

DS-3000 series Data Station

Calibration method for the vibration sensor by using the sensitivity calibrator for accelerometer

Applicable version: DS-0320 Ver 2.2.0.14. (17/09/2013) or later



DS-3000 series Operation Manual

Calibration method for the vibration sensor by using the sensitivity calibrator for the accelerometer

■Overview of the function

This manual describes the calibration method of the built-in amplifier piezoelectric type accelerometer by using the vibration calibrator.

Following figure is the connection example.



The DS-0321 FFT analysis software and CH1 are used in the following explanation.



■Operation procedure

Ŀ	nput	Cond	ition Setting						
			Auto Range	/oltage Range	Coupling	CCLD	Auto Zero	Analog Filter	
		CH1		1 Vrms 🚩	AC 🔽		V	Z(FLAT)	~
		CH2		1 Vrms 🚩	AC 🔽			Z(FLAT)	~
		CH3		1 Vrms 🚩	AC 🔽		✓	Z(FLAT)	~
		CH4		1 Vrms 🚩	AC 🔽		✓	Z(FLAT)	~
	Vrn	ns 💽	🖌 🗌 Auto Rane	e When Range	Over			Set to All CH	
							ОК	Cancel	

1. Select [Input/ Output Setting] > [Input Condition Setting] in this order from the menu and put a check mark on [CCLD].

<Note>

CCLD is the function which supplies a power to the built-in amplifier accelerometer. The built-in amplifier accelerometer is used in this example, so put a check mark to CCLD in here.

2. Select [Input/ Output setting] > [Unit/ Cal Setting] in this order from the menu and put a check mark on CH1 to turn on the EU.

Cal	Setting												×
	Unit/0	Calib.	E	U/SP									
		EU	Unit	Name		EU Value	EU Typ	e	0 dB Reference	e	Offset		Get TEDS Info
	CH1	V		- V -	•] 1 [.	. V/EU	•	1	•	 0dB	•	EXEC
	CH2	V		- V -	•] 1 [.	. V/EU	•	1	•	 0dB	•	EXEC
	СНЗ	V		V	•) 1 🗌	. V/EU	•	1	•	 0dB	•	EXEC
	CH4	V	V	•	•] 1 .	. V/EU	-	1	•	 0dB	•	EXEC
			m N mm Pa SPL V										
													OK Cancel



3. Select [EU/SP] tab from the calibration setting window and select the settings as follows for example.



Source CH

Voltage range

- Channel to be set (CH1 in here) •
- Approx. 100 mVrms to 0.316 Vrms ÷
- Unit name m/s2 (for acceleration)
 - 0dB reference value 1 (to convert in linear value) ÷

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- Frequency range 1 kHz (Normally calibration signal for vibration is low frequency) Lin (to convert in linear value)
- Lin/Log
- Averaging time
- ÷ 5 s (5 seconds in here)
- Calibration value 10 m/s2 (Normally input the effective value) •

4. Turn ON the power of calibrator for the accelerometer. When the vibration is stabilized, perform averaging of the calibration signal of the constant frequency (159.2 Hz in here) for 5 seconds. Click X button to change the mode to averaging mode and click button to execute the averaging for 5 seconds.

5. Click the [Execute] button to obtain the sensitivity value (voltage value per 1m/s2 (V/EU)) of the accelerometer from the power spectrum data which is calculated by the input calibration value.

In here, check that the search cursor (red line) is in right end (Search display X: Overall) of the overall value, and the Y axis is displayed as an effective value (m/s2r) on the graph.



6. Check that the sensitivity value of the accelerometer which is displayed appropriately in the EU value when the calibration setting window tab is returned to [Unit/Calibration]. From the above, voltage of <u>approx. 1.098 mV is outputted per 1 m/s2 acceleration</u> from this accelerometer.

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Cal Sett	ing								
Unit/C	Calib.	EU/SP							
	EU	Unit Name	EU Value	EU Type	0 dB Reference Value	•	Offse	et	Get TEDS Info
CH1	~	✓ []	1.091397	 V/EU 🔽	2E-05	v	40dB	~	EXEC
CH2		V 🔽 📖	1	 V/EU 💌	1	v	-50dB	^	EXEC
CH3		V 🔽 📖	1	 V/EU 💌	1	•	-30dB		EXEC
CH4		V 🔽 💷	1	 V/EU 🔽	1	v	-10dB		EXEC
							10dB		
							20dB	×	
									Set to All CHs
									UK Cancel

Approx. 1.098 mV per 1 m/s2 acceleration

-End-