PRODUCT DATA

Noise Monitoring Terminals Types 3639 and 3655

The Brüel & Kjær family of Noise Monitoring Terminals (NMTs) is ideal for anyone who needs to continuously monitor noise levels in order to demonstrate compliance with regulations, manage their activities, limit noise impact or measure to improve their noise maps. Each NMT provides noise information you can trust, enabling you to make real-time decisions to avoid breaching noise restrictions. Unlike other instruments that are not specifically designed for continuous unattended outdoor monitoring, Brüel & Kjær NMTs accurately and reliably capture data. Each unit runs with little user attention, which reduces your total monitoring cost and reduces the demands on your valuable time.

The family of Noise Monitoring Terminals (NMTs) is made up of intelligent units designed to work unattended as part of an environmental noise monitoring system for permanent, mobile or portable monitoring. Using Brüel & Kjær noise management software, the NMTs can be controlled by a remote PC enabling them to measure, record, process, store and transmit noise information.

Uses and Features

Uses

- Permanent, mobile and portable monitoring of any application requiring unattended outdoor noise measurement

Features

- Specifically designed for permanent, continuous outdoor monitoring
- A wide range of solutions for all applications, needs and budgets
- Type approved to IEC 61672 Class 1 specifications; uniquely, including windscreen effects
- 120 dB dynamic range
- Self-monitoring capabilities for increased uptime
- Built-in facilities to minimise gaps in data
- Charge Injection Calibration (CIC) or a built in actuator for remote verification of the entire measurement chain
- Safe and reliable live data streaming
- LAN, WLAN, 3G and CDMA communication capabilities for remote operation
- Industry-standard Internet and security protocols for safe and reliable data transfer
- Wide range of integrated peripherals for communications, powering, mounting, weather, GPS, camera, etc.

Physical Configurations

The NMTs are modular both in hardware and software, making them suitable for a wide range of applications, needs and budgets. They come in a wide range of standard and customised configurations and with a wide range of accessories, peripherals and services, so whatever professional noise monitoring solution you need, Brüel & Kjær can deliver a solution. NMTs are available in permanent, mobile and portable variants with two microphone options for either general or specialist use. A wide range of peripherals covering communications, integrated weather monitoring, power, physical mounting and additional inputs such as GPS modules, cameras, etc., are available.

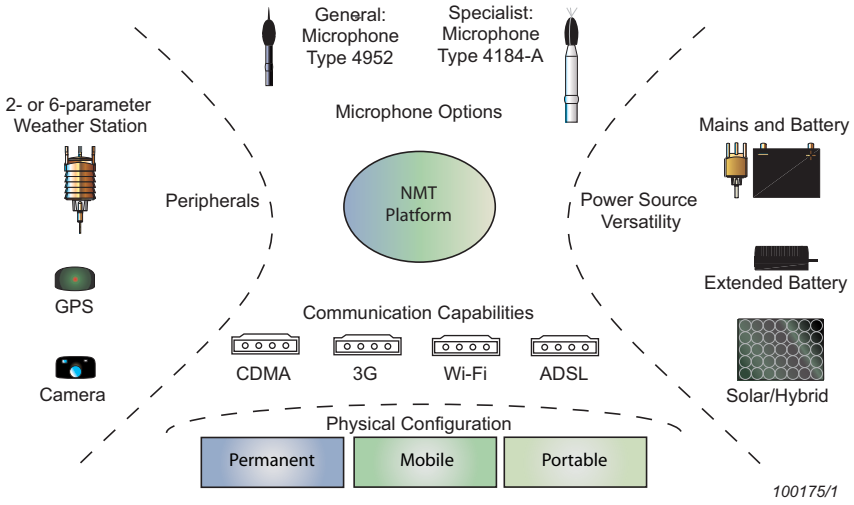

Fig. 1
Overview of the Noise Monitoring Terminal and its accessories

Permanent Noise Monitoring

Fig. 2
Permanent NMT mounted on a pole (microphone on top of pole not visible)

Suitable for permanent continuous monitoring at the same location for periods of several months to several years, Brüel & Kjær's Permanent NMTs (Fig. 2) have been specifically designed to operate unattended in harsh environments, protecting the contents from weather, tampering, vandalism, theft, etc. The durable, weatherproof cabinet includes a mounting kit for fastening the cabinet to a wall or pole. The cabinet is well protected by a weatherproof locking mechanism, and padlocks can be mounted. Protection is also provided for the cabling to reduce the risk of tampering or accidental damage. Permanent NMTs send a signal to the remote PC when the door is open, allowing unauthorised intrusion to be detected and recorded. The NMTs work according to specifications even in winter conditions, operating on mains down to –30°C. If required, a low-temperature protection kit is available for continuous operation under even more extreme weather conditions. Contact your local Brüel & Kjær representative for more information.

Permanent NMTs can be battery operated so that they can function when there is no usable local power source or mains power has been disrupted. They can be powered from a variety of sources, such as solar panels, through the DC supply input.

A 10 m microphone cable is included to ensure that the outdoor microphone can be positioned in the correct acoustical position while the cabinet is conveniently and securely mounted. It is easy to add new accessories, like a GPS unit or weather station, to the NMT even after the installation of the NMT on a wall or a pole, easing installation and configuration.

Fig. 3
Example of mobile NMT, which offers months of independent operation

Mobile Noise Monitoring

For continuous monitoring for periods of one week or more, mobile configurations (Fig. 3) are available as special orders enabling independent operation either with on-line communication to and from the central control software or completely off-line. Mobile NMTs are typically trailer mounted and, like permanent NMTs, offer remote system health monitoring capabilities including alarms, which reduce down-time by ensuring timely manual intervention. The full range of NMT peripherals and options, including power and communication accessories, are available with mobile configurations. Contact your local Brüel & Kjær representative for more information.

Portable Noise Monitoring

Compact and lightweight hand-carry portable units (Fig. 4) for periods of a few hours to several days, with the possibility of mains power connection, are available. A light and robust case protects the same analyzer as used in the permanent or mobile configurations, ensuring the same high-quality system interface. The case's contents are protected by high-density machined foam inlays, from weather and from unauthorised access. The case also enables the provision of power, remote control capability and data retrieval for truly independent operation. Battery power for extended measurement durations is provided by two hot-swap Li-Ion batteries. Li-Ion batteries are renowned for their excellent charge retention and very high energy efficiency (5 times better power-to-weight ratio than traditional lead-acid batteries).

These lightweight batteries make the NMT compact and completely portable. For reliable long-life operation, the batteries have internal circuitry to protect against shorts and over discharge. Chargers for the batteries, included in the case, enable the system to be powered from the mains or from external DC power, ensuring a very flexible solution. The case's power panel directs power from the source with the highest voltage to supply the entire unit, thus enabling you to change power sources, including hot-swapping batteries without disturbance at any time during measurement as long as one power source is available. During measurements any cables exiting the case, such as the microphone extension cable and a mains power cable (if used), are strain-relieved inside the case and protected by a rain shield mounted on the case lid.

Fig. 4
Portable NMT on location

Different Microphones for Different Needs

Two different standard microphones, for either general use, appropriate for use in all applications, or for specialist use. The general-purpose Outdoor Microphone Type 4952 is a handy, robust outdoor microphone offering easy mounting, maintenance and calibration. The specialist Weatherproof Microphone Type 4184-A is an extremely robust microphone for demanding situations. Both ensure that the NMTs fulfil the strictest measurement standards (IEC 61672 Class 1) and give you results you can trust.

General Use: Outdoor Microphone Type 4952 (for General-purpose NMTs)

Fig. 5
Outdoor Microphone Type 4952 with integrated coupling for easy fitting onto the top of a water pipe

NMTs fitted with Outdoor Microphone Type 4952 are general purpose, suitable for all applications and for long periods of unattended outdoor use. The basic design principle is ease of use. The outdoor microphone is light, small and comes with integrated coupling for simple fitting on top of standard, widely available, 1" water pipe. The microphone's exterior housing is made of a chemical-resistant polymer that provides extremely high protection against corrosion. The microphone's long-term stability guarantees unattended outdoor use for up to a year without any significant change in sensitivity (after which period, the microphone should be checked and recalibrated). The windscreen and bird spike can be removed in seconds, enabling easy acoustical calibration of the microphone using Sound Calibrator Type 4231, which gives a fixed calibration signal, independent of atmospheric conditions. Frequency response is precisely controlled such that, with the appropriate linearization, IEC 61672 Class 1 requirements are fulfilled, with either 0 or 90° reference direction. Outdoor Microphone Type 4952 can be safely placed inside the NMT cabinet during transportation.

Specialist Use: Weatherproof Microphone Type 4184-A (for Specialist NMTs)

Fig. 6
Weatherproof Microphone Type 4184-A with adaptor for easy fitting onto the top of a standard water pipe

NMTs fitted with the Weatherproof Microphone Type 4184-A become suitable for specialist use where monitoring in a high-humidity or corrosive environment or where you wish to use an electrostatic actuator for remote calibration checks.

The Weatherproof Microphone is extremely robust and has become the global reference to which all other outdoor microphones are compared. The unit can be used in most humid and corrosive atmospheres because the casing is made completely of stainless steel and has a built-in protection system against humidity. The microphone's unique probe design ensures not only an extremely high level of protection within the casing, affording rain protection according to IEC 529 IP44 and operation all the way up to 100% RH, but also maintains measurement accuracy complying with the most strict measurement standards (IEC 61672 Class 1). The microphone has both CIC function and a built-in actuator for remote verification of system integrity and correct operation. Being extremely robust and with a high level of system integrity built in, the microphone requires little maintenance and offers high uptime and extreme long life, even after accredited calibrations and periodic verification due to the use of greasing to reseal the microphone unit.

Noise Monitoring and Analysis

For all configurations, noise monitoring and analysis is performed by the included analyzer protected inside the cabinet. The analyzer measures data coming from the outdoor microphone and logs it onto its removeable memory, including broadband and spectral Leqs or SPLs* with one or two frequency weightings, continuously at half- or one-second intervals. The NMT can also identify, record and analyse noise events. Analyses produced include:

- **Hourly reports:** Information each whole hour including Total L_{eq} and statistical distribution. Total, Background and Noise Event L_{eq} and Effective Perceived Noise Level (EPN) of all events according to ICAO Annex 16
- **Short reports:** Information during a period of time between 1 and 30 minutes, calculating minimum, maximum, L_{eq} and five user-defined L_N values. Short reports can include sound recordings†
- **Calibration Check reports:** Results of the Charge Injection Calibration or Actuator tests, which can be performed automatically four times a day
- **Noise events:** Information on noise events detected based on hourly varying trigger and duration values. For each event, SPL or L_{eq} values, spectra, Perceived Noise Level (PNL), and Perceived Noise Level Tone Corrected (PNLT) values according to ICAO Annex 16, are stored at half- or one-second intervals. Sound recordings of events can also be stored
- **Instrument Health reports:** Information on the NMTs internal temperature, battery voltage, mains voltage and external voltage

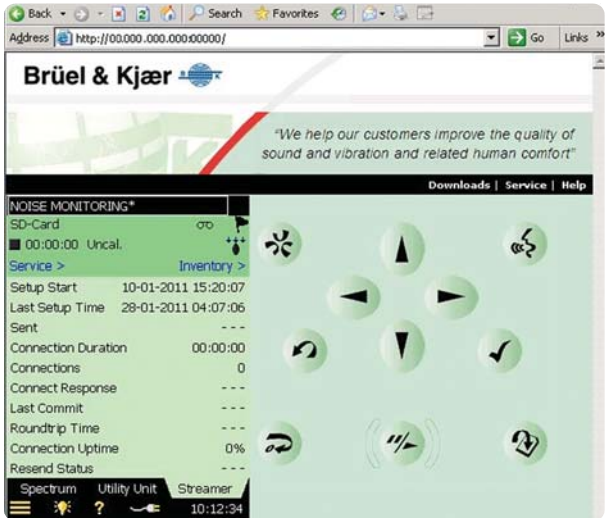

Fig. 7
View the results and status of the NMT remotely from a web browser

Data can be streamed over LAN-based communication or via 3G, with a maximum deviation of two seconds from the NMT to the central control server with Brüel & Kjær noise management solutions. Once on the server, Brüel & Kjær's central control software client can access and analyse the data.

In addition, the NMT's user interface can be viewed directly in a web browser allowing simple remote access to data and the status of the NMT from any PC.‡

The NMT can be upgraded through its software licensing to interface to third party software for remote noise monitoring with batch data transfer.

Alarms**

Permanent NMTs have a number of alarms that are triggered as soon as the related condition is detected so users can quickly respond to issues. Alarms cover:

- Door Open/ Close
- Mains Power Off/On
- Battery Low/OK
- Temperature High/OK
- Communications power off/on

Setup and Calibration

The analyzer's display and interface eases initial setup and servicing. Initial calibration of the NMT is done using Sound Calibrator Type 4231 or Pistonphone Type 4228 – depending on microphone. In addition, the NMT has built-in CIC, a patented technique used for remotely monitoring the entire measurement setup including the microphone, preamplifier and connecting cable. With specialist NMTs, calibration check using an actuator is also possible. The NMT can initiate up to four automatic, routine system checks per day at user-specified times, storing results for later download and investigation.

* Two frequency weightings are not available with Types 3639-E and -G

† Sound recording quality, duration and level is user-defined. Recording low-quality files reduces the time and bandwidth required to download the files from the NMT, often reducing operating costs. High-quality files enable post-processing, for example, tone analysis to determine noise limit compliance based on rating levels, using Brüel & Kjær's PULSE Multi-analyzer system or other application.

‡ Currently not available for Types 3639-E and -G

** Not all alarms are available for Type 3655 portable noise monitoring units

You can also remove the analyzer and use it as a stand-alone sound level meter or hand-held analyzer* by purchasing the relevant application software licenses for the required functions.

Off-line Operation with Hot-swap Memory

The NMT can be used independently from a central software system. With the NMT's hot-swap memory, the NMT can be deployed without on-line communication with the server. Data transfer is achieved by exchanging the NMTs memory card. No measurement data is lost (only sound recording is unavailable for the minute or so it takes to swap the SD memory card). Once back in the office, simply upload the data to the server using a standard card reader with any PC connected to the server. In addition, the setup of the NMT can be changed using the new SD card.

NMT Peripheral Equipment

Table 1
Optional peripherals available by configuration

Product	Peripheral			
	Weather Station	GPS Device	Camera	Other External Peripherals[1]
Portable Noise Monitoring Unit 3655-C	•			
General-purpose Permanent NMT 3639-A	•			
Specialist Permanent NMT 3639-C	•			
NMT Plus for ENM/ANOMS 3639-E	•	•	•	•
NMT Advanced for ENM/ANOMS 3639-G	•	•	•	•

[1] For more information, see Product Data for NMT Types 3639-E/G (BP 2098)

Communications

NMTs are delivered with LAN-based communication as standard. Additional peripherals for other LAN-based communication are available as standard, including 3G, ADSL, W-LAN and CDMA.

Meteorological Data†

Fig. 8
A weather terminal can be connected to the NMT, and its weather data integrated with the noise measurements

NMTs can simultaneously monitor weather conditions from a connected weather station and store the data with noise information for communication to the central system. These data are useful for determining the validity of measured noise data and ensuring that measurements are not contaminated by wind noise, increased noise due to heavy rainfall and that temperature and humidity comply with the standards for good measurement practice.

NMTs are available with two types of weather station – one with the two most used parameters: wind speed and wind direction for correlation with wind data; and another with six parameters: wind speed, wind direction, temperature, pressure, humidity and rainfall for full correlation and analysis.

Images*

With optional Outdoor Camera WQ-2837 connected, images can be captured at 1-second intervals and integrated with noise events for easier identification and documentation of the sources of noise.

GPS Geographical Positioning*

NMTs support GPS, so with a standard GPS receiver and antenna unit (such as GPS Receiver with Antenna ZZ-0249) longitude, latitude and height can be monitored and stored with the noise measurements. This makes measurement location identification and documentation easier and less prone to human error.

* For more information, see Product Data for Hand-held Analyzer Type 2250 (BP 2025).
† See Table 1 for availability

Power

Fig. 9
Add solar panels to the NMT to reduce power consumption or even allow 24/7 battery operation

Permanent NMTs are delivered with one battery so that the NMT can function if mains power has been disrupted. With two batteries mounted in the cabinet, the NMT can operate for 90 hours on battery power, thus fulfilling a range of specific legislation, standards and de facto good practice that demand significant battery back-up. With Battery Box UA-2141, the NMT can operate for 180 hours (more than seven days) on battery power for even more demanding remote monitoring locations.

The batteries are charged whenever external AC or sufficient DC power is applied to the NMT. Additionally, the NMT can be powered from a variety of sources connected through the DC supply input. Thus, solar panels can be added to the NMT, which enables lower power use or even permanent 24/7 operation. Additional batteries are used to provide sufficient backup for operation in overcast conditions, even during winter months.*

Note: The use of the peripheral devices described above may increase power consumption and reduce the back-up power duration.

Permanent Mounting

Permanent NMTs come complete with a mounting kit for fastening the cabinet to a wall or pole. This mounting kit allows of the use of small, low-cost, standard size water pipes to protect the cables for the microphone and weather station. For compliance with specific legislation, standards and de facto good practice, the microphone must be placed at, for example, 4 or 6 m height and at some distance from large reflecting surfaces. Brüel & Kjær can supply a range of alternative masts for permanent or temporary mounting of the cabinet and correct positioning of the microphone. These include ground-mounted, wall-mounted and telescopic masts. For more information, contact your local Brüel & Kjær representative.

Service and Support

Brüel & Kjær offers a wide range of support and services to ensure efficient and problem-free operation. These include a range of calibration services (accredited and traceable), repairs, conformance tests, warranty extensions, installation, training, a help line and equipment rental. These services can be performed on site, locally or at the factory. For example, Traceable Calibration is available both as an on-site service and as a more rigorous calibration at the factory in Denmark. Annual and long-term service packs for NMTs and for entire environmental noise management or noise monitoring systems are also available. In addition, NMTs may be operated from systems hosted by Brüel & Kjær, such as WebTrak for airports and Noise Sentinel for urban and industrial applications.

* For more information, see case study: Solar/Wind Power for Noise Monitoring Terminals (BN-0619) or contact your local Brüel & Kjær representative.

Compliance with Standards

CE C-Tick	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive. C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand.
Safety	EN/IEC 61010–1 and ANSI/UL 61010–1*: Safety requirements for electrical equipment for measurement, control and laboratory use. UL 61010B–1: Standard for Safety – Electrical measuring and test equipment.
EMC Emission	EN/IEC 61000–6–3: Generic emission standard for residential, commercial and light industrial environments. EN/IEC 61000–6–4: Generic emission standard for industrial environments.* CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits. FCC Rules, Part 15: Complies with the limits for a Class B digital device. IEC 61672–1, IEC 61260, IEC 60651 and IEC 60804: Instrumentation standards.
EMC Immunity	EN/IEC 61000–6–1: Generic standards – Immunity for residential, commercial and light industrial environments.* EN/IEC 61000–6–2: Generic standards – Immunity for industrial environments. EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements. IEC 61672–1, IEC 61260, IEC 60651 and IEC 60804: Instrumentation standards.

* Specifically referring to Type 3655-C
Note: The above is only guaranteed using accessories listed in this document

Conforms with the following National and International Sound Level Meter Standards:
- IEC 61672–1 (2002-05) Class 1
- IEC 60651 (1979) plus Amendment 1 (1993–02) and Amendment 2 (2000–10), Type 1
- IEC 60804 (2000–10), Type 1
- DIN 45657 (1997–07)
- ANSI S1.4–1983 plus ANSI S1.4 A–1985, Amendment, Type 1
- ANSI S1.43–1997, Type 1

Conforms to the following National and International Frequency Analysis Standards:
- IEC 61260 (1995–07) plus Amendment 1 (2001–09), 1/3-octave Bands Class 0
- ANSI S1.11–1986, 1/3-octave Bands, Order 3, Type 0–C
- ANSI S1.11–2004, 1/3-octave Bands, Class 0

Note: The International IEC Standards are adopted as European standards by CENELEC. When this happens, the letters IEC are replaced with EN and the number is retained. The analyzers also conform to these EN Standards

Specifications for Noise Monitoring Terminal Type 3639-A

All specifications are valid with Noise Monitoring Software BZ-7232 version 4.1.1.

General-purpose Permanent Noise Monitoring Terminal Type 3639-A is supplied with Outdoor Microphone Type 4952, which includes Microphone Preamplifier ZC-0034. The microphone can only be connected to the analyzer through a microphone extension cable

MICROPHONE
Type: Prepolarized Outdoor Microphone
Nominal Open Circuit Sensitivity: 31.6 mV/Pa, (corresponding to –30 dB re 1 V/Pa) ±2 dB
Capacitance: 12 pF (at 250 Hz)
Reference Direction: Selectable between 0° (Top) and 90° (Side)

MICROPHONE PREAMPLIFIER ZC-0034
Nominal Preamplifier Attenuation: 0.3 dB
Extension Cable between Microphone Preamplifier ZC-0034 and Analyzer: Up to 100 m without degradation of the specifications

MEASURING RANGES (BROADBAND)
Dynamic Range: From typical noise floor to max. level for a 1 kHz pure tone signal, A-weighted: 20.0 – 141 dB
Linear Operating Range: In accordance with IEC 61672, A-weighted: 1 kHz: 31.1 – 141 dB
Primary Indicator Range: In accordance with IEC 60651, A-weighted: 29.8 – 124 dB
Linearity Range: In accordance with IEC 60804, A-weighted: 27.7 – 141 dB

MEASURING RANGES (1/3 OCTAVE)
Dynamic Range: From typical noise floor to max. level for a pure tone signal at 1 kHz 1/3-octave: 2.9 – 141 dB
Linear Operating Range: In accordance with IEC 61260: ≤29.5 – 139.3 dB

SELF-GENERATED NOISE LEVEL
Typical values at 23°C for nominal microphone open-circuit sensitivity:

Weighting	Microphone	Electrical	Total
A	14.0 dB	18.7 dB	20.0 dB
B	12.9 dB	17.5 dB	18.8 dB
C	13.0 dB	18.7 dB	19.7 dB
Z (5Hz – 20 kHz)	14.4 dB	24.8 dB	25.2 dB

Specifications for Noise Monitoring Terminal Type 3639-C

All specifications are valid with Noise Monitoring Software BZ-7232 version 4.1.1.

Specialist Permanent Noise Monitoring Terminal Type 3639-C is supplied with Weatherproof Microphone Type 4184-A, which includes Microphone Preamplifier ZE-0773. The microphone can only be connected to the analyzer with a microphone extension cable

MICROPHONE
Type: Weatherproof Microphone
Nominal Open Circuit Sensitivity: 10.9 mV/Pa, (corresponding to –39.25 dB re 1 V/Pa) ±1.5 dB
Capacitance: 18 pF (at 250 Hz)
Reference Direction: Selectable between 0° (Top) and 90° (Side)

MICROPHONE PREAMPLIFIER ZE-0773
Nominal Preamplifier Attenuation: 0.2 dB
Extension Cable between Microphone Preamplifier ZE-0773 and the Analyzer: Up to 100 m without degradation of the specifications

MEASURING RANGES (BROADBAND)
Dynamic Range: From typical noise floor to max. level for a 1 kHz pure tone signal, A-weighted: 28.8 – 149.7 dB
Linear Operating Range: In accordance with IEC 61672, A-weighted: 1 kHz: 40.2 – 149.7 dB
Primary Indicator Range: In accordance with IEC 60651, A-weighted: 38.9 – 132.7 dB
Linearity Range: In accordance with IEC 60804, A-weighted: 36.8 – 149.7 dB

MEASURING RANGES (1/3-OCTAVE)
Dynamic Range: From typical noise floor to max. level for a pure tone signal at 1 kHz 1/3-octave: 11.1 – 149.7 dB
Linear Operating Range: In accordance with IEC 61260: ≤37.0 – 149.7 dB

SELF-GENERATED NOISE LEVEL
Typical values at 23°C for nominal microphone open-circuit sensitivity:

Weighting	Microphone	Electrical	Total
A	21.1 dB	28.2 dB	28.8 dB
B	18.7 dB	26.8 dB	27.4 dB
C	18.7 dB	27.3 dB	27.9 dB
Z (5Hz – 20 kHz)	22.7 dB	32.5 dB	32.9 dB

Common Specifications for Types 3639-A and 3639-C

All specifications are valid with Noise Monitoring Software BZ-7232 version 4.1.1.

TRANSDUCERS
Transducers are described in a transducer database with information on Serial Number, Nominal Sensitivity, Polarization Voltage, Free-field Type, CCLD required, Capacitance and additional information.
The analog hardware is set up automatically in accordance with the selected transducer

CORRECTION FILTERS
For Microphone Types 4952 and 4184-A, Noise Monitoring Software BZ-7232 is able to correct the frequency response to compensate for sound field and accessories
Sound Field: Free-field or Diffuse-field. Two Free-field reference directions: 0° (Top) and 90° (Side)

MICROPHONE POLARIZATION VOLTAGE
Selectable between 0 V and 200 V

CALIBRATION
Initial calibration is stored for comparison with later calibrations
Acoustic calibration:
- NMT 3639-A and 3655-C: Using Sound Calibrator Type 4231 , the calibration process automatically detects the calibration level
- NMT 3639-C: Using Pistonphone Type 4228

Automatic checks: Performed up to 4 times per day
- NMT 3639-A: Charge Injection Calibration (CIC)
- NMT 3639-C: CIC or Actuator Calibration

Calibration History: Up to 20 of the latest calibrations made are listed. Can only be viewed on the analyzer

FREQUENCY ANALYSIS
1/1- or 1/3-octave band analysis (availability depending on the system management software used)
1/1-oct. Band Centre Frequencies: 16 Hz – 16 kHz
1/3-oct. Band Centre Frequencies: 12.5 Hz – 20 kHz

INPUT SOCKET
Connector: Triaxial LEMO
Input Impedance: ≥1 MΩ
Direct Input: Max. input voltage: ±14.14 Vpeak
CCLD Input: Max. input voltage: ±7.07 Vpeak
CCLD Current/Voltage: 4 mA/25 V

POWER CONSUMPTION

Operational Mode	Typical Power Draw at 12 V DC or Mains AC (W)	Comments
LAN (Analyzer and Utility Unit only)	4.5	
Router (operational)	3 (extra)	
Weather station	0.05 (extra)	For operation down to +3ºC ambient temperature
	11 (extra)	For lower temperatures (**Note:** Between –2 and +3ºC, the additional power needed is 5.5 W)
Heater (activated below 5ºC)	18 (extra)	
Recharging internal batteries	7.5 (extra)	
Low-temperature Protection Kit	30 (extra)	Operate only on AC

POWER SUPPLY
The measuring part of Type 3639-A/C is powered from the analyzer's internal battery pack. The battery pack is charged from the external AC supply, External DC supply or the NMT Batteries. The NMT Batteries are charged from either the External AC supply or sufficient External DC supply. Typical Operating Times are given at room temperature. At low temperatures it will be reduced

Analyzer Battery Pack:
- Type: Rechargeable Li-Ion
- Typical Operating Time: 8 hours

NMT Batteries:
- Type: One or two 12 V rechargeable, valve regulated, lead acid
- Typical Operating Time: One battery, 45 hours; two batteries, 90 hours; four batteries, 180 hours*. With Cellular Router installed, 25/50/100 hours

* Requires Battery Box for Permanent NMTs UA-2141

External DC Power Supply:
- Voltage: 12 – 24 V DC

External AC Power Supply:
- Voltage: 90 – 132 and 180 – 264 V_{RMS}, Autoranging
- Frequency: 47 – 66 Hz

CLOCK
Back-up battery powered clock. Drift <0.45 seconds per 24-hour period

WARM-UP TIME
From Power Off: <2 minutes
From Standby: <10 seconds with prepolarized microphones

TEMPERATURE
IEC 60068–2–1 & IEC 60068–2–2: Environmental Testing. Cold and Dry Heat
Operating Temperature: –30 to +55°C (–22 to 131°F), <0.1 dB
Storage Temperature: –25 to +70°C (–13 to 158°F)

HUMIDITY
IEC 60068–2–78: Damp Heat: 90% RH (non-condensing at 40°C (104°F))
Effect of Humidity: <0.1 dB for 0% <RH <90% (at 40°C (104°F) and 1 kHz)

SOUND POWER EMITTED FROM TYPE 3639-A/C
Sound Power Level: <36 dB (A) L_w

MECHANICAL
Environmental Protection: IP 55 (without external cables), IP 44 (with external cables)
Non-operating:
- IEC 60068–2–6: Vibration: 0.3 mm, 20 m/s^2,10 – 500Hz
- IEC 60068–2–27: Shock: 1000 m/s^2
- IEC 60068–2–29: Bump: 4000 bumps at 400 m/s^2

DIMENSIONS AND WEIGHTS
NMT Cabinet:
- Height: 610 mm (24 in)
- Width: 390 mm (15.4 in)
- Depth: 120 mm lb(4.7 in)
- Weight: 10.14 kg (22.4 lb) with no NMT battery; 16.1 kg (35.5 lb) with one battery; 22.4 kg (49.4 lb) with two NMT batteries

Mounting Kit: 7.5 kg (16.5 lb)

SOFTWARE
Measurement Partner Suite BZ-5503: Update of software and licenses for the analyzer. BZ-5503 is supplied on DVD BZ-5298

COMPUTER REQUIREMENTS (FOR BZ-5503)
Operating System: Windows® 7 or XP (32- or 64-bit versions)
Recommended PC:
- Intel® Core™ 2 Duo
- 2 GB RAM
- SVGA graphics display/adaptor
- Sound card
- DVD drive
- Mouse
- USB
- Windows® 7
- Microsoft®.NET 4.0

Specifications for Software Controlled via Remote PC

All specifications are valid with Noise Monitoring Software BZ-7232 version 4.1.1.

Noise Monitoring Terminal Type 3639-A/C can be remote controlled from a PC running Environmental Noise Management System Software Type 7843, ANOMS or Noise Sentinel Type 7871. The specifications that can be fulfilled is dependent on the system software used. In some cases, the relevant system software is specified

BASIC MEASUREMENTS
Logging Rate: ½ or 1 s
Detectors: Parallel detectors on every measurement:
A- or B-weighted (switchable): Broadband detector channel with one exponential time weighting (Fast, Slow, Impulse), one linearly averaging detector and one peak detector
C- or Z-weighted (switchable): As for A- or B-weighted
Overload Detector: Monitors the overload outputs of all the frequency weighted channels
Measurements:
X = frequency weightings A or B
Y = frequency weightings C or Z
V = frequency weightings A, B, C or Z
U = time weightings F,S or I

LXeq	LYeq	LXE	LYE	LCeq – LAeqk
LXUmax	LYUmax			
LXUmin	LYUmin			
LXIeq	LYIeq	LAIeq – LAeq		
Lvpeak				

EVENT DETECTION
Settings: Individual setting for each hour in a 24-hour period
Event Start Trigger: L_{eq} or $L_{(SPL)}$ with minimum threshold exceeding duration
Event Stop Trigger: L_{eq} or $L_{(SPL)}$ with minimum threshold exceeding duration

REPORTS*†
Short Reports:
- **Period:** User-defined 1 to 30 minutes, whole number of reports each hour
- **Data:** Start time; Stop time; Minimum of $L_{(SPL)}$ over the period; Maximum of $L_{(SPL)}$ over the period; Total L_{eq} over the period; Total L_{leq} over the period; 5 L_N Values with user-defined percentile levels; Standard deviation; Wind speed and wind direction (Noise Sentinel only)

One Hour Reports:
- **Data:** Start time; Stop time; Level distribution (per mil ‰ for L (instantaneous)) in 110 1 dB classes, plus an Overload class and a Below class; One hour minimum of $L_{(SPL)}$; One hour maximum of $L_{(SPL)}$; One hour total L_{eq}; One hour minimum of L_{eq}; One hour maximum of L_{eq}; L_{eq} Event value (total L_{eq} for all the events during the one-hour period); L_{eq} Background value (total L_{eq} for all the periods between events during the one-hour period); Persistent overload for the one-hour period; Standard deviation

Event Reports:
- **Data Compression:** Event data for ENM/Noise Sentinel are compressed. The event data samples are L_{eq} values if the trigger is set to L_{eq} and $L_{(SPL)}$ values if the trigger is set to SPL. The maximum number of samples is 101 (always one sample before trigger). If the event period exceeds 100 samples, the samples are compressed with a factor 2, 4, 8 ...
- **Data:** Based on ½ or 1 s logging. Start time; Stop time; Event data; T10 Duration (T10 is the time within the event where the level is below 10 dB of the maximum level); $L_{E(T10)}$ calculated over the T10 period; L_{eq} Spectrum (total L_{eq} spectrum over the event period); EPNL over the event period; Total L_{eq} over the event period; L_E calculated over the event period; Maximum of L_{eq} over the event period; Time of maximum of L_{eq}; Maximum of $L_{(SPL)}$ over the event period; Time of maximum of $L_{(SPL)}$; 120 PNL and PNLT, where each value is a 0.5 s PNL/PNLT value (dB 10); $L_{eq2} – L_{eq1}$
- **Additional Data for ANOMS:** Wind speed at time of maximum L_{eq}; Wind direction at time of maximum L_{eq}; Humidity; Temperature; Event spectra; Number of event spectra

* Which data is available is dependent on the central system management software the NMT is used with. For more information, see the relevant central system management software's Product Datasheet.

† All trigger levels, L_{eq} values and SPL values can be with one or two frequency weightings

- **Weather (with optional Weather Station MM-0256):** Wind speed; Wind direction; Temperature; Relative humidity; Atmospheric pressure; Liquid precipitation.
  1-minute resolution: Wind speed and direction can be set to 1-second resolution
- **Weather (with optional Weather Station MM-0316):** Wind speed; Wind direction.
  1-minute resolution: Wind speed and direction can be set to 1-second resolution
- **GPS (with optional GPS Receiver ZZ-0249):** Latitude; Longitude; Altitude

System Check Reports: CIC or actuator (depending on configuration). Start time; L_{eq} during check; L_{eq} before check; L_{eq} after check
NMT Health Reports: One hour reports with Start time and 60 minute values of Internal temperature, Battery voltage, Mains voltage, External voltage (connection to Utility Unit ZH-0689 required), Internal/Storage disk capacity, Internal/Storage disk free space, Available physical memory, and Idle CPU
NMT Alarms: Door open/close, Power off/on, Battery voltage below/above set value, Temperature above/below set value, Router power off/on (connection to Utility Unit ZH-0689 required)

SOUND RECORDING
Triggered By: Events or Short Reports
Duration: User-defined up to 3 min
Format: WAV

Sound Quality	Sampling Rate (kHz)	Memory (kbyte/s)
Low	8	16
High	48	96

CALIBRATION CHECK
The calibration can be checked and reported using CIC (Charge Injection Calibration) or AC (Actuator Calibration – Type 4184-A only)

Interval: Up to 4 times per 24 hour
Report: Start Time, L_{eq} before check, L_{eq} during check, L_{eq} after check

INTERNAL STORAGE
Logged data are stored on an 8 Gbyte Secure Digital memory card (SD card)
Capacity: Up to 30 days. After this time the oldest data are overwritten

AUDIO STORAGE
The NMT continuously records the audio in listening quality
The last 2 days of audio are stored kept in NMT for retrieval of audio by Noise Sentinel alert functionality. After this time the oldest data are overwritten

INTERFACE
LAN or Cellular Router

OFFLINE MEASUREMENTS
If no connection is available to the central management system, the SD card can be replaced with another SD card that has been prepared by Offline NMT Tool (part of Brüel & Kjær system management software)
Offline NMT Tool can then upload the data from the replaced SD card to the central management system
The SD card replacement is done without losing data; however, sound recording is not possible during the replacement of the SD card

READOUTS
Data Status: Overview of the number of reports generated and sent
Streamer: Readout parameters displaying the status of the streamer engine and network connection
Utility Unit: Readout parameters from the Utility Unit, like Temperature, Voltage, GPS parameters and Weather station parameters

Specifications for Software Controlled via Analyzer Interface

All specifications are valid with Noise Monitoring Software BZ-7232 version 4.1.1.

Noise Monitoring Terminal Type 3639-A/C can act as a stand-alone Sound Level Meter using the analyzer's user interface. This is possible even when the NMT is remote controlled from a PC. The data logged to the PC and the data displayed on the analyzer's user interface originates from the same detectors.

MEASUREMENTS
For display only
Broadband Values:
X = frequency weightings A or B
Y = frequency weightings C or Z

Start Time	Stop Time	Elapsed Time
L_{XS}	LXF	LXI
L_{YS}	L_{YF}	L_{YI}
$L_{XS(SPL)}$	LXF(SPL)	LXI(SPL)
$L_{YS(SPL)}$	$L_{YF(SPL)}$	$L_{YI(SPL)}$
L_{Xeq}	L_{Yeq}	L_{XFmax}
L_{XSmax}	L_{XImax}	L_{YFmax}
L_{YSmax}	L_{YImax}	

Internal temperature
Main DC voltage
External DC voltage
Battery voltage
Frequency Analysis Values:
X = frequency weightings A, B, C or Z
Y = time weightings F or S

L_{XS}	L_{XF}	L_{Xeq}

MEASUREMENT DISPLAYS
Broadband: Measured data are displayed as dB values, housekeeping data as numbers in relevant format
Frequency Analysis: One or two spectra superimposed + A/B and C/Z broadband bars
Y-axis: Range: 5, 10, 20, 40, 60, 80, 100, 120, 140 or 160 dB. Auto-zoom or auto-scale available
Cursor: Readout of selected band

MEASUREMENT CONTROL
Manual: Manually controlled single measurement
Manual Controls: Reset, Start, Pause and Continue
Automatic: Pre-set measurement time from 1 s to 24 hr in 1 s steps

MEASUREMENT STATUS
On Screen: Information such as overload and running/paused are displayed on screen as icons
Traffic Lights: Red, yellow and green LEDs show measurement status and instantaneous overload

DATA MANAGEMENT
Project Template: Defines the display and measurement setups

PREFERENCES
Date, Time and Number formats can be specified

LANGUAGE
User Interface in Catalan, Chinese, Chinese (Taiwan) Croatian, Czech, Danish, English, Flemish, French, German, Hungarian, Italian, Japanese, Korean, Polish, Portuguese, Romanian, Serbian, Slovenian, Spanish, Swedish and Turkish

HELP
Concise context-sensitive help in English, French, German, Italian, Japanese, Korean, Polish, Portuguese, Romanian, Serbian, Slovenian and Spanish

Ordering Information

Type 3639-A-200 General-purpose Permanent Noise Monitoring Terminal

Includes the following accessories:

- Type 4952: Outdoor Microphone
- Type 2250-N-D00: Hand-held Analyzer Type 2250-L (G4) with Noise Monitoring Software BZ-7232 and selected accessories (no microphone or preamplifier)
- UA-2126-A: NMT Unit for Hand-held Analyzer
- AO-0645-D-100: Microphone Extension Cable, 10 m (33.3 ft)
- QB-0065: 12 V DC Battery
- UL-1017: Secure Digital Memory Card
- Country-specific Mains and Aux. Mains Cables

Type 3639-C-200 Specialist Permanent Noise Monitoring Terminal

Includes the following accessories:

- Type 4184-A: Weatherproof Microphone
- Type 2250-N-D00: Hand-held Analyzer Type 2250-L (G4) with Noise Monitoring Software BZ-7232 and selected accessories (no microphone or preamplifier)
- UA-2126-A: NMT Unit for Hand-held Analyzer
- AO-0441-D-100: Microphone Extension Cable, 10 m (33.3 ft)
- QB-0065: 12V DC Battery
- UL-1017: Secure Digital Memory Card
- Country-specific Mains and Aux. Mains Cables

Type 3655-C General-purpose Portable Noise Monitoring Terminal

Includes the following accessories:

- Type 4952-A: Outdoor Microphone
- Type 2250-N-D00: Hand-held Analyzer Type 2250-L (G4) with Noise Monitoring Software BZ-7232 and selected accessories (no microphone or preamplifier)
- Type 3535-A: All-weather Case
- AO-0645-D-030: Microphone Extension Cable, 3 m (9.8 ft)
- UA-0801: Tripod
- ZG-0426: Mains Power Supply for Hand-held Analyzer
- UL-1017: Secure Digital Memory Card

Optional Accessories

OPTIONAL ACCESSORIES FOR PERMANENT NOISE MONITORING

Type 4231	Sound Calibrator
Type 4228	Pistonphone
QB-0065	Battery
ZG-0453	Battery Charger for QB-0065
UA-2141	Battery Box for Permanent Noise Monitoring Terminals
WQ-3129	DIGI Wireless Cellular Router WAN 3G HSPA
AO-1449-D-005	LAN Cable, 0.5 m (1.6 ft)
AO-1450	LAN Cable, 2 m (6.6 ft)
UA-1695	Mounting Kit for Antenna
DB-4126	Mounting Plate for Antenna
ZH-0697	NMT DC Power Guard
ZZ-0249	GPS Receiver
MM-0256	Weather Station (6-parameter)
MM-0316	Weather Station (2-parameter)
UA-0587	Tripod (for microphone)
UA-1690	Tripod (for NMT)
DB-4024	Tripod Adaptor
BZ-7222-UPG	Upgrade Software for 2250 NMT to 2250 SLM
UA-2126-A	NMT Unit for Hand-held Analyzer
WQ-2837	Outdoor Camera
Type 7871	Noise Sentinel
	WebTrak
	ANOMS

OPTIONAL ACCESSORIES FOR PORTABLE NOISE MONITORING TERMINAL TYPE 3655-C

Type 3535-A	All-weather Case
QB-0073	Battery
ZG-0857	Charger including mains cable

Calibration

3639--CAF	3639-A, -B or -C Accredited Calibration IEC 61672-3 2006 class 1
3639--CAI	3639-A, -B or -C Accredited Initial Calibration IEC 61672-3 2006 class 1
3639--CTF	3639 Traceable Calibration performed at Factory
3639--CVN	Conformance test of NMT terminal with measurements report

Products, Services and Accessories Quoted Upon Request

- Mobile NMTs
- Masts
- Solar panels
- Low-temperature Protection Kit
- Mounting masts and hydraulic and other tripods
- Installation Support of NMT
- Maintenance Agreement
- Calibration
- Warranty Extension
- Help-line Support

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HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark
Telephone: +45 7741 2000 · Fax: +45 4580 1405 · www.bksv.com · info@bksv.com

Local representatives and service organisations worldwide

Brüel & Kjær