



User manual for Nova® sound level meters



Pulsar Nova® sound level meter user manual

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The Nova® is designed and manufactured in the United Kingdom by:

Pulsar Instruments Plc., The Evron Centre, John Street, Filey North Yorkshire, YO14 9DW, United Kingdom.

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Pulsar Nova® sound level meter user manual

About this manual

- The instructions in this user manual refer to the operation of Pulsar Instruments plc Nova® sound level meters.
- Some functions described in this manual are only available on some versions of the Nova® sound level meters. Where functions are applicable to only some instruments in the range, this will be clearly indicated in the text.
- In this manual, "Nova®" is used as a general reference for the Nova® sound level meters and "calibrator" is used as a general reference for an acoustic calibrator.
- This manual describes the recommended usage of the Nova®. Any warnings will be indicated by the following warning symbol:



The additional information required for testing in accordance with IEC 61672 is provided as a supplementary document, Nova® Sound Level Meters Technical Data Part B, which is available for download at:

<http://pulsarinstruments.com/technical-support/>

This supplementary document forms part of this manual

- **It is not possible to change the way that the instrument measures through the software or firmware. Any legal metrology aspects of the instrument cannot be affected by any changes made in the instrument.**
- **The Common Specifications section on page 44 defines which standards relate to the different functions available in the instruments. Additional approvals and certifications may apply to the instruments and these will be listed in the Appendices.**

More detailed explanations of the repeat measurement timers are available to download from the Pulsar website at

<http://pulsarinstruments.com/technical-support/>

Quick Start Guide for the Nova® sound level meters can be downloaded from the Pulsar website at

<http://pulsarinstruments.com/technical-support/>

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Updates

In the interests of continuous product improvement, Pulsar Instruments plc reserves the right to make changes to product specifications without notice.

To understand the latest updates that have been implemented into this product and to download the most current version of this user manual, visit our website at www.pulsarinstruments.com

Version 1.3 September 2016

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Pulsar Nova® sound level meter user manual

Preface

The Pulsar Nova is a powerful instrument providing excellent expansion capability and has been designed to provide reliable, accurate measurements over a long period of time.

This manual describes the procedure that should be followed to set up and operate the Nova® sound level meter, as well as comprehensive technical information, using optional accessories and troubleshooting.

This manual also contains the information regarding the Model 105 and Model 106 Acoustic Calibrators.

The different versions of the Nova® are:

Nova series features table

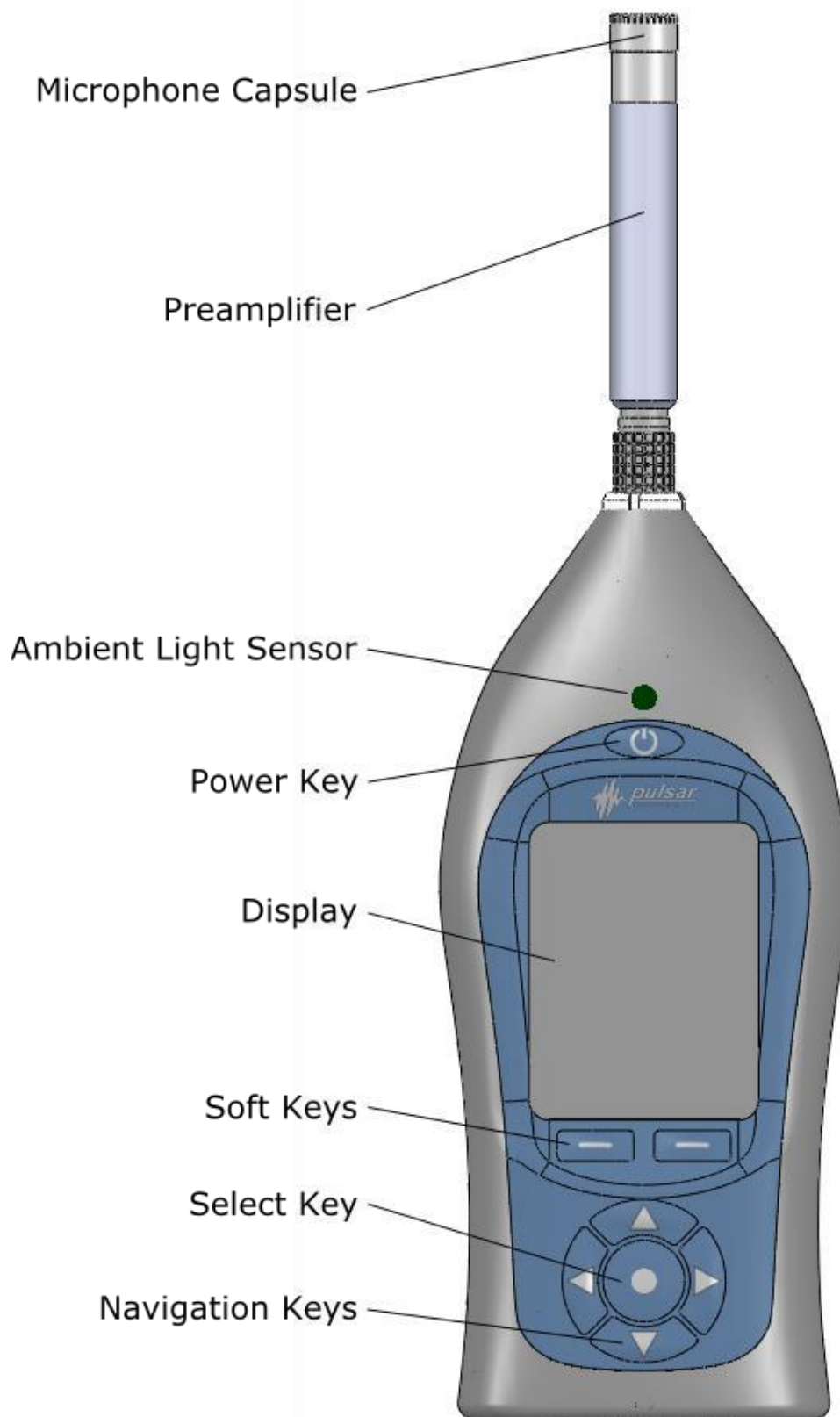
| | Class 1 | Class 2 | SPL | Simultaneous A, C & Z Frequency Weightings | Simultaneous F S & I Time Weightings | Leq/Peak (inc C-A & Quick Integrator Settings) | Pause & Back Erase | Data Logging | Manual Audio Record & Data Logging | Audio Note & Data Logging | Repeat Timer & Data Logging | Single Timer | TWA/dose | Ln Values | 1:1 Octaves |
|----------|---------|---------|-----|--|--------------------------------------|--|--------------------|--------------|------------------------------------|---------------------------|-----------------------------|--------------|----------|-----------|-------------|
| Model 41 | ✓ | | ✓ | ✓ | ✓ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Model 42 | | ✓ | ✓ | ✓ | ✓ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Model 43 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Model 44 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Model 45 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Model 46 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

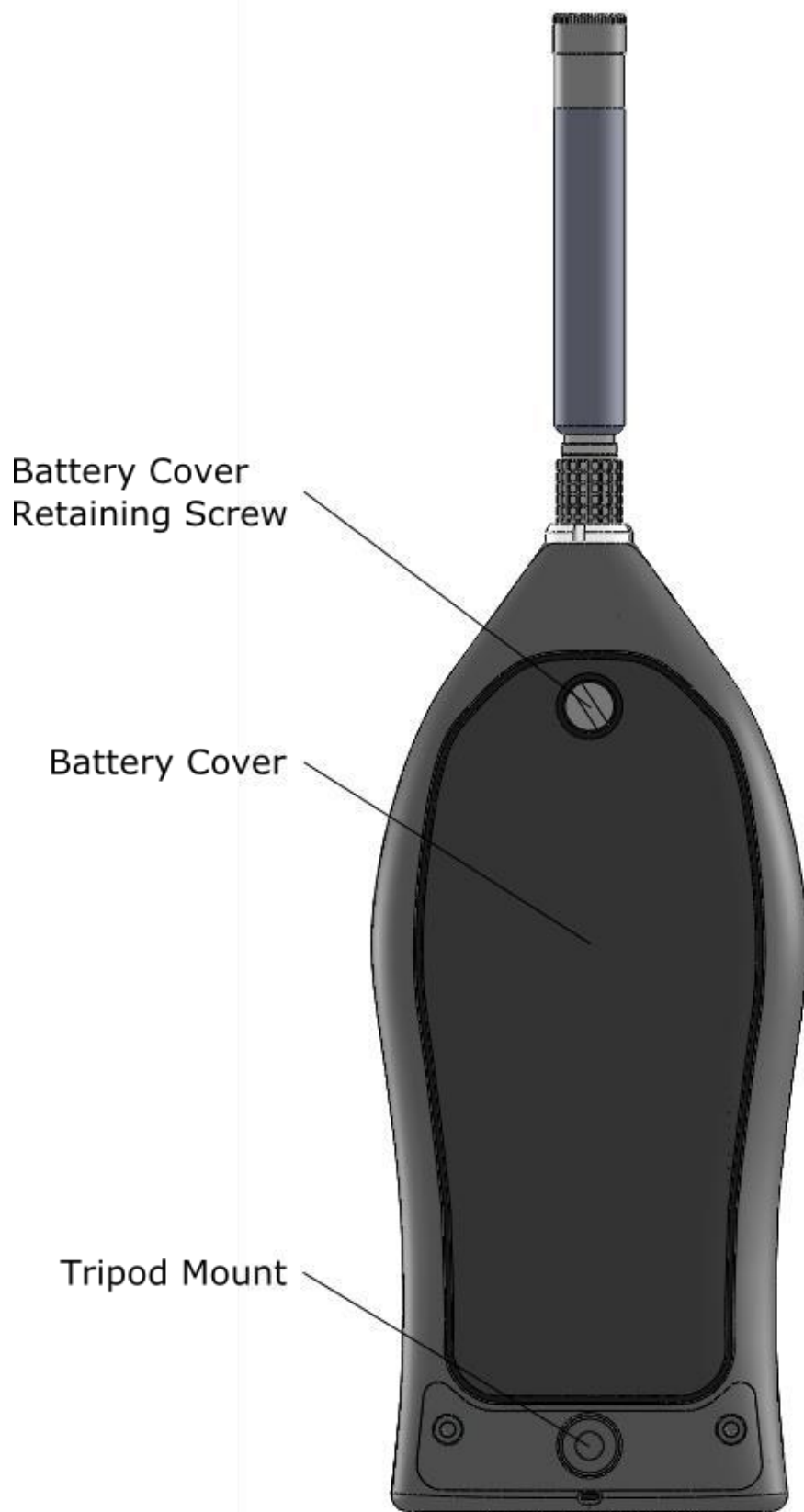
✓ Standard feature ○ Optional add on feature

The Nova® sound level meters meet the requirements for Class 1 and Class 2 of IEC 61672-1:2013 standard for Class 1 Group X or Class 2 Group X sound level meters as appropriate.

The Nova® sound level meters also meet the requirements for Class 1 and Class 2 according to IEC 60651 and 60804 depending upon the version of the instrument. Please refer to page 43 for full technical details of the Nova® sound level meters.

To meet the requirements of ANSI S1.4 for Random Incidence microphone response, an NK:70 Random Incidence Adaptor should be used when making measurements. Please refer to page 51 for details of the use of the NK:70 Random Incidence Adaptor.





Pulsar Nova® sound level meter user manual

Introduction

The new Pulsar Nova® – the smartest sound level meter in the world for noise at work measurements!

- Robust
- Easy to use
- Compliant
- Faster – Intuitive design
- Stronger – Durable metal case
- Longer – 30+ hour battery life
- OLED high resolution anti-glare screen
- Full colour display
- Soft touch keypad
- 4GB removable memory card
- Data logging*
- Audio recording*

* - Option on some models

One of the key aims of the Nova® instruments is to give you a sound level meter that is as simple to use as possible whilst providing the very highest level of performance and function.

You cannot forget to measure a specific function as they are all measured at the same time and stored internally.

For example, if you have chosen the F (Fast) time weighting View Option, the Nova® will still measure S (Slow) and I (Impulse) at the same time.

You can choose another time weighting View Option from the menu, and then see real-time data or review stored measurements using the new parameters.

This applies to all other noise parameters (excluding Dose).

The Nova® measures all the parameters of noise at the same time and the View Option determines what is displayed.

By using the very latest in digital technology combined with 45 years' experience in designing sound level meters, we have given the Nova® a single measurement range going all the way from 20dB(A) to 140dB(A) [143dBC peak] in a single span.

By doing this the problems of multi-ranges on older instruments have been eliminated. Thus, there is no need for you to choose which range you may need for your measurement, and there is almost no chance of the instrument overloading or under- ranging.

A clear, simple display of the information you need:

The display used on the Nova® is a high resolution colour OLED type. This gives a clear, bright display that is easy to read in all light conditions as well as allowing us to use colour to show specific functions and information. All the information that you need is shown clearly on the screen with the most useful function, for example the Leq in the Leq View, shown in large text. This makes it easy for you to see the information that is important at a glance.

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Getting Started

Your Nova® sound level meter has been shipped in reusable packaging that should be retained for safe shipment when returning the instrument for calibration or servicing.

All Nova® meters come with the following standard accessories:

- PA40 Microphone Preamplifier
- Microphone capsule (attached to the preamplifier)
- Wrist strap
- 6 x AA batteries
- User Manual
- Product USB Stick (with AnalyzerPlus software and documentation)
- USB download cable
- Windshield
- Keyring

You may have other accessories, depending on your package. Please check for damaged or missing items before using your Nova®.



The preamplifier is connected by a rugged, high quality, self-latching push pull connector.

Please note: Twisting or turning the preamplifier body may cause serious damage. The microphone capsule is also delicate. Care needs to be taken when handling.

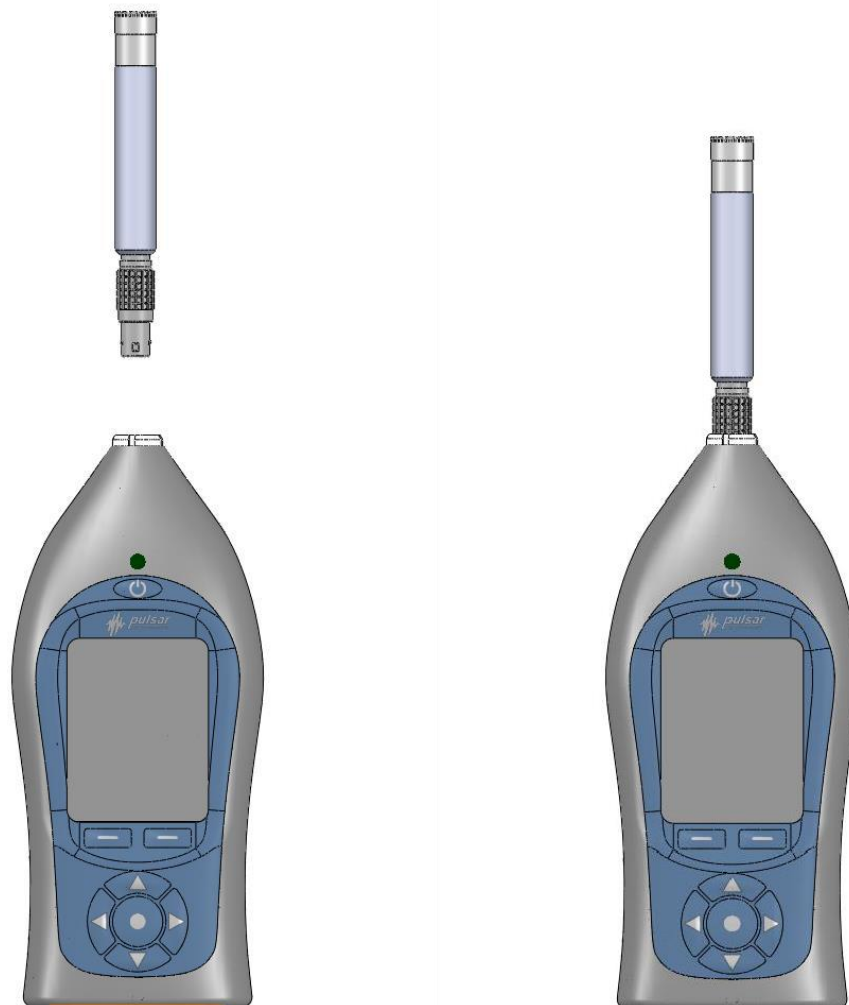
Damage to the microphone and the display caused by misuse is not covered by the warranty for the instrument.

For more information on the warranty please see page 59.

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Fitting the Preamplifier

To connect or remove the preamplifier, please follow the diagram:



When connecting the preamplifier, please take care to align the locking tab (and red markings) on the preamplifier and instrument socket. Push the preamplifier connector into the instrument socket to connect them.

Simply pull the knurled part of the connector towards the microphone to remove the preamplifier again.



DO NOT ATTEMPT TO TWIST OR TURN THE PRE-AMPLIFIER!

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Inserting the batteries

Your Nova® is powered by 6 x AA batteries (also called MN1500 or LR6). We recommend that you use alkaline, lithium or high quality rechargeable batteries to give the best performance.

Remove the battery cover by loosening the captive battery cover retaining screw (as shown below). The included Pulsar Instruments keyring is designed exactly for this purpose.



Please look carefully at the diagram inside the battery compartment that shows the correct polarity. After inserting the batteries in the correct orientation, replace the cover and tighten the battery cover retaining screw.



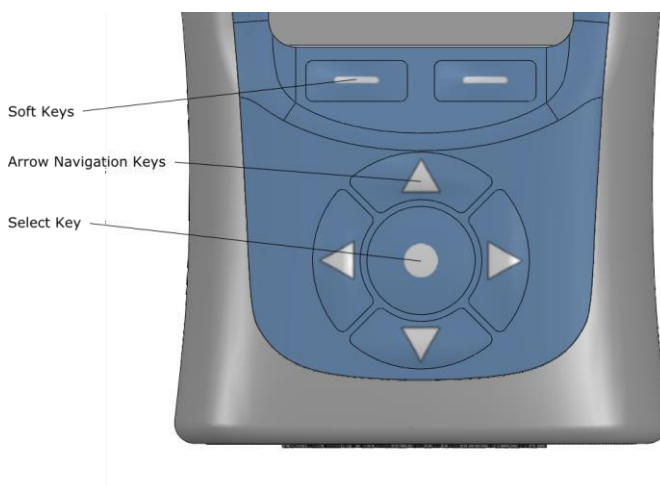
Whenever the instrument is not used for a long period of time, remove the batteries to prevent damage from leakage. Damage caused by leaking batteries is NOT covered by the warranty.

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Keypad and Controls

The Nova® is controlled via the four arrow keys (up, down, left and right), the center select button and two soft keys, which change in function depending upon the mode that the instrument is in. The soft key function is shown above the button on the display.


The left and right keys move between the Views and the up and down keys move between the pages of each View.



The ambient light sensor on the front of the instrument will illuminate the elastomer keypad and adjust the brightness of the display automatically when the light level falls.

If the instrument has the pause function and it has been activated (described on page 33), the right soft key toggles between pause and stop. Press once to pause/back erase (if enabled – see page 37) and twice to stop, or alternatively press and hold for three seconds to stop.

Switch on

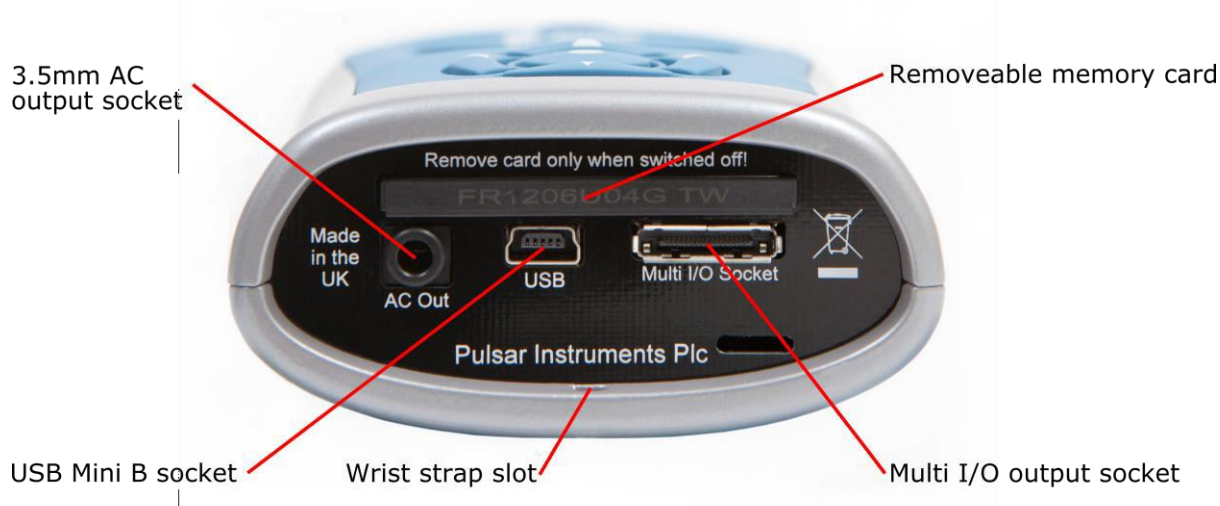
The instrument is switched on by pressing and releasing the power button  on the top of the keypad. After the boot screen, your Nova® will display the last View that was used.

If the start-up screen flashes quickly when you press the power button, the batteries have insufficient power to start and they must be changed.

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Connectors

The connectors used by the Nova® to communicate with a PC and AnalyzerPlus PC software are at the bottom of the instrument under a protective cover.



The Nova® can be powered via the multi-pin connector on the bottom of the instrument.

The options are:

PSR171 - Nova® power input cable (2.1mm Power Jack, 2m long).

PSR176 - Nova® 12v Battery pack cable.

PSR190 - Nova® power input cable (2.1mm Power Jack, 2m long) and mains power supply.



The Nova® can also be powered from the USB connector but only if there are no batteries in the instrument. If the batteries are fitted they will still be discharged with USB power present.

An AC output is available on the Nova® via the 3.5mm jack socket. The output is un-weighted and the output level can be adjusted using the setup options in the AnalyzerPlus software. It is used with the following cable:

PSR177 - Nova® AC output cable 3.5mm Mono to 3.5mm Stereo Jack 2m long.

The Multi I/O Interface Connector presents AC and DC outputs and can be used with the following cables:

PSR174 - Nova® AC & DC Output 18way to 2 x Phono 1m long.

PSR185 - Nova® AC output cable 18 way to Phono 1m long.

See page 50 for details of the electrical outputs.

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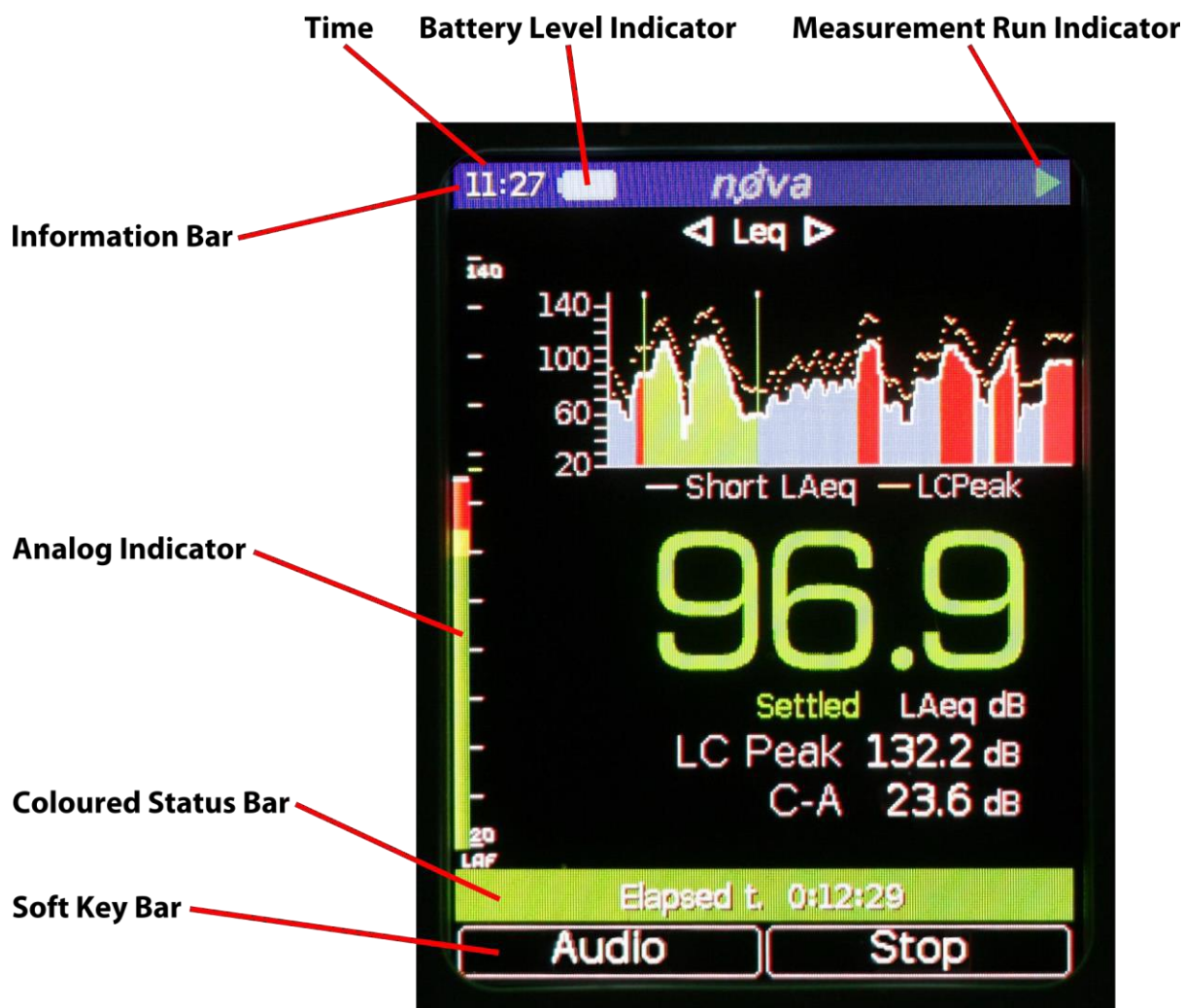
Screen saver

If no keys are pressed for 6 minutes the display will dim to preserve battery and screen life and reduce power consumption. After 30 minutes with no key presses the display will switch off completely and the keypad will flash every two seconds to show that the instrument is powered. The screen dim and screen saver functions will occur during measurements as well as when not measuring. Press any key to restore the display.

The time intervals for the screen dim and screen saver are configurable in AnalyzerPlus.

Display

The Nova® uses a high resolution colour OLED (organic light-emitting diode) screen to show a clear and easy to read display of all the information you need.



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Information Bar

The information bar shows the battery level, if external power is connected and if the Nova® is connected to a PC via the USB connector.



The status of the batteries is shown in the Battery Level Indicator. When the batteries need replacing, the indicator will turn red and start to flash. If the start-up screen flashes quickly when you press the power button, the batteries have insufficient power to start and need changing.



When external power is being used to power the instrument this symbol will show in the information bar.



When the instrument is connected to a PC via USB this symbol will show in the information bar.

The information bar also shows icons when functions are active. Examples of the icons are shown below:



The Play symbol is shown when the instrument is recording a measurement.



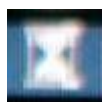
The Pause symbol is shown when a measurement that is in progress has been paused.



The Audio record symbol is shown when real audio is being recorded.



The Single timer symbol is shown when a Single timer has been set up in the menu.



The Repeat timer symbol is shown when a Repeat timer has been set up in the menu.

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View

This text describes the current measurement view or which menu you are currently looking at. Left and right arrows show that additional views are available – use the left and right navigation buttons to view them.

Measurement Display

The main part of the display shows the measurement functions. In addition, the display features an Analog Bar on the left of the screen, which shows real time A-weighted sound level. If more pages of information are available for the currently selected function this will be shown at the bottom of the screen, ie 1 of 3 – use the up and down navigation buttons to view them.

Status Bar

The Nova® uses a colour coded status bar at the bottom of the screen to help you quickly identify what mode it is currently in.

| |
|----------------------------------|
| Dark Blue – Not measuring mode. |
| Yellow – Audio Note recording. |
| Green – Measuring mode. |
| Light Blue – Measurement paused. |
| Purple – Measurement review. |
| Red – Recording audio. |

When the Nova® is not measuring, the status bar shows the date and time. When it is measuring, the display shows the elapsed time. In Review mode, it shows the measurement number and the total number of measurements stored.

Soft Key Bar

The soft key bar shows the current operation of the two soft keys at the top of the keypad. These change function based upon what you are doing at the time.

Overload and Under-Range Indication

Overload is indicated by the word 'overload' and Under-Range is indicated by the word 'under range' (in the chosen language) on the display.

On the Sound Level View and Leq View the indicators are situated beneath and to the left of the large number. When a measurement is not in progress, the indicator is shown for at least 1 second, so that very short transient overload or under-range conditions are visible to the operator.

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When a measurement is in progress, the overload indicator stays on until the measurement is stopped or reset.

In some circumstances the overload and under range indicators will be shown simultaneously. In this case the text will be abbreviated to save space.

Note: If any displayed decibel value on the Sound Level View or Leq View is below 14.0dB, the value will be replaced by dashes ('---'). These levels are typically below the noise floor of the microphone capsule and so will only be encountered during electrical testing.

'Bluescreen'

Under rare circumstances, when the Nova® encounters a condition it cannot recover from, a 'bluescreen' error message will show with an error code.

If this should happen to your Nova®, please make a note of the code so that the engineers at Pulsar Instruments can diagnose your problem accurately.

After writing down the code, pressing the right key will clear the screen and the instrument can be used as normal.

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Calibration

As strongly recommended in all modes of use, any noise measuring instrument should be calibrated before use and the Nova® sound level meter knows if you have calibrated it before it takes the first measurement after turning it on. If you haven't performed a calibration when you press Start to commence your measurement it will go to the Calibration screen. All noise measuring instruments should be calibrated before use (measurement session), because the microphone is susceptible to minor damage from even small knocks.

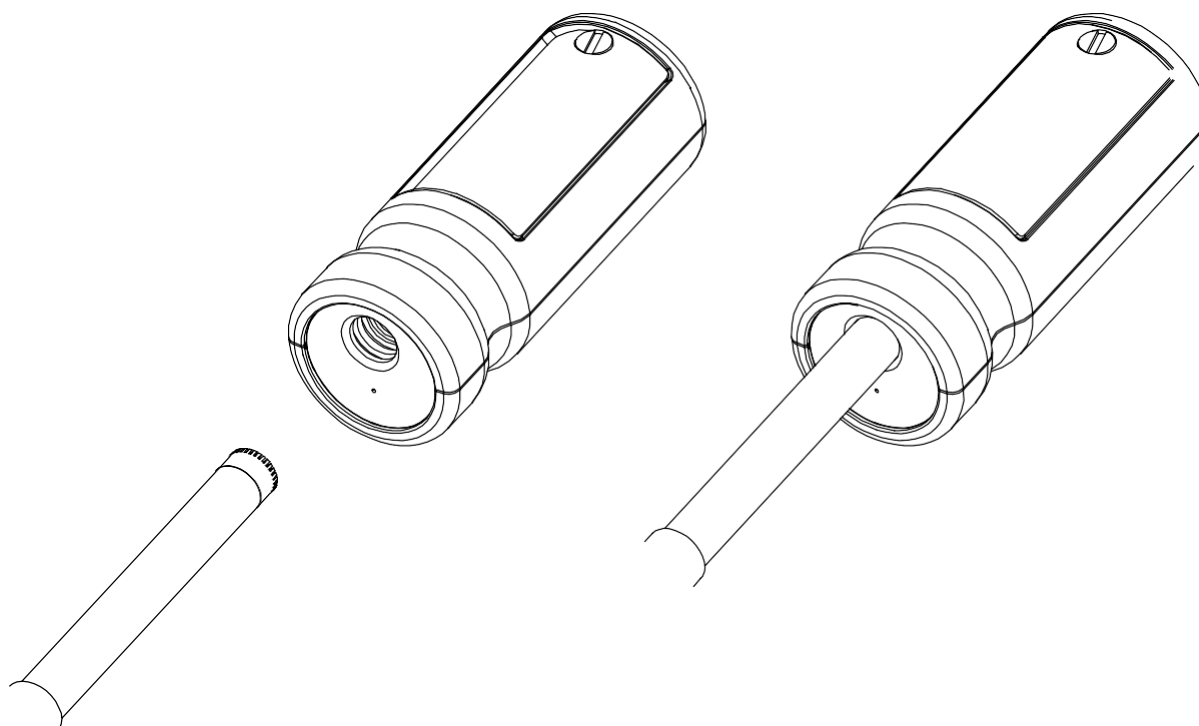
If you do not wish to calibrate your Nova® simply press Cancel and you will still be able to take your measurement.

The calibration applies corrections (if needed) to ensure that your measurements are as accurate as possible.

Calibration should also be carried out at the end of a measurement session to make sure that nothing has happened to the instrument during the session.

To calibrate your Nova®, carefully push the microphone into the cavity at the end of the calibrator. Ensure the microphone is fully inserted into the cavity and is past the 'O' ring seals.

Ensure that the small pressure equalisation hole next to the microphone cavity on the calibrator is not blocked, as this could cause damage to the microphone.





Take care not to use a twisting motion when pushing the microphone into the calibrator, as this is likely to cause damage to the preamplifier.

Press the power button on the end of the calibrator. Press the calibrate button in the Nova® **Menu**.

The instrument will measure the sound level from the acoustic calibrator to determine if it is within the required tolerance and levels. The calibration level must be stable to within $\pm 0.075\text{dB}$ for 5 consecutive seconds for the calibration to be successful.

When the calibration is completed, the Nova® will display the level along with the correction or adjustment made.

The Nova® is preset with the correction values needed for Pulsar Instruments microphone capsules, so no manual adjustment is required. The calibration level you should expect is 93.7dB.

As specified in the International standards, only a Pulsar Instruments calibrator should be used with the Nova®, as these have the appropriate correction factor for the difference between the free field and pressure responses of the microphone.

The correction factor specified by another manufacturer may be very different and put the subsequent measurements out of tolerance. Refer to page 53 for detailed operating information for the Model 105 Class 1 and Model 106 Class 2 Acoustic Calibrators.

Getting to know your Nova® – features and capabilities

To check which capabilities are included in your Nova®, go into the Menu, go to Advanced Options, Information and scroll down to Instrument Capabilities. This will list all the available capabilities. Alternatively, a Feature Matrix is available on the Pulsar Instruments website at <http://pulsarinstruments.com/technical-support/> which lists the capabilities for all the Nova® models.

Colour Coding

The Nova® uses a colour coded status bar at the bottom of the screen to help you quickly identify what mode it is in.

| |
|----------------------------------|
| Dark Blue – Not measuring mode. |
| Yellow – Audio Note recording. |
| Green – Measuring mode. |
| Light Blue – Measurement paused. |
| Purple – Measurement review. |
| Red – Recording audio. |

Views

The views are accessed by pressing the left and right control keys. The views are available when the Nova® is measuring, not measuring or in review mode, but the pages available in each mode will differ.

Not Measuring

When not measuring, the information shown is live, instantaneous values.

Measuring

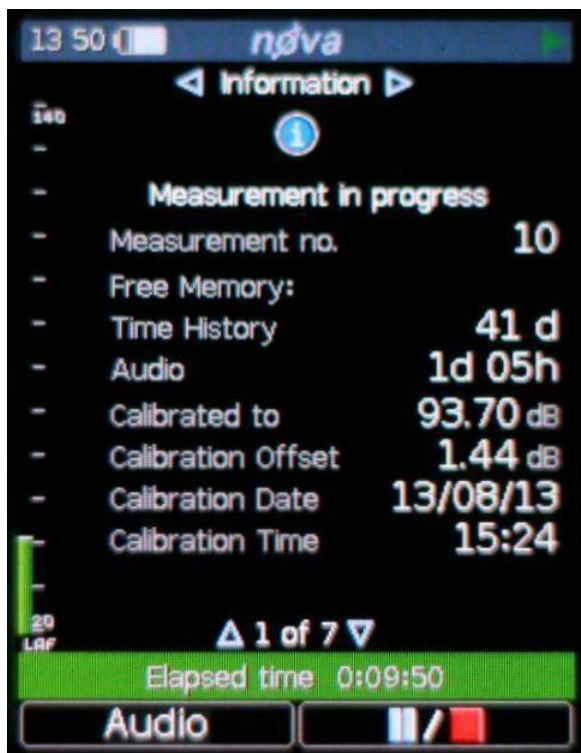
When measuring, these live values are still shown, but you are also shown cumulative overall values for the current measurement period.

Review Mode

In review mode, the values shown are the overall cumulative values for the measurement.

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Information



This shows the status of the instrument including the calibration data.

Press the down or up buttons to view the various information screens.

Sound Pressure Level



This view shows the Sound Pressure Level or SPL, with the maximum and minimum sound level (Lmax and Lmin) with a choice of A, C and Z frequency weightings.

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Leq



This view shows you the Leq, Peak, and C-A values with a choice of A, C and Z frequency weightings.

The C-A data can be used with the HML method for selecting hearing protection.

If the Time Weighting is set to Impulse, the C-A function is replaced by LAeq,I (also known as LAIeq).

When the instrument is set to the German language, an additional 'Taktmaximal' page is also available.

Dose



The Dose View shows you a number of different functions depending upon the configuration of the Quick Settings.

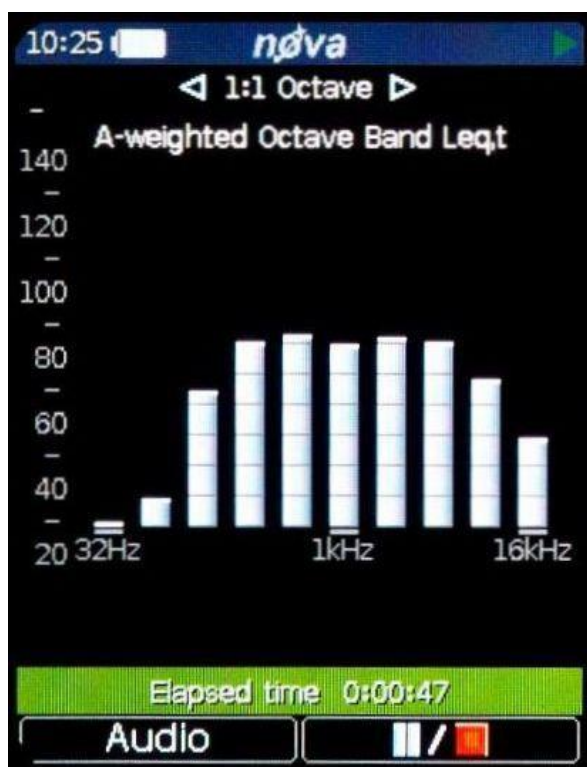
For the UK option, this View gives you Leq, LEP,d, % Dose and Estimated Dose along with the Projected Exposure Calculator.

For the EU option, this View gives you Leq, LEX,8, % Dose and Estimated Dose along with the Projected Exposure Calculator.

For all other options the Lavg, TWA, % Dose and Estimated % Dose for two integrators, in addition to ISO (EU), will be shown according to the setting you have chosen.

Two custom integrators can also be used, configured in AnalyzerPlus. When chosen, they will be shown in addition to ISO (EU).

1:1 Octave Band



This view shows the noise levels divided into Octave frequency bands.

This can be used to aid in the selection of hearing protection and also for noise control applications.

Ln



The Ln view shows the statistical or Ln values calculated during the measurement.

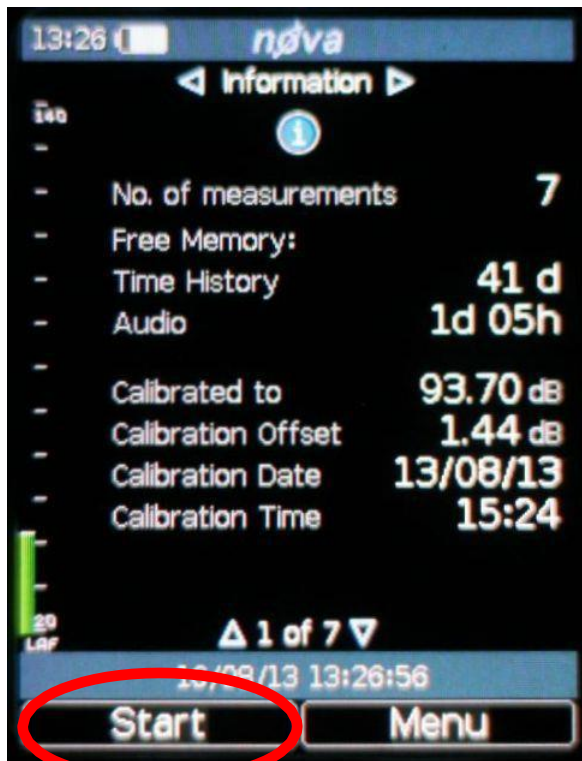
The first seven Ln values are set by default to commonly used values and 8-14 are definable in AnalyzerPlus.

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Making a measurement

The Nova® makes your noise measurements simple, it measures everything (model dependent) all the time! You cannot forget to measure the right function as everything is measured at the same time.

For example the Nova® measures Fast, Slow and Impulse time weightings all at the same time. This applies to all other noise parameters (excluding Dose).



Press the Start softkey

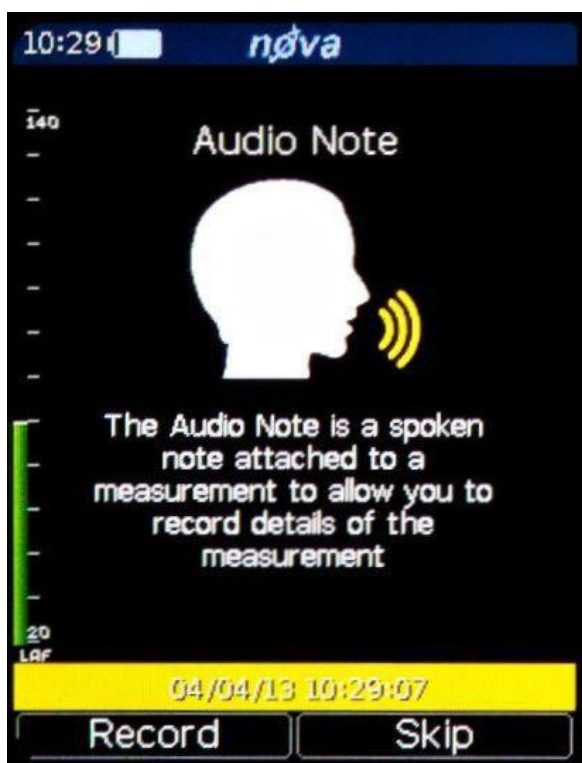
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If this is the first measurement you are making you will be taken to the Calibration screen.

It is good practice to Calibrate before your first measurement and after your last measurement in a session to ensure the microphone has not been inadvertently damaged.

Please see the Calibration section on page 52 for more details.



If your instrument has the Audio Note feature and it has been enabled in the menu option or AnalyzerPlus software, then the Audio Note recording screen will be the next screen you see.

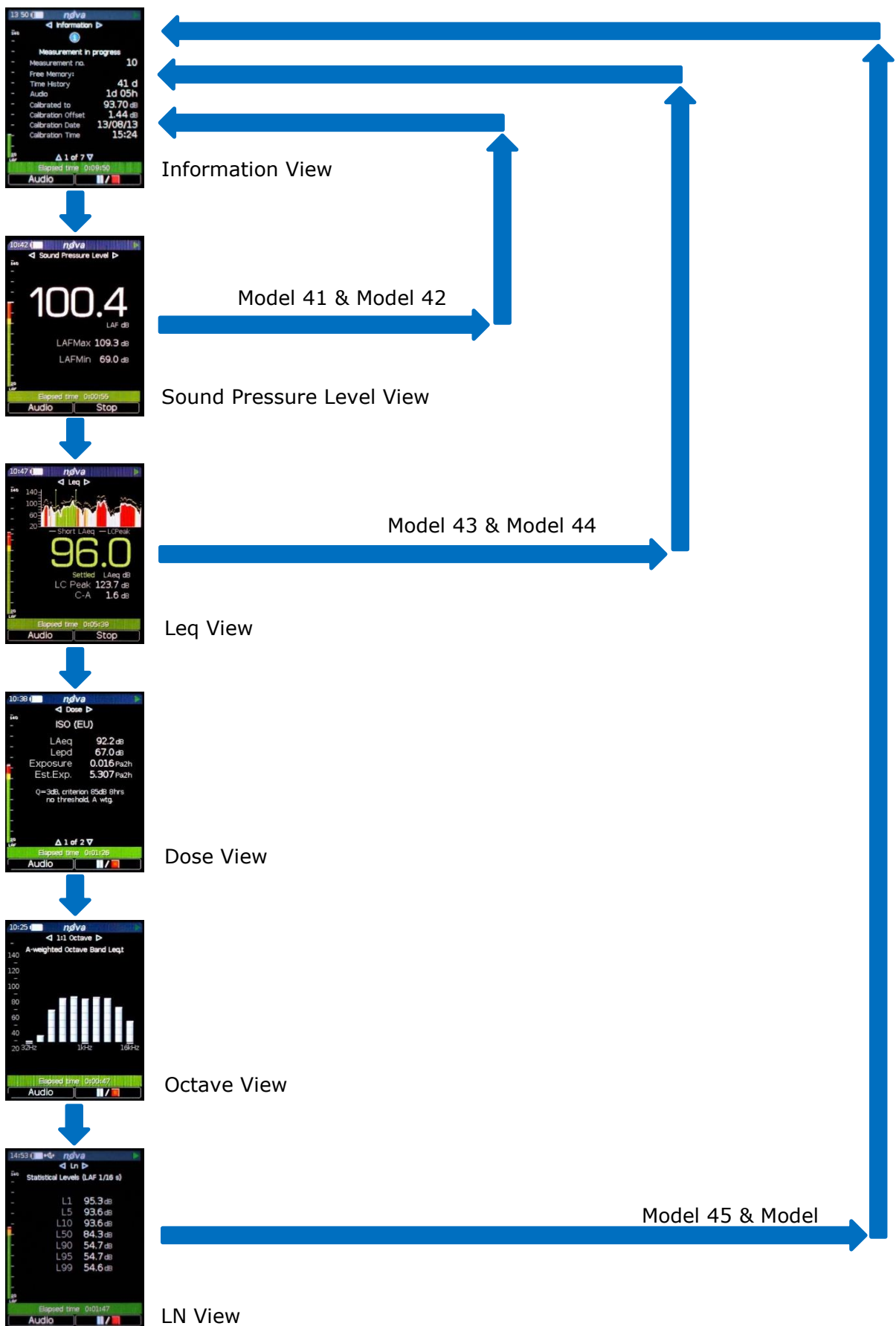
Press Record to record a short Audio Note describing the measurement you are taking or the location for example.

Please refer to page 37 for more information and features of Audio Note recording.

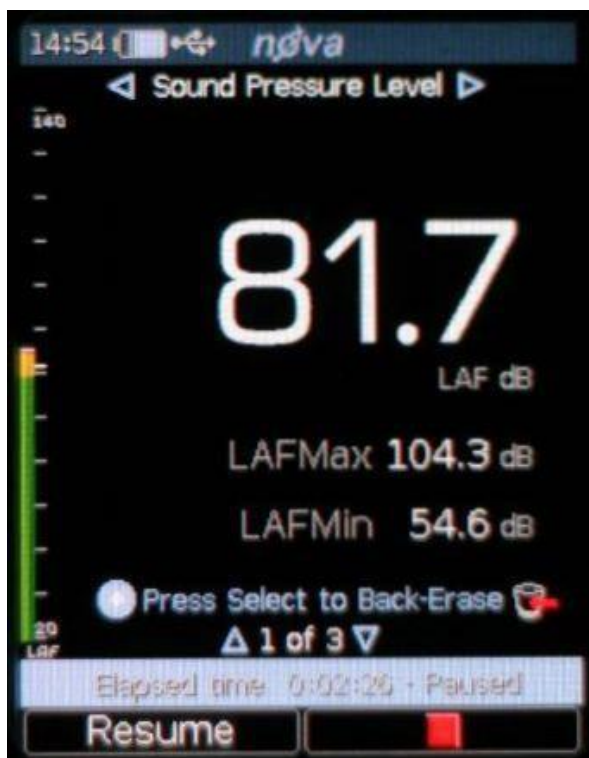
If you do not want to record an Audio Note for this measurement simply press the Skip key.

The next screen you will see will be live data that the instrument is recording. The pulsing green play symbol in the top right hand corner shows the instrument is acquiring data. The exact screen will depend upon the features your instrument has and what screen you were viewing before starting to record your measurement, but using the left and right navigation keys you can loop around the following screens (dependent on your instrument):

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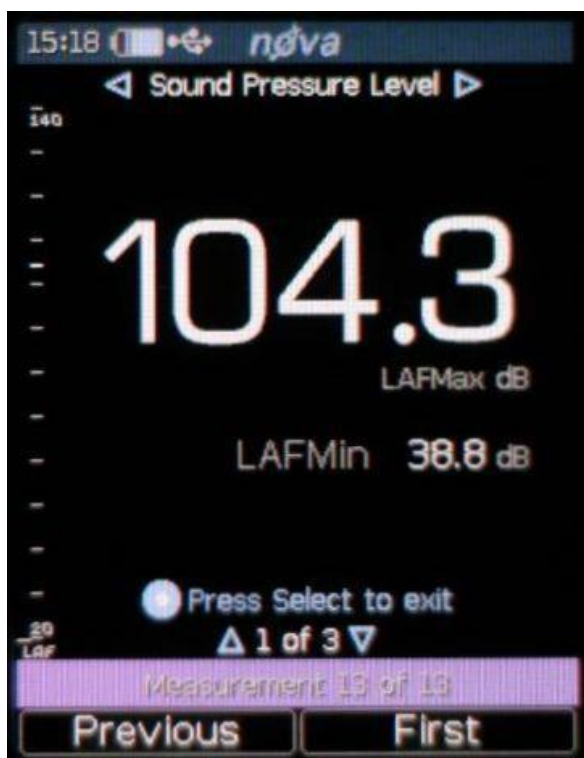


If your instrument has the Pause/Back Erase feature the measurement can be paused by pressing the Pause/Stop soft key.

Press once to pause/back erase and twice to stop, or alternatively press and hold for three seconds to stop. (For Pause & Back Erase, see page 38).

The Pause/Back Erase function is only available if this has been enabled in the AnalyzerPlus software.

To stop the measurement, press the Stop key. The instrument will change from measurement to review mode, and your data is stored and ready to review and download if your instrument has data logging.



In measurement review mode you can review all the same screens as before by using the navigation arrow buttons.

Press the center Select button when you are finished reviewing your measurement.

Stored measurements can be reviewed at any time through the menu.

Restarting A Measurement

If you wish to restart a measurement at any time press and hold the center select button for 2 seconds.

You will be prompted to confirm that you want to restart the measurement, to do so press the Restart softkey. If you do not want to restart the measurement press the Cancel softkey.

If you restart a measurement all data for that measurement is lost and the measurement starts again. It does not affect any measurements already stored.

Configuring the sound level meter

Menus

In the following menus, different options can be chosen on the Nova®. To activate a function, press the 'Select' key to put a tick in the square box.

You can now use the up and down soft keys to select your setting. Your selection will be saved once you press the 'back' soft key. In the menu pages, the Status Bar will display information about your current settings and the option you have chosen.

The following chapter shows the navigation between the Menus and Pages, and the options available. For more detailed information, please see the appendices.

Main Menu

Calibrate
Set clock
Quick settings
Review stored data
Clear memory
Storage options
View options
Advanced options

Calibrate

User Calibration is a very important process. Your Nova® sound level meter can be calibrated at any time by selecting Calibrate from the menu. Please refer to page 52 for full details.

Set Clock

Select Menu>Set Clock> and use the Left, Right, Up and Down keys to change the Time and Date settings.

Quick Settings

- UK
- EU
- OSHA HC and PEL
- OSHA HC and ACGIH
- MSHA HC and EC
- Custom

The default is: **UK**.

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Review Stored Data

Using the left and right keys moves between the different Views (see previous chapter for details) and the up and down keys move between the Pages of each View. The status bar will tell you which measurement you are looking at out of the total (for example Measurement 4 of 9).

Clear Memory

Permanently deletes all stored measurements.

Storage Options

Repeat Timer

This sets the measurement time of repeated measurements. Setup options are Timer On/Off and measurement time (1min, 2min, 5min, 10min, 15min, 30min, 1hr, Custom or Day/Evening/Night).

The default is: **Off, run time 10min.**

Single Timer

This sets the measurement time of a single one-off measurement. Setup options are Timer On/Off and measurement time (1min, 2min, 5min, 10min, 15min, 30min, 1hr, Custom or Lden (day, evening, night)).

The default is: **Off, run time 10min.**

Audio Note

Audio Note can be enabled to allow an audio note to be made before every measurement or disabled from within AnalyzerPlus.

The default is: **On.**

View Options

Time Weighting

This sets the Time Weighting that you use to view the measurements either in real time, recording or review mode – remember the Nova® measures ALL the different Time Weightings ALL the time. The view options are 'F' (Fast), 'S' (Slow) and 'I' (Impulse).

The default is: **'F' (Fast).**

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Adjust Screen Brightness

Screen brightness can be set to automatic mode, or set to a fixed brightness level.

The default is: **Auto**.

Language

The Nova® can be set to the following Languages: English, French, German, Spanish and Italian. Some other languages are available to special order.

The default is: **English**.

Please note: when changing language, the instrument must be restarted for the change to take effect.

Display Mode

The Nova® range has two Display Modes, Standard and Advanced. In Standard Mode only the most common parameters required are displayed in real time, recording and review mode – remember the Nova® measures ALL the different measurement parameters ALL the time, this setting just affects what parameters are *displayed* on the display. If a measurement has been made with the Nova® set in Standard mode, all the parameters will still be available to download into AnalyzerPlus for review afterwards if required. For a full list of what is displayed in each mode go to Stored Measurements on page 48.

The default is: **Standard display mode**.

Advanced Options

Restore Factory Settings

Restores the instrument back to its original factory setup.

Information

The capabilities of the instrument, serial numbers of the instrument, microphone and preamplifier along with details of the standards that the instrument meets are all available to view in the Information menu.

Advanced Setup Options Using AnalyzerPlus

All the setup options available in the instrument menus and some more advanced setup options can be set up from the AnalyzerPlus software.

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Audio Note Enable/Disable

Audio Note can be enabled so that you can make an audio note before every measurement or disabled from within AnalyzerPlus.

The default is: **On**.

Level Colours

The level in dB where the analog bar down the left hand side of the display changes from green to yellow and from yellow to red can be changed within AnalyzerPlus.

The default is: **Yellow at 80dB, Red at 85dB**.

Time History Rate

The time history rate can be selected from, 2 seconds, 1 second, 1/2 second (500ms), 1/4 second (250ms), 1/8 second (125ms), 1/16 second (62.5ms), 1/100 second (10ms) within AnalyzerPlus.

The default is: **1 second**.

Audio Length

The maximum length of audio recorded can be set of 2 minutes, 5 minutes, 10 minutes or unlimited within AnalyzerPlus.

The default is: **unlimited length**.

Ln's Setup

The first seven Ln values are set by default to commonly used values (**L1, L5, L10, L50, L90, L95 and L99**) and 8-14 are definable in AnalyzerPlus.

AC Output Settings

The AC Output can be enabled or disabled, have +20dB gain added to it, or have its range set to High Levels (70-140dB) or Low Levels (20-90dB) within AnalyzerPlus.

The defaults are: **Disabled, +20dB Gain Off and High Levels (70-140dB)**.

DC Output Settings

The DC Output can be set to LAF, LCF, LZP, LAS, LCS, LZS, LAI, LCI OR LZI. There is also the ability to set a V/dB Correction within AnalyzerPlus.

The defaults are: **LAF and +5.96% V/dB Correction**.

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Memory Options

A Partition Editor in AnalyzerPlus allows the adjustment of the storage settings available for Audio and Time History recording.

Pause/Back Erase

The Pause/Back Erase feature can be enabled or disabled within AnalyzerPlus. When Pause is enabled the Back Erase feature is also enabled at the same time.

The defaults are: **Pause Enabled and 5 seconds Back Erase length.**

Time and Date Format

It is possible to change the Time and Date format to any of the following:

dd/mm/yy, mm/dd/yy, dd.mm.yy, dd-mm-yy, yy-mm-dd
hh:mm:ss, hh:mm:ss AM/PM

The defaults are: **dd/mm/yy and hh:mm:ss.**

Features in more detail



Please note: from this chapter on, the manual describes capabilities which are available on different models within the Nova® range.

If you are unsure which capabilities your Nova® has, you can check on the instrument by looking at the Information page in the Advanced Options menu (page 3), or look at the Features Matrix available on the Pulsar Instruments website:

<http://pulsarinstruments.com/technical-support/>

AnalyzerPlus

All Nova® instruments are delivered with a copy of the AnalyzerPlus software which can be used to configure the instrument (some options are only configurable within AnalyzerPlus and not on the instrument – it will be made clear in the text where this is the case).

AnalyzerPlus is also a powerful environment for storing, analysing and organising your data, and produces reports for publication. Audio Note recordings and audio recordings can only be played back through AnalyzerPlus.

Audio Recording

Audio Recording is started manually using the Audio soft key. This starts the Nova® recording raw WAV data at a quality which can be set in the AnalyzerPlus software.

Pressing the audio key again stops the recording. There is no maximum duration of an audio recording set by default, but it can be changed in AnalyzerPlus.

The audio recording includes a 10 second back buffer (on the Standard quality setting). When triggering a recording manually, it is very difficult to record the beginning of a sound that catches your attention.

The back buffer will cover the time it takes you to respond and press 'record'. 10 seconds is the default duration, which can be changed in AnalyzerPlus also.

The Time History display turns **green**, the Status bar turns **red** and the Analog bar turns **blue** when audio recording is running.

Starting and stopping audio recording during a measurement does not affect the noise measurement data being recorded.

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Audio Note

The Audio Note function allows you to record notes and information before a measurement by simply speaking into the microphone. You can then play them back later in the AnalyzerPlus software.

Please note, Audio Notes are recorded BEFORE the measurement starts and are for spoken notes only, not for analysis of recorded sounds.

Timers

The single and repeat timers allow you to make precisely timed measurements over pre-set or custom defined durations, which are set on the instrument using the Storage Options Menu.

Single Timer

The single timer allows you to set a precise time that a single measurement will run for as soon as you start measuring. The Nova® can still be paused, stopped and started manually when the single timer is active.

Repeat Timer

The repeat timer allows measurements to be stopped and started automatically over a long period of time. The Nova® can still be paused, stopped and started manually when the repeat timer is active.

The repeat timer is synchronised to the real time clock, so if you choose a 30 minute duration the measurement will begin on the hour or at 30 minutes past. When the measurement ends, a new one will begin and last for the next 30 minute interval.

If the Nova® is paused when an automatic timer begins, the new timed measurement will also be paused.

Please note, after 5 minutes in Pause the Nova® will restart.

Back Erase/Pause

Pause

The Nova® sound level meters provide Pause and Back Erase function which can be used during a measurement.

When the Pause function is enabled in the AnalyzerPlus software, the Stop button is replaced by the Pause/Stop button. This also enables the Back Erase function, the duration of which can also be set in the AnalyzerPlus software.

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Back Erase

The Back Erase function allows a section of the measurement to be removed from the data used to calculate the overall values.

An example of this would be if, during the measurement of cars on a road, a large truck passed by the measurement location. If the intention was only to measure cars, the truck can be excluded from the overall measurement data by pressing the Pause button and then using the Back Erase to remove a preset section of noise.

The time that the pause button was pressed, along with the Back Erase duration, will be excluded from the calculation of the overall noise values such as the Leq, Lmin, Lmax, LPeak, and the 1:1 Octave Band overall values.

The duration of the Back Erase can be set to between 1 and 30 seconds using the AnalyzerPlus software. If the Pause function is disabled, the Back Erase function is also disabled.

Memory

The Nova® has a 4GB removable memory card. This is partitioned into two sections, one to record time history and one for audio (Audio Note and audio recordings). The space allocated to each can be configured in AnalyzerPlus.

The free space in the memory is shown in the General View as days or hours available for both time history and audio. When either partition is full, the Nova® will overwrite the oldest data in that partition.

To clear the memory and permanently delete all stored data, choose the 'Clear Memory' Menu page and follow the instructions on screen. Before permanently erasing the data, you will be asked to press 'OK' to confirm.

Restore Factory Settings

This is in the Advanced Options Menu, and restores the Nova® to the default options for all user-definable settings in the Menus, and clears the calibration offset. For settings such as 'language' where there is no default, the Nova® will return to the option it was shipped with.

Follow the instructions on the screen, and press 'OK' to confirm. This does not delete any stored measurements.

Windshield

The Nova® can be used with a WS90 90mm foam windshield which will reduce the noise levels generated by air turbulence over the microphone capsule. It can also help protect the microphone capsule from dust and fluids which can affect the performance of the instrument.

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Downloading Measurements

Before any measurements can be downloaded, the AnalyzerPlus software must be installed on to a suitable PC.

Connect your Nova® to your PC using the supplied mini-B USB cable using the USB connector under the removable rubber connector panel at the bottom of the instrument.

When the AnalyzerPlus software is run, it will automatically find the instrument plugged in and look for completed measurements to download.

For further information on how to use the AnalyzerPlus software please refer to the software help files/videos.

Troubleshooting

Please visit <http://pulsarinstruments.com/technical-support/> for the latest troubleshooting information.

This section contains information which may solve simple operational problems you may encounter. If you are unable to solve the problem or experience any problems with the assembly or operation of the instrument contact Pulsar Instruments Plc or your local representative for further assistance.

Basic Operation

| Symptom | Possible Cause | Possible Remedy |
|-----------------------------------|--|--|
| The instrument does not switch on | The batteries are not fitted | Fit new batteries and switch on |
| | The batteries are flat or very low | Fit new batteries and switch on |
| | The batteries are not correctly fitted | Remove the batteries and check the polarity of the batteries |
| | The instrument has become corrupted | Contact your local distributor or Pulsar Instruments Plc |

Calibration

| Symptom | Possible Cause | Possible Remedy |
|--------------------------------|---|---|
| The calibration fails: Too Low | The Acoustic Calibrator is not switched on | Switch on the Acoustic Calibrator and retry |
| | The Acoustic Calibrator is not fitted correctly | Check that the Acoustic Calibrator is fitted according to the instructions supplied |
| | The Preamplifier is not fitted correctly | Refer to page 13 for details of fitting the preamplifier |

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| | | |
|---------------------------------|--|--|
| | The microphone capsule is loose or not fitted | Check that the microphone capsule is tight and fitted correctly |
| | Calibration level set to a different level | Set the calibration level to the value provided by the Acoustic Calibrator using the AnalyzerPlus software |
| | The Microphone may be damaged | Contact Pulsar Instruments Plc or your local representative for assistance |
| The calibration fails: Too High | The Acoustic Calibrator is set to a higher level than the expected level | Set the Acoustic Calibrator to the correct level if it has more than one setting |
| The calibration fails: Unstable | The background noise level is within 15dB of the calibration level | Move to a location where the background noise level is more than 15dB below the calibration level |
| | The Microphone may be damaged | Contact your local distributor or Pulsar Instruments Plc |

Measurements & Settings

| Symptom | Possible Cause | Possible Remedy |
|--|---|--|
| The measurement stops after a set time | The Single Measurement timer has been set to a preset value | Change the Single Measurement timer duration or disable it |
| | The Single Measurement timer has been set to a user defined value | Change the Single Measurement timer duration or disable it |

Configuring the instrument from AnalyzerPlus

Connect the Nova® to your PC using the supplied mini-B USB cable using the USB connector under the removable rubber connector panel at the bottom of the instrument.

When the AnalyzerPlus software is run, it will automatically find the instrument plugged in and look for completed measurements to download. The popup download window can be closed.

At the bottom of the main screen the Configure button next to the instrument details will bring up the Instrument Settings pop-up window, where the relevant instrument settings can be configured.

For further information on how to use the AnalyzerPlus software please refer to the software help files/videos on our website www.pulsarinstruments.com under the software tab for each of the Pulsar Nova® models.

Additional Information

Additional technical information on the Nova® can be found on the Pulsar Instruments website.

Please visit <http://pulsarinstruments.com/technical-support/> for the latest tips, hints, help and videos.

Appendices

IEC 61672 test data

Technical data for IEC 61672 testing is contained in the **Part B** document which can be downloaded from the Pulsar Instruments plc website.

Visit <http://pulsarinstruments.com/technical-support/> to download the latest information.

This chapter of the manual contains the overall specifications for the Nova® range of sound level meters.

Common Specifications

Applicable Standards

IEC 61672-1:2013 Electroacoustics - Sound level meters –
Part 1: Specifications Class 1 or Class 2 Group X

- Model 41
- Model 42
- Model 43
- Model 44
- Model 45
- Model 46

IEC 60651:2001 Sound level meters Type 1 I or Type 2 I

- Model 41
- Model 42
- Model 43
- Model 44
- Model 45
- Model 46

IEC 60804:2000 Integrating-averaging sound level meters Type 1 or Type 2

- Model 41 – only if option installed
- Model 42 – only if option installed
- Model 43
- Model 44
- Model 45
- Model 46

IEC 61252:2002 Electroacoustics - Specifications for personal sound exposure meters
Personal Sound Exposure Meters

- Model 41 – only if option installed
- Model 42 – only if option installed
- Model 43 – only if option installed
- Model 44 – only if option installed
- Model 45
- Model 46

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ANSI S1.4 -1983 Specifications for Sound Level Meters (R2006)

Model 41
Model 42
Model 43
Model 44
Model 45
Model 46

ANSI S1.43 - 1997 Specifications for Integrating-Averaging Sound Level Meters (R2007)

Model 41 – only if option installed
Model 42 – only if option installed
Model 43
Model 44
Model 45
Model 46

ANSI S1.25:1991 Specification for Personal Noise Dosimeters

Model 41 – only if option installed
Model 42 – only if option installed
Model 43 – only if option installed
Model 44 – only if option installed
Model 45
Model 46

1:1 Octave Band Filters to IEC 61260:2001 Electroacoustics - Octave-band and fractional-octave-band filters & ANSI S1.11-2004 Octave-Band and Fractional-Octave- Band Analog and Digital Filters

Model 41 – only if option installed
Model 42 – only if option installed
Model 43 – only if option installed
Model 44 – only if option installed
Model 45
Model 46

| | |
|--------------------------|--|
| Microphone: | Class 1 Instruments: PM1 pre-polarized Free-field 1/2" Class 2 Instruments: PM2 pre-polarized Free-field 1/2" |
| Microphone Preamplifier: | PA40 Removable Preamplifier for Class 1 & Class 2 instruments |
| Total Measurement Range: | 24dB to 140dB RMS Single Range |
| Noise Floor: | <18dB(A) Class 1, <21dB(A) Class 2 |
| Frequency Weightings: | RMS: A, C, & Z (un-weighted) Measured Simultaneously Peak: A, C, & Z (un-weighted) Measured Simultaneously |
| Time Weightings: | 'F' (Fast), 'S' (Slow) & 'I' (Impulse) Measured Simultaneously |
| Display: | High resolution OLED (Organic Light Emitting Diode) display with ambient light sensor & illuminated keypad |

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| | |
|---|--|
| Display of: | Measured parameters Recalled Measurement Parameters (Data Logging Versions) Battery Level & External Power Connection Overload & Under Range Time & Frequency Weighting Elapsed Measurement Time Instrument status |
| Memory: | 4GB removable Compact Flash card |
| Time History Data Rates (Global settings): | 10ms, 62.5ms, 125ms, 250ms, 1/2 sec, 1 sec, 2 sec (User selectable via AnalyzerPlus software) |
| Audio Note Audio Recording: | User selectable recording of audio voice notes before each measurement for download to AnalyzerPlus software. 30 seconds per recording with audio files downloaded with noise measurement information. |
| Size: | 280mm x 80mm x 42mm with preamp and microphone |
| Weight: | 440g without batteries |
| Batteries: | 6 x AA |
| Battery life: | Typically 30+ hours with Alkaline Batteries Typically 50 hours with Lithium AA Non-Rechargeable batteries |
| Note: Battery life is dependent upon the battery type and quality and screen brightness | |
| External Power: | 5v-15v via Multi I/O socket |
| Tripod Mount: | 1/4" Whitworth socket |
| Connections: | USB 2.0 Mini B to PC Multi-pin IO for external power and AC & DC output 3.5mm Stereo Jack for AC output |
| Case Material: | Rugged die cast aluminium with soft touch back & elastomer keypad |
| Environmental: | |
| Temperature: Operating: | -10°C to +50°C |
| Temperature Storage: | -20°C to +60°C |
| Humidity: | Up to 95% RH Non Condensing |
| Electromagnetic performance: | Emmissions: EN 61326-1:2006 Immunity: EN 61326-1:2006 |
| Language options: | English, French, German, Spanish and Italian. |

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Software Support: AnalyzerPlus Download, Configuration & Analysis software as standard.
Compatible with Microsoft Windows XP, Vista, 7 (32bit & 64bit) & 8 (32bit & 64bit)

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Views

Sound Level View

- Sound Level: L_{xy} , $x=A, C, Z$; $y= 'F'$ (Fast), $'S'$ (Slow) & $'I'$ (Impulse)
- Maximum Sound Level: L_{xyMax} where $x=A, C, Z$; $y= 'F'$ (Fast), $'S'$ (Slow) & $'I'$ (Impulse)
- Minimum Sound Level: L_{xyMin} where $x=A, C, Z$; $y= 'F'$ (Fast), $'S'$ (Slow) & $'I'$ (Impulse)
- Measurement Run Time

Leq View

- L_{xeq} where $x = A, C, Z$
- LC_{Peak} , LZ_{Peak} ,
- $LC_{eq-LAeq}$,
- L_{xE} where $x = A, C, Z$
- $LA_{eq,I}$ (Also known as $LA_{Ieq,t}$) - replaces $LC_{eq-LAeq}$ when Impulse Time Weighting is selected)
- Graphical: Short LA_{eq} , LC_{Peak}
- Measurement Run Time
- Taktmaximal levels and integrated levels, and 3 and 5 seconds, $'F'$ (Fast) and $'I'$ (Impulse) time weighted (only displayed when set to German language)

1:1 Octave Band View

- Graphical display of L_F real time octave bands with the highest value for each band (updated every 1/16 seconds) from 32Hz to 16kHz (16Hz 1:1 Octave Band stored for display in the AnalyzerPlus software)
- Graphical display of cumulative Leq for each octave band
- Graphical display of cumulative LA_{eq} for each octave band
- Numeric display of $Leq,1s$ real time octave bands (updated every 1 second)
- Numeric display of cumulative Leq for each octave band
- Numeric display of cumulative LA_{eq} for each octave band
- Measurement Run Time

Ln View

Measures and stores statistical values during measurements

Provides 7 Ln values to 0.1dB resolution

- L1.0
- L5.0
- L10.0
- L50.0
- L90.0
- L95.0
- L99.0

Ln values are calculated using 1/16 second L_{AF} samples by default. Sampling rate, time weighting and frequency weighting can be changed in AnalyzerPlus.

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Dose View

| | | |
|----------------------|---------------|---------------|
| Integrator 1 | Integrator 2 | Integrator 3 |
| Run Time | Run Time | Run Time |
| Leq1 | Leq2 | Leq3 |
| LEP,d (Lex) | TWA | TWA |
| Dose % | Dose % | Dose % |
| Est Dose % | Est Dose % | Est Dose % |
| Configuration | Configuration | Configuration |
| Measurement Run Time | | |

Stored Measurements

Sound Level View

- Overall: Lxy Max where x = A, C, Z; y = 'F' (Fast), 'S' (Slow) & 'I' (Impulse) (9 items).
- Time History: Lxy Max where x = A, C; y = 'F' (Fast), 'S' (Slow) & 'I' (Impulse) (6 items).
- Time History: Lxy Min where x = A, C; y = 'F' (Fast), 'S' (Slow) & 'I' (Impulse) (6 items).
- Measurement Run Time
- Time & Date of Measurement Start
- Time History data rate is user configurable in the global settings

Leq View

- Overall: LCPeak, LZPeak. LAeq, LCEq, LZeq (5 items).
- Time History: LAeq, LCEq, LZeq
- Time History: LCPeak, LZPeak, LAPeak
- Time History: LAeqI (also known as LAIeq,t)
- Time History data rate is user configurable in the global settings
- Measurement Run Time
- Time & Date of Measurement Start

Dose View

- Overall: LAeq2, LAeq3. (Lavg stored, TWA, % Dose & Est % Dose also available)
- Time History: LAeq2, LAeq3
- Time History data rate is user configurable in the global settings
- Measurement Run Time
- Time & Date of Measurement Start
- Integrator 1 values are stored in the Leq module

1:1 Octave Band View

- Overall Leq for each octave band
- Overall LAeq for each octave band
- Time History: Leq for each octave band. (10 items) stored at the Global data rate (minimum duration of 1/16 seconds)

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- Measurement Run Time
- Time & Date of Measurement Start

Ln View

- 7 Ln values for each measurement

Menu / Quick Settings

The Quick Settings available are:

UK: 3dB, No Threshold, No Time Weighting, Criterion Level of 85dB

EU: 3dB, No Threshold, No Time Weighting, Criterion Level of 85dB

OSHA HC & PEL

Integrator 2: 5dB, 80dB Threshold, Slow Time Weighting, 90dB Criterion Level

Integrator 3: 5dB, 90dB Threshold, Slow Time Weighting, 90dB Criterion Level

OSHA HC & ACGIH

Integrator 2: 5dB, 80dB Threshold, Slow Time Weighting, 90dB Criterion Level

Integrator 3: 3dB, No Threshold, Slow Time Weighting, 85dB Criterion Level

MSHA HC & EC

Integrator 2: 5dB, 80dB Threshold, Slow Time Weighting, 90dB Criterion Level

Integrator 3: 5dB, 90dB Threshold, Slow Time Weighting, 90dB Criterion Level

Custom

Custom settings defined by the AnalyzerPlus software

Electrical Outputs

AC Output

The AC Output is provided on the 3.5mm jack socket at the bottom of the instrument. Do not use a Stereo Jack Plug in this socket. Only use a 3.5mm Mono Jack Plug.

The AC output has four settings: a combination of High or Low levels and a 0 or +20dB amplifier.

Voltages and full scale levels are as follows:

High Levels (70-140dB):

0dB gain 1.3V pk-pk (450mV rms) at full scale 140dB

+20dB gain 1.7V pk-pk (600mV rms) at full scale 132dB

Low Levels (20-90dB):

0dB gain 400mV pk-pk (140mV rms) at full scale 90dB

+20dB gain 1.3V pk-pk (450mV rms) at full scale 90dB

The output is unweighted, i.e. Z-weighted.

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AC Output Cables

The AC Output should be used with a PSR174, PSR177 or PSR185 Cable.

These cables are available from Pulsar Instruments plc or your local distributor. Do not use any other cable with the Nova®. This may damage the instrument and invalidate your warranty.

DC Output

The DC Output is provided on the 18 Pin Multi-IO socket at the bottom of the instrument. The output is set to 25mV/dB with LAF updated 16 times per second.

DC Output Cables

The DC Output is available using a PSR174 Output Cable.

This cable is available from Pulsar Instruments plc or your local distributor. Do not use any other cable with the Nova®. This may damage the instrument and invalidate your warranty.

Accessories

The Nova® sound level meters can be used with a range of accessories. The most commonly used accessories are listed below.

General Accessories

- Model 105 – Class 1 Acoustic calibrator
OR
- Model 106 – Class 2 Acoustic calibrator
- K4 – Hard kit case
- WS90 – Windshield
- CP1 – Carry pouch for sound level meter and calibrator
- TR1 – Tripod

Outdoor Measurement Kit

- WK3 – Outdoor weatherproof kit with heavy duty outdoor microphone system

Replacement Microphone Capsules

- PM1 – Class 1 ½" Electret condenser microphone capsule
- PM2 – Class 2 ½" Electret condenser microphone capsule

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Cables

The Nova® sound level meters can be used with a range of cables. The standard cables are listed below.

Microphone Extension Cables

- PSR202 - 2m long Microphone extension cable
- PSR205 - 5m long Microphone extension cable
- PSR210 - 10m long Microphone extension cable

Alternative lengths of microphone extension cable are available on request.

Input & Output Cables

- PSR101 - 1m Mini-B to Type A USB cable
- PSR171 - Nova® power input cable, 2.1mm power jack, 2m long
- PSR174 - Nova® AC & DC output, 18 way to 2 x phono, 1m long
- PSR176 - Nova® 12v Battery pack cable 2m long to tinned ends with inline fuse
- PSR177 - Nova® AC output cable, 3.5mm mono to 3.5mm stereo jack, 2m long
- PSR185 - Nova® AC output cable, 18 way to phono, 1m long
- PSR190 - Nova® power input cable, 2.1mm power jack and mains power supply (Please specify Country)

NK:70 Random Incidence Adaptor



The NK:70 Random Incidence Adaptor is designed to modify the response of the microphone capsule from Free Field to Random Incidence in order to comply with the requirements of ANSI S1.4.

For instruments supplied for use outside of the USA, this adaptor may not be supplied. For further details, please contact your local representative.

To fit the NK:70 Random Incidence Adaptor, push the adaptor over the microphone grill. Do not attempt to remove the microphone grill as this may cause damage to the capsule.

To calibrate the instrument fitted with the microphone capsule, remove the NK:70 Adaptor and follow the instructions supplied with the instrument. Do Not attempt to calibrate the instrument with the NK:70 fitted.

Acoustic Calibrator Information

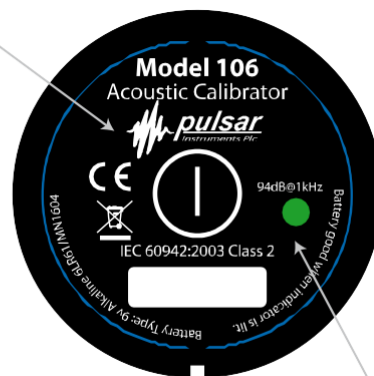
This chapter refers to the use of a Pulsar Instruments plc Model 105 or Model 106 Acoustic Calibrator.

Switching on the Calibrator

Press the Power Button on the end of the Calibrator to switch the unit on. The Indicator will illuminate to show that the unit is operating. The calibrator will automatically switch off after 5 minutes to preserve battery power.

To switch off the calibrator manually, press the power button again and the indicator will extinguish to show that the unit is switched off.

Power Button



Power Indicator

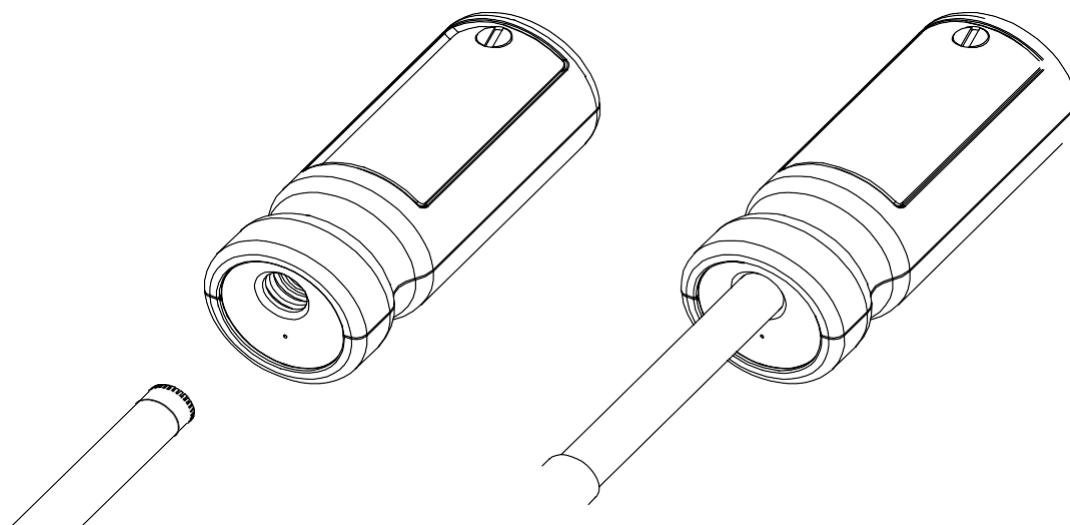
Permanent 'On' Mode

For some applications there may be a need to have the calibrator switched on continuously. To allow for this, the calibrator can be turned on by pressing and holding the power button for three seconds. Release the button and the indicator will flash to show that the unit is in permanent 'ON' mode. Press the power button to switch off the calibrator.

Calibrating a Sound Level Meter

Push the microphone of the sound level meter into the cavity at the end of the calibrator. Ensure the microphone is fully inserted into the cavity and is past the 'O' ring seals.

The microphone should be parallel to the body of the calibrator. Also ensure that the small bleed-hole next to the microphone cavity is not blocked as this could cause damage to the microphone.



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The Nova® sound level meter will automatically make adjustments for the level produced by the acoustic calibrator and the microphone type fitted to the instrument.

Background Noise

In order for the calibrator to operate as intended, the ambient acoustic noise level should be no greater than 80dBA.

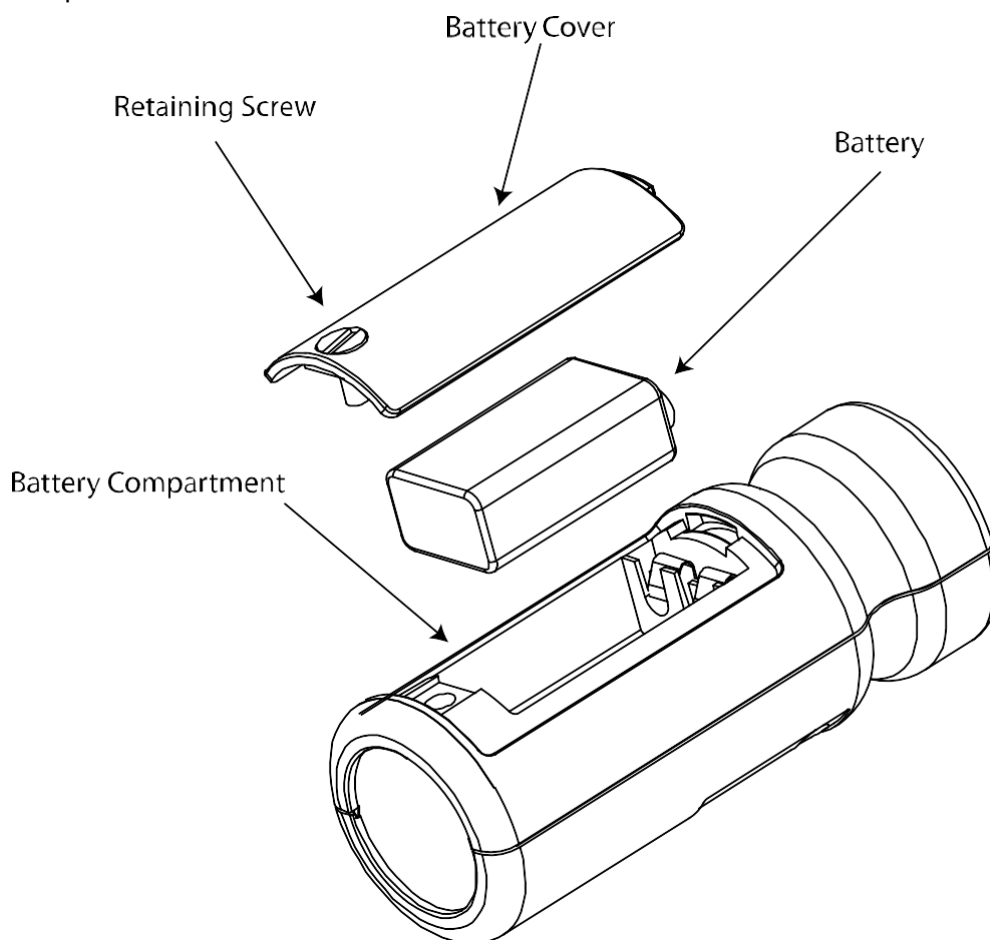
Stabilisation

In order for the sound pressure level and frequency to stabilise after switching the calibrator on when coupled to a microphone, a period of at least 3 seconds should be allowed before performing a calibration.

Changing the Battery

The Model 105 or Model 106 acoustic calibrators use a single 9v alkaline battery. This type of battery is known as 6F22 or NEDA 1604. It is also commonly known as PP3.

1. Unscrew the screw holding the battery cover on, using a coin or the keyring provided



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2. The battery, type 6F22 (PP3) can now be eased out of its holder and replaced. The battery should be eased out terminal side first by pushing against the spring at the other end.

Ensure that the battery is inserted with the correct polarity with the negative terminal at the contact with the larger cut out.

Battery type

The battery should be an alkaline battery, not an ordinary dry cell. The battery is 9 volts when new and will operate the calibrator down to 6.4 volts.

When the battery voltage is below 6.6 volts but above 6.4 volts, the power LED will flash to indicate that the battery voltage is low. When the battery voltage is below 6.4 volts the calibrator will not turn on.

A discharged battery may allow switch-on but will soon drop in voltage and indicate low battery or switch off.

Specifications

| | |
|---------------------------|--|
| Frequency | 1kHz \pm 1% |
| Sound Level | 94dB re 20 μ Pa |
| Standardisation | Model 105 - IEC 60942:2003 Class 1 Model 106 - IEC 60942:2003 Class 2 |
| Distortion | Less than 2% |
| Operating Humidity | 25 to 90% Relative Humidity |
| Operating Static Pressure | 65kPa to 108kPa |
| Operating Temperature | -10°C to +50°C |
| Storing Temperature | -20°C to +60°C |
| Effective Volume | 6.19 cm ³ \pm 0.2 cm ³ |
| Cavity Diameter | 0.525 inch |
| Battery | 1 x 9v 6F22 (Neda 1604) |
| Battery Life | Approx 15 Hours Continuous Use |
| Battery Voltage | 9v Nominal (10v Max, 6.4v Min) |
| Weight With Battery | 185g |
| Dimensions | 135mm x \varnothing 48mm |

Technical Information

The normal mode of operation of the calibrator is with the unit switched on. When the LED indicates the unit is switched on this produces the greatest radio frequency emissions.

The calibrator continues to function after exposure to contact discharges up to 4kV and air discharges up to 8kV, for both positive and negative voltages relative to earth ground. The calibrator conforms to IEC 60942:2003 for a modulated root-mean-square electromagnetic field strength of 10 V/m.

The maximum susceptibility to power and radio frequency fields is with the cavity facing away from the emitter with the battery compartment facing the table, the antenna polarisation horizontal and the calibrator switched on.

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Free Field Correction

When calibrating a microphone which is to be used for free field measurements, a small correction may be necessary to compensate for the difference between the microphone's free field response at 'zero degrees' or 'head-on' incidence and the pressure level generated by the calibrator.

The correction is typically -0.3dB for ½ inch microphones (making the effective calibration level 93.7dB).

Calibration corrections are listed below for the Pulsar Instruments plc ½" Capsules and three microphone capsules commonly used in Calibration Laboratories:

Microphone Correction Values

| Microphone Type | Calibration Correction | Effective Calibration Level |
|-----------------|------------------------|-----------------------------|
| PM1 | -0.3dB | 93.7dB |
| PM2 | -0.3dB | 93.7dB |
| B&K 4134 | 0dB | 94.0dB |
| B&K 4180 | 0dB | 94.0dB |
| B&K 4192 | 0dB | 94.0dB |

Example:

An example of the procedure used to calculate the value for an PM1 microphone is shown below :

Level = 94.0dB + Microphone Correction
Level = 94.0dB + (-0.3dB)
Level = 93.7dB

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CE Certificate of Conformity

Pulsar Instruments plc Filey UK



Manufacturer:

Pulsar Instruments Plc
The Evron Centre
John Street
Filey
North Yorkshire
YO14 9DW
United Kingdom



Tel: +44 1723 518011

Equipment Description

The following equipment manufactured after 1st January 2012:

Model 41 Sound Level Meter
Model 42 Sound Level Meter
Model 43 Sound Level Meter
Model 44 Sound Level Meter
Model 45 Sound Level Meter
Model 46 Sound Level Meter
Model 105 Acoustic Calibrator
Model 106 Acoustic Calibrator

Along with their standard accessories

According to EMC Directive 93/68/EEC meet the following standards:

EN 61326-1:2006

EMC : Generic emission standard for residential, commercial and light industrial environments.

EN 61326-1:2006

EMC : Generic immunity standard for residential, commercial and light industrial environments.

A handwritten signature in black ink, appearing to read "D. Cartman".

Dan Cartman
Chief Engineer

Dated 1st August 2013

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Warranty

1. This document is a short summary of the full warranty document and is in ordinary English; it is not a legal document.
2. The warranty covers any new acoustic measuring instrument manufactured by Pulsar Instruments plc after 21st October 2011.
3. The warranty covers all faults, including parts and labour, on the instrument resulting from manufacturing defects or accidental damage (except to the microphone capsule or the display) for the period given in paragraph (5) below,
4. The warranty does exclude damage to an instrument caused by the use of any accessories or components not specified or recommended by Pulsar Instruments plc.
5. The initial period of the warranty is 2 (two) years or 104 weeks from the date of purchase as a new instrument from Pulsar Instruments plc or their formally approved distributors OR 126 weeks from the date the instrument passed its final manufacturing inspection at Pulsar Instruments plc - whichever is the shorter.
6. Any rechargeable battery only has the battery manufacturer's warranty (usually one year) however there will be a reduced charge for replacing rechargeable batteries during the annual "Routine Verification" process. (Commonly referred to as "Annual calibration" and formally as IEC 61672 part 3 verification)
7. On completion of each routine verification by Pulsar Instruments plc, the instrument will automatically be given an additional free 12 month warranty. It follows that should the instrument be routinely verified by Pulsar Instruments plc every year, the warranty is effectively continuous to a maximum of 7 (seven) years from the date of purchase.
8. There will be a charge for IEC 61672 -3 routine verification and the price is published in the Service Price List.
9. The customer is responsible for all shipping, duty and other charges relating to the routine servicing and calibration of the instruments, except where the instrument is deemed to be faulty due to manufacturing defects, when Pulsar Instruments plc will cover the shipping, duty and other charges relating to the repair of the instrument. Pulsar Instruments plc reserves the right to decline an instrument under the warranty where there is clear evidence of tampering or where no fault is found. In these cases, the customer will be liable for any shipping, duties or charges.
10. Pulsar Instruments endeavours to ensure stocks of service components for a full fifteen year period but of course cannot guarantee parts availability as certain components become obsolete or are discontinued.
11. If a sub-component becomes obsolete and/or stocks are depleted then Pulsar Instruments will endeavour to facilitate a repair but may not be able offer the same length of guarantee.
12. In the event of any dispute on the terms of the warranty Pulsar Instruments plc will accept pendulum arbitration by the United Kingdom Institute of Acoustics Ltd.
13. The warranty does not in any way reduce any legal right of the buyer or user of the sound level meter; it is in addition to all legal rights determined by the European Union.
14. Pulsar Instruments plc reserves the right to amend or update these terms and conditions without prior notice.

Guarantee

Pulsar Instruments Plc. also offer a 7-year guarantee on all their units manufactured after 21st October 2011, providing that the instrument has undergone annual "Routine Verification" as described in the relevant IEC standard. The guarantee covers all parts and labour excepting only damage caused by the user.

Because of the unique fragility of microphones, only internal short or open circuits are accepted as faults and not accident damage.

The guarantee requires the user to return the unit to their nearest authorised Pulsar Instruments Plc. distributor/agent. This guarantee is in addition to any statutory rights in your country.

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Pulsar Instruments Contact

Pulsar Instruments Plc. also have approved distributors and agents in many countries worldwide. For details of your local representative, please contact Pulsar Instruments Plc. at the address below. Contact details for Pulsar authorised distributors and agents are also available from the Internet Web site at the address shown below.

Registered Office, factory & commercial and customer contact

Pulsar Instruments Plc
The Evron Centre
John Street
Filey
North Yorkshire
YO14 9DW

Tel: +44 1723 518011
Fax: +44 1723 518043

E-Mail: sales@pulsarinstruments.com
Technical Support: support@pulsarinstruments.com

Websites:

UK site www.pulsarinstruments.co.uk
English Language www.pulsarinstruments.com
German Language www.pulsarinstruments.de
French Language www.pulsarinstruments.fr

Distributors www.pulsarinstruments.com/distributors

www.linkedin.com/company/pulsar-instruments-plc

Twitter: [@PulsarMeters](https://twitter.com/PulsarMeters)