CASE STUDY

Bringing Intelligence to Vibration Monitoring Solutions

ADLINK Introduces an Easily Integrated, Complete and Remote Vibration Monitoring Solution

For manufacturers, service and components costs tend to be some of the most unpredictable expenses. Although machinery often comes with a warranty and service guidelines, the simple truth is that any piece of equipment with a rotary motor is prone to malfunction and breakdown. If the machine runs long enough, it is practically an assurance.

Not only must the manufacturer pay for the repairs and replacement parts, but they also must absorb the costs from a production delay. Suddenly, manufacturing schedules are days or weeks behind, employees are working overtime, customers are unhappy that their products are delayed and the business's reputation as a reliable vendor is tarnished. All of these have tangible financial ramifications that can cost many times more than just the equipment repair.

Problem

Some manufacturers employ internal maintenance teams to inspect and service equipment. Downtimes for inspection and service can be scheduled so at least the maintenance costs and equipment availability can be predictable. Additionally, manufacturers may opt for a third-party contract service as maintenance backup. Considering the immense stakes, it is a small cost for production reliability.

However, precision sensors and modern
data storage and sharing offer a more efficient and adaptive means to ensure manufacturing equipment, from robots to pumps to material handling equipment and more, is in proper working order.

ADLINK®
Leading EDGE COMPUTING

Solutions

ADLINK has developed the MCM-100, highlighting around-the-clock continuous data collection and vibration measurement with maximized precision and sampling rates for rotating machinery and equipment. Combining data collection, vibration analysis algorithms, computation and network connection in one system, the MCM-100 allows manufacturers to overcome challenges in traditional machinery upkeep and promises a streamlined approach to machinery connectivity. Installation is seamless; there is no need for programming and the Phoenix GM Lite software is an intuitive interface for users.

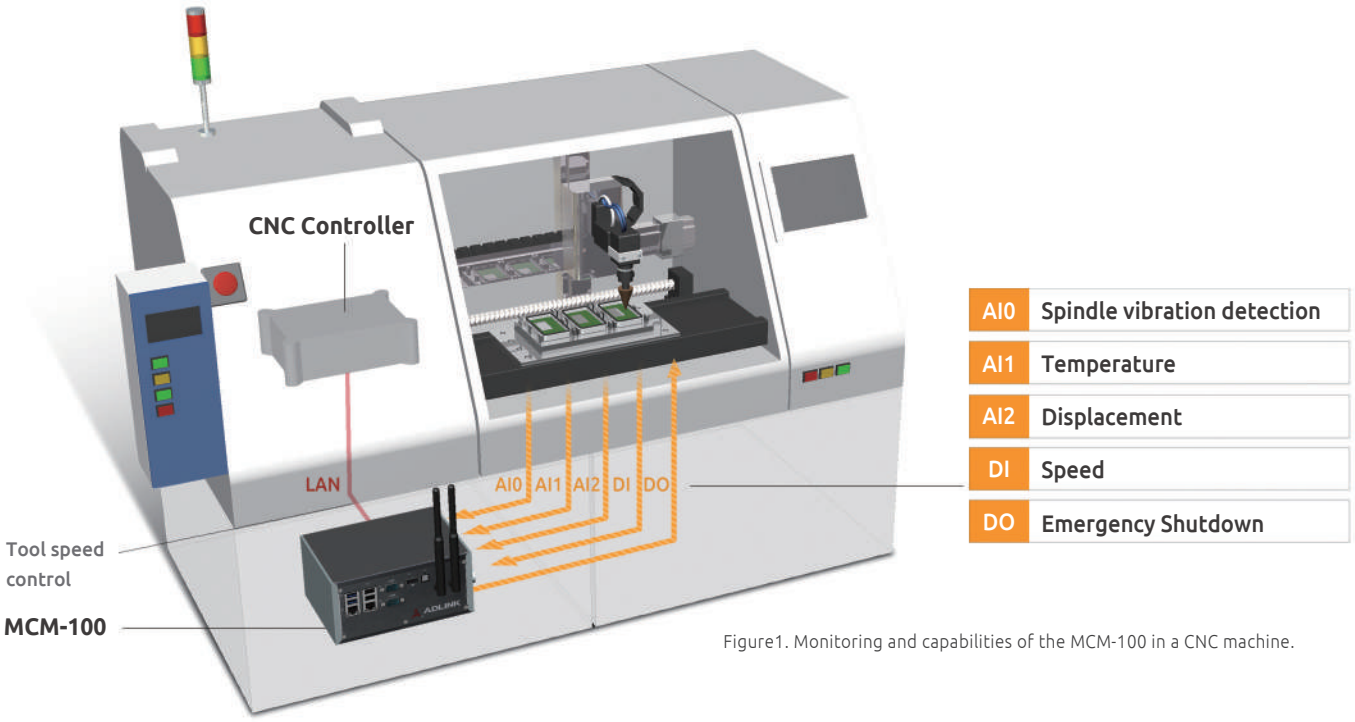

Figure1. Monitoring and capabilities of the MCM-100 in a CNC machine.

A prime example is CNC machinery, which requires frequent inspection and regular cutting tool replacement. In a traditional maintenance approach, multiple individuals might be tasked with this machine's upkeep. However, the MCM-100 allows a single individual to monitor the status of multiple machines in real-time. Changes in vibration measurement from the CNC machine help engineers determine the overall health of the machine. Certain vibration changes might indicate a need to adjust process parameters, such as by modifying spindle speed or changing cutting tools, to ward off potential future disasters.

Once problems such as imbalance, resonance or misalignment increase machine vibration beyond an acceptable range, equipment is more likely to break or fail. Some vibration signals even indicate distinct problems, such as an imbalanced connector, a cracked bearing or a loose fastener. From the engineer's perspective, breakdowns become identifiable and easier to fix while service lives for wear components can be maximized.

PLC-based vibration monitoring solutions have existed for some time, but PLCs have limited analysis capabilities, including a low sampling rate, limited frequency range and fixed algorithms. PLC solutions, able to collect only a limited amount of information, are of little help.

In contrast, the MCM-100 is an all-in-one design that combines a personal computer and data acquisition and signal conditioning modules. It delivers more vibration data as it features 24-bit high-definition communication (versus conventional solutions with 12- to 16-bit) and also captures high-frequency signals at a very high 128 kS/s, compared to the conventional 20 kS/s or lower. The MCM-100 wirelessly links to a personal computer interface by the cloud, providing users with more computing power and a seamless installation. Manufacturers are better able to parse datasets and find trends, and therefore create their own maintenance plans based on the application.

Conclusion

Equipment manufacturers can also benefit from the vibration monitoring provided by the MCM-100. Not only can they provide better quality assurance on their machinery, but there is also ample opportunity for value-added services, such as charging customers based on machine uptime and remote equipment monitoring.

Without a doubt, the MCM-100 lowers the total cost of ownership of equipment with vibration concerns. Manufacturers are able to maintain equipment proactively and efficiently, without risking interruptions from downtimes. Manufacturers have a lot to gain from a high-tech, intelligent monitoring solution like the MCM-100 — and nothing to lose that isn't already at risk today.

Figure 2. The MCM-100 is an easily integrated, complete and remote vibration monitoring solution.