructive vibration. Temperature sensors detect the temperature of generator and gear box to ensure equipment's are working within a safe temperature range. Rotary encoder is mounted on generator's main bearing to monitor rotating speed of turbine. The monitoring of lubricant needs oil temperature sensor, particle counter sensor and oil level sensor to work together in gathering the temperature, quality and liquid level information of the lubricant so that unwanted conditions in gear box and turbine such as lubricant shortage, low-quality and overheated lubricant could be diagnosed before any damage. Voltage and current sensors are used to monitor generator's output power as an output power higher than a certain threshold tends to damage the generator. Temperature and humidity sensors installed in generator compartment are used to monitor environmental conditions in compartment so as to protect parts from being damaged by inappropriate temperature and humidity.

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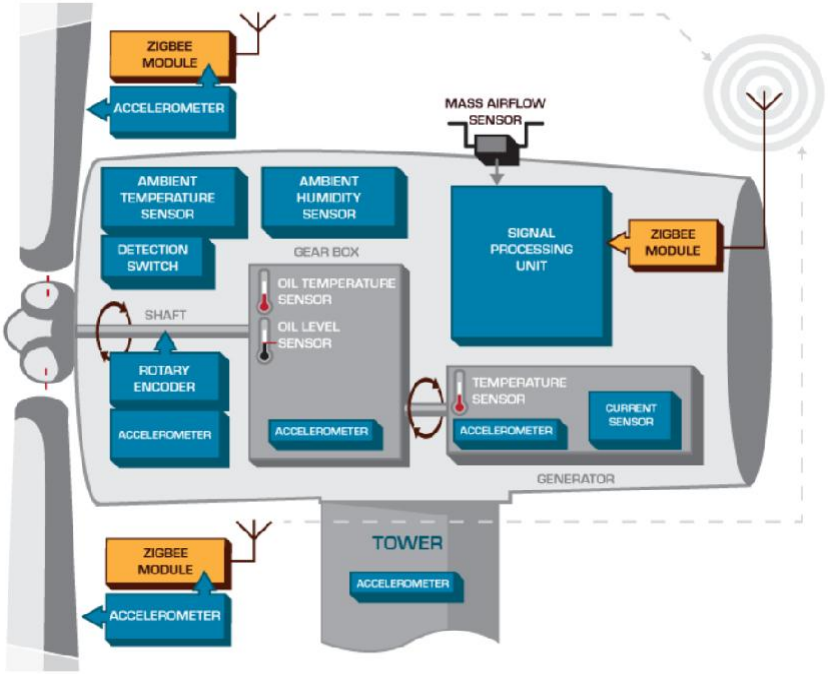
ZIGBEE MODULE
ACCELEROMETER
MASS AIRFLOW SENSOR
AMBIENT TEMPERATURE SENSOR
AMBIENT HUMIDITY SENSOR
DETECTION SWITCH
GEAR BOX
SIGNAL PROCESSING UNIT
ZIGBEE MODULE
OIL TEMPERATURE SENSOR
OIL LEVEL SENSOR
SHAFT
ROTARY ENCODER
ACCELEROMETER
ACCELEROMETER
TEMPERATURE SENSOR
CURRENT SENSOR
ACCELEROMETER
GENERATOR
TOWER
ZIGBEE MODULE
ACCELEROMETER
ACCELEROMETER