6310 Type - WiSenMeshWAN® Vibration Sensor Node	
Basics	
Battery Power	Qty. x 1 (3.6V Lithium primary D-Cell ER34615)
Accuracy Stop Voltage	2.1VDC
Mesh Stop Voltage	2.1VDC
Battery Connection	Standard Aluminium Battery Holder
Alternative DC Input	3.3VDC ± 0.3V
Local Storage	Min. 1500 Messages during Meshing at Mesh3.0 Protocol
Dimension (L x W x H)	100 x 100 x 60mm
Weight	≤ 0.65kg
Primary Sensor	
Sensor Type 1	**Acceleration in X-axis; Y-axis; Z-axis for Vibration measurements**
Sampling Rate	1000Hz (Default), 125Hz (Changeable via command)
Acceleration Range in Time Domain	±8.0g (Default), ±4.0g, ±2.0g
Noise Floor	0.7mg @ 1000Hz Sampling Rate 0.25mg @ 125Hz Sampling Rate
Resolution	Better than 1.0mg
Frequency Accuracy	±2%
Measurement Range	Assume: Acceleration range of 8g;

Vibration Frequency: Range: 0.5 ~ 200Hz Resolution: 0.1Hz	**Example@1Hz**	**Example@20Hz**	**Example@200Hz**
PPV Amplitude Range: Resolution: 0.01mm/s	0~12000mm/s	0~620mm/s	0~62mm/s
Displacement	0~1950mm	0~5.0mm	0~0.05mm

Data Output Categories 1), 2) & 3)

1) Acceleration:

A. Time Domain with Max. amplitude, RMS and Vector Sum (*in g unit*);

B. FFT-based Frequency Domain with:

1st/2nd/3rd order resonant frequencies

at resonant frequency (*in Hz unit*) and Amplitude (*in g unit*).

Axis	Amp_Max (g)	RMS (g)	FFT_Peak					
			1st_Amp (g)	1st_Freq (Hz)	2nd_Amp (g)	2nd_Freq (Hz)	3rd_Amp (g)	3rd_Freq (Hz)
X	0.00127	0.00034	0.00009	13.428	0.00006	49.072	0.00006	27.100
Y	0.00179	0.00048	0.00023	13.916	0.00019	26.611	0.00016	15.381
Z	0.00334	0.00097	0.00072	13.428	0.00033	26.611	0.00012	15.381
	XYZ_Vector_Sum_Amp_Max (g): 0.00350							

Figure. Screenshot from Wisen Web Platform.

2) Velocity:

A. Time Domain with PPV, RMS and PVS amplitude (*in mm/s unit*);

B. FFT-based Frequency Domain with:

1st order resonant frequency

at resonant frequency (*in Hz unit*) and Amplitude (*in mm/s unit*).

PPV (mm/s)	RMS (mm/s)	FFT_Peak	
		1st_Amp (mm/s)	1st_Freq (Hz)
0.078	0.023	0.011	13.428
0.138	0.043	0.026	13.916
0.304	0.104	0.084	13.428
XYZ_PVS (mm/s): 0.313			

Figure. Screenshot from Wisen Web Platform.

3) Displacement (Providing a Sine wave typed vibration)

A. Time Domain with Max. amplitude, RMS and Vector Sum (*in mm unit*);

B. FFT-based Frequency Domain with:

1st order resonant frequency;

at resonant frequency (*in Hz unit*) and Amplitude (*in mm unit*).

Amp_Max (mm)	RMS (mm)	FFT_Peak	
		1st_Amp (mm)	1st_Freq (Hz)
0.001	0.000	0.000	3.418
0.002	0.001	0.000	13.916
0.004	0.001	0.001	13.428
XYZ_Vector_Sum_Amp_Max (mm): 0.004			

Figure. Screenshot from Wisen Web Platform.

Sensor Type2	**X-axis; Y-axis; Z-axis Tilt**
Range	-90° to +90°
Accuracy	0.002° (7.2'' or 0.0349mm/m) @ [-2.0°, 2.0°] & Better than 0.01° (36'' or 0.1745mm/m) @ Any 1° over (-90°, 90°)
Resolution	0.0001° (0.36" or 0.001745mm/m)

Data Output Categories 4)

4) Static Tilt:

X (g)	Y (g)	Z (g)	X(°)	Y(°)	Z(°)
0.96602	0.00762	-0.05518	86.6997	0.4512	-3.2693

Figure. Screenshot from Wisen Web Platform.

Standard System Parameter	
Temperature	Range: -40 to 85°C; Accuracy: ±0.1°C; Resolution: 0.1°C
Humidity	Range: 0 to 100%RH; Accuracy: ±1.5%RH
Voltage	Accuracy: ± 0.1V

WSN Interface	
Mesh Wireless Interface	WiSenMeshWAN® Protocol
Industrial Standard	
Casing and Painting Materials	Aluminium-Alloy Die Castings 12 (Epoxy Polyester Powder Coating)
IP Rating	≥ IP66
Operating Temperature	-40 to 85°C
Fire Proof	Approved

Designed based on the Standards (as shown below)

A. BS7385-1-1990, Evaluation and Measurement for Vibration in Building - Part 1: Guide for measurement of vibration and evaluation of their effects on buildings;

B. BS7385-2-1993, Evaluation and Measurement for Vibration in Building - Part2: Guide to damage levels from ground borne vibration;

C. DIN-4150-2, Vibrations in buildings - Part 2: Effects on persons in buildings;

D. DIN-4150-3, Vibrations in buildings - Part 3: Effects on structures;

E. ISO8569.

Product Images

Figure. 6310 Type - Vibration Sensor Node Product Photos.

Highlights

Note:

There are 3 Modes in a Wisen Vibration Sensor Node, which performs different actions and therefore outputs different data.

Mode 1: Time Interval Based Sampling (over 4s)

Output:

1) Acceleration
2) Velocity
3) Displacement (Providing a Sine wave typed vibration)
4) Static Tilt

The data output table at "/Data/Show Table" on Wisen Visualisation Platform is as below.

M1 Mode (a/v/d)	Last Seen	Intervals Active	Sampling Frequency (Hz)	Range (g)	X (g)	Y (g)	Z (g)	X(°)	Y(°)	Z(°)				
	2025-05-15 14:39:54	10	1000.000	8	0.96602	0.00762	-0.05518	86.6997	0.4512	-3.2693				
Sub-SN	V1102161		V1102165			V1102163				V1102164				
Sub-Type	VI01		VI04			VI02				VI03				
Axis	Amp_Max (g)	RMS (g)	FFT_Peak							PPV (mm/s)	RMS (mm/s)	FFT_Peak		Amp_Max (mm)	RMS (mm)	FFT_Peak	
			1st_Amp (g)	1st_Freq (Hz)	2nd_Amp (g)	2nd_Freq (Hz)	3rd_Amp (g)	3rd_Freq (Hz)				1st_Amp (mm/s)	1st_Freq (Hz)			1st_Amp (mm)	1st_Freq (Hz)
X	0.00360	0.00074	0.00050	100.098	0.00023	98.389	0.00015	49.561	0.141	0.036	0.014	14.404	0.002	0.001	0.000	4.395	
Y	0.00413	0.00131	0.00085	31.494	0.00078	35.889	0.00024	32.959	0.205	0.065	0.042	31.494	0.001	0.000	0.000	31.494	
Z	0.00328	0.00116	0.00061	31.494	0.00047	14.893	0.00012	12.939	0.269	0.078	0.049	14.893	0.003	0.001	0.001	14.893	
	XYZ_Vector_Sum_Amp_Max (g): 0.00450								XYZ_PVS (mm/s): 0.305				XYZ_Vector_Sum_Amp_Max (mm): 0.003				

Figure. Screenshot from Wisen Web Platform.

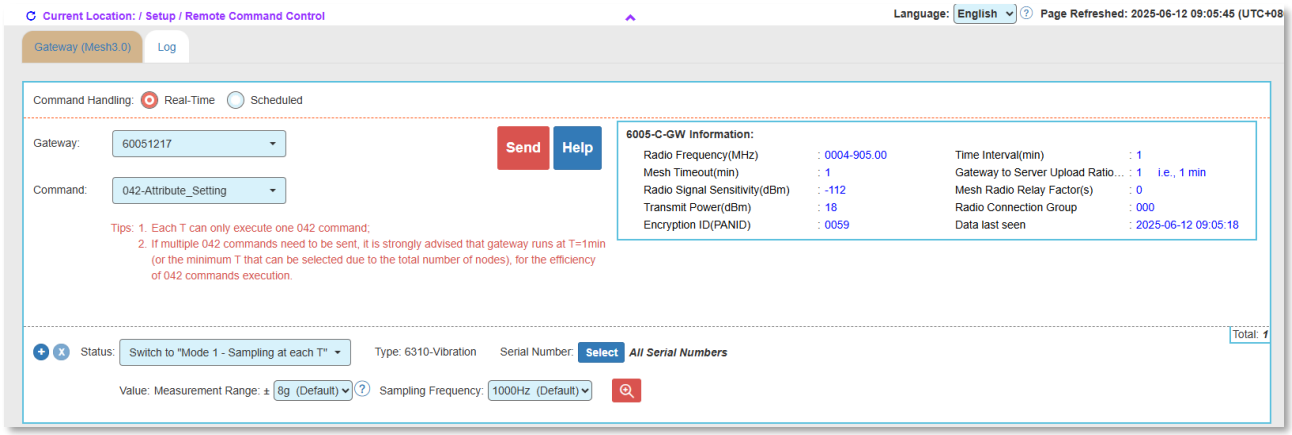

Figure. Switch to "Mode 1 - Sampling at each T" with Range, Sampling Frequency setting.

Mode 2: Event-driven Self-triggering

Output:

1) Acceleration over the first 3 vibration events that exceed the internal vibration threshold (configured via a remote command);
2) The statistics of the total trigger events, etc.

The data output table at "/Data/Show Table" on Wisen Visualisation Platform is as below.

M2 Mode (a x 3)	Last Seen	Intervals Active												
	2025-04-08 16:36:17	14												
Sub-SN	V1102166				V1102167				V1102168				V1102169	
Sub-Type	VI05				VI06				VI07				VI08	
Event	E1: 2025-04-08 16:35:28				E2: 2025-04-08 16:35:41				E3: 2025-04-08 16:35:58				Total_Event_Count	4
Axis	Time Domain		FFT_Peak		Time Domain		FFT_Peak		Time Domain		FFT_Peak		Sample (s)	4.096
	Amp_Max (g)	RMS (g)	Amp (g)	Freq (Hz)	Amp_Max (g)	RMS (g)	Amp (g)	Freq (Hz)	Amp_Max (g)	RMS (g)	Amp (g)	Freq (Hz)	Sampling Frequency (Hz)	1000.000
X	0.04954	0.00197	0.00027	45.410	0.02084	0.00109	0.00019	45.410	0.02325	0.00135	0.00021	45.654	Range (g)	2
Y	0.02112	0.00171	0.00037	25.146	0.01286	0.00114	0.00031	28.320	0.01700	0.00143	0.00031	27.588	Threshold (g)	1.05
Z	0.32321	0.01753	0.00388	17.822	0.16193	0.01178	0.00294	17.822	0.21758	0.01511	0.00339	18.066	SD Card Status	On
	XYZ_Vector_Sum_Amp_Max (g): 0.32476				XYZ_Vector_Sum_Amp_Max (g): 0.16230				XYZ_Vector_Sum_Amp_Max (g): 0.21833				SD_Error	No

Figure. Screenshot from Wisen Web Platform.

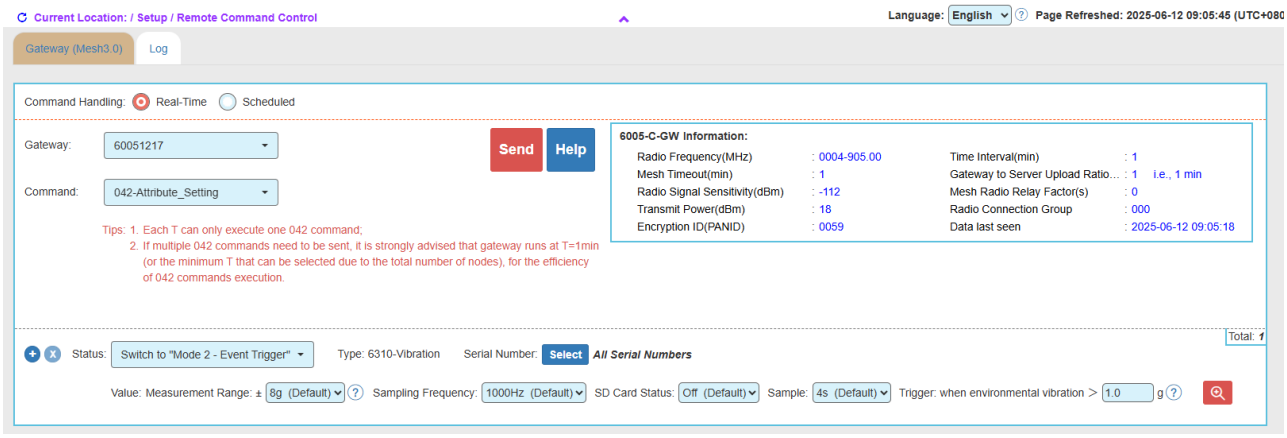

Figure. Switch to "Mode 2 - Event Trigger" with Range, Sampling Frequency, Trigger setting.

Procedures:

A. Set up the trigger limit from remote command page, by default, it is Xg;

B. During each T, when vibration in g unit is over the limit (ranged from 1.1 to 7.9g), the first 3 events of accelerations are calculated and outputted with:
   - Time Domain with RMS and Max. Amplitude in g unit
   - FFT-based Frequency Domain with:
     1st order resonant frequency;
     in frequency in Hz unit and Amplitude in g unit.

C. Report all the info. in Step B, at each Time Interval;

D. On board SD card of 8GB capacity is, by default, turned off (for lower power status).

By enabling SD card, it will record all the raw data of accelerations at three axes, over the first 3 events. Then customer will need to retrieve the SD card from a node, insert it into a SD reader, and read out the data from Wisen Vibration software on a Windows PC.

Mode 3: USB to Type-C Cable - real time output to a PC.

Please refer to “/Technical Support / Document & Software”, instruction document namely, “Real-time Data to a PC from Vibration Sensor Node via WiSen Acoustics & Vibration Software”.

Switch at “Mesh”: Enables wireless modes.

A. Mode 1: Time Interval Based Sampling;

B. Mode 2: Event-driven Self-triggering.

Switch at “USB": Enables **Mode 3 - USB Real-time Data Streaming** to a Windows PC.

- *For indoor use only. Power is supplied via the PC's USB port; no battery is required.*

Figure. Clarifications on Modes 1, 2 & 3 Relations.

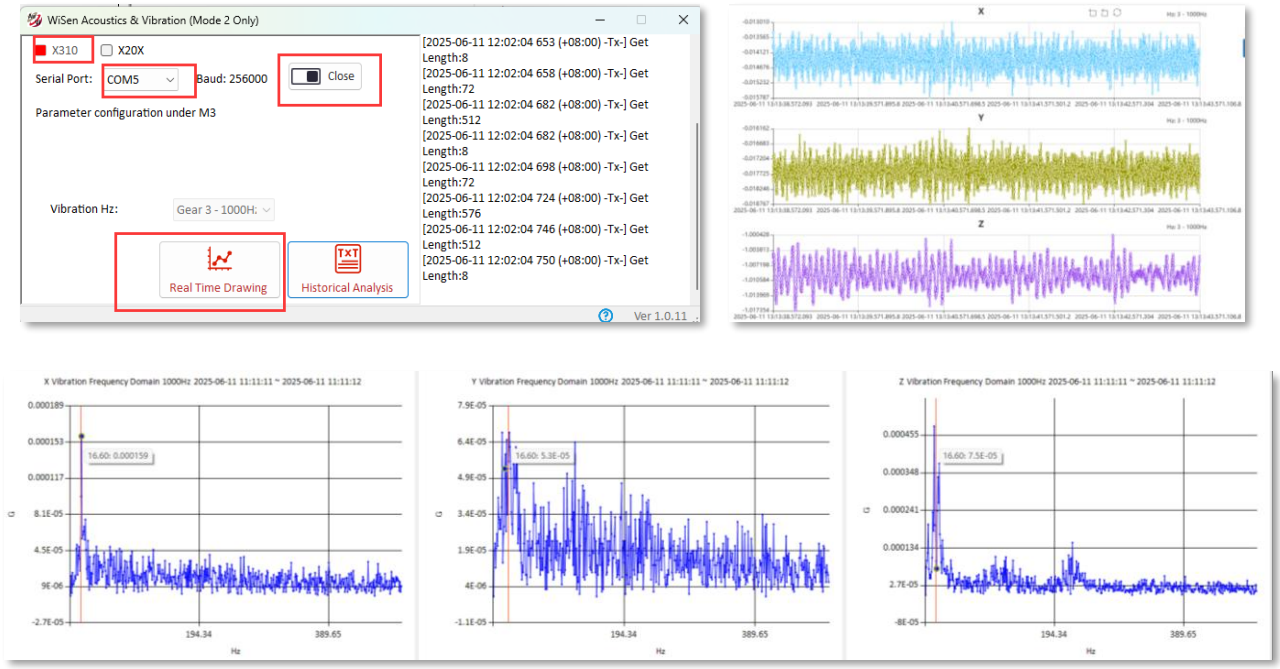

Figure. Mode 3 Operation Window, Real Time Plot and FFT Display.

Internal Battery Life Table @ Mode 1

T/min	Months
1	1.1
5	5.2
15	16.2
30	28.4
60	56.5