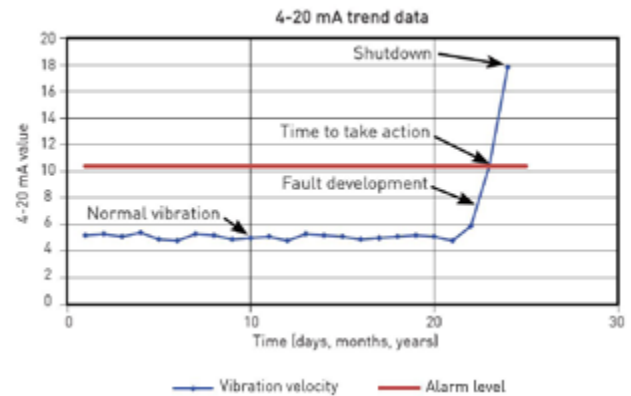


# Simplified condition-based monitoring

Vibration monitoring is essential to understanding machine health. With 24/7 trend data for fault detection, it allows users to monitor machinery more effectively and avoid unscheduled downtime. Many process control systems already accept 4-20 mA inputs, making it easy to integrate vibration data into existing monitoring programs.

- 4-20 mA signal outputs directly to process control system for clearly visible trend data
- Changing vibration levels provide warning prior to equipment failure
- Increase plant efficiency by focusing only on problematic machines



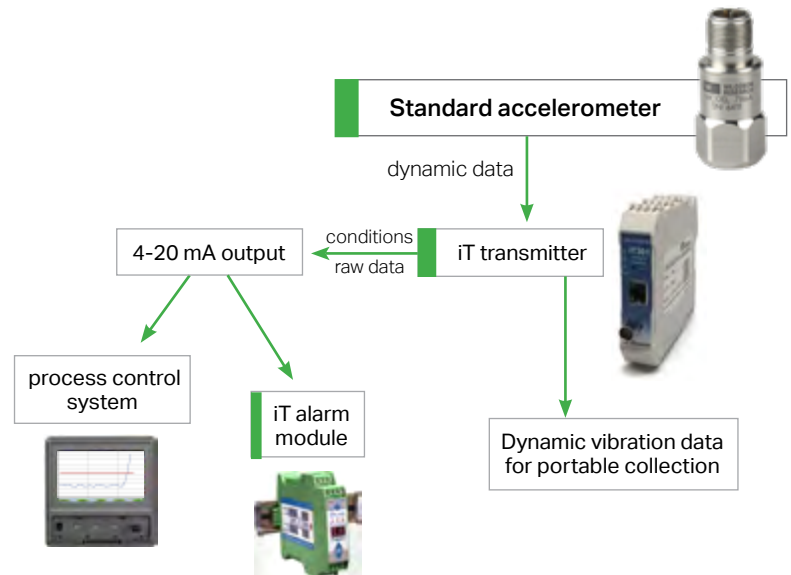
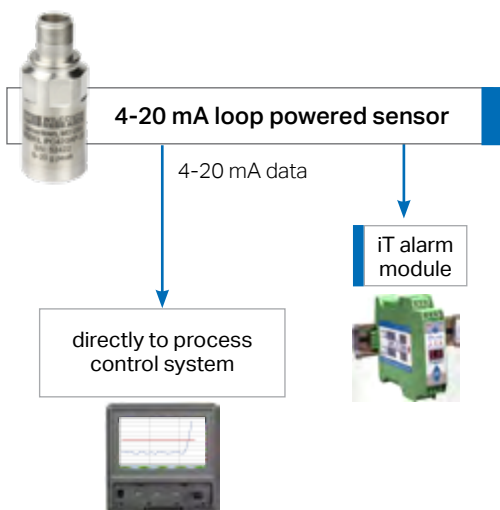
## 4-20 mA monitoring options

### 4-20 mA loop-powered sensor (4-20 mA data)

- Lower total cost of monitoring set-up
- Simple trend data for continuous monitoring
- Multiple output types (RMS, peak, true peak)

### IEPE accelerometer and intelligent transmitter

- More detailed information on machine condition
- Enables access to dynamic data
- Wider sensor selection – suitable for a broad range of applications



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## 4-20 mA monitoring options

### 4-20 mA loop powered sensors

For plants already utilizing PLC/DCS/SCADA systems, the most cost-efficient option is the use of 4-20 mA vibration sensors that output directly to the control system. This approach offers the lowest relative cost per data point, can be easily incorporated into existing infrastructure, and provides 24/7 continuous monitoring. Combining 4-20 mA sensors with an iT relay alarm also has the advantages of continuous monitoring, and is a good option if a control system is not already in place.

### Accelerometers and velocity transducers

Some applications require more complex monitoring than can be provided by 4-20 mA sensors – for example, low frequency measurements are best taken with accelerometers designed specifically for that purpose. Paper machines, cooling towers, and slow speed agitators are common low frequency applications, although some high speed machinery (such as gearboxes and compressors) can exhibit faults in the low frequency range. In other cases, simple trend data showing overall vibration levels is just *too simple* to be of use in diagnosing machine faults. The best option for these applications is the combination of an accelerometer and an intelligent vibration transmitter. The transmitter converts the dynamic output to a 4-20 mA signal, making this approach compatible with process control systems while preserving access to dynamic data.

Some intelligent transmitter models feature a BNC output for compatibility with portable data collectors. For applications that include walkaround monitoring, access to dynamic data is required, making the IEPE sensor and intelligent transmitter combination the best option. This approach does not provide continuous monitoring and technicians must be trained in vibration analysis.

CBM approach	Relative cost per data point	Dynamic data	24/7 continuous monitoring	Required		Advance warning
				PLC/DCS/SCADA	Programming/Training	
4-20 mA sensor to control system	\$	no	yes	yes	yes/no	1-3 months
4-20mA sensor + alarm module	\$\$	no	yes	no	no/no	1-3 months
IEPE sensor + intelligent transmitter	\$\$	yes	yes	yes	yes/no	1-4 months
IEPE sensor + intelligent transmitter + alarm module	\$\$\$	yes	yes	optional	yes/no	1-4 months
Portable data collection	\$\$\$\$\$\$	yes	no	no	yes/yes	1-6 months
Traditional online monitoring	\$\$\$\$\$\$\$\$	yes	yes	no	yes/yes	3-18 months

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## Product overview

### 4-20 mA vibration sensors

- Measurements in terms of acceleration, velocity or displacement
- Choice of RMS, peak, true peak, peak-to-peak output
- Selectable full-scale range
- Digital sensor with HART protocol (model PCH420V)



### iT series intelligent transmitters

- Accepts measurements from accelerometers, velocity transducers or dual-output sensors
- Two mappable 4-20 mA outputs
- Dynamic output available (iT300 series)
- Field-configurable, with no standalone software needed (iT300 series)
- Modbus/RS485 and relay mapping available (iT301)

### Accelerometers and velocity sensors

Wide selection of sensitivity, frequency range, temperature range, size, specialty



### iT401 alarm module

- Works with any 4-20 mA sensor
- Three independent field-adjustable relays
- LED display of 4-20 mA value or full scale



## Complete solutions for condition-based monitoring

### Cable assemblies

- IP68 rated options
- Class I, Div 2 suitable options
- Temperature ratings up to 200° C
- Shielded, twisted pair, multiconductor and coaxial
- New 6H/6HI and 6HD2 connectors for use with HART sensors

### Mounting hardware

- Mounting bases and studs
- Fin mounts
- Isolators
- Magnetic bases
- Mounting pads

### Power supplies

- 24 VDC power supplies
- Models iT001, iT002, iT004

### Enclosures

- iT051/iT052 DIN rail transmitter enclosures
- VL series switchboxes

### iT accessories

- TBUS connectors
- Terminal blocks
- Fuses



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