

First Edition

Accurate INSTRUMENTS

Sound Measuring Equipment



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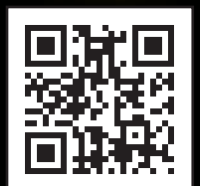
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Accurate Instruments offers some of the world's best top quality trade instruments available, yet the pricing is often highly competitive and represents value for money.

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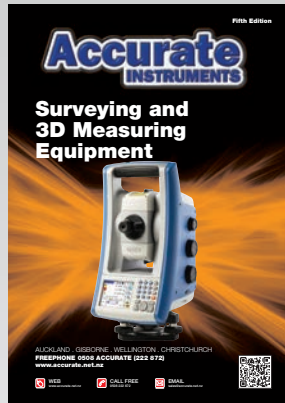
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Our entire **extended product range** is now also available for **download**.

Currently under construction for 2014, these seven specialised equipment catalogues will be available for PDF download from our website www.accurate.net.nz

Each of these catalogues cover the extended range of products, services and calibration/testing available from Accurate Instruments.

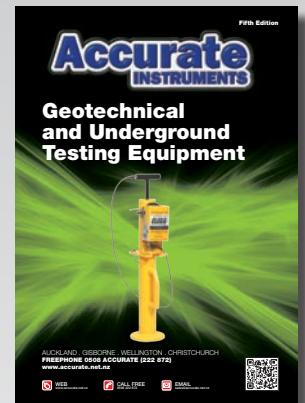
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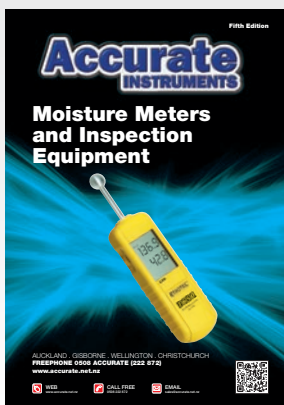
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What sound meter do I need?

When it comes to measuring sound, it is important to get the correct type of measuring equipment for the required task. The first question is always “what kind of sound measurements are you wanting to perform?”

There are two main types of sound measurements performed;

- 1) Sound Level Measurement
- 2) Exposure to Noise

SOUND LEVEL

Sound Level (or Sound Pressure Level – SPL) is the actual change of the pressure in the air which has been converted into decibel's. The SPL is an instantaneous 'snapshot' of the noise level at any given moment in time.

So how do we measure sound?

The sound level is typically measured using a sound level meter. This handheld electronic device will measure and display the sound pressure level in decibels, usually on an LCD display.

Many sound level meters will only measure the 'instantaneous' sound level. This is a snapshot of the sound made at any given time in a specific location. If the sound level is very consistent, the level of accuracy and reliability of measurement is usually good.

If the sound level is variable, inconsistent and changing, then the best way to measure the true sound level is to measure the Average Sound Level. Average values are what most of New Zealand's standards, compliance and council regulations are based on.

Average Sound Level

The average sound level is the true equivalent sound level measured over time, often displayed as Leq or Leq.t. Because sound level is measured in the logarithmic scale, the average CANNOT be determined by simply adding all the level measurements together and dividing by the total. Also, background noise can cause a considerable error in measurements. What is required is an INTEGRATED meter capable of performing this type of measurement.

If you are a business operation, trade/construction company, industry or are simply trying to meet the council requirements for zoning regarding sound, you will require an averaging sound level meter to perform the measurements. The **Pulsar Nova, Assessor** and **Quantifier** are all examples of an Integrated Sound Level Meter.

Ln (exceedance values)

Along with Average sound level above, Ln values are still referred to by many documents and regulations still used today in New Zealand.

Ln values (commonly referred to as Exceedance or Percentile values) are the value of the sound level measurement spent either at or above the corresponding sound level for a percentage of the run time.

e.g. 45dBA L10 would mean that for 10% of the time, the sound level was either equal to or higher than 45dBA.

Frequency Weightings

The Frequency Weightings are the filters applied that cover the frequency range of human hearing. There are three common frequency 'weightings' (A, C and Z) and the corresponding reading will be given in dB with either A, C or Z. i.e. 85dBA or 106dBC etc.

The A weighting is far and above the most common frequency measured. This frequency is the internationally standardised filter applied by sound level meter manufacturers in an attempt to replicate the response of the human ear to specific frequencies.

The 'C' weighted frequency gives much more emphasis to low frequency sounds.

The 'Z' weighted frequency, often referred to as the Linear or Flat is zero weighting with no weighting across the frequency range of human hearing.

Octave Filters

For sound pressure measurement, the spectrum of sound is divided into frequency bands called octaves.

The whole measurement is referred to as the Broadband measurement whereas the frequency bands are called octaves.

The most common Octave Filter is the 1:1 whole octave where the highest frequency is twice the lowest frequency.

Most Environmental and Health & Safety measurements are performed using the 1:1 Octave Filter.

The 1:3 Octave Filter, often referred to as the Third Octave is where each band is divided into 3 adjacent bands.

Using Octave Filters can help identify comparative differences between different noise sources.



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i.e. a turbine and compressor have a similar broadband measurement of approx. 113dBA however the Octave measurements will indicate that the turbine has more low frequency noise when compared to a compressor.

Another example would be when there are different loud sources of noise on a construction site. All the broadband measurement can indicate is that there are high sound levels, whereas an Octave measuring meter will indicate at what frequency/s the noise is being made.

Peak Sound Level

Peak sound level is the measurement of the highest point of the sound pressure wave reached during an instantaneous measurement.

The 'C' weighting is commonly applied to Peak measurements (LCpeak) and is used for determining the risk from noise sources that are typically impulsive in their quality.

Peak is different to Maximum because Peak is detected independently of the meter's Time weighting (i.e. Fast or Slow)

Time Weighting

Time weightings exist primarily due to the response time of analogue meters using needles.

Older units would vary depending on the dampening of the needle. i.e. a sensitive analogue needle would react well to impulse sound changes whereas a slower, more heavily dampened needle would be slow to react.

There are two main Time Weightings – Fast (F) and Slow (S). Fast is typically a response time of 125ms where slow is typically 1 second. I (Impulse) is less common, and typically relates to LCpeak measurements (see above)

Classes

There are two distinctions of classes. Class 1 (or Type 1), has stricter performance tolerances and higher accuracy, primarily based upon the frequency of sound being measured. This type of meter is commonly used by testing facilities or for environmental work and/or occupational noise surveys. Class 2 (or Type 2) is used for more broader, less governed applications. Most sound measuring applications will at the least, specify a requirement of Class. ***If the meter has no Class rating, it may not be suitable.***

NOISE EXPOSURE

The human ear is an amazing instrument. It can determine noises from as quiet as a simple pin dropping to as loud as a jet aircraft taking off. Due to this it is a highly sensitive organ which is susceptible to irreversible damage.

Excessive long term exposure to noise can lead to permanent damage to a person's hearing. In general, the risk and amount of damage that can be caused is related to the level of noise and the duration of time that a person is exposed to that noise.

One of the most common causes of hearing loss or deafness is inner ear damage from noise induced hearing loss. Noise Induced Hearing Loss is one of the most common industrial diseases in the western world.

As an example, in the United Kingdom, 1 in every 7 people is either deaf or hard of hearing. For this reason, there are specific standards worldwide that stipulate what a safe level of noise exposure is.

In New Zealand, this is stated as 85dBA based on an 8 hour working day (85dBA Lex,8h). This value is often expressed also as Dose (Pa2h).

How is noise exposure measured?

Noise exposure is measured using either a Dosimeter or a Sound Level Meter. A dosimeter is a small programmed device, worn on the body, as close to the ear as comfortably/conveniently possible, that measures noise through the course of the day that the worker is exposed to. These measurements will represent the true reality of the working day and will capture all noise events from the day (i.e. noisy machinery, lunch room activities etc).

Some sound level meters available have an LEX function which automatically calculates this value based on settled readings. In other instances, software packages, spreadsheets and online calculators can work out a person's sound exposure level based on sound level measurements.

LEX

LEX is a measurement of the amount of noise energy a person is exposed to (or receives) during a working day. It is typically given over an 8 hour working period.

Dose

Dose is another measurement parameter of a person's exposure to noise over a working time period. As opposed to LEX (see above) Dose is given as a value percentage as opposed to a sound level.

TWA

This is the Time Weighted Average value. The value is based on a constant sound level lasting for 8 hours. It always averages the sound level over an 8 hour time period. TWA starts as a zero value and increases over the duration of the day. It is often the required value to provide for Occupational Health & Safety noise measurements for a working environment.

Sound Warning Systems

These are usually visual indicators, set at threshold measurements (i.e. 85dBA) that will trigger and illuminate when sound levels are exceeded.

The **PulsarSafeEar** system is a good example of this. This LED sign will illuminate with bright LED's and a message such as WARNING – HIGH NOISE LEVELS when the sound level exceeds the pre-set trigger configuration.

FIVE THINGS YOU NEED TO KNOW BEFORE YOU BUY

- Are you measuring sound level or exposure to noise?
- Do you need to meet any standards, regulations or zoning requirements for sound levels or noise exposure?
- Do you require a Class 1 or Class 2 meter.
- Is the meter calibrated, tested and certified? Check for an approved calibration certificate.
- Can the meter be recalibrated? Is service and backup available?



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Founded in 1969 and located in the United Kingdom, Pulsar Instruments Plc, have over 45 years of experience in noise measurement, environmental noise monitoring and workplace sound compliance.



For over 45 years, Pulsar has focussed on producing noise level measurement instrumentation that is above all robust, easy to use, yet accurate; always fully complying with the latest applicable worldwide standards.

With compliance becoming more integral in Health & Safety for many businesses, making a product that is robust, user friendly, requires minimal training yet is compliant to standards is a key priority.

Unlike many other companies, Pulsar are foremost a sound level measurement company.

The product portfolio includes entry level models such as the basic Class 2 Model 14 meter for simple noise decibel measurement, the popular Assessor and Quantifier models providing users with LEQ, Ln and Octave measurement data through to the new state of the art real-time Nova meters. With the doseBadge products and PulsarSafeEar Noise Warning System, workplace noise measurement and awareness can be easily monitored ensuring health and safety compliance in the workplace.

They manufacture and test nearly all their products in Britain, operate and manage assembly plants, control quality assurance and have industry respected team members that are associated with the key developments of industry compliance and rules/regulations. Personnel from Pulsar Instruments PLC have even overseen noise compliance and measurement in New Zealand.

With Pulsar's latest product, the Nova SPL meter range, the company worked with a number of local contractors such as photographers, designers, printers and promotional companies to assist with the launch of the project. This highly innovative range makes use of the latest technology available and is a credit to British engineering.

The Nova meters were designed in Yorkshire in the United Kingdom and are wholly produced there which is part of a continued desire from the organisation to support the local economy.

Pulsar's wide range of Sound Level Meters, Noise Dose meters and Noise activated Warning Signs have been designed with the busy health and safety, construction or acoustic professional in mind.



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BASIC CLASS 2 SOUND LEVEL METER

Pulsar Model 14



The Pulsar Model 14 is an economical entry level Class 2 Sound Level Meter for general purpose measuring of sound levels.

Compared with many other low cost sound level meters available on the market which are just rebadged units, the Model 14 comes from Pulsar Instruments Inc, a globally recognised and renown sound level measuring manufacturer in the UK.

The Model 14 is the ideal solution for users needing a low cost, basic accurate instrument for those applications where a Digital Sound Level Meter would be useful but a high specification meter would be too expensive. The Model 14 is very easy to use, whilst meeting the requirements of the latest international sound level meter standard IEC 61672 at Class 2 accuracy.

The large and easy to read LCD screen, displays the Sound Level (SPL) in decibels. You can select either the standard A-frequency-weighting or the alternative C-frequency-weighting. The C weighted measurement is commonly used for the peak or max reading only.

The maximum hold function allows the unit to freeze the display showing the highest level measured. This is very useful where the allowable level is given in terms of a maximum (LAFmax or LCFmax).

An optional Class 2 acoustic calibrator is available for the Model 14. See page 15 for more information.

WHAT IS CLASS 2?

Class 2 is a common type of sound level meter that conforms to the requirements of the international IEC 61672-1 standard for SPL (sound pressure level) meters. When purchasing a sound level meter, this international standard is often referred to.

The Model 14 is supplied with a calibration test certificate.

N.B. Should your application require the measurement of integrated, average or exposure sound level measurements such as LEQ, L10 or LEX, please see the Nova, Assessor and Quantifier models on pages 6 to 11.



NOISE MEASUREMENT KIT

- Measurement Range:** 35 - 130dBA
- Range Limits:** 35 to 100dBA (Low), 65 to 130dB (High)
- Frequency Types (Weighting):** A, C
- Time Weighting:** Fast, 125ms
- Measurement Accuracy:** Typically +/- 1.4
- Measurement Functions:** LAF, LCF, LAFMAX, LCFMAX
- Microphone Type:** 1/2" pre polarised electret condenser (Type MK:268)
- Tripod Mount:** No
- Display:** LCD
- Weight:** 227 grams
- Battery Type:** 1x 9V
- International Standards:** IEC 61672:2002-1 & IEC 60651:1979 Class 2
- Warranty:** 1 Year

Standard package includes: Model 14 SPL meter, dated calibration sticker, calibration certificate, alkaline battery, windshield and soft carry case.



REAL TIME CLASS 1 & 2 SOUND LEVEL METERS

Pulsar Nova

State-of-the-art digital
Real-time sound level meter
developed to meet the latest
industry standards for noise
measurement.



Real-time digital
sound level meter

MODEL 41 (CLASS 1)
MODEL 42 (CLASS 2)



Manufactured in northern England and released in 2013, consisting of a new upgradeable digital platform, the Nova appeals to all users of Sound Level decibel meters, from entry level general noise levels, right through to occupational and health and safety exposure measurements, professional acoustic technicians, and everyone in between

The combination of a rugged metal casing, ergonomic handheld design and a high definition colour OLED with large anti-glare display, makes the Pulsar Nova the most robust sound level meter on the market.

The gem-in-crown of the Nova is the ability for the operator/user to choose the configuration of the meter they require. On entry level models such as the 41 and 42, features such as Data logging, LEQ time measurements, Ln statistical values, Audio Note and Audio Record functions can be selected at the time of purchase or upgraded at a later date.

If the calibration testing of the Nova meter is maintained as per calibration dates, the warranty of the Nova extends to seven years! There are six standard models available in the Nova range. (Three models for Class 1, three models for Class 2)



7 year warranty*

If the calibration testing of the Nova meter is maintained as per calibration dates, the warranty of the Nova extends to 7 years

The Model 41 & 42 are the entry level meters in the Nova range.

Utilising the latest digital platform of the Nova range along with the large, high resolution colour OLED screen, the 41 & 42 are basic, easy to use Class 1 (Model 41) and Class 2 (Model 42) sound level meters designed to measure general sound level (decibels) in your location/ environment.

These meters are the ideal choice where integrated noise levels such as LEQ or Ln values (e.g. L10) are **not** required, yet the highest accuracy and quality are required as well future upgradeability.

Data logging, LEQ, Ln values, 1:1 Octave plus a range of other key Nova features can be added to the Nova 41 & 42 either upon purchase or at a later stage.

NOISE MEASUREMENT KIT

The Nova Models can be purchased as a noise measurement kit.

This kit contains: Nova SPL meter with alkaline batteries and calibration test certificate, Acoustic Calibrator with calibration test certificate, windshield, hand strap, AnalyzerPlus software CD with USB cable, operating manuals (for meter and calibrator), hard lined carry case, height adjustable tripod.



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Real-time HML affordable hearing protection sound level meter

MODEL 43 (CLASS 1)
MODEL 44 (CLASS 2)



Premium Real-time Octave sound level meter

MODEL 45 (CLASS 1)
MODEL 46 (CLASS 2)



The Model 43 & 44 are the mid-range meters in the Nova range.

They have all the features and functionality of the entry level 41 & 42 sound level meters with the addition of LEQ integrated measured values, Peak (incl. C-A Quick Integrator Settings) for the HML method of hearing protection calculation.

The Pause/Back erase feature also comes standard on the Model 43 & 44. The Model 43 & 44 are ideal instruments if you are a safety professional looking to meet any occupational noise or industrial regulations.

Data logging, Ln values, 1:1 Octave plus a range of other key Nova features can be added to the Nova 41 & 42 either upon purchase or at a later stage.

The Model 45 & 46 are the premium meters in the Nova range.

These sound level meters feature the full suite of Nova technologies. The 45 & 46 meters offer a versatile and high performance approach to noise measurement with additional features such as the Audio Note and Audio Record functions that allow the operator to voice tag sound recording both before and during the measurement.

With 1:1 Octave band filters standard, the 45 & 46 models are suitable for professional acoustic technicians who require all the features of the Nova meters.

Standard on the Model 45 & 46 is Data logging, LEQ, Ln values, Real-time 1:1 Octave Band filter Analysis (31.5Hz to 16kHz), Audio Record and Audio Note, TWA/Dose and Repeat/Single Timer.

	41	42	43	44	45	46
Class/Type	1	2	1	2	1	2
Measurement Range	20 – 140 dBA					
Noise Floor Limit	21 dBA (18 dBA for Class 1)					
Peak Measurement	143 dBC					
IEC International Standards	IEC 61672-1 (Class 1 and Class 2) / IEC 60651:2001 (Type 1 and 2) / IEC 60804:2000 (Type 1 and 2) / IEC 61252:1993					
Microphone Type	Class + PM1 pre-polarized					
Frequency Weightings	RMS & Peak: A, C, Z all measured simultaneously					
Time Weightings	F (Fast, 125ms), S (Slow, 1s) & I (Impulse, 0.35ms) all measured simultaneously					
Measurements – L (A, C, Z)			✓	✓	✓	✓
Measurements – Max/Min (A,C, Z)			✓	✓	✓	✓
Measurements – LCpeak	Opt. upgrade	Opt. upgrade				
Measurements – Leq,t (A,C, Z)	Opt. upgrade	Opt. upgrade	✓	✓	✓	✓
Measurements – LE (A, C, Z)	Opt. upgrade	Opt. upgrade	✓	✓	✓	✓
Measurements – TWA, Dose %, Est Dose %	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	✓	✓
Measurements – Ln values	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	14 Ln values	14 Ln values
Short LAeq / LCpeak graph	Opt. upgrade	Opt. upgrade	✓	✓	✓	✓
Pause / Back Erase	Opt. upgrade	Opt. upgrade	✓	✓	✓	✓
C-A Automatic Calculation	Opt. upgrade	Opt. upgrade	✓	✓	✓	✓
Audio Record	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	✓	✓
Audio Note	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	✓	✓
Repeat & Single Timer	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	✓	✓
Octave Filter	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	✓	✓
Octave Frequency Bands	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	1:1 (31.5Hz to 16kHz)	✓
Data Recording	Opt. upgrade	Opt. upgrade	Opt. upgrade	Opt. upgrade	✓	✓
Memory	4GB removable Compact Flash memory card					
Display	High resolution anti-glare OLED display with ambient light sensor & illuminated keypad					
Battery Type	6x AA Alkaline batteries					
Battery Life	Typically > 30 hours					
Dimensions	280mm x 80mm x 42mm					
Weight	440 grams (without batteries)					
External Connections	USB 2.0 Mini-B to PC / AC output via 3.5mm Stereo jack / AC & DC output via Multipin I/O socket					
Warranty	7 years					



INTEGRATED CLASS 1 & 2 SOUND LEVEL METERS

Pulsar Assessor

The Pulsar Assessor is a range of professional Class 2 and Class 1 sound level meters designed to measure general sound levels as well as average, exposure and HML method values.



LEQ and LEX compliant integrated sound level meter

MODEL 81A (CLASS 1)
MODEL 82A (CLASS 2)



Compared to many basic sound level meters, the Assessor range from Pulsar are integrated meters, which mean they can measure and calculate average (or time-averaged) noise measurements such as LEQ (or LEQT)

Most New Zealand standards and local council bylaws are based on integrated measurements. For general noisy environments, using an Assessor model will allow you to accurately determine these levels.

All Assessor models (excl. the CA models) can also display the estimated **noise exposure duration (LEX,8)**. This feature estimates the noise exposure in the workplace that would be achieved if the measurement was made over a longer period of time.

For data recording, the Analyser software package is available, which allows the user to download the data from the Assessor to a PC computer.

Manufactured in the United Kingdom, the meter is simple to operate and featuring a robust die cast construction. The Assessor has a large easy to read LCD screen which displays all the relevant sound level information at one time.

Six models of the Assessor are available. (Three models for Class 1, three models for Class 2)

The Assessor Models 82A/81A are a simple to operate integrated sound level meter with just four buttons, designed to measure current and average sound levels.

Both models will display the current sound pressure level (LA dBA), average sound level (Leq dBA), peak value (LCpeak), time exposure and noise exposure (LEX).

Data recording is an OPTIONAL upgrade on the Model 82A and 81A.

NOISE MEASUREMENT KIT

The Assessor Models can be purchased as a noise measurement kit.

This kit contains: Assessor SPL meter with alkaline batteries and calibration test certificate, Acoustic Calibrator with calibration test certificate, wind shield, hand strap, Analyser software CD with USB cable, operating manuals (for meter and calibrator), hard lined carry case, height adjustable tripod.



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HML affordable hearing protection sound level meter

MODEL 81CA (CLASS 1)
MODEL 82CA (CLASS 2)



1:1 Octave sound level meter

MODEL 83 (CLASS 1)
MODEL 84 (CLASS 2)



The Assessor Models 81CA/82CA have been designed for the HML method of hearing protection calculation.

The HML is an affordable method of establishing and calculating hearing protection. The 81CA and 82CA models feature an automatic C-A button, which will automatically switch the instrument from the regular sound level "broadband" mode to the C-A mode.

By knowing the 'C' and 'A' Leq values and the difference between them, you can use a simple formula to prescribe suitable hearing protection in your workplace.

Data recording is an OPTIONAL upgrade on the Model 81CA and 82CA.

The Assessor Models 83/84 have all the basic measurement features of the 81A/82A models with the addition of 1:1 Octave band measurements between 31Hz and 8kHz.

It is ideal for users wanting general and integrated sound levels, sound exposure and the 1:1 Octave Band method of hearing protection.

The 1:1 Octave provides the user with the frequency of the source of the noise. A special blue LED indicates when the user is operating in the Octave band mode.

Unlike other Assessor models, the 83 and 84 come standard with Data recording.

	81A	82A	81CA	82CA	83	84
Class/Type	1	2	1	2	1	2
Measurement Range	57 – 130 dBA					
Noise Floor Limit	52 dBA					
Peak Measurement	143 dBC					
IEC International Standards	IEC 61672-1 (Class 1 and Class 2) / IEC 60651:1994 (Type 1 and 2)					
Microphone Type	½" Class + Electret Prepolarised Condenser					
Frequency Weightings	A,C			A,C,Z		
Measurements – LA	✓	✓	✓	✓	✓	✓
Measurements – LCpeak	✓	✓	✓	✓	✓	✓
Measurements – LAeq,t	✓	✓	✓	✓	✓	✓
Measurements – LCeq,t			✓	✓		
Measurements – LZeq,t					✓	✓
Measurements – LEX,t	✓	✓			✓	✓
C-A Automatic Calculation			✓	✓		
Octave Filter					✓	✓
Octave Frequency Bands					1:1 (31.5Hz to 8kHz)	
Data Recording	Optional	Optional	Optional	Optional	✓	✓
Display	Graphical LCD with measured values, elapsed time, frequency, battery level indicator					
Battery Type	2x AA Alkaline batteries					
Battery Life	Typically > 18 hours					
Dimensions	300mm x 75mm x 25mm (340mm x 75mm x 25mm for Class 1)					
Weight	450 grams					
External Connections	USB					
Warranty	2 years					



CLASS 1 & 2 SOUND LEVEL METERS

Pulsar Quantifier

The Pulsar Quantifier is a range of high performance data logging Class 2 and Class 1 sound level meters, which can measure general sound levels, Ln statistical values such as L10, L50 as well as average, 1:1 and 1:3 Octave measurement.



Standard Data Logging statistical sound level meter

MODEL 91 (CLASS 1)
MODEL 92 (CLASS 2)



Differentiating the Quantifier from other models in the Pulsar portfolio of products is that every model in the range comes standard with data recording and Ln values (e.g. L10, L50, L95 etc).

The wide measurement range of 25dBA through to 140dBA make the Quantifier suitable for almost all types of environmental sound measuring, especially the measurement of lower sound levels between 30 and 50dBA, where many of New Zealand's standards have average measured values to meet compliance.

Manufactured in the United Kingdom, the meter is simple to operate and features a robust die cast construction. The Quantifier has a large easy to read LCD screen where the user can alternate through the various displayed measurements.

Six models of the Quantifier are available. (Three models for Class 1, three models for Class 2)

The Quantifier Models 91/92 are simple to use sound level meters ideal for the measurement of general environmental noise, where the local bylaws and standards often require the measurement of Ln values such as L10 or LEQ.

To perform sound measurement with the 91 and 92, simply switch the instrument on, perform the calibration test and then begin measuring noise levels.

All the standard noise levels can be measured as well as LEQ values. With data logging standard on the 91 and 92 models, a periodic LEQ report can be generated using the analyser software.

NOISE MEASUREMENT KIT

The Quantifier Models can be purchased as a noise measurement kit.

This kit contains: Quantifier SPL meter with alkaline batteries and calibration test certificate, Acoustic Calibrator with calibration test certificate, windshield, hand strap, Analyser software CD with USB cable, operating manuals (for meter and calibrator), hard lined carry case, height adjustable tripod.



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1:1 Octave sound level meter

MODEL 93 (CLASS 1)
MODEL 95 (CLASS 2)



1:3 Octave sound level meter

MODEL 95 (CLASS 1)
MODEL 96 (CLASS 2)



The Model 93 & 94 are the mid range meters in the Quantifier range.

They have all the features and functionality of the entry level 91 & 92 sound level meters with the addition of **1:1 Octave Band filters**.

The 1:1 Octave Band measurements range from 31Hz to 16kHz. These are used for the selection of accurate hearing protection. The operator then chooses the preferred PPE from a database of hearing defender products included in the Analyser software package.

For Environmental noise monitoring the 93 & 94 provide either an automatic or manual sweep through the filter bands in a measurement duration of 1 minute for the 1:1 Octave Band Filters.

The Model 95 & 96 are the premium meters in the Quantifier range.

These units offer the greatest flexibility of measurement of the Quantifier range, with the available measurement values.

Compared with the other models, the 95 & 96 meters are the only units in the range to feature the **1:3 Octave Band Filters**. They also have the 1:1 filters as found on the 93/94 models.

The 1:3 Octave Band measurements range from 25Hz to 16kHz. Many environmental measurements require the use of 1:3 filters, such as tonal analysis. There is also the option on the 95 & 96 meters to add 20Hz to 20kHz filter bands.

	91	92	93	94	95	96
Class/Type	1	2	1	2	1	2
Measurement Range	25 – 140 dBA (21 – 140dBA for Class 1)					
Noise Floor Limit	20 dBA (18 dBA for Class 1)					
Peak Measurement	143 dBC					
IEC International Standards	IEC 61672-1 (Class 1 and Class 2) / IEC 60651:2001 (Type 1 and 2) / IEC 60804:2000 (Type 1 and 2)					
Microphone Type	MK ½" Class + Electret Prepolarised Condenser					
Frequency Weightings	A, C, Z					
Time Weightings	F (Fast, 125ms), S (Slow, 1s) & I (Impulse, 0.35ms)					
Measurements – L (A, C, Z)	✓					
Measurements – Max/Min (A,C, Z)	✓					
Measurements – LCpeak	✓					
Measurements – Leq,t (A,C, Z)	✓					
Measurements – LE (A,C,Z)	✓					
Measurements – Ln values	L0.1 to L99.9 (five simultaneous user-selected values available)					
Octave Filter	✓					
Octave Frequency Bands			1:1 (31Hz to 16kHz)		1:1 (315Hz to 8kHz) / 1:3 (25Hz to 16kHz)	
Data Recording	✓	✓	✓	✓	✓	✓
Memory	16Mbit internal memory allowing up to 1300 broadband measurements					
Display	Graphical LCD with measured values, elapsed time, frequency, battery level indicator					
Battery Type	2x AA Alkaline batteries					
Battery Life	Typically > 24 hours					
Dimensions	340mm x 75mm x 25mm					
Weight	450 grams					
External Connections	USB Type B Data Out / Multipin I/O for optional connections					
Warranty	2 years					



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NOISE WARNING SYSTEMS

PulsarSafeEar

The Pulsar Quantifier is a range of high performance data logging Class 2 and Class 1 sound level meters, which can measure general sound levels, Ln statistical values such as L10, L50 as well as average, 1:1 and 1:3 Octave measurement.



WARRANTY

The PulsarSafeEar is an easy to install, LED noise activated sign, perfect for use in factories, workshops, garages, libraries and universities to warn when noise levels become too high and indicate when hearing protection must be worn.

In environments where the wearing of hearing protection may not be required at all times, the PulsarSafeEar noise activated warning sign will inform employees when Personal Protective Equipment is required and also when it can be safely removed.

The PulsarSafeEar can also be used in quiet locations such as classrooms, hospitals and libraries to indicate when noise levels must be kept down. By setting the PulsarSafeEar to trigger at a lower level ensures that noise levels in quiet environments stay within acceptable levels.

A USB Data logger is available as an option so sound levels can be recorded and downloaded to a PC. This simply plugs into the PulsarSafeEar and can record noise levels over long periods of time. The Data Logger can be programmed to start recording at a specific time and date and run, for example, over an 8 hour shift.

When plugged into a PC, the software will display a graph of the recorded noise levels and allow the data to be printed, exported and annotated for reference.

Up to 3 remote displays can be connected and controlled by the Master Unit, to inform you of safe noise levels in the workplace. A simple cable from the Master Unit connects the displays by daisy-chaining them together so that a wide area can be covered. The cable length between the displays is 10 metres.



THERE ARE FOUR MODELS OF THE PulsarSafeEar AVAILABLE:

1. HEARING PROTECTION MUST BE WORN
2. WARNING HIGH NOISE LEVELS
3. CAUTION HIGH SOUND LEVELS
4. SHHH! QUIET ZONE

Each sign lends itself to specific market uses. e.g. the SHHH! QUIET ZONE sign is suitable for hospitals, doctor waiting rooms, libraries and universities whereas the HEARING PROTECTION MUST BE WORN sign is well suited to commercial maintenance, engineering and fabrication plants.

WHY INVEST IN THIS INNOVATIVE SOUND PROTECTION?

- Quick and simple to install
- Mount, set, plug and go
- Illuminates to indicate when hearing protection must be worn
- Warns when noise levels must be kept down
- Trigger level from 40dB(A) to 114dB(A)
- Extendable with additional remote units to cover a large area
- Different pictures and messages available to suit your business
- Easily upgradable with data-logging facility
- Suitable for use in quiet environments



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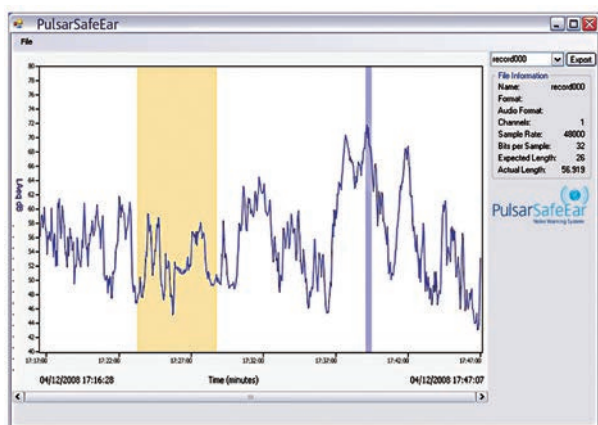
Four standard designs to cover all applications.

PulsarSafeEar is also available with a range of other graphics and text which allows it to be used in environments where there is a need to warn or indicate excessive sound levels.

SPECIFICATIONS

- Trigger Detection Range:** 40 - 114dBA
- Frequency Types (Weighting):** A,
- Time Weighting:** Slow, 1s
- Microphone:** PU112
- Display Delay Time:** None to 30 secs
- Display Type:** Visual Indication High intensity white LED with user controllable brightness
- Wall Mountable:** Yes
- Data Logging:** Optional, USB data logger with 32,000 storage points
- Weight:** 600 grams
- Power:** Mains operated 230V
- International Standards:** IEC 61672:2002
- Warranty:** 1 Year

Standard package includes: PulsarSafeEar Master display, 230V mains power supply, 5 metre power cable.





NOISE DOSIMETERS

Pulsar doseBadge



The Pulsar doseBadge is a simple compact and lightweight dosimeter that is worn on the human body and measures the amount of sound that the person wearing the device is exposed to.



WARRANTY



Accurately assessing and capturing the true noise exposure of workers is made simple using this innovative device from Pulsar.

This revolutionary personal noise dosimeter is a self-contained noise measurement device (or PSEM), that has no cables, no displays or controls, making it the perfect solution for noise dosimetry, because units cannot be tampered easily with during measurements.

THE DOSEBADGE KEY FEATURES ARE:

- Small, unobtrusive compact design, weighing only 45grams
- LAeq, LAVG, LCpeak, LEX,8h, LAE, % Dose, Exposure (Pa2h), Estimated % Dose measurement values
- Cable-free
- Programmable with compliance for almost all world-wide safety regulations
- Infra-red reader with internal acoustic calibrator
- Supplied with dBLink3 software

The Model 22 doseBadge communicates with an infra-red reader unit, similar technology to a television remote control. The Reader Unit controls the doseBadge to program, calibrate, start-stop, download and store measurements.

All key measurement parameters can be viewed on the large clear backlit screen of the Reader Unit, which also displays a time history graph of worker's daily noise exposure.

The Reader Unit contains an integral acoustic calibrator allowing the doseBadge to be calibrated prior to and following each measurement in accordance with international regulations.

Worldwide Occupational or Industrial Noise Regulations require the typical daily exposure of an individual worker to be determined. Health and Safety requirements state that the noise exposure for an employee should not exceed **85dB(A)** – same for dB(C) over an 8 hour period. This measurement is often referred to as an LEX or LEX8 value.

The Model 22 doseBadge system can be purchased as a 1, 2, 5 or 10 dosimeter kit. Additional doseBadges can be purchased individually.

SPECIFICATIONS

Measurement Range (dBA): 70 - 130dB RMS

Measurement Range (dBC): 120 - 140dB Peak

Frequency Types (Weighting): A, C

Measurement Functions: LAeq, LAVG, LCpeak, LEX,8h, LAE, % Dose, Exposure (Pa2h), Estimated % Dose

Memory: Up to 93 measurements of 8 hours duration

Weight: 45 grams

Battery Type: Rechargeable NiMH battery

International Standards: IEC 61252:1993, IEC 60942:2001 Class 2, ANSI S1.25:1991

Standard package includes: Model 22 doseBadge, leather mounting kit, Model 22-R reader unit, doseBadge charger, power supply, dBLink3 software CD, USB cable, K3 hard carry case, batteries, calibration certificate.



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ACOUSTIC CALIBRATORS

Pulsar Model 105 & 106



The Pulsar Model 105 and Model 106 are precision Class 1 and Class 2 acoustic calibrators, employing the latest technology, designed for use with a wide range of portable sound level meters.



WARRANTY

Both models have been tested and formally EU Pattern Approved under certificate PTB-1.61.4028829, as meeting all the requirements of the latest International standard, IEC 60942: 2003.

This version of the IEC standard is far more stringent than previous versions and so far very few manufacturers have managed to meet it.

The two models are intended to calibrate (that is set the sensitivity) any approved sound level meter that uses a standard measurement microphone.

Both Models 105 and Model 106 give a standardised 1kHz tone - the frequency where all weighting networks are the same, at a pressure of 1 Pascal which is a sound level of 94 decibel. They have sensors to correct for temperature, humidity, barometric pressure and battery voltage so that they remain stable and accurate under almost any conditions where they are likely to be used.

The Model 105 complies fully with Class 1 - the precision class, while Model 106 fully meets the requirements for the calibration of industrial sound level meters used in almost all Health and Safety applications. As of today, almost all approved sound level meters use the Internationally standardised "1/2 inch" microphone, the microphone cavity is this diameter, but adapters are available for smaller microphones such as 1/4 inch.

WHY USE AN ACOUSTIC CALIBRATOR?

Even if your sound level meter has a current calibration certificate, for most Occupational and Environmental noise measurement, a field calibration test is required to be performed prior and after each measurement session. This is performed using an approved acoustic calibrator with the sound level meter.

Another reason to regularly use a calibrator is because several factors can influence the performance and accuracy of a sound level meter.

The most fragile, important and expensive component of a meter is the microphone capsule. This can become damaged by physical damage, moisture or environmental changes (i.e. rain, wind etc) or by chemicals.

SPECIFICATIONS

Classes: 105 (Class 1), 106 (Class 2)

Sound Pressure: 94dB

Pressure: 1 Pascal

Pressure Tolerance: 105 - 0.2 dB, 106 - 0.4dB

Frequency: 1kHz (1000cps) +/- 0.2%

Microphone diameter: Fits microphones nominal 1/2" to IEC 1094-4.

Adapter available for smaller microphones

Indicator: Green LED shows operation with good battery

Power: 9V IEC type 6F22 or PP3

International Standards: IEC 60942

Standard package includes: Calibrator, 9V battery



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BASIC SOUND LEVEL METERS

Trotec SL300 and BS15



WARRANTY

The Trotec SL300 is a basic Class 2 Sound Level Meter for general purpose measuring of sound levels where calibration certificates are NOT required.

The SL300 is designed for general consumers who require a low cost, basic sound level meter for testing general instantaneous sound levels.

The LCD screen is large and easy to read, displaying the Sound Level (SPL) in decibels.

You can select either the standard A-frequency-weighting or the alternative C-frequency-weighting with max and min values. There is also a basic record function which allows the user to store a measurement for viewing later (non-downloadable).

The SL300 has a measuring range of 30 - 130 dB and features a tripod thread, enabling the operator to attach the meter to a camera tripod.



WARRANTY

The Trotec BS15 is an entry level basic Sound Level Meter for DIY and home use only.

It is designed for the basic assessment of general noise levels in the home or small office based workplace etc.

It is suitable for measuring maximum noise levels in decibels (dBA) very close to the source of the noise, typically within 1 meter of the source. With a measuring range of 30 - 130 dB, a backlit easy to read LCD display and maximum, minimum, hold measuring modes, the BS15 is the ideal tool for basic simple sound levels.

N.B. Should you application require the measurement of integrated, average or exposure sound level measurements such as LEQ, L10 or LEX, please see the **Nova, Assessor** and **Quantifier** models on pages 6 to 11.

Standard package includes: Trotec SPL meter, alkaline battery, windshield and carry case.

	BS15	SL300
Class/Type	No Class/Type	2
Measurement Range	30 - 130 dB	
Frequency Weightings	A	A, C
Time Weightings	F (Fast, 125ms)	F (Fast, 125ms), S (Slow, 1s)
Measurements - Max/Min	✓	✓
Display	LCD with backlit display	
Battery Type	1x 9V battery	
Battery Life	Typically > 40 hours	
Weight	135 grams	230 grams
Warranty	1 year	



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SOUND LEVEL

Accessories

HEIGHT ADJUSTABLE CAMERA TRIPODS

The **Slik F630** standard and **Topman TV3230** heavy duty camera tripods allow for the use of applicable sound level meters on a fixed location. Both models feature a 1/4" thread fitting and are height adjustable.



SLIK F630 CAMERA TRIPOD

Thread: 1/4"
Extended size: 1.46m
Closed size: 0.60m
Weight: 0.6kg



TOPMAN TV3230 HEAVY DUTY CAMERA TRIPOD

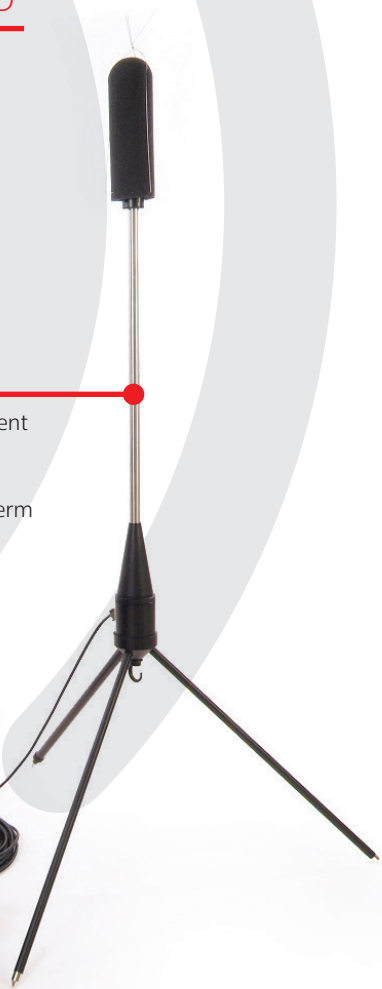
Thread: 1/4"
Extended size: 1.92m
Closed size: 0.76m
Weight: 2.3kg

ENVIRONMENTAL MONITORING KITS

Because environmental noise monitoring usually takes place outside, the sound measurement device is therefore subjected to various weather conditions.

There are kits available for the Pulsar Nova and Quantifier, for both short term and longer term monitoring. These are the WK1 'short-term' and WK2 'long-term' kits.

These outdoor kits contain a weatherproof case to house the sound measurement device such as a sound level meter, acoustic calibrator and rechargeable power source.



CARRY CASES

The K2 and K3 heavy duty cases are available for the Pulsar Assessor, Nova, Quantifier and doseBadge products. Each case has the specific internal foam cut-outs to house all the correct components and accessories for each meter.



Hearing Protection

When it comes to hearing conservation, determining and measuring the sound level is only part of the equation. Where an SLM (sound level meter) or Warning Sign (i.e. Pulsar SafeEar) can identify high sound levels in your environment, they do not protect the individual's hearing from the source of the noise. For this, Hearing Protection is required.

Along with workplace Health & Safety training, general prevention and care, the following products are available to help reduce the effect of noise hazards.



PASSIVE EARMUFFS

A wide range of noise blocking earmuffs are available for various segments of the industry. These include;

- Class specific earmuffs (i.e. Class 3,4,5)
- Folding earmuffs
- Helmet attaching earmuffs
- Neckband earmuffs
- High visibility earmuffs
- Children's earmuffs

PELTOR H7A HEADBAND EARMUFFS

With a wide protection range that covers both severe and high noise levels the H7 earmuffs are versatile enough to meet the protection requirements of almost any working environment.



ACTIVE EARMUFFS

A combination of noise blocking earmuffs with cup mounted ambient listening microphones that allow you to hear others speak whilst while automatically, and instantly limiting dangerously loud sounds to prevent hearing damage. Available in headband and helmet mounted versions.

IMPACT SPORT EARMUFFS

Impact Sport keeps wearers both protected from hazardous noise and connected to their environment. Impact Sport employs built-in directional microphones that amplify range commands and other ambient sounds to a safe 82 dB, providing more natural listening and enhances communication.



RADIO EARMUFFS

From simple AM/FM models to models combining ambient listening microphones, we've got the range covered. Starting with stereo radio earmuffs that provide proper levels of hearing protection, whilst giving wearers high-fidelity sound, and the ability to listen to the radio and personal listening devices. More sophisticated include ambient listening functionality so you can hear others speaking while automatically, and instantly limiting dangerously loud sounds to prevent hearing damage

HOWARD LEIGHT SYNC AM/FM/MP3 RADIO EARMUFF

Very popular Class 5 Radio Earmuff providing workers with a total solution for hearing protection, worker motivation and visibility –incorporating an exclusive reflective headband that glows when exposed to light, providing increased visibility and safety on the job.





2 WAY COMMUNICATION EARMUFFS

Built in passive hearing protectors with a variety of 2 way communication technologies such as Bluetooth, short range FM transmitters and interfaces via cable to 2 way radios, all designed to make communication easier and safer within the workplace.

Products like the Sensear Smart Muffs combine noise blocking and speech enhancement plus a raft of communication technologies to deliver a complete noise, communication and protection solution.

SENSEAR NOISE CANCELLING BLUETOOTH COMMUNICATION EARMUFF

An industry-leading noise cancelling Bluetooth® headset enabling users to have a clear phone conversation even in 120dB noise. The Bluetooth® headset even has built in hearing protection and noise suppression technology so users are still aware of their surroundings.



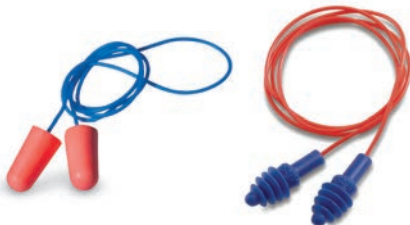
DISPOSABLE EARPLUGS

One of the quickest ways to improve hearing conservation is to utilise an earplug in high noise zones. As per re-useable earplugs, several models, class types and construction materials are available.

Our complete line of hearing protection is all but unsurpassed in the NZ PPE industry. Hearing protectors on offer are designed with the user in mind to be as comfortable as possible while protecting against hazardous noise in the workplace. All hearing protection products are tested and approved by an independent third party test laboratory to AS/NZ 1270. Our utmost concern is in offering the highest quality in hearing protection whilst making the workplace a safer and more productive environment.

X-TREME CLASS 5 DISPOSABLE EARPLUG

High visibility soft polyurethane foam construction provides a high level of long-wearing comfort, while it's bullet shape aids in easy insertion and removal. Available corded or uncorded, X-Treme is also available in a variety ready-to-use dispenser options.



CORDED EARPLUGS

Corded earplugs are typically used to avoid either careless loss of the earplugs, with the cord keeping the plugs around the neck when not in use OR contamination of the environment.

REUSEABLE EARPLUGS

Designed to be re-used over a period of time (product dependant). Various types and Classes are available with optimisation for inner ear comfort and increased long term wear.



AIRSOFT CLASS 5 REUSABLE EARPLUG

Optimised for exceptional in-ear comfort, AirSoft's reusable earplug delivers optimal protection and increased comfort for long-term wear. Internal fins create an interlocking, noise-blocking barrier within the air pocket, providing dependable attenuation for all wearers upon proper insertion.



**Want to see our full range of Hearing Protection Products?
Visit the Safety Shop at www.hsesafety.co.nz**

OR scan the QR Code left using your smartphone or tablet to directly go to the website.

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Please call us for further information on any of these products.



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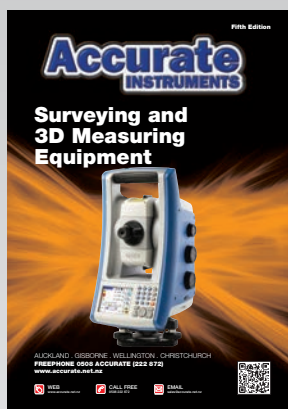
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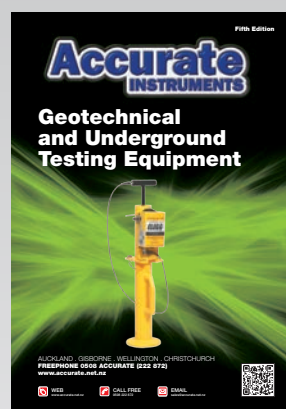
Please call us for more information on the product ranges.



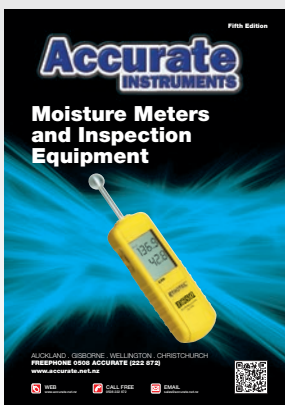
Total Stations, GPS & GIS systems, 2D & 3D measurement, surveying accessories including prisms, tribrachs, adaptors, tripods, prism and GPS poles plus much more.



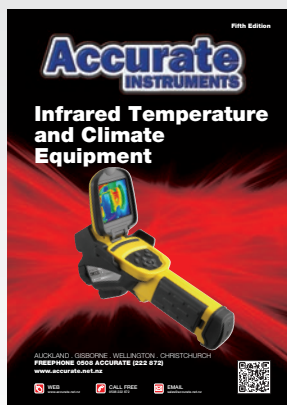
Building and construction laser levels, grade lasers, pipe lasers, boom mounted receivers, machine control, laser tape measures, tripods and staves and measuring wheels.



Clegg Hammers, Scala penetrometers, shear vanes, soil augers, Cat & Genny cable locators, fault finders, flexitraces, pipe & drainage cameras.



Moisture meters for timber and concrete, inspection cameras, leak detection, videoscopes, airflow meters etc.



Thermal imaging cameras, temperature & humidity data loggers, hygrometers, pyrometers, dehumidifiers, fans and heaters, electrical testers.



Rebar locators, ultrasonic testing, crack determination, GPR ground penetrating radar, concrete inspection.



Hearing, eye, face and respiratory protection, gas meters, safety footwear, protective clothing, confined space entry equipment, fall protection

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NEW ZEALAND**

OFFICIAL SUPPLIER 2013



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