CTC AppNotes

A series of technical documents written by members of the CTC community

Basic Steps to Developing and Implementing a 4-20mA Monitoring Program

Despite the fact that many of those in the vibration analysis industry feel our technology is proven beyond a reasonable doubt, some companies still have not developed full fledged vibration programs of their own. For these companies basic 4-20 mA monitoring of critical machinery is frequently the first step to creating real in depth vibration programs.
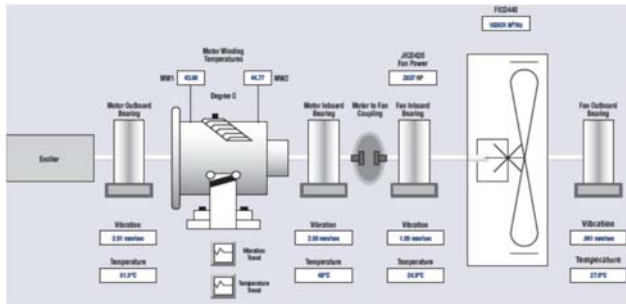

Figure 1. Typical process analysis graph sometimes used in determining which machines need monitoring

First steps

Fig. 2. Typical 4-20 mA sensor with output proportional to velocity

The first items on in implementing a basic program is to determine what machines are critical to the process of the facility and deciding what order to implement monitoring. The answers to which machines will cause lost time or loss of material determine the first machines to be monitored. The second step is to determine what instruments will be doing continuous monitoring. PLC, DCS and SCADA systems are frequent choices. There may already be a plant health management system in place for other areas of the plant which can be tied into with the proper vibration sensors. Once the monitoring system is chosen, then the sensors to be used can be determined. Primary choices for 4-20 monitoring are 4-20 mA dedicated sensors or dynamic vibration sensors (used with a signal conditioner to convert the dynamic output to 4-20) In the case where 4-20 mA monitoring has been chosen, the correct sensor can be matched to each machine point to be monitored. Generally the sensor/systems require that a full scale value, frequency monitoring band and Peak or RMS outputs be selected. Once these items are determined the final sensor part numbers (and signal conditioners) can be chosen. Once these first steps are completed all that remains is to source the sensors, cables signal conditioners (if required) and connect everything.

Fig. 3 Dynamic Vibration sensor & signal conditioner
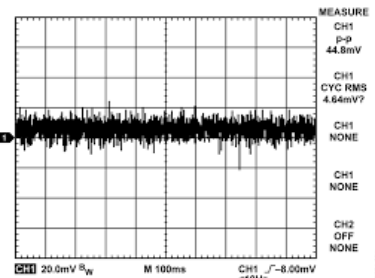
Fig. 4. Typical 4-20 mA plot of a process variable.

If you have any questions feel free to contact CTC directly. Call toll free 1-800-999-5290 in the US/ Canada or +1-585-924-5900 internationally, or alternatively, email techsupport@ctconline.com.

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If any CTC vibration analysis hardware product should ever fail, we will repair or replace it at no charge.