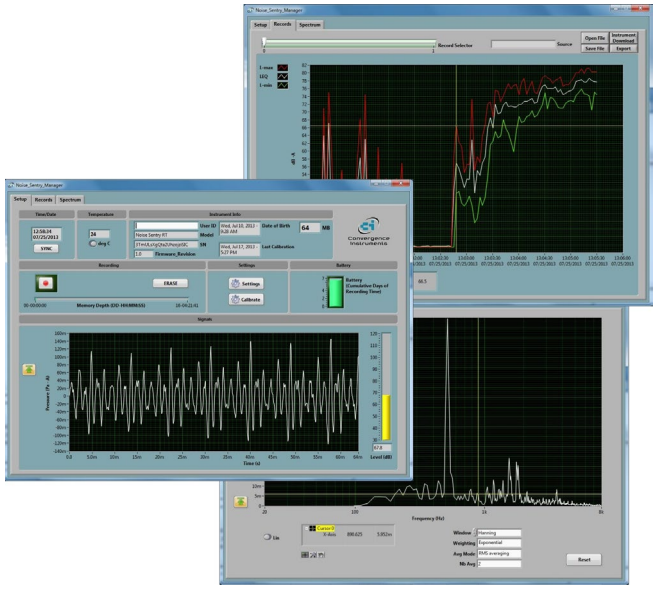
Convergence Instruments

NSRTW_mk4

Data Sheet





August 5 2023

Bruno Paillard

PRODUCT DESCRIPTION 2

1 APPLICATIONS 2

2 SPECIFICATIONS 3

2.1 Frequency Response 4

2.2 Directivity 5

3 INSTRUMENT MANAGER APPLICATION SPECIFICATIONS 6

4 OTHER APPLICATIONS 6

Product Description

NSRTW_mk4 is the 4th generation of Convergence Instrument's *WiFi*™ enabled smart integrating sound-level meters/dataloggers. It includes a digital MEMS microphone, an accurate date/time clock, a non-volatile 128 Mb recording memory and *wireless* connectivity. Running on battery, it can record sound pressure levels and report them through *WiFi*™ for a week. Connected to an external USB charger it can record and report for months. Its very small size allows it to be attached to or embedded within the monitored equipment.

The *NSRTW_mk4* includes the following features:

- Type I precision
- A, C and Z weighting curves.
- *Integrating* Sound-Level Meter, records L-peak, L-max, L-min and Leq levels.
- Adjustable response time.
- Log interval adjustable from 125 ms (8 points per second) up to hours.
- Individual Manufacturer's Certificate of Calibration from Convergence Instrument provided with every instrument purchased.
- *WiFi*™ connectivity to report measured levels remotely and automatically at preset intervals.
- Can connect to open network if specified network does not work (for instance if instrument is moved).
- Email alerts on instantaneous level, LEQ, as well as low-battery.
- Digital very sensitive MEMS microphone (30 dBA typical noise floor)
- Completely sealed weatherproof enclosure designed for outdoors applications. Includes an ePTFE membrane that seals the microphone against dust and water.
- All-digital design.
- Ultra-stable sensitivity (field recalibration is easily done, but seldom required)
- Very low sensitivity variation due to temperature changes
- Very low sensitivity to vibrations
- Software functions calculates global Leq and/or dose, according to ISO and OSHA methods.
- Software functions to calculate percentiles, as well as complex metrics, such as CNEL, LDEN, Lday… etc.
- Preprogrammed recording start date/time.
- Integrated oscilloscope function that can show the acoustic signal in real time.
- Spectral analyzer software that can show and record the spectrum (or 3rd-octave bands) in real time.
- Can be used as a high-quality USB digital microphone. USB Audio interface is included
- Allows the observation of recorded levels while the recording is ongoing.
- Works standalone, or USB-connected.
- Long life internal rechargeable battery that recharges from USB and most USB chargers.
- Can be field-calibrated.
- Observes and records 100% of the acoustic signal (no missed samples).
- Editable individual custom ID for easier instrument management.
- All settings are stored in non-volatile memory. So the instrument will regain full functionality and *WiFi* connection from hard-reset or battery loss.
- Compatible with Convergence Instrument's Cloud service.

1 Applications

- Sound level and acoustic dose measurement and recording.
- Monitoring of safe working conditions.
- 24/7 noise monitoring on construction sites.
- Email Alerts when the noise is too loud.

- Activity detection and logging.
- Long-term measurement and recording of acoustic levels for environmental impact studies.
- Specially designed for long-term outdoors applications.

2 Specifications

Category	Specification
Bandwidth	• 20 Hz to 20 kHz
Microphone Sensor	• Digital MEMS
Precision Class	• Type I
Saturation Level (typical @ 1 kHz)	• 120 dB-A • 120 dB-C • 120 dB-Z
Temperature Error	• Better than 0.6 dB (-20 degC < T < 60 degC
Sensitivity to Vibrations	• 60 dB_{SPL}/g (20 dB lower than typical measurement microphone)
Weighting Curve	• dB-A • dB-C • dB-Z
Noise-Floor (Typical)	• 30 dB-A • 46 dB-C • 52 dB-Z
Recording Resolution	• 0.1 dB
Duty Rate of Signal Capture and processing	• 100% - No Missed Samples
Minimum Log Interval	• 125 ms (8 points of Lpeak, Lmin, Lmax and LEQ per second)
Real-Time Spectral Display	• 2048-point Power Spectrum – dB or Lin Scale.
Calibration	• Field-calibrated using a 94 dB 1/2” calibrator
Connectivity	• USB • WiFi
Radio Standard	• IEEE 802.11 b/g/n (2.4GHz-only transceiver)
Radio Certification	• FCC • IC • Japan • Korea • CE

WiFi Band	• 2.4 GHz Band (Channels 1 to 11, 2412MHz to 2462 MHz)
WiFi Max Power	• 100 mW (20 dBm)
Battery Type	• Integral Li-Poly - USB-Rechargeable
Recharge Time	• 2 H 30 (Typical)
Battery Autonomy (Full-Charge)	• 7 days while recording (WiFi operation will drain battery slightly more, depending on rate of connect)
Battery Life	• > 300 Charge/Discharge Cycles
Temperature Range	• -20 degC to 60 degC (-4 degF to 140 degF)
Recording Memory Type	• Non-Volatile Flash Memory
Recording Memory Capacity	• 128 Mb • Ex: can continuously record Lmax, Lmin and Leq levels at 1s intervals for 32 days, or 10s intervals for 320 days.
Recording/Erasure Cycles	• Greater than 100 000
Data Retention	• Greater than 20 Years
Dimensions	• 19 mm x 42 mm x 160 mm • (0.75" x 1.65" x 6.25")
Weight	• 100 g
Construction	• Weather-proof enclosure
Microphone Dust Protection	• Expanded polytetrafluoroethylene (ePTFE) dust and water barrier
WiFi Security	• Open • WEP • WPA / WPA2 Personal • WPA2-Enterprise (EAP-PEAP, EAP-TTLS)
Server Connection	• IP address or Domain Name
Protocol	• TCP/IP

Table 1

2.1 Frequency Response

Figure 1 shows the typical spectral error in dB-A, dB-C and dB-Z, at 32 kHz and 48 kHz sampling rate, together with the type I limit lines.

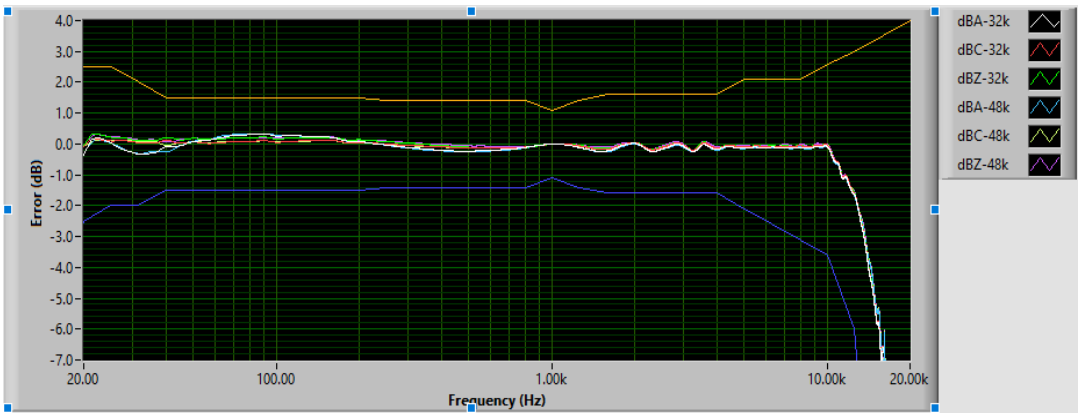


Figure 1

2.2 Directivity

Figure 2 shows the directivity of the instrument as a function of frequency.

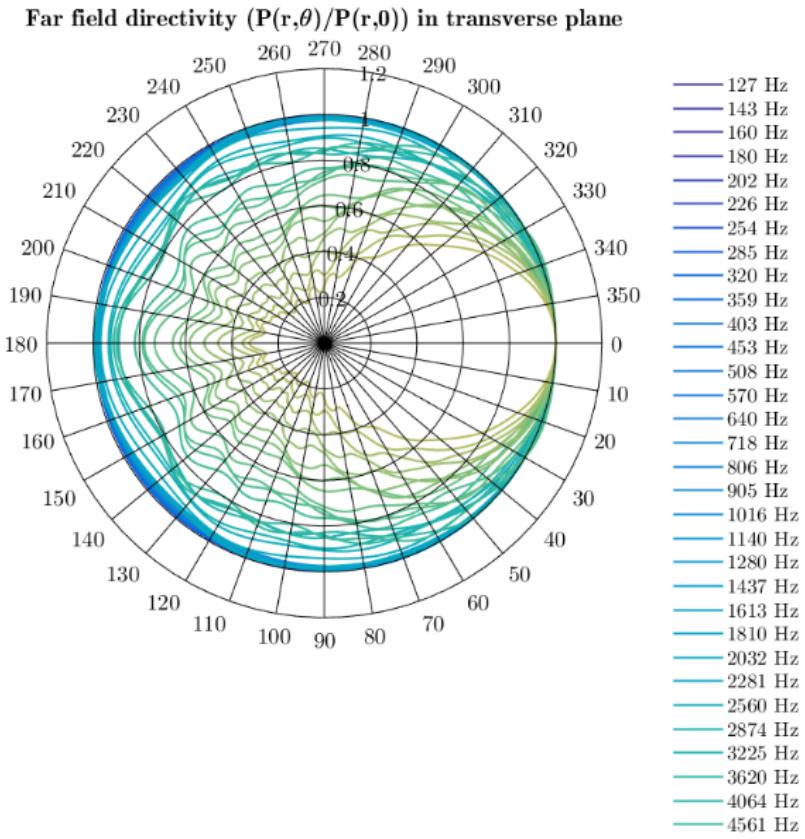


Figure 2

3 Instrument Manager Application Specifications

Category	Specification
Compatibility	• Windows 7, Windows 8, Windows 10, Windows 11
Supported Instruments	• All in Sentry series
Configuration	• Full Instrument Configuration • Save and Recall Configuration Files
Display	• Real-Time Acoustic Signal • Real-Time Sound Level • Real-Time Spectrum • Recorded Sound Levels • Global Leq/Dose Calculation (ISO and OSHA methods) • Battery Level and Charge • All graphs can be viewed in dB or Lin scale
Record Management	• Record Manual Start/Stop • Record Programmed Start/Stop • Recording Memory Download (Even while recording) • Recording Memory Clear • Auto-Calculation of Memory Depth
Cloud Compatibility	• Supported by Convergence Instrument's Cloud solution
Data Export (all graphs)	• Export to Tab-Delimited Format for Use with Spreadsheet Applications

Table 2

4 Other Applications

Application	Description
Cloud	Web-based cloud solution so that instrument data can be reported and viewed/downloaded from anywhere in the world through Convergence Instruments Cloud service (requires a subscription)
Instrument Listener	Required for WiFi operation when the cloud service is not used. The application must be running on PC to allow instruments to connect and download their data via WiFi.
Noise Sentry RT Community Noise Metrics	Application to calculate various noise metrics, such as CNEL, LDEN, and many others.

Table 3