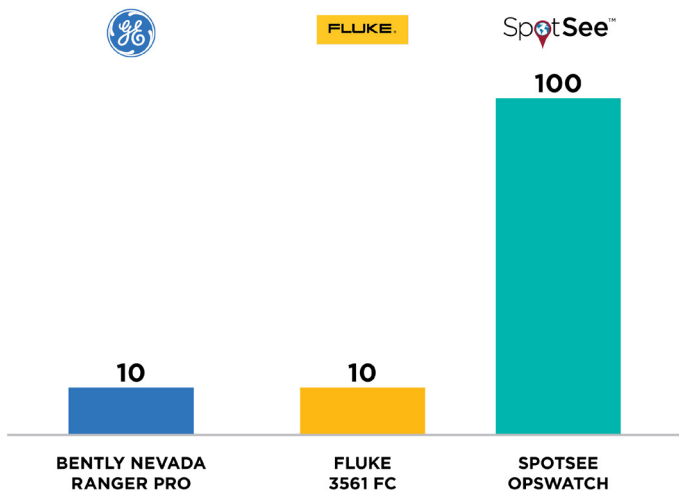




OpsWatch - Stand Alone Device

The OpsWatch monitoring system delivers real-time vibration and shock information which allows you to spot anomalies in trends and detect indications of developing faults before they result in costly failures and unplanned downtime.

### SENSOR TO GATEWAY TRANSMIT POWER (mW)



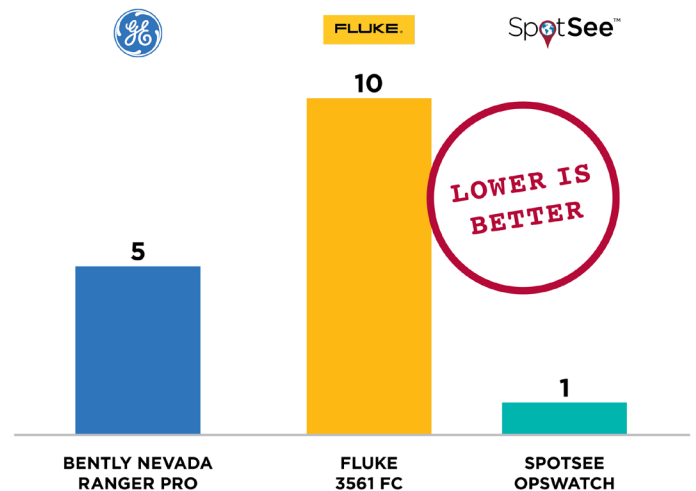
Our "all in one" design reduces the probability for RF interference by at least 10x.

Both Bently Nevada and Fluke utilize battery powered sensor nodes that communicate to a hub, while OpsWatch is an "all in one" design that requires direct power (typically available on the equipment being monitored). The benefit of the wired OpsWatch vs. the battery powered solutions offered by the competitors are:

- 10x more transmit power to ensure superior radio link reliability
- Significantly more volume of data communication (not constrained by battery power)
- Less machine maintenance (no need for battery replacement)
- No battery temperature constraints

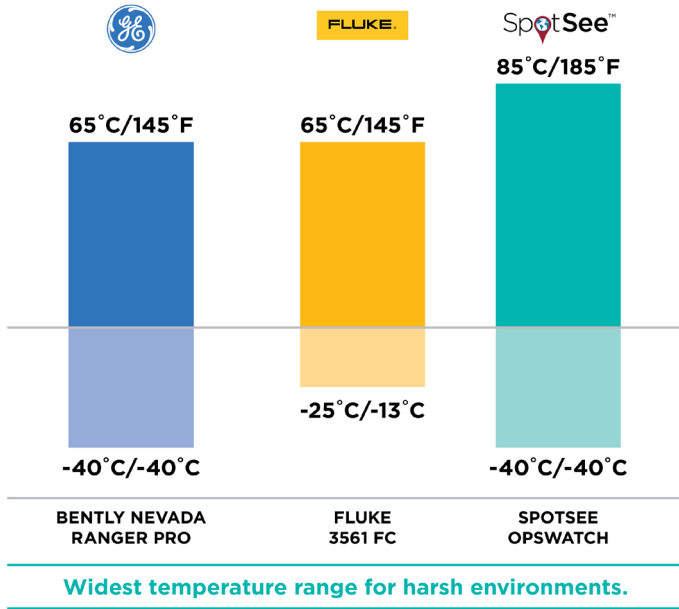
- Lowest frequency floor enables monitoring a wider class of equipment including slowly rotating equipment
- Lower frequency vibrations have higher damage potential

### VIBRATION LOWEST FREQUENCY (Hz)



OpsWatch detects vibrations that competitors cannot.

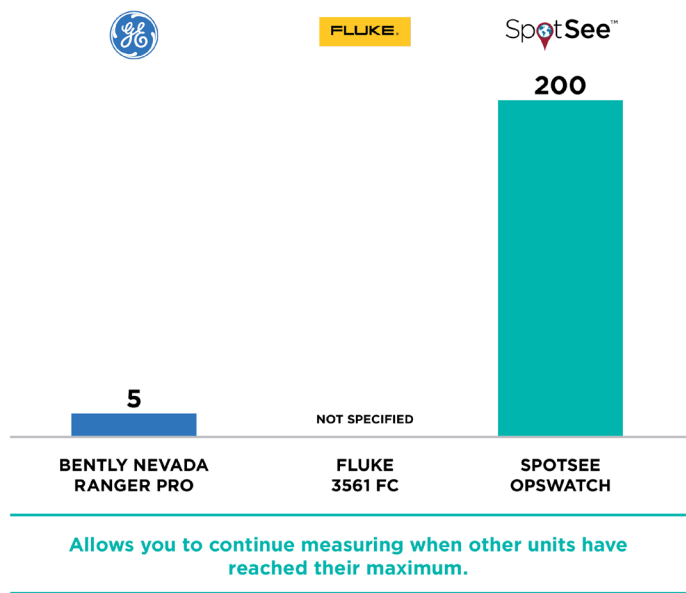
## FULL SYSTEM TEMPERATURE RANGE (SENSOR + GATEWAY)



- Vibration damage happens in harsh environments
- Gateway temperature specifications of competing devices limit environments where the unit can be utilized

- **40x** times greater velocity range available than competitive set
- Scale Range: 1cm/s to 200cm/s
  - Provides measurements as small as 7mm/s up to 2000mm/s
- FFT Analysis Capability
  - Streaming data can be analyzed in FFT or PSD formats

## VELOCITY RANGE (cm/s)



	BENTLY NEVADA RANGER PRO	FLUKE 3561 FC	SPOTSEE OPSWATCH
Vibration Range ( $\pm$ G)	20	32	200
Vibration Accuracy (over full range)	10%	5%	10%
Low Vibration Frequency (Hz)	5	10	1
Vibration Highest Frequency	4000 Hz	1000 Hz	1000 Hz
Number of Axis	3	3	3
Velocity Range (cm/s)	5	Not specified	200
Measurement Interval	Constrained by battery life	Constrained by battery life	Unconstrained
Sensor Temperature Range	-30° to +85°C (but operation above 30°C severely reduces battery life)	-30° to +85°C (but operation above 30°C severely reduces battery life)	-40° to +85°C
Sensor Temperature Range (Low) (°C)	-30°	-30°	-40°
Sensor Temperature Range (High) (°C)	85°	85°	85°
Full System (Sensor + Gateway) Temperature Range (Low) (°C)	-40°	-25°	-40°
Full System (Sensor + Gateway) Temperature Range (High) (°C)	65°	65°	85°
Minimum System Configuration	1 Sensor + 1 Gateway	1 Sensor + 1 Gateway	Single unit
System Parts	2	2	1
Sensor Power	Lithium Battery 3.6V	Lithium Battery 3.6V	Mains
Sensor Battery Life	Weeks to months (but operation at elevated machine temperatures severely reduces battery life)	Weeks to months (but operation at elevated machine temperatures severely reduces battery life)	Unlimited - no battery required
Sensor to Gateway Link Type	ISA100.11a	BlueTooth Low Energy	No link required
Sensor to Gateway Frequency Band	2.4 GHz	2.4 GHz	No sensor-to-gateway radio spectrum required
Sensor to Gateway Transmit Power (mW)	10	10	100
Sensor to Gateway Security	AES 128-bit	AES 128-bit	No link required
Sensor to Gateway per-country Radio Certification Required	Yes	Yes	No
Environmental	IP67 dust/water resistant	IP67 dust/water resistant	IP67 dust/water resistant
Internet Connectivity	Ethernet (cabled)	WiFi	WiFi
Uplink Frequency Band	N.A. (wired)	2.4 GHz	2.4 GHz
Uplink Power Source	Mains	Mains	Mains
Uplink Operating Temperature	-40° to 65°C	-25° to 65°C	-40° to 85°C
Uplink Security	N.A. (wired)	WPA2/AES	WPA2/AES
Uplink RF Transmit Power	N.A. (wired)	100mW	100mW

	<b>BENTLY NEVADA RANGER PRO</b>	<b>FLUKE 3561 FC</b>	<b>SPOTSEE OPSWATCH</b>
<b>Uplink Range</b>	Limited by ethernet cable length	100m line-of-sight	100m line-of-sight
<b>Uplink per-country Radio Certification Required</b>	N.A. (wired)	Yes (WiFi module)	Yes (WiFi module)
<b>ATEX Certification</b>	Yes	No	Yes
<b>Temperature Measuring Range</b>	Full operating range	Full operating range	Full operating range
<b>Temperature Resolution</b>	0.1° C	0.1° C	0.1° C
<b>Temperature Accuracy (over full operating range)</b>	Unspecified	Unspecified	+ - 2° C
<b>Installation Time</b>	Unspecified	Less than 1 hour	Less than 1 hour
<b>Sensor Size (inches)</b>	3.46 x 1.57 x 1.57	2.42 x 0.95 x 1.1	4.8 x 3.1 x 2.2 (excluding antenna)
<b>Sensor Length (inches)</b>	3.46	2.42	4.8
<b>Sensor Width (inches)</b>	1.57	0.95	3.1
<b>Sensor Height (inches)</b>	1.57	1.1	2.2
<b>Gateway Length (inches)</b>	9.5	2.26	0
<b>Gateway Width (inches)</b>	8.66	1.55	0
<b>Gateway Height (inches)</b>	5.27	1.82	0
<b>Gateway Size (inches)</b>	9.5 x 8.66 x 5.27 (excluding antenna)	2.26 x 1.55 x 1.82	No gateway required