



CONNECTION TECHNOLOGY CENTER, INC.

LEVEL 3 – LESSON 3
*TWO WIRE 4-20 mA SENSORS AND
FOUR WIRE TRANSMITTERS*



INTRODUCTION

Welcome to **Level 3, Lesson 3** of CTC's free online vibration analysis training. We're glad you have taken the time to view this self-paced lesson. We hope you enjoy the training and will continue to build your vibration analysis knowledge as you progress through Level 3.

'Two Wire 4-20 mA Sensors and Four Wire Transmitters' is created and presented by CTC for complimentary educational use only. This training presentation may not be edited or used for any other purposes without express written consent from CTC.



OBJECTIVES

Upon completing the following lesson, you will understand the basic application and benefits of:

- ❑ **Two wire 4-20 mA loop power sensors**
- ❑ **Four wire transmitters**



TWO WIRE 4-20 mA SENSORS

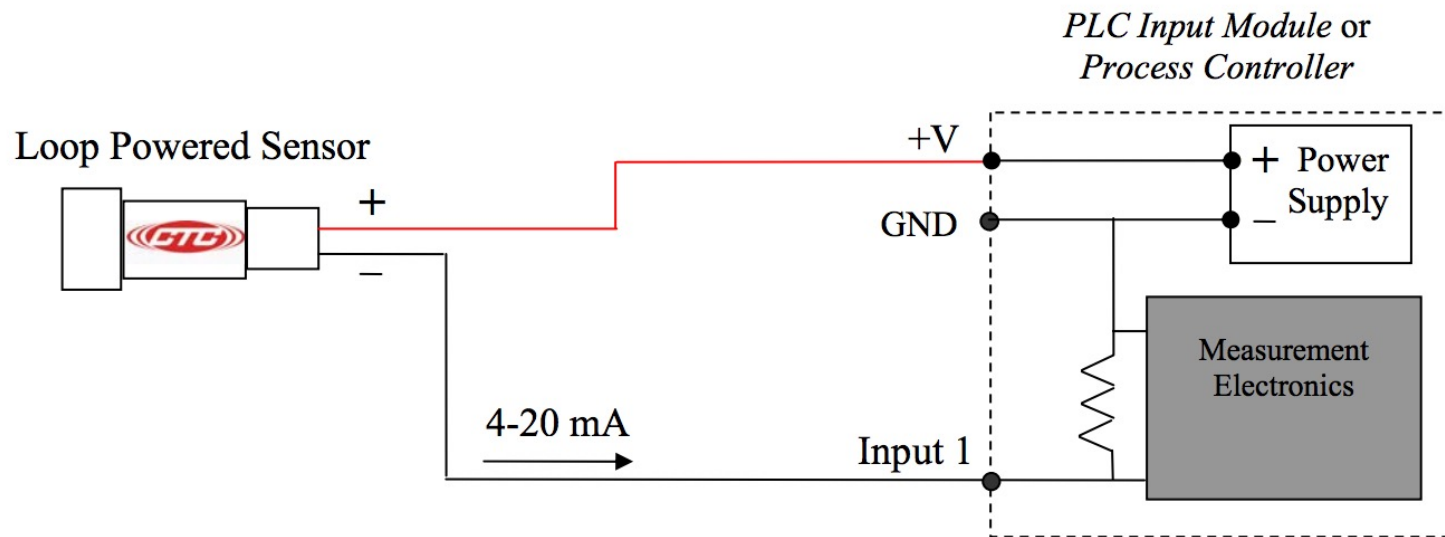
Two wire loop power sensors from CTC require only two connections:

- ❑ **+18 to 30 volt power lead**
- ❑ **DC common (negative) lead**

The sensor regulates the loop so that the current is proportional to the vibration parameter being measured.



TWO WIRE 4-20 mA SENSORS



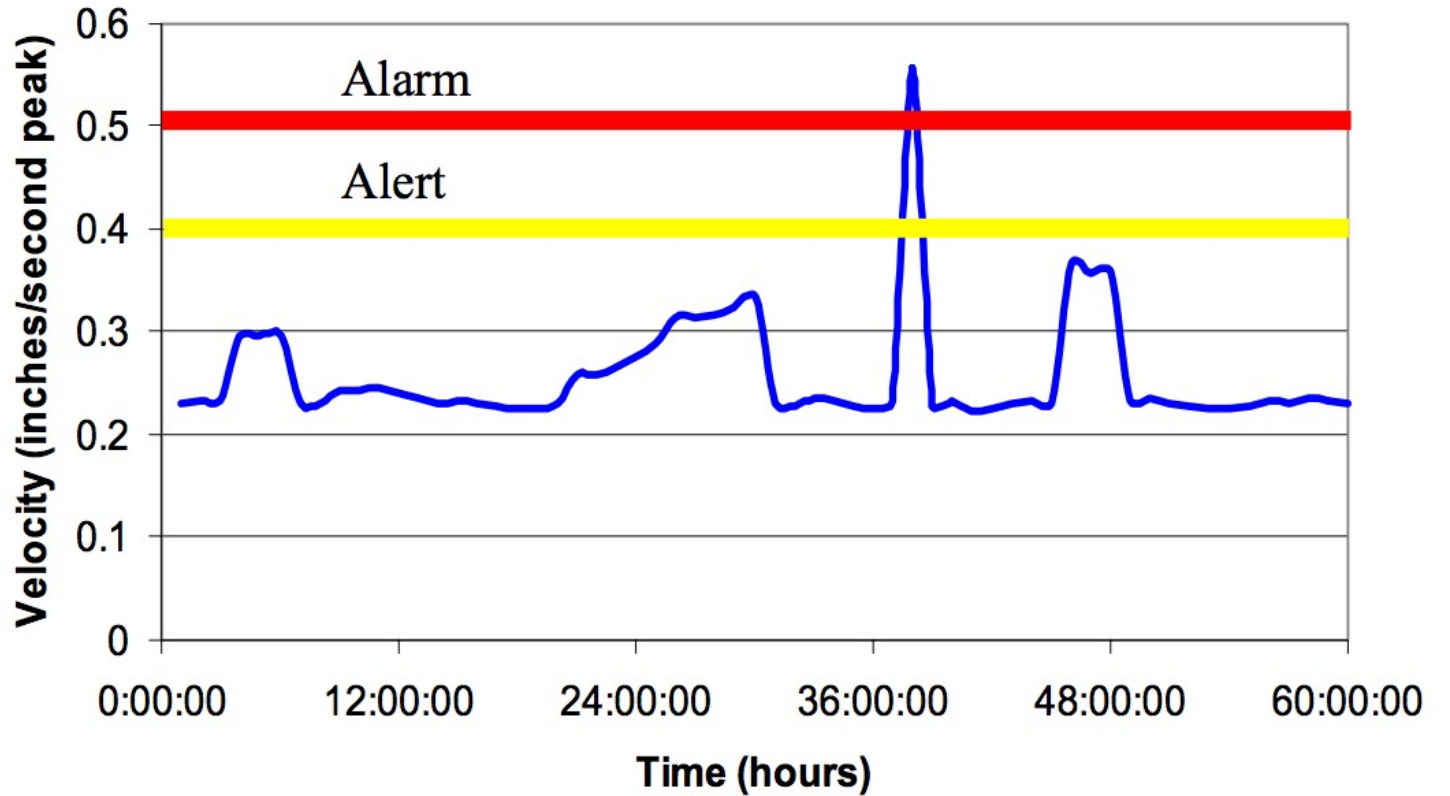
- ❑ The sensors can be wired directly into analog input modules on PLCs or Process Controllers that accept 4-20 mA signals
- ❑ The sensor must be connected to a power source at the positive lead and the common (negative) lead will be connected to the Controller's analog input
- ❑ The power supply is used to complete the loop through the Controller's ground

TWO WIRE 4-20 mA SENSORS

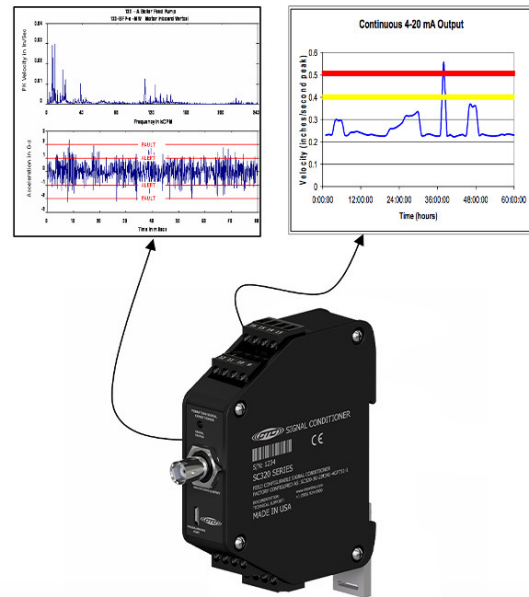
Example of a loop powered sensor's output vs. time



Loop Power Output



FOUR WIRE 4-20 mA TRANSMITTERS



Example of the dual outputs of CTC's vibration transmitter

CTC's vibration transmitters constitute a more versatile approach to continuous monitoring than the standard loop powered sensors.

The transmitters are capable of wider frequency and amplitude ranges and can provide a dynamic vibration signal in addition to the overall 4-20 mA output.

The dynamic vibration signal is available through a buffered output.

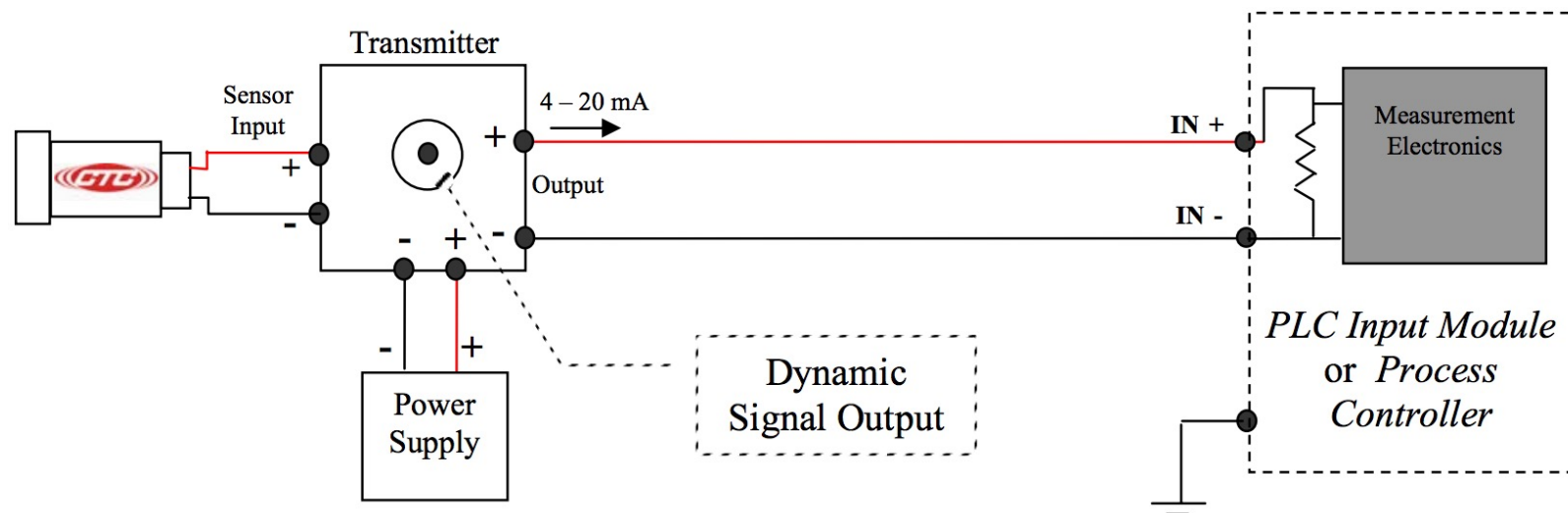
FOUR WIRE 4-20 mA TRANSMITTERS

The four wires needed to monitor overall vibration level using a transmitter are:

- ❑ **Positive and negative power supply leads** that will provide power to the electronics
- ❑ **Positive and negative output signal leads**

These two pairs of leads are separate and distinct from one another. The figure below shows typical wiring into a PLC or process controller with analog input module.

A two conductor cable with a plug (F) type BNC connector can be used to monitor the dynamic vibration signal coming out of the BNC jack on the transmitter.



SUMMARY

Thank you for taking the time to review this training lesson.

CTC prides itself on the industry's best customer service and technical support. CTC is proud to employ Vibration Institute Certified Analysts as part of our commitment to providing the industry's best service and support.

For more technical information, additional white papers, and training materials, we invite you to visit our website at www.ctconline.com.



SUMMARY

CTC offers a full range of vibration analysis hardware and process and protection instruments for industrial use. Our customers choose us time and time again based on:

- ❑ **Superior durability**
- ❑ **Accuracy and performance**
- ❑ **Quick service (shipping most orders in 3 days)**
- ❑ **Knowledgeable support staff**
- ❑ **Industry's only UNCONDITIONAL LIFETIME WARRANTY
on all CTC Line products**

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