HIOKI
MADE IN JAPAN

Application Note

HIOKI FT3432
Sound Level Meter for Noise Pollution Monitoring

Noise Pollution

Noise is unwanted sound [1] and measured in decibel (dB) unit. Noise pollution happens when a regular noise at high dB unit is present and is harmful to humans or animals. A few sources of environmental noise pollution are as follows [2]:

Effects of Noise Pollution

The most profound effect of noise pollution is auditory problems such as temporary or permanent hearing loss and tinnitus [3]. Emotional balance is also affected, leading to high blood pressure, headaches and heart failure.

There's also economic impact as seen in the lawsuit case of some 5000 residents living around a Tokyo military base; they received USD22 million compensation over the annoyance and blood pressure irregularity suffered due to the noise pollution [4]. Eco-system imbalance also occurs as animals living near the sources of noise pollution that relies heavily on sound for hunting and protection loses their hearing capability as the noises drowned these sounds [5].

Hence it's vital to monitor areas with potential loud noise generation such as construction sites and high traffic volume areas (cities, airports, train stations) to protect both humans and animals.

Hioki FT3432 for Noise Monitoring

Hioki's FT3432 Sound Level Meter measures a wide range of sound from 30dB to 137dB and requires no range switching. This meter is highly portable with a compact- size weight of only 105g. Measurement capabilities include:

- **Sound level**
- **Equivalent continuous sound level**
- **Sound exposure level**
- **Maximum sound level**
- **C-weighted peak sound level (*Only when peak range is selected)**

There are 2 methods to use Hioki's FT3432 for noise / sound recording and monitoring as listed below. Both methods generate csv output files for reporting purpose.

Model: SOUND LEVEL METER FT3432

Model No. (Order Code)
FT3432

Specifications

Applicable standards	IEC 61672-1: 2013 Class 2, JIS C 1509-1: 2005 Class 2, JIS C 1516: 2014 Class 2
Measurement functions	Sound level, Equivalent continuous sound level, Sound exposure level, Maximum sound level, C weighting peak sound level (measurement possible only when peak range is selected)
Measurement times	1/5/10 minutes, or 1 hour
Microphone	1/2-inch electret condenser microphone
Frequency weighting characteristics	A weighting, or C weighting
Measurement level range	[Wide range] A weighting: 30 dB to 137 dB, C weighting: 36 dB to 137 dB [Peak range] A weighting: 65 dB to 137 dB, C weighting: 65 dB to 137 dB
Frequency range	20 Hz to 8000 Hz
Time weighting characteristics	F (fast) and S (slow)
Calibration	Electronic calibration: Using an internal electronic signal (1 kHz, 94.0 dB) Sound calibration: Using NC-74 (1 kHz, 93.9 dB), NC-72A (250 Hz, 114.0 dB)
Processing	Digital sampling interval 30.3 μs (Lp, Leq, Lmax, LE, LCpeak)
Functions	Storing processing results (Storing capacity : 199 pieces of data), Warning indications, Bar graph
Output connector	DC output connector / AC monitor output connector
Power supply	LR03 (AAA) alkaline battery ×2, Continuous use 9 hr at wide range, R03 (AAA) manganese battery ×2, Continuous use 3 hr at wide range, Consumption: 80 mA
Environmental conditions for operation	-10 to 50˚C (14˚F to 122˚F), 10 to 90% RH (No condensation)
Dimensions and mass	63 W × 120 H × 23.5 D mm (2.48" W × 4.72" H × 0.93"D), 105 g (3.7 oz.) (including batteries)
Accessories	Wind screen WS-14 ×1, Hand strap VM-63-017 ×1, Windscreen fall out prevention rubber NL-27-014 ×1, Silicon cover NL-27-089 ×1, Carrying Case 9757 ×1, LR03 (AAA) alkaline batteries ×2, Instruction manual ×1

1. Hioki FT3432 with the LR5042 Voltage Logger for scaled output (dB) recording with real-time noise monitoring.

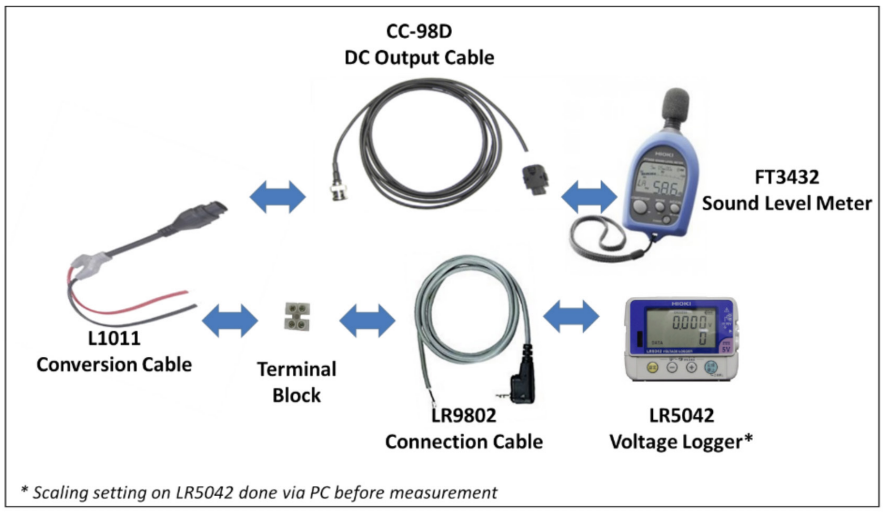

Figure 1.0 Hioki FT3432 recording with LR5042

Figure 2.0 Scaled result on LR5042

This combo allows the scaled readings (dB) display on the LR5042 for real-time monitoring. The recording starts and stops time are controlled manually or automatically via the scheduled mode (configurable via PC). Output files can be viewed via LR5000 Utility software on PC in following formats:

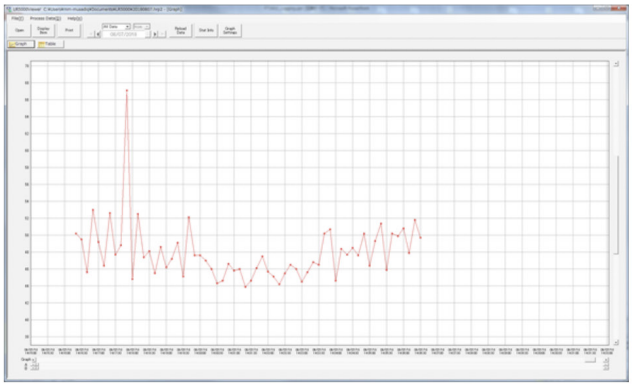

Figure 3.0 Direct graph trend by time

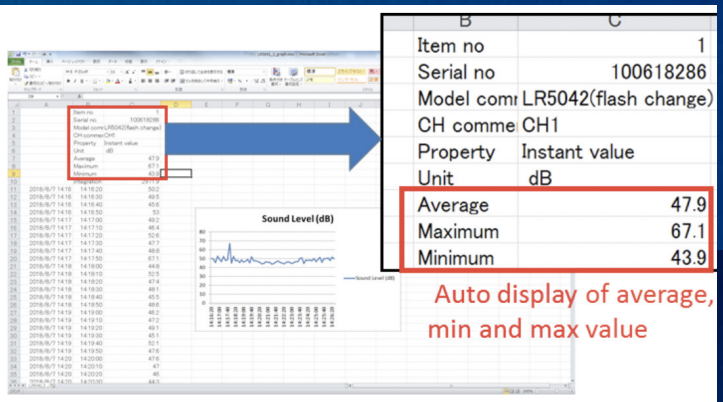

Figure 4.0 Csv file data edited to xls format

2. **Hioki FT3432 with the CM4372 Clamp Meter for DC output (V) with wireless data transfer capability**

Measured data on FT3432 is transferred wirelessly to smart devices via Bluetooth. The data is viewed via GENNECT Cross app (freeware) or transferred in csv file format for editing in xls.

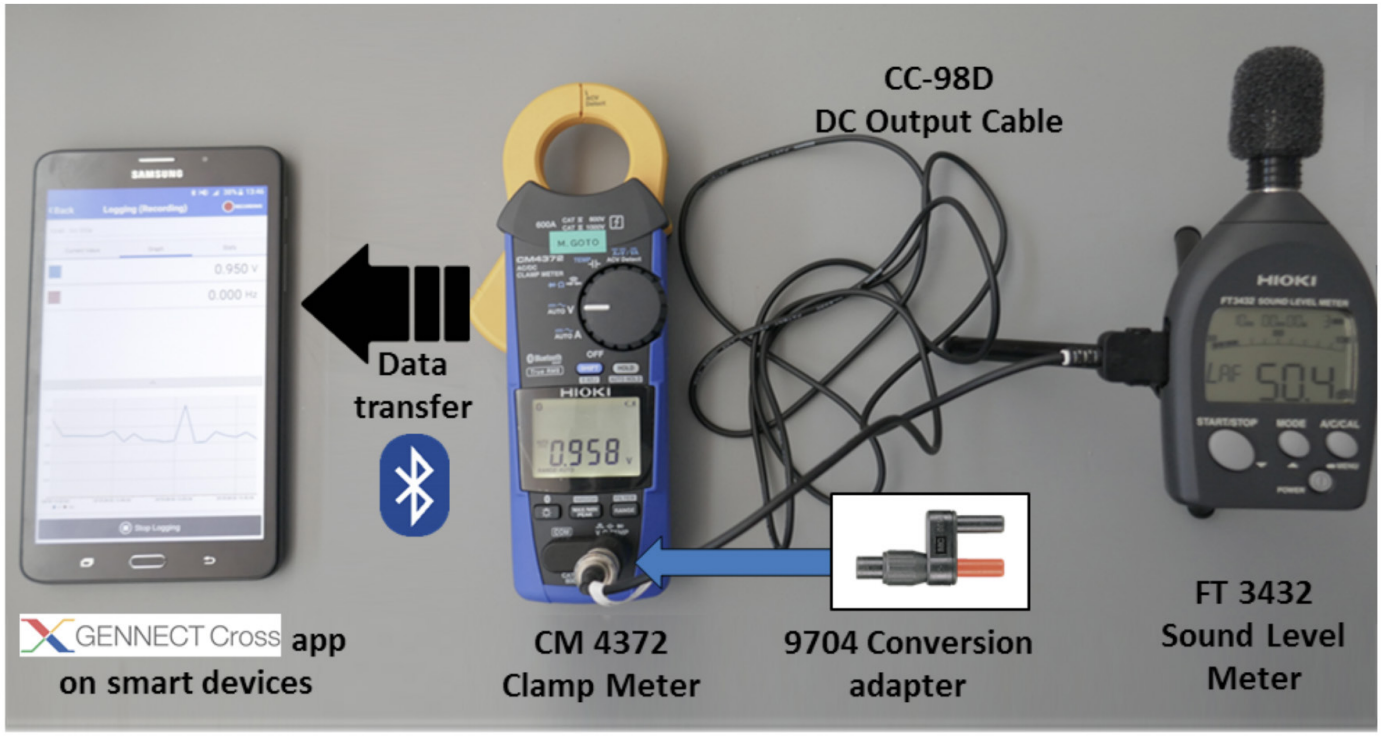

Figure 5.0 Hioki FT3432 with CM 4372

There are two reporting formats option – csv (editable in xls) and Hioki Connect Format (via GENNECT Cross app). A simple scaling calculation is required to get the readings in dB unit (Please consult our representatives for the details)

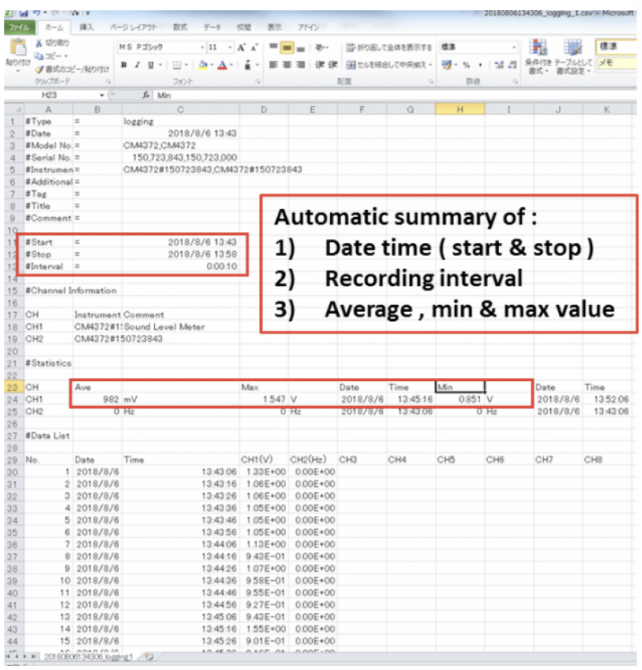

Figure 6.0 Csv file edited to xls format

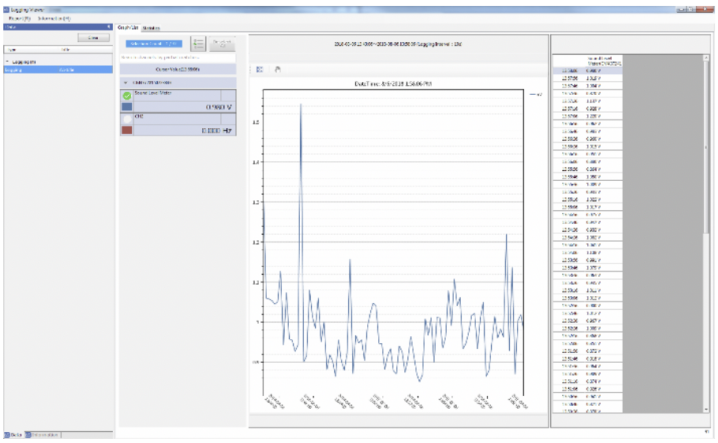

Figure 7.0 GENNECT Cross App data display

Noise pollution needs close monitoring especially with the urbanization of various areas. The above mentioned two methods of using Hioki's FT3432 Sound Level Meter enables easy recording and reporting of noise pollution.

References

1. https://infrastructure.planninginspectorate.gov.uk/document/2322958
2. https://www.environmentalpollutioncenters.org/noise-pollution/
3. https://www.nidcd.nih.gov/health/noise-induced-hearing-loss
4. https://blog.arcadiapower.com/15-facts-stats-noise-pollution/
5. https://greentumble.com/how-noise-pollution-is-disrupting-the-ecosystem/