SVT Series Wireless Vibration Sensors

THETA

The SVT series wireless vibration sensors are industrial-grade sensors designed for equipment condition monitoring and fault diagnosis applications. Each sensor integrates vibration and temperature sensing capabilities, featuring low noise, high accuracy, ultra-low power consumption, and robust durability, making them ideal for long-term use in harsh industrial environments.

The sensors use high-performance triaxial accelerometer sensors to capture equipment vibration signals. The SVT210 and SVT510 models utilize triaxial MEMS sensors, while the SVT220 and SVT520 models feature high-performance piezoelectric sensors for the main axis (Z) and MEMS sensors for the auxiliary axes (X and Y). The SVT520-Z model is equipped with a triaxial piezoelectric sensor.

The sensors support both periodic data collection and low-power wakeup-triggered data acquisition. With powerful edge computing capabilities, they can process 24-dimensional feature vibration data to detect mechanical anomalies and faults. The collected feature and waveform data is wirelessly transmitted to a remote monitoring platform. Users can remotely monitor equipment vibration and temperature, quickly detecting abnormal operating conditions. Through detailed waveform analysis, users can diagnose faults such as loosening, imbalance, misalignment, bearing faults, gear faults, and blade faults in rotating equipment.

Features and Advantages

Accurate	⇨	Low noise, high-performance sensing, and high frequency response.
Easy-to-install	⇨	Cable-free with stud, adhesive, or magnetic mounting options.
Wireless	⇨	Reliable transmission of both feature data and waveform data via Bluetooth, LoRa, or 4G Cat.1.
Low-powered	⇨	Built-in battery with 2-10 years of life for normal usage.
Ruggedized	⇨	Waterproof, dustproof, shockproof, corrosion-resistant, and intrinsically safe; suitable for harsh industrial environment.
Flexible	⇨	Configurable measurement range, sampling frequency, sampling points, and sampling period to meet specific requirements.
Accessible	⇨	Remotely accessible anytime, with automatic alerts and maintenance-free operation.
Convenient	⇨	Bluetooth compatible and can be connected via mobile app.

Product Models

Frequency Response （Z/XY）	BLE	Enhanced BLE	LoRa / LoRaWAN *	4G Cat.1
0-2k/0-1k **	SVT210-K	SVT510-KP	SVT510-KL	SVT510-KC
0-6k/0-5k	SVT210	SVT510-P	SVT510-L	SVT510-C
2-20k/0-5k	SVT220	SVT520-P	SVT520-L	SVT520-C
2-20k/0-1k	-	SVT520-KP	SVT520-KL	SVT520-KC
0.1-20k/0-5k	-	SVT520-AP	SVT520-AL	SVT520-AC
2-15k/2-15k	-	SVT520-ZP	SVT520-ZL	SVT520-ZC
Line-of-sight Range	300m	600m	3000m	Unlimited

* LoRa supports waveform data once per day, while LoRaWAN does not support waveform data
** Do not support waveform data

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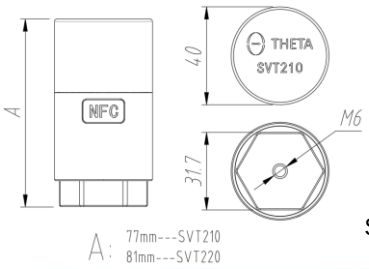
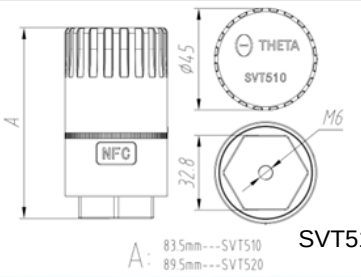
THETA SENSORS CORPORATION

Specifications

Product Model	SVT210-K SVT510-KP SVT510-KL SVT510-KC	SVT210 SVT510-P SVT510-L SVT510-C	SVT220 SVT520-P SVT520-L SVT520-C	SVT520-KP SVT520-KL SVT520-KC	SVT520-AP SVT520-AL SVT520-AC	SVT520-ZP SVT520-ZL SVT520-ZC
Accelerometer Type	Triaxial MEMS		Z: Piezoelectric; X/Y: MEMS			Triaxial piezoelectric
Acceleration Resolution	16 bits		Z: 24 bits; X/Y: 16 bits			24 bits
Acceleration Range	±16g		Z: ±50g or ±100g; X/Y: ±16g			±50g or ±100g
Velocity Range (@80Hz)	200mm/s		Z: 600mm/s; X/Y: 200mm/s			600mm/s
Acceleration Sensitivity	0.5mg/LSB		Z: 0.006mg/LSB; X/Y: 0.5mg/LSB			0.006mg/LSB
Acceleration Frequency Response (Z)	0Hz-2kHz (±10%)	10Hz-2kHz (±5%), 0Hz-6kHz (±3dB)	2Hz-20kHz 10Hz-10kHz (±10%), 2Hz-15kHz (±3dB)		0.1Hz-20kHz 10Hz-10kHz (±10%), 0.1Hz-15kHz (±3dB)	10Hz-10kHz (±10%), 2Hz-15kHz (±3dB)
Acceleration Frequency Response (XY)	0Hz-1kHz	0Hz-5kHz	0Hz-5kHz	0Hz-1kHz	0Hz-5kHz	
Resonant Frequency	-		Z: >50kHz			>35kHz
Temperature Drift	1%/°C		Z: ±10% (-40~125°C); X/Y: 1%/°C			±10% (-40~125°C)
Nonlinearity	2%		Z: ±1%; X/Y: 2%			±1%
Noise (μg/√Hz)	75		Z: 4; X/Y: 75		Z: 25; X/Y: 75	8μg/√Hz
Acceleration Sampling Frequency (Z)	0.2-12.5ksps	0.417-26.67ksps	0.4-64ksps			0.4-64ksps
Acceleration Sampling Frequency (XY)			0.417-26.67ksps	0.2-12.5ksps	0.417-26.67ksps	
Feature Data Sampling Number	1k/2k/4k					
Velocity Frequency Range	10Hz-1kHz					
Displacement Frequency Range	10Hz-1kHz (Low: 10Hz-200Hz; High: 200Hz-1kHz)					
Envelope Acceleration	Sampling rates of 25.6/26.67/51.2/64ksps: 500Hz-10kHz (SKF ENV3); Other sampling rates: 500Hz high-pass filter					
Acceleration FFT	2048 lines					
24-dimension Vibration Feature Data	Frequency, peak acceleration, acceleration RMS, velocity RMS, peak-to-peak displacement, envelope acceleration, skewness, skewness index, variance, margin factor, crest factor, kurtosis, kurtosis index, pulse factor, fundamental frequency amplitude, 2nd harmonic amplitude, 3rd harmonic amplitude, half harmonic amplitude, spectral variance, spectral mean, spectral RMS, inclination angle, pitch angle, roll angle					
Temperature Range	-40~125°C					
Temperature Precision	±1°C					
Data Acquisition Period	1/2/5/10/15/20/30/60/120 minutes					
Waveform Data Acquisition Time	-	10-20000ms				
Data Storage	-	64MB				
Communication	SVT210-K/SVT210/SVT220: Bluetooth 5.0, line-of-sight range 300m SVT510-KP/SVT510-P/SVT520-P/SVT520-KP/SVT520-AP/SVT520-ZP: Bluetooth 5.0, line-of-sight range 600m SVT510-KL/SVT510-L/SVT520-L/SVT520-KL/SVT520-AL/SVT520-ZL: LoRa/LoRaWAN, line-of-sight range 3000m SVT510-KC/SVT510-C/SVT520-C/SVT520-KC/SVT520-AC/SVT520-ZC: 4G Cat.1					
Battery	SVT210/SVT220: 4000mAh; SVT510/SVT520: 6500mAh, and SVT510-H and SVT520-H are high-temperature batteries with a capacity of 7500mAh. Li/SOCL2, replaceable					
Dimensions	See the diagram below					
Weight	SVT210: 185g; SVT220: 212g; SVT510: 211g; SVT520: 247g					
Operating Temperature	-40~85°C					
Operating Humidity	10%~90% RH					
Enclosure	Stainless steel and polyamide with fiberglass					
Explosion Protection	EX ia IIC T4 Ga					
Ingress Protection	IP67					
Mounting	Stud, adhesive, or magnetic mounting					



SVT210/SVT220



SVT510/SVT520

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