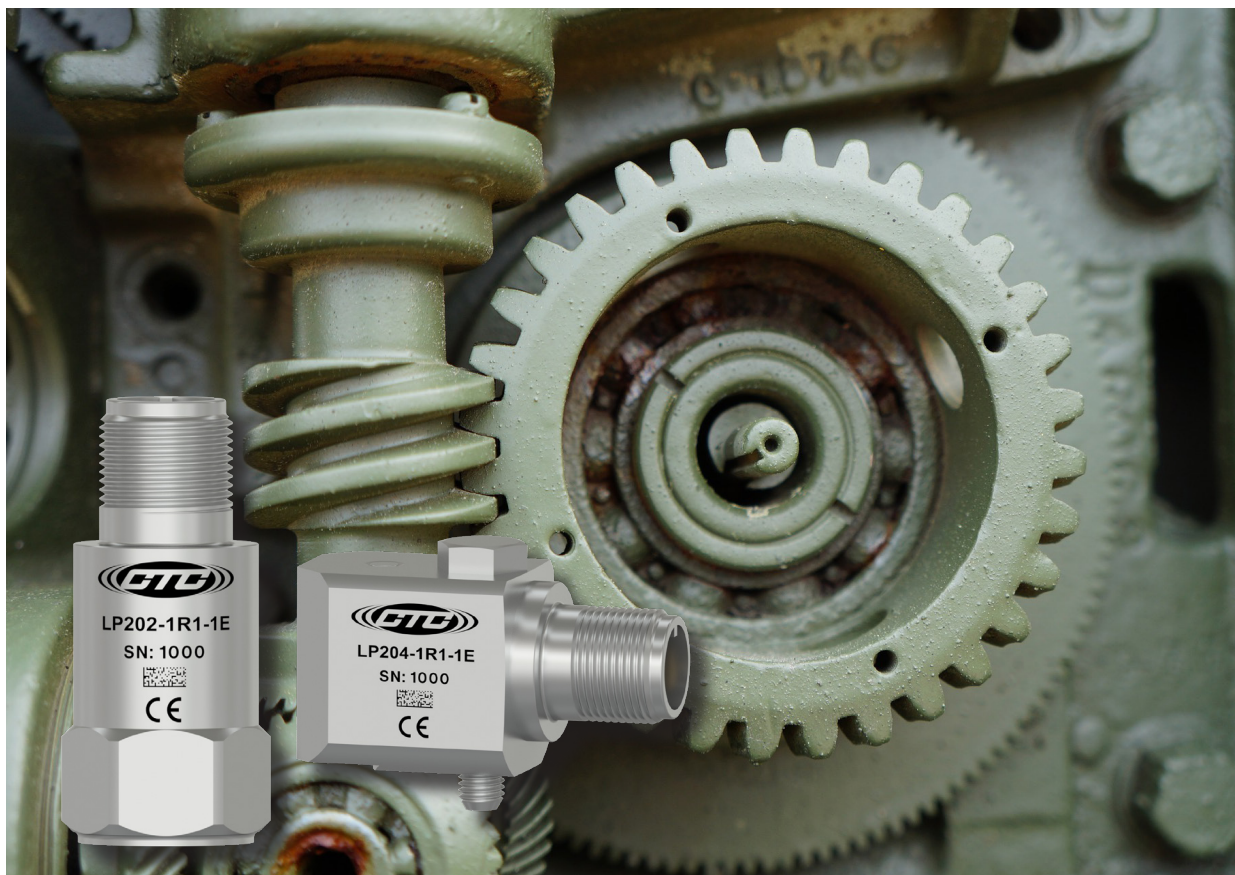


# 4-20 mA

## VIBRATION MONITORING

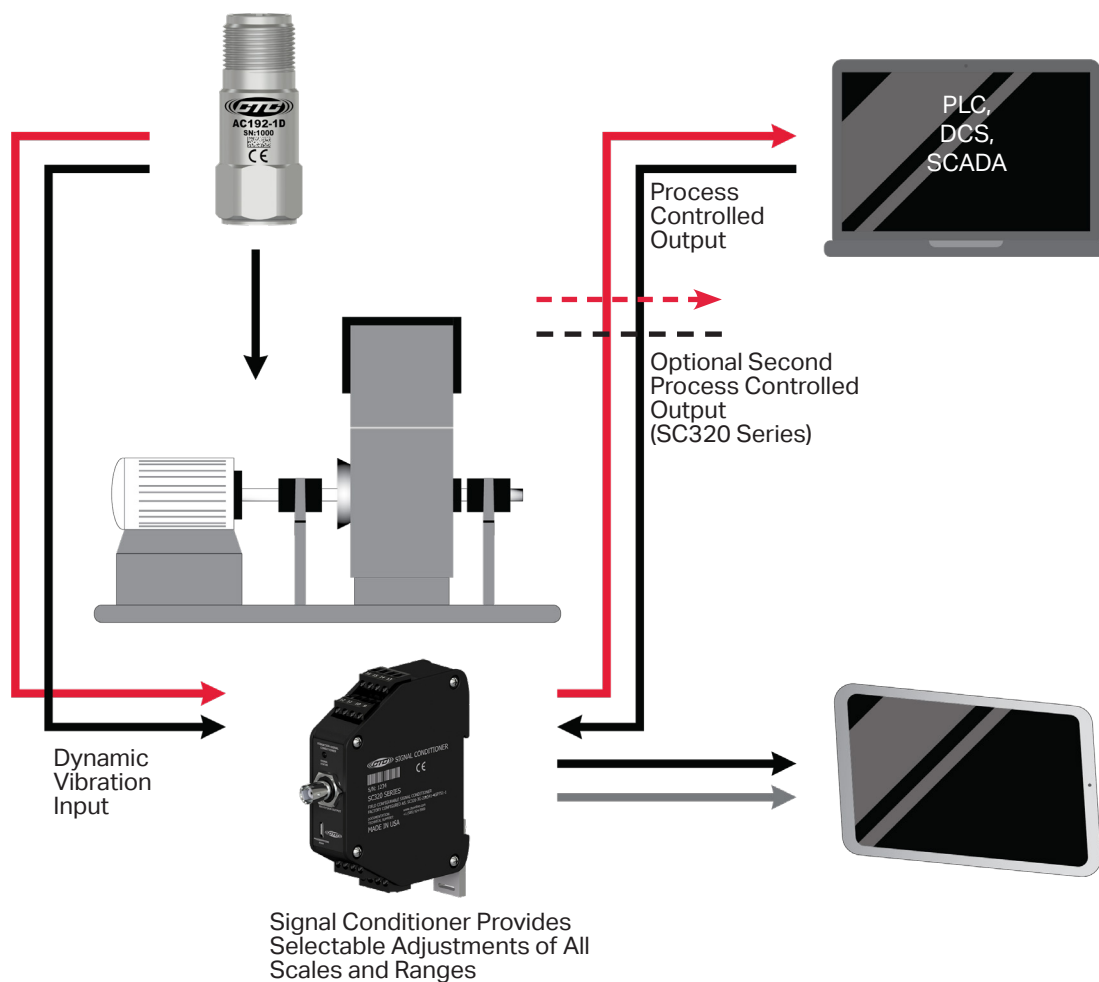


WHEN RELIABILITY MATTERS  
CONNECT TO CONFIDENCE

## How Does 4-20 mA Vibration Monitoring Work?

4-20 mA technology is a simple, cost-effective way for continuous machine health monitoring. The purpose of the 4-20 mA analog current loop is to transmit the signal from an analog vibration sensor in the form of a 4-20 mA current signal. The current signal generated is proportional to the overall vibration of the equipment or machinery that is being monitored. This output current has a range of 4-20 mA, with 4 representing the minimum, and 20 representing the maximum amplitudes (within the range of 4-20 mA).

The 4-20 mA signal output is proportional to the defined amplitude generated within a specific frequency band. Therefore, the signal does not include data from frequencies outside of the frequency band, but includes all vibration (critical and non-critical faults) within that band. This information can be used to set and trip alarms to protect critical machinery from excessive vibration. With 4-20 mA technology, route-based data collection is not necessary. Only when a machine displays a critical vibration level is a vibration analyst required to diagnose the machine health problem.



## Loop Power Vibration Sensor Offerings

CTC offers a wide variety of Loop Power Sensors which are designed to withstand the harshest industrial environments and can be customized to focus on the most important frequencies for your application. Our LP Series Sensors come in standard connector exit, molded integral, and armored integral options with 4-20 mA output proportional to acceleration or velocity. Dual Output Loop Power Sensors with a 4-20 mA vibration output and °C temperature output, as well as hazardous rated options, are also available.



**LP200 & LP300  
Series Loop Power  
Sensors**



**LP800 & LP900  
Hazardous Rated  
Loop Power Sensors**

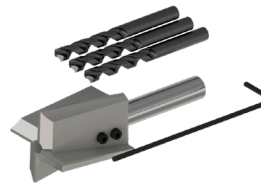
CTC recommends stud mounting LP Sensors to the machine using CTC's MH117 Series installation tool kits with 1" (25.4 mm) end mill diameters.



**MH117-2A  
Installation Tool Kit,  
1" (25.4 mm) End Mill  
Diameter, for 10-32  
Thread**



**MH117-2B  
Installation Tool Kit,  
1" (25.4 mm) End Mill  
Diameter for 10-32  
Thread, with Tap Set**



**MH117-3A  
Installation Tool Kit,  
1" (25.4 mm) End Mill  
Diameter for 1/4-28  
Thread**



**MH117-3B  
Installation Tool Kit,  
1" (25.4 mm) End Mill  
Diameter for 1/4-28  
Thread, with Tap Set**

LP Sensors are compatible with all standard CTC connectors and cabling. Popular options include:



**A2R / A3R  
Polycarbonate Connector with Metal Locking Ring.  
Ideally Suited for Most Industrial Environments.**



**V2R / V3R  
Viton™ Seal-Tight Boot Connector with PPS Insert.  
Ideally Suited for Hot and Caustic Environments.**

## Signal Conditioners

Signal Conditioners can be used in conjunction with standard dynamic accelerometers, piezo velocity sensors, or displacement probes. The Signal Conditioner accepts the dynamic input and converts it to a proportional 4-20 mA, 0-20 mA, 0-5 Vdc, or 0-10 Vdc output for the PLCs, DCS, or SCADA system. The Signal Conditioner can be adjusted in the field so that the scaling and filters match your application. The benefit to using a Signal Conditioner is that the dynamic vibration signal is available from a standard BNC connection on the front of the Signal Conditioner, or as an optional output from the terminal block.



**UEB330 Series**  
Dynamic Vibration and  
Ultrasound Sensors



**SC300 Series**  
Signal Conditioners



**SCE400 Series**  
Stainless Steel  
Enclosure for 1 to 8  
Signal Conditioners

CTC's SC300 Series Signal Conditioners feature dual band technology, allowing the user to set two bands of 4-20 mA output from one sensor. This dual band technology is ideally suited for simultaneous monitoring of standard vibration faults in conjunction with early bearing fault detection or lubrication monitoring. When utilizing an SC320 Series Signal Conditioner with CTC's UEB330 Series Dynamic Vibration and Ultrasound Accelerometer, the user can set one band pass filter to the ISO standard filter of 10 Hz to 1 kHz to automate the vibration output from the UEB330 Series Sensor, and a second pass band filter to 20 kHz to 40 kHz to automate your ultrasound band. Signal Conditioners are DIN rail mountable in CTC's SCE Enclosures. SCE Enclosures come in fiberglass and stainless steel options, and can fit up to eight Signal Conditioners per box. When ordered at the same time, CTC will install and wire your Signal Conditioners and Power Supply in the enclosure for easy installation.

## Relay and Protection Systems

CTC offers PMX1500 Series Enclosures for use with Loop Power Sensors, as well as SCD Series Enclosures for use with Signal Conditioners, which feature displays on the front of the box, which are capable of displaying the vibration level from the Loop Power Sensor or Signal Conditioner and also triggering alarms and shutdowns based on the amplitude of the overall vibration within a selected frequency range. These boxes are essential to protecting critical machinery from excessive vibration, which can cause catastrophic failure and downtime.



**PMX1500**  
Extended Capacity  
Fiberglass Enclosure  
for 1 or 4 Single Output  
Loop Power Sensors



**SCD100 Series**  
Fiberglass Enclosure  
for 1 to 4 Signal  
Conditioners