

PRODUCT INFORMATION:

NOISE LOGGER TYPE 3659

PORTABLE ENVIRONMENTAL SLM PROTECTION KIT TYPE 3538

Noise monitoring is often required when new developments are planned or during compliance investigations. Assessments require sound levels to be measured over long periods of time to determine the impact on nearby communities, and it is not practical or efficient for acoustical experts to spend days or weeks on site taking continuous measurements.

Noise Logger Type 3659 performs real-time, unattended noise measurements efficiently, accurately and reliably. The system is intelligently packaged for easy transportation and on-site setup and is ready to measure all the parameters you need right out of the box.

The system is available as Type 3659, a complete noise logger with or without a router (Types 3659-B and 3659-A, respectively), or as Type 3538, a kit for use with your existing Hand held Analyzer Type 2250, 2250 L or 2270.



USE AND FEATURES

Uses

Measurements made:

- Outdoors
- Unattended
- In workplaces and on construction sites
- In remote locations
-

Measurements for:

- Area planning
- Noise control
- Complaint investigation
- Venue licensing

Features

- Weather protection to IP 54
- Easy single-person transportation and setup
- Tamper protection
- 18 W solar panel for continuous usage in sunny conditions
- 32 Ah battery enabling at least six days use in winter conditions
- Microphone cable protected from weather and wildlife
- Hand-held Analyzer Brüel & Kjær Type 2250
- Outdoor Microphone Type 4952 for long-term outdoor use
- Works with Brüel & Kjær Measurement Partner Suite and with EMS' Sentinel

USE AND FEATURES

Additional Features with Type 2250/2250-L/2270 software:

- Type approved to Class 1
- Level trigger
- Sound recording of events
- Auto Charge Injection Calibration (CIC) check
- Remote 3G broadband operation
- Automatic status SMS text messages*
- Automatic status email messages*
- External trigger
- Supply voltage check†
- Timer controlled measurement
- Periodic reports‡

* Requires router or similar (not included)

† Type 2250/2270 software only

‡ Type 2250/2270 Enhanced Logging software and Noise Monitoring Software only



NOISE LOGGER TYPE 3659

Noise Logger Type 3659 performs real-time, unattended noise measurements efficiently, accurately and reliably. Intelligently packaged for easy transportation and on-site setup, it is ready to measure all the parameters you need right out of the box, enabling you to take unattended noise measurements with confidence.



The logger includes Hand-held Analyzer Type 2250 and all of the software and accessories you need to complete your monitoring project, including full statistics, 1/3-octave band analysis, audio recording with event triggering and a memory card.

Noise Logger with Communications Type 3659-B is 3G-enabled and has a range of remote connectivity features to make logging more convenient and streamlined. For example, measurements can be automatically uploaded to Brüel & Kjær Measurement Partner Cloud or Noise Sentinel environmental monitoring service. And email alerts can notify you when pre-set noise levels have been exceeded or the internal battery is running low. For noise assessment scenarios that do not require remote connectivity, Noise Logger Type 3659-A is available and offers additional operation duration.

The logger's rugged case protects all of the contents from the elements and provides a solid base for the outdoor microphone. The microphone cable is contained within the mast for protection from weather and wildlife.

INSIDE THE CASE

Contents of the Type 3659-A:

- Compact 18 W solar panel and microphone mast stored in lid
- 32 Ah lithium iron phosphate battery
- Detachable microphone mast and mounting bracket
- Hand-held Analyzer Type 2250 with:
 - BZ-7223: Frequency Analysis Software
 - BZ-7225: Enhanced Logging Software
 - BZ-7226: Signal Recording Option
 - BZ-7232: Noise Monitoring Software
- Outdoor Microphone Type 4952 stored below Type 2250
- Rugged weatherproof case (IP 54)
- 3G Router UL-1041 and Antenna UL-1036 included (Type 3659-B)



TRANSPORTATION AND SETUP



Easy transport, easy setup

Noise Logger Type 3659 has been specifically designed to meet these needs. Everything is contained within a single case, there's no need to carry a separate tripod and microphone. It can be deployed within a few minutes and operates continuously logging noise data. At the heart of it is Hand-held Analyzer Type 2250 giving sound level meter class 1 measurements making it suitable for any monitoring application. It is paired with Outdoor Microphone Type 4952. Used in hundreds of airports and unattended monitoring systems around the world, it will withstand the rigours of the outdoors. The enclosed microphone cable and a strong mounting arrangement make it resistant to attention from wildlife.

Protection of the contents

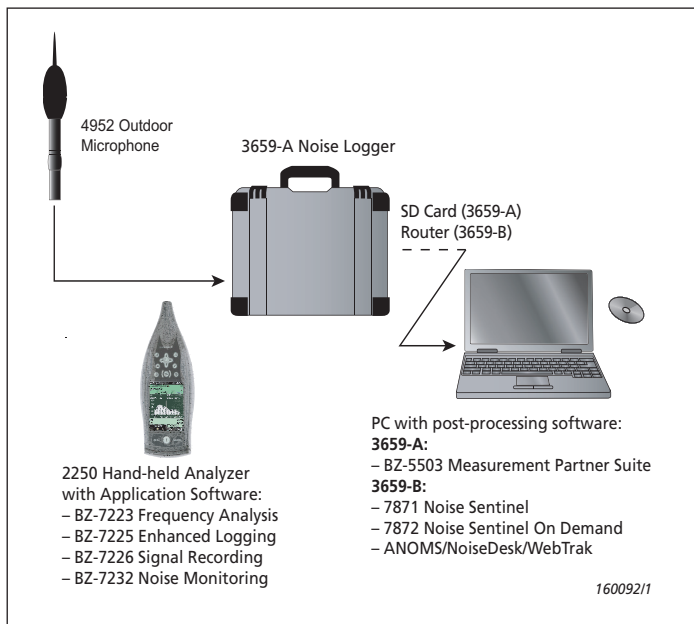
Using proven equipment designed for long-term outdoor use, Noise Logger Type 3659 gives you the peace of mind that it is doing the job you put it out there to do. During transportation all parts are secured. During measurement, the microphone cable is contained within the mast for protection from weather and wildlife, ensuring that monitoring continues uninterrupted.

POWER

The solar panel enables long periods of operation without the need for visits to change batteries. Operating life is dependent on the amount of sunlight. It will operate for at least 6 days during winter and continuously, self-sustained by the solar panel during the summer. These are worst case scenarios and data is available on our website to help you determine approximate operating life based on time of year and location.



TYPE 3659 SOLUTION



Noise Logger Type 3659 is available in two variants:

Noise Logger Type 3659-A:

A fully equipped logger for long-term deployment.
Data is transferred from site by swapping SD cards

Noise Logger with Communications Type 3659-B:

A fully equipped logger that includes digital mobile communications so you can view noise data in real time, check equipment functionality, transfer data and manage measurements during the survey.

Features

- Simple to install – set up in a matter of minutes
- Convenient – rugged outdoor case for easy transport
- Solar powered – continuous operation in many conditions
- Robust – an outdoor microphone and mountable microphone and enclosed cables prevent damage from weather and wildlife
- Flexible – also available with an accessory pack for use as a hand-held analyzer

Type 3659-B is compatible with Noise Sentinel On Demand service, which transitions the unit into a fully fledged real-time noise compliance monitor. Noise Logger SLM Accessory Pack Type 3659-UPG includes: ½" free-field microphone, preamplifier, windscreen, hinged instrument cover, black leather carry case, power supply, backpack, wrist strap and tripod extension – everything you need to use the hand-held analyzer for the variety of applications available for Type 2250 excluding building acoustics, tone assessment and FFT Analysis.

If you already own a Hand-held Analyzer Type 2250 or Type 2270, Portable Environmental SLM Protection Kit Type 3538 will turn it into a Type 3659-A provided you also have the appropriate applications on the instrument.

The compact and lightweight Outdoor Microphone Type 4952 is suitable for long periods of unattended outdoor operation. The microphone is protected against the effects of wind, rain and perching birds and, with the hand-held analyzer, fulfils IEC 61672 Class 1 requirements.

The reference direction angle of incidence can be set to 0° or 90°, dependent on the noise monitoring application. Inside, the microphone is a highly stable prepolarized free-field ½" microphone cartridge with a stainless steel diaphragm.



TEMS INCLUDED IN TYPES 3659 A, 3659 B AND 3538

Item	Noise Logger Type 3659-A	Noise Logger with Communications Type 3659-B	Portable Environmental SLM Protection Kit Type 3538
Waterproof case	✓	✓	✓
Type 2250 hand-held analyzer with software modules: <ul style="list-style-type: none"> • Frequency Analysis • BZ-7223 • Enhanced Logging BZ-7225 • Signal Recording BZ 7226 • Noise Monitoring BZ-7232 	✓	✓	
8 GB SD card	✓	✓	
Type 4952 outdoor microphone	✓	✓	✓
Microphone cable	✓	✓	✓
Microphone mast	✓	✓	✓
Aluminium mast mount	✓	✓	✓
18 W solar panel	✓	✓	✓
32 Ah backup battery	✓	✓	✓
Mains power supply	✓	✓	✓
PRODUCT INFORMATION: NOISE LOGGER		✓	

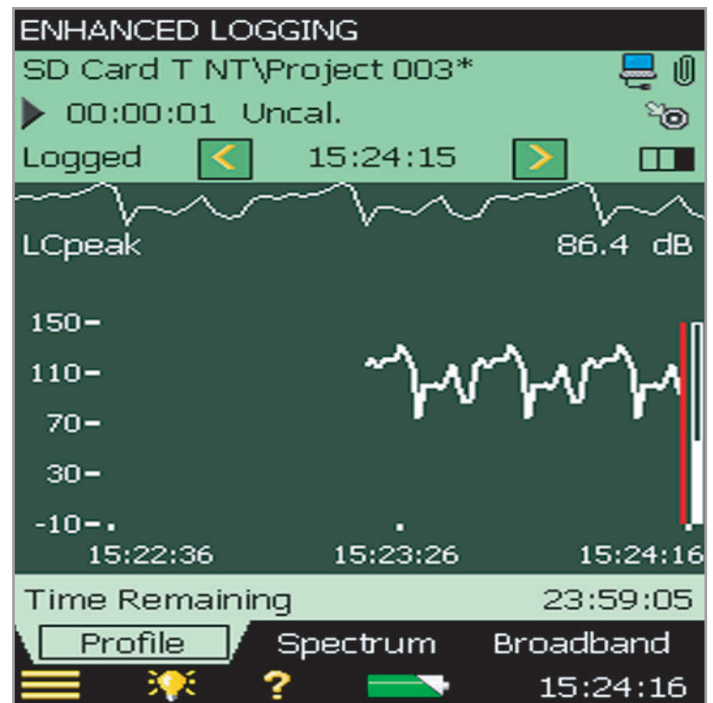
APPLICATION SOFTWARE

Noise Logger Type 3659 is ready to measure all the parameters you need right out of the box, including full statistics, 1/3-octave band analysis and audio recording. Noise data can be processed using the Measurement Partner post-processing suite.

Logging software will log data down to 1 s resolution and log LAF and LAeq at 0.1 s resolution. Broadband data, statistics and frequency spectra can be logged, and markers can be set manually or by level triggers. Graphical displays include an overview profile of the entire measurement, and a detailed profile for a selected period.

Enhanced Logging provides Ldn, Lden, Levening and Lnight calculations as well as two concurrent Leq periods. With long-duration measurements, it provides periodic reports, continuous measurement, automatic reboot and resumption of operations in case of power failure.

Brüel & Kjær's patented Charge Injection Calibration (CIC) is available in the Logging and Enhanced Logging software. For 10 seconds, CIC injects an electrical signal into the microphone diaphragm, checks the entire measurement chain and delivers a pass result to show that all is in order. CIC can be activated manually or automatically at preset time intervals.



With Sound Recording software, you can initiate a sound recording manually, automatically using level triggers (both broadband and frequency based level triggers) or at set time intervals. Pre-recording lets you record sound occurring before sound recording is triggered, and memory space is saved by setting a suitable recording quality and maximum duration.

RELIABLE UNATTENDED MEASUREMENTS



Measurement integrity is of primary importance in noise measurement situations. Class 1, as described in the current sound level meter standard IEC 61672 – 1:2002, is the grade of accuracy often required for hand-held measurements. In addition, nothing less than Class 1 accuracy is required for outdoor measurement systems incorporating rain shields, wind shields or any other form of environmental protection used in microphone systems. Placing a small device, such as a rain guard, in close proximity to the microphone diaphragm may produce significant acoustic disturbance and thus measurement errors at mid and high frequencies.

Hand-held Analyzer Type 2250 and Outdoor Microphone Type 4952 are a type-approved system combination, independently approved to Class 1 accuracy by PTB in Germany (see type approval certificate: Fig. 5). This ensures that the measurement system complies with the minimum requirements of accuracy for unattended noise measurement, a consideration often overlooked in portable noise measurement systems. Type approval of the system to IEC 61672 – 1:2002 also permits the weather-protected measurement system to be laboratory calibrated in accordance with part III of this sound level meter standard.



POST-PROCESSING

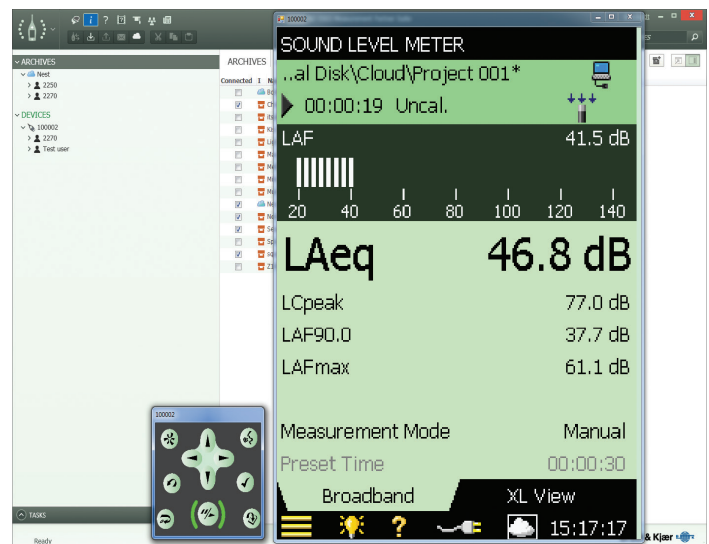
When the logger is used with Enhanced Logging software, Measurement Partner Suite BZ-5503 provides essential post-processing tools for the measurement data. In its basic configuration as standard PC software, Measurement Partner Suite provides an advanced viewing and maintenance platform for your hand-held analyzer, and includes Measurement Partner Field App to help you with field measurements. In addition, valuable post-processing modules are available on time-limited subscriptions.

Measurement Partner Suite BZ-5503 is an all-purpose program that forms the information link to (and from) your analyzer, see Fig. 6. Its primary functions are to manage and archive user data, manage the data transfer from a remote noise monitoring location and handle application software updates, upgrades and licensing.

It enables you to perform the following:

- Use the extensive preview functions to listen to recordings and annotations, and view results and photographs including spectra and profiles
- Export data to Microsoft® Excel® or export in XML or delimited text format


Measurement Partner Suite BZ 5503 is supplied with all Type 2250, 2250-L and 2270 hand-held analyzers. For more information, see the Measurement Partner Suite BZ-5503 product data BP 2430.



When the logger is used with Noise Monitoring software, it can be used with Noise Sentinel™ and Noise Sentinel On Demand. Noise Sentinel is a Web-based subscription service that provides continuous, real-time monitoring and compliance management. It provides audio playback for investigation and comprehensive reporting provide a traceable record of regulatory compliance.

Noise Sentinel is aimed at permanent or multi-year monitoring in urban and industrial areas, and includes noise, ground vibration, dust and air quality. Noise Sentinel On Demand is intended for shorter-term monitoring projects.

COMPLIANCE WITH STANDARDS

	<p>The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EU directives</p> <p>RCM mark indicates compliance with applicable ACMA technical standards – that is, for telecommunications, radio communications, EMC and EME</p> <p>China RoHS mark indicates compliance with administrative measures on the control of pollution caused by electronic information products according to the Ministry of Information Industries of the People's Republic of China</p> <p>WEEE mark indicates compliance with the EU WEEE Directive</p>
SAFETY	<p>EN/IEC 61010 – 1: Safety requirements for electrical equipment for measurement, control and laboratory use</p> <p>ANSI/UL 61010 – 1: Safety requirements for electrical equipment for measurement, control and laboratory use</p>
EMC EMISSION	<p>EN/IEC 61000 – 6 – 3: Generic emission standard for residential, commercial and light industrial environments</p> <p>EN/IEC 61000 – 6 – 4: Generic emission standard for industrial environments</p> <p>EN 55022: Information technology equipment. Radio disturbance characteristics</p> <p>CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits</p> <p>FCC Rules, Part 15: Complies with the limits for a Class B digital device</p> <p>This ISM device complies with Canadian ICES – 001 (standard for interference-causing equipment)</p>
EMC IMMUNITY	<p>EN/IEC 61000 – 6 – 1: Generic standards – Immunity for residential, commercial and light industrial environments</p> <p>EN/IEC 61000 – 6 – 2: Generic standards – Immunity for industrial environments</p> <p>EN/IEC 61326 – 1: Electrical equipment for measurement, control and laboratory use – EMC requirements</p> <p>Note: The above is only guaranteed using accessories listed in this Product Data sheet</p>
TEMPERATURE	<p>IEC 60068 – 2 – 1 & IEC 60068 – 2 – 2: Environmental Testing. Cold and Dry Heat</p> <p>Operating Temperature:</p> <p>Battery powered: 0 to 45 °C (32 to 113 °F); 0 to +40 °C (32 to 104 °F) for compliance with IEC 61672 Class 1</p> <p>Charge Temperature: 0 to 45 °C (32 to 113 °F)</p> <p>Storage Temperature: 0 to 40 °C (32 to 104 °F)</p>
HUMIDITY	<p>IEC 60068 – 2 – 78: Damp Heat: 93% RH (non-condensing 40 °C (104 °F)). Recovery time 2 - 4 hours</p>
MECHANICAL	<p>Non-operating:</p> <p>IEC 60068 – 2 – 6: Vibration: 0.3 mm, 20 m/s², 10 – 500 Hz</p> <p>IEC 60068 – 2 – 27: Shock: 1000 m/s²</p> <p>IEC 60068 – 2 – 29: Bump: 1000 bumps at 250 m/s²</p>
ENCLOSURE	<p>IEC 60529: Protection provided by enclosures: min. IP 54</p>

FOR TYPE 3659-B

EU Radio Directive: 2014/53/EU Radio Equipment Directive

ADDITIONAL STANDARDS FOR ROUTER UL 1041

SAFETY	EN 62311 EN 60950-1
EMC IMMUNITY	EN 301 511 EN 301 908 – 1 EN 301 908 – 2 EN 301 489 – 1 EN 301 489 – 7 EN 301 489 – 24

Accords with the Sierra Wireless™ declaration of conformance

NOISE LOGGER TYPE 3659 - SPECIFICATIONS

	3659-A	3659-B
Battery		
Approvals	UN 38.3	
Chemistry	Li Fe Po	
Weight	4.8 kg (10.6 lb)	
Nominal Voltage	12.8 V	
Nominal Capacity	32 Ah	
Energy	409.6 Wh	
Expected Life Cycles	> 2000 cycles at 100% discharge >80% rated capacity	
Charge Retention in Storage	1 year at 30 °C (86 °F) to > 90% charge retained	
Solar Panel		
Weight	0.29 kg (10.2 oz)	
Nominal Voltage	12 V	
Rated Capacity	18 W	
Open-Circuit Voltage	23.7 V	
Charger		
Mains Input	100 – 240 V AC, 50 – 60 Hz	
DC Outputs	16.0 V, max. 4 A	

Physical		
Dimensions (L × W × D)	524 × 428 × 206 mm (20.6 × 16.9 × 8.1")	
Weight (with analyzer)	16.3 kg (35.9 lb)	16.8 kg (37.0 lb)
Max. Height (assembled, to centre line of Type 4952)	150 cm (4' 11")	
Logging Capacity (8 GB memory card): minimum durations when logging all parameters		
Logging only	15 Days*	
Logging and continuous 16-bit/8 kHz audio	4 Days†	
Logging and continuous 24-bit/48 kHz audio	15 hours	
With Noise Sentinel	2 days audio plus 30 days data‡	
Operating Life		
Minimum sunlight for continuous operation	> 4 ½ solar hours/day	> 9 ½ solar hours/day
Worst-case winter (3 solar hours/day)	9 days	4 days
Worst-case summer (7 solar hours/day)	Continuous	10 days

* Based on complete logging of all broadband and spectral parameters at 1 s, plus 100 ms LAeq and LAF, plus full statistical distribution, plus spectrum statistics with Enhanced Logging Software

† Based on 16-bit 8 kHz audio quality and complete logging with Enhanced Logging Software. Event audio will reduce this depending on the frequency of events

‡ Noise Sentinel interfaces with NMT Software BZ-7232

MEASUREMENT CAPABILITY

See following product data:

- Hand-held Analyzer Types 2250 and 2270 (BP 2025)
- Noise Monitoring Terminals Types 3639 and 3655 (BP 2379)

ORDERING INFORMATION

COMPLETE NOISE LOGGER KITS

Type 3659-A Noise Logger

Including:

- Type 3538 (see above) plus
- Type 2250-N-D02 Hand-held Analyzer G4 without microphone and preamplifier with software modules:
 - BZ-7223: Frequency Analysis Software
 - BZ-7225: Enhanced Logging Software
 - BZ-7226: Signal Recording Option
 - BZ-7232: Noise Monitoring Software
- QB-0089: Battery for Type 2250, 4.55 Ah, Lithium-ion
- UL-1017: 8 GB SD Memory Card

Type 3659-B Noise Logger with Communications

Including Type 3659-A (see above) plus:

- UL-1036: Stub, Angled Antenna
- UL-1041: Router

Type 3659-UPG Noise Logger SLM Accessory Pack

Including:

- Type 4189: ½" Pre-polarized Free-field Microphone
- QB-0061: Battery, 5.2 Ah, Lithium-ion
- UA-1710-D00: Standard Accessory Kit
- ZC-0032: Microphone Preamplifier for Hand-held Analyzer

SOUND LEVEL METER PROTECTION KIT

Type 3538 Portable Environmental SLM Protection Kit

Including:

- Type 4952: Outdoor Microphone
- AO-0787-D-030: Microphone Cable, 3.0 m (10 ft), long LEMO connector
- DD-0050: Solar Panel Bracket for microphone mast
- DE-0019: Microphone Mast (4 pcs)
- DE-0020: Microphone Mast Mount
- KE-1031: Carrying Case
- QB-0090: Battery, 32 Ah Lithium Iron Phosphate

- UA-4117: Solar Panel Kit
- VF-0005: Fuse, F fast-acting 5 A 250 V AC
- ZG-0874: Power supply for Type 3538

ACCESORIES AND COMPONENTS

Field Calibration

Type 4231 Sound Calibrator

Measuring

Type 4952-A	Outdoor Microphone including Tripod Adaptor UA 1707
Type 4952-A	Outdoor Microphone including Tripod Adaptor UA 1707
AO-0645-D-100	Microphone Extension Cable for Type 4952, 7-pin LEMO to 10-pin LEMO, 10 m (33 ft)
AO-0441-D-030	Microphone Extension Cable, 10-pin LEMO, 3 m (10 ft)
AO-0441-D-100	Microphone Extension Cable, 10-pin LEMO, 10 m (33 ft)
MM-0256-A	Six-parameter Weather Station Kit
MM-0316-A	Two-parameter Weather Station Kit
UA-0587	Tripod
UA-0588	Microphone Holder
UA-0801	Small Tripod
UA-1317	Microphone Holder
UA-1707	Tripod Adaptor for Type 4952

Post-Processing

BZ-5503 Measurement Partner Suite

Accredited Calibration

3659-CAI Noise Logger, Accredited Initial Calibration
3659-CAF Noise Logger, Accredited Calibration

EMS Brüel & Kjær

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