



## **iT300 Beginner's Guide**

Introduction to 4-20 mA vibration monitoring




# What is 4-20 mA?

## » Current loops 101

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- Allows for remote, continuous monitoring
- Used to monitor:
  - Temperature
  - Pressure
  - Flow
  - Speed
  - Vibration!
- Simple, two-wire system with signal accepted by:
  - PID controllers
  - SCADA systems
  - PLCs
- Represents “zero” to “full-scale” of parameter being measured
  - 4 mA = zero
  - 20 mA = full-scale
  - Linear output, easy to reconcile



# How can 4-20 mA be applied to vibration?

» Current loops 101

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- Vibration is monitored on rotating machinery across the world
- Some data requires analysis – think frequency or spectral content
  - Allows for troubleshooting and fault identification
- 4-20 mA monitoring gives a simple way to track vibration through:
  - Establishing a baseline for vibration
  - Monitoring signal over time to detect changes
  - Allowing for instrumentation (such as PLC or SCADA) to be programmed to alarm when values exceed or drop lower than important levels
- Two things important to know:
  - Output type (proportional to what?)
  - Full-scale (what is the maximum [20 mA] equivalent to?)

# How can you acquire a 4-20 mA signal?



» Product offerings for 4-20 mA vibration monitoring – two paths

## 1. 4-20 mA sensor

- Choose a sensor preprogrammed to output 4-20 mA signal
- Proportional to acceleration or velocity
- Selectable output types (peak, RMS or true peak)
- Selectable full-scale range
- Mount, power and obtain direct 4-20 mA signal
- See options below!

<https://buy.wilcoxon.com/vibration-sensors-4-20ma.html>

## 2. Accelerometer + vibration transmitter

- Choose a dynamic IEPE accelerometer or velocity sensor
- Combine with iT30X series vibration transmitter to field-configure full-scale range, measurement frequency band, and output types
- Acquire two (2) separate 4-20 mA outputs from the single sensor input, maintain access to dynamic signal via BNC connector for analysis
- See options below!

<https://buy.wilcoxon.com/vibration-sensors-iepe.html>

<https://buy.wilcoxon.com/vibration-transmitters.html>

# How is 4-20 mA be applied to vibration?

## » An example

- Say you have a motor operating at 1800 RPM (nominal) and you want to mount a vibration sensor for continuous monitoring.
- Regardless of the path chosen, sensible 4-20 mA settings are:
  - Output proportional to peak velocity
  - Full-scale value of 1.0 ips (inch per second)
- Once measurement chain is complete, you establish a baseline of.....6 mA?
  - If 4 mA = zero vibration and 20 mA = 1 ips (remember full-scale), then 6 mA must be between 0 and 1 ips.
  - For the full-scale selected, each mA represents 0.0625 ips
    - 1 ips/16 mA = 0.0625 ips/mA
  - Therefore, 6 mA = 2 mA \* 0.0625 ips/mA = 0.125 ips
- Now that baseline is established, PLC tracks current (mA) level and reacts to any changes or programmed alarms.



# How can Wilcoxon Intelligent Transmitters help?

» Applicable to the real-world

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- The iT series of vibration transmitters allow for the user to configure the desired output type and full-scale range
  - Through pre-order part number selection (iT150 series)
  - Through field configuration (iT30X series)
- Wire two separate 4-20 mA outputs to control system for continuous monitoring
- Provide access to the raw voltage signal originating in the sensor
  - Troubleshoot the machinery through spectrum analysis
  - Pinpoint and identify faults with ability to narrow frequency bands of interest
- Alarm and relay capability, MODBUS communication, temperature sensor input compatibility
  - Available on select models



# Any questions?

» Contact us!

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» [www.Wilcoxon.com](http://www.Wilcoxon.com)

» 301-330-8811

» [info@Wilcoxon.com](mailto:info@Wilcoxon.com)