

**DS-0221 General-purpose FFT Analysis Software**  
Simple unit calibration method of the MI-1233 Microphone and  
MI-3110 Preamplifier

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# DS-0221 General-purpose FFT Analysis Software

## Simple unit calibration method of the MI-1233 Microphone and MI-3110 Preamplifier

This manual describes the simple calibration method of the sound pressure level (dBspl) using the MI-1233 microphone and MI-3111 preamplifier.

To unit calibrate the sound pressure level with the combination of MI-1233 microphone and MI-3111 preamplifier, calculate the unit calibration value per 1V from the sensitivity value of the inspection table of MI-1233 and the insertion loss value of the inspection table of the MI-3110. For accurate unit calibration, recommended you to use the SC-3100 Sound Calibrator (Reference sound pressure level 124 dBspl 250Hz),



SC-3100  
Sound Calibrator



MI-1233 Microphone  
+  
MI-3110 Preamplifier



DS-2100 series Data Station  
+  
DS-0221 General-purpose  
FFT Analysis Software

### ■ Inspection Table

Item	Data sheet	Description
MI-1233 Microphone sensitivity	-29.54dB re 1V/Pa	Taking 1Pa as 1V as a reference, -29.54 dB (=0.0333V) at 1Pa
MI-3110 Insertion loss	-3.02dB	-3.02 dB output (0.706V) at 1V (=0 dB) input
Total sensitivity	-32.56dB re 1V/Pa	Combination sensitivity of MI-1233 and MI-3110: -32.56 dB

(Note):

Since the value of the data sheet of the microphone and preamplifier are changed individually, please check the inspection for the inspection sheet.

The total sensitivity of the MI-1233 and MI-3110 is a sum of each sensitivity (-32.56 (dB/Pa) and the microphone sensitivity = -32.56 dBV/Pa.

The sound pressure level 94 dB is an effective value (rms). Also, the total sensitivity describes [The voltage of the microphone at the sound pressure level of 94 dB is -32.56 dBVr.] from the sound pressure 1 Pa (rms) =94 dB (rms).

When setting the correction coefficient as K;

$$-32.56 \text{ dBV}_r + 20 \text{Log} \frac{K}{1 \text{ V}_r} = 94 \text{ dB}$$

$$20 \text{Log} \frac{K}{1 \text{ V}_r} = 94 + 32.56 = 126.56 \text{ dB}$$

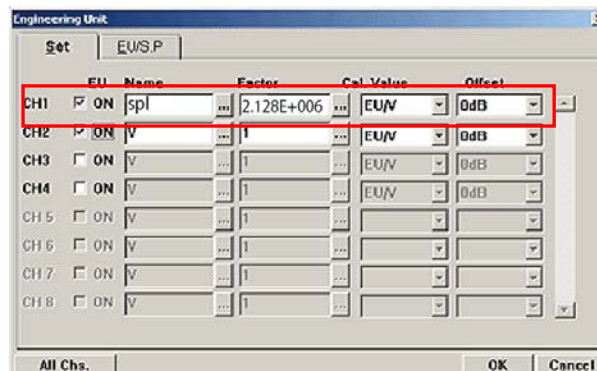
$$K = 10^{\frac{126.56}{20}} = 2128139 \text{ (EU / V)}$$

From the next operation, set the unit calibration as [2128000 EU/V], the display is changed to sound pressure level (dBspl) unit. Also, the Y-axis spectrum is initial setting (effective value Log display).

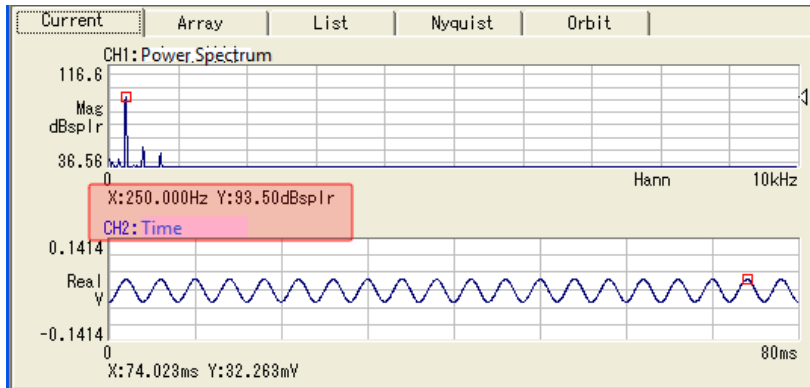
### ■Operation method

From the file menu, select [input] > [Unit calibration] in this order and set each value of CH1 on the [set] tab of the [Unit, Calibration] window as follows. When the setting is completed, click the [OK] button at the right bottom. When input the [2128139] to the item of the physical quantity, the display is changed to the exponential display of [2.128E+006].

Calibration	Check
Unit name	spl
Physical quantity	2.128E+006
Calibration value setting	EU/V ( Not V/EU )
Offset	0dB



The following figure shows the power spectrum of CH1 and the time waveform of CH2 when the same sine signal wave is input to CH1 and CH2.



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