Low Cost Vibration Monitoring for Grain Processing Facilities
Jerry Lee Lewis once sang:

“There’s a whole lot of shakin' going on”

Grain processors are not paying attention and it’s costing them money
Why would I want to monitor machinery vibration?

- Reduce your maintenance and railroad overtime costs caused by equipment failure.
- Poor lubrication, machinery imbalance and damaged bearings are the primary causes of equipment failure and can all be detected with vibration monitoring.
How is vibration monitored today at most facilities?

- In most facilities, no vibration monitoring is currently being done
- The only indication of pending failure is audible noise, visible shaking or catastrophic failure
What are the current methods of measuring vibration?

- Most vibration analysis is done by consultants using portable vibration analysis systems.
- This form of measurement requires expensive equipment and an expert to interpret the results.
CMC Industrial Electronics

Why are so few doing vibration analysis?

• There is a high recurring cost of having the consultants attend the facility and take the measurements
• Lack of awareness of the value of vibration analysis
What’s New?

• A low cost vibration sensor designed specifically for grain processing facilities
How does it work?

- The sensor incorporates a MEMS accelerometer and a DSP computer to analyze the vibration of machinery.
- The DSP computer processes the vibration signal and extracts the critical information you need to take preventative action.
Why has no one done this before?

- Advances in technology both in accelerometers and digital signal processing have made this sensor possible.
- Sensors with adequate high frequency response have just become available.
How is vibration measured?

- Vibration is measured using an accelerometer.
- The most common unit of measure is velocity expressed as inches/second.
CMC Industrial Electronics

What vibration types are important?

• RMS velocity is the average amount of vibration your machine is producing
• Peak velocity detects short duration, high speed movements
RMS Velocity

- RMS velocity is a measure of how much your machine is shaking.
- The more your machine shakes, the more stress is put on its bearings.
CMC Industrial Electronics

Peak Velocity

- Short duration, high velocity movements are the signature of a failing bearing
- Damaged rollers, races, lack of lubrication and contamination all give off fast moving, high velocity signals
How is this new sensor deployed?

- It can be installed as part of a CMC hazard monitoring system
- Can connect directly to your PLC control system
- Should always be installed with a bearing temperature sensor
Why is temperature important?

- Temperature is a good indicator of lubrication status
- Over or under lubricated bearings will run hotter than normal
- Another good indication that something is going wrong at that bearing
How is mounted?

- A single ¼” fine thread stud is used to mount the sensor.
- Optionally, a prefabricated sensor mount can be attached using epoxy cement.
- Mounting is important to ensure the vibration signal gets through to the sensor.
But will it survive?

- The sensor is manufactured of solid stainless steel
- It is fully potted for all environments
- It has a built in conduit fitting for full cable protection
Is it certified by a testing agency for use in grain processing facilities?

- When used as part of the CMC hazard monitoring system, the complete system has been certified to CSA standards as Intrinsically Safe
- It is rated for all areas of a grain processing facility
- No additional safety barriers are required
There is a lot more to the story!

- Come and see us in booth 749 for more information or visit us on the web at:

  www.cmciel.com