

Trojan^{LITE}

Noise Nuisance Recorder



Instrument Handbook

Trojan^{LITE}
Noise Nuisance
Recorder

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Updates

In the interests of continuous product improvements, Cirrus Research 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 web site at www.cirrusresearch.co.uk

Instrument Serial Number & Information

Please record the serial number and purchase date of your instrument below along with details for any accessories supplied with your optimus sound level meter.

Instrument	Serial Number	Purchase Date
_____	_____	_____
_____	_____	_____
_____	_____	_____

Publication History

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About this user manual

- The instructions in this user manual refer to the operation of the Cirrus Research plc CK:199L Trojan^{LITE} Noise Nuisance Recorder
- In this manual, "instrument" is used as a general reference for the sound level meter or Trojan^{LITE} Noise Nuisance Recorder, "remote control" for the RC:199 Remote Control Unit and "calibrator" for an acoustic calibrator.
- This manual describes the recommended method of operation of use for the instrument and any described accessories.
- Throughout this manual, icons and symbols may be used to highlight important information and these sections should be read carefully.

On the next page is a Quick Start Guide to using the Trojan^{LITE}.

In addition to this guide, we would recommend that you read through this manual before using the Trojan^{LITE} for the first time to make sure that you are familiar with the functions and features.

Getting help

We have a range of support resources available on our websites which can help you get the best from your equipment.

In particular, we'd recommend that you look at the videos that we've posted on our YouTube channel which show how to use the NoiseTools software.

www.cirrusresearch.co.uk/trojan-videos

If you can't view YouTube videos, you can also see these on our Vimeo channel using the link below:

<https://vimeo.com/album/3779804>

If you have a question to ask or if you need to raise a support ticket, you can use our support website at:

<http://support.cirrusresearch.co.uk/>

Introduction



The Trojan^{LITE} is an advanced noise nuisance recorder that has been designed to be simple to both setup and operate.

The system features a precision data logging sound level meter which records both the noise levels and audio recordings over long periods of time.

Once the equipment is installed and setup, the user has no control over the operation of the sound level meter which will measure and store noise levels for up to 30 days in a single session.

The sound level meter is configured to store 24 hour blocks of measurement data, repeating until either the memory is full or the instrument is switched off.

The only interaction needed by the user is to start and stop the audio recordings using the standard wireless remote control or the optional wired remote control.

When the remote control is activated, the instrument will start to record audio and will continue to do so until the stop button is pushed on the remote control.

If the user forgets to press stop, the instrument will end the audio recording after 5 minutes, whilst the measurement of noise levels continues.

The system also features a pre and post trigger system that allows the audio recordings to include 20 seconds of information from before and after the user starts and stops the recording.

If the power is removed, for example, if the user unplugs the mains power supply, the unit will run on its internal batteries for approximately 8 hours with a new set of batteries. Changing the batteries is covered in the optimum sound level meter user manual supplied with the Trojan^{LITE}.

If the power is reconnected before this time, the system will simply revert to mains power and continue unaffected.

If the mains power is not reconnected and the internal batteries are run down, the instrument will store the noise data and audio recordings and then shut down safely.

When the mains power is reconnected, the instrument will reboot and after 10 minutes (or when the remote control is pressed if this is sooner) restart measuring and storing noise data.

This reduces the risk of data being lost when power is removed from the system.

All of the measurements are stored directly to a high performance memory card which is internal to the system.

The measurements are stored continuously which prevents data loss and ensures that the data cannot be tampered with or adjusted before it is downloaded to the reviewing software.

Quick Start Guide

- Connect cables
 - Microphone Cable & Power Cable If not already connected
 - Connect Microphone & Preamplifier
 - Connect microphone & preamplifier to cable Take care!
 - Connect to tripod mount Take care!
 - Plug in power supply
 - Switch on power supply
 - Check the clock on the Sound Level Meter Adjust if needed
 - Calibrate sound level meter
 - Attach acoustic calibrator Switch on calibrator
 - Press Calibrate on sound level meter Wait for calibration cycle
 - Remove acoustic calibrator Take care!
 - Attach windshield
 - Start measurement
 - Press start key on sound level meter
 - Use the remote control to start & stop audio recordings
 - Stop measurement
 - Press the Stop key on the sound level meter
 - Press the Exit button on the sound level meter
 - Switch off
 - Press and hold the power button
 - Disconnect microphone & preamplifier
 - Remove windshield
 - Remove from tripod mount
 - Store in case
 - Download the measurements
-

Getting started

It is recommended that you connect the sound level meter to the NoiseTools software and check that the instrument is configured as required before deployment.

See Appendix 1 Configuring the sound level meter for noise nuisance measurements for details of the configuration options that are specific to the Trojan^{LITE} Noise Nuisance Recorder.

Connecting the cables

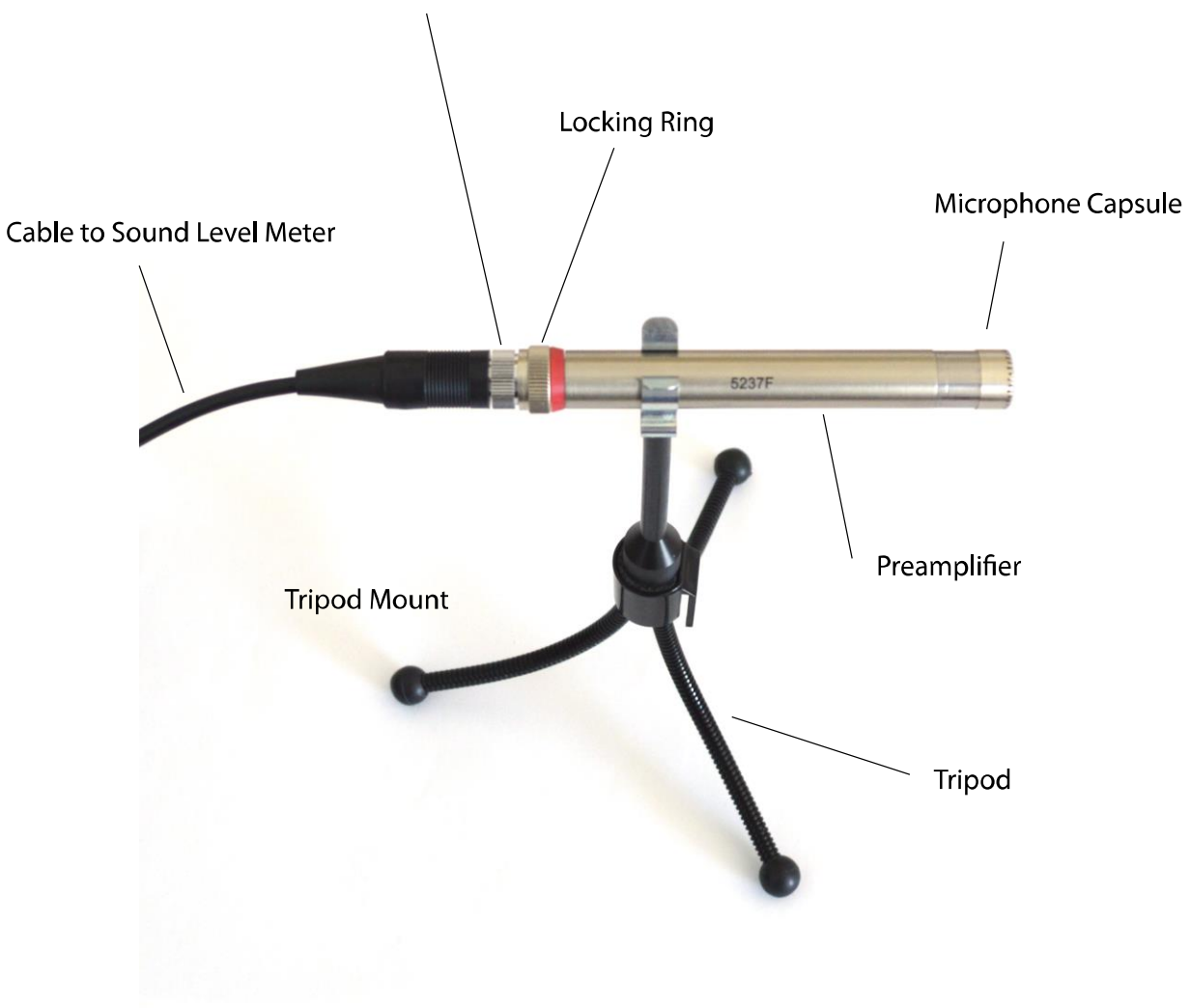
The Trojan^{LITE} is shipped with the cables connected so that it can be setup quickly and easily.

The mains power supply and microphone cable can be disconnected from the case. This allows the cables to be replaced if they become damaged.

Connecting the microphone & preamplifier

The microphone and preamplifier are stored inside the case next to the sound level meter. Carefully remove the microphone & preamplifier from the case and connect to the microphone extension cable.

DO NOT TWIST THE CABLE OR PLUG



1. Align the pins in the preamplifier to the holes in the cable plug
2. Gently insert the plug into the socket
3. Tighten the Locking Ring so that it is finger-tight only

DO NOT TWIST THE CABLE OR PLUG AS THIS WILL DAMAGE THE CABLE

Take care when connecting the cable to the preamplifier. The socket and plug will only connect in one orientation and care should be taken to ensure that the plug and socket are correctly aligned.

Mounting the microphone

The microphone and preamplifier are mounted onto a tripod which can be positioned away from the main case in the most appropriate location.

The tripod mount clips onto the preamplifier to hold it securely.

Attach the windshield to the microphone. This will help to protect the microphone from damage.

Switching on

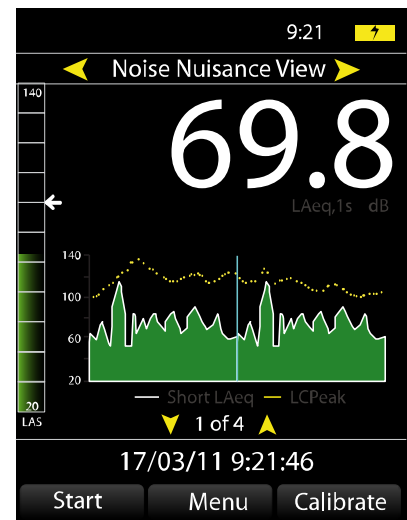
Connect the mains power supply to a socket and switch on the power.

The Green Power Indicator on the Receiver unit will light up and the instrument will start.

When the instrument has booted, the display will switch to showing noise levels.

At the top of the screen the instrument will show **Noise Nuisance View**.

The main display will show the current sound level as a 1 second LAeq value and the graph below shows the noise profile or time history.



When the instrument is not running or recording, this graph will be displayed in green with yellow markers above showing the peak noise levels.

The instrument is not recording or storing data at this point.

If a measurement is not started within 10 minutes, the instrument will automatically start itself and will begin to record noise levels.

Check the instrument clock

All of the noise measurements and audio recordings made by the Trojan^{LITE} are stamped with the current time and date. It is important that the internal clock in the instrument is set correctly.

At the bottom of the main screen, above the three soft keys, is the current time and date of the instrument. If this is not correct, press the menu key and select Set Clock.

Follow the instructions on screen to set the time and date.

Press **OK** and **Back** to return to the main screen.

Memory Size with audio recordings

Audio recordings take up much more memory than the noise levels measurements and so the Trojan^{LITE} is fitted, as standard, with a 4GB internal memory card.

This allows the instrument to store up to 24 hours of audio recordings. The instrument will also store 30 days of noise level measurements alongside the audio recordings.

Calibrating the instrument

The instrument should be calibrated before each measurement. To calibrate the instrument, switch on the acoustic calibrator and verify that the green indicator light is showing on the calibrator.

Carefully attached the calibrator to the microphone and press the **Calibrate** key on the sound level meter.

The instrument will not perform a calibration. When this is complete and has been successful, the display will show 93.7 and the instrument is ready to be used.

Press **OK** return to the main screen.

Attached the windshield to the microphone to protect it from damage.

Starting a measurement

To start a new measurement, press the **Start** key on the sound level meter.

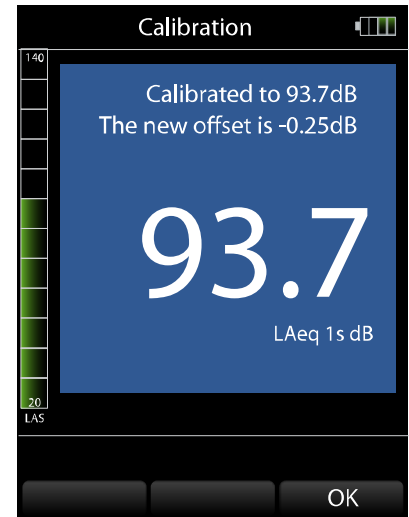
The first measurement will run from when the start button is pressed up to midnight. At that time, the current measurement will be stored and a new 24 hour measurement started. This will continue until the instrument is stopped.

The display will change and in the top left corner will be shown a red spinning indicator. This shows that the instrument is now measuring and storing noise levels.

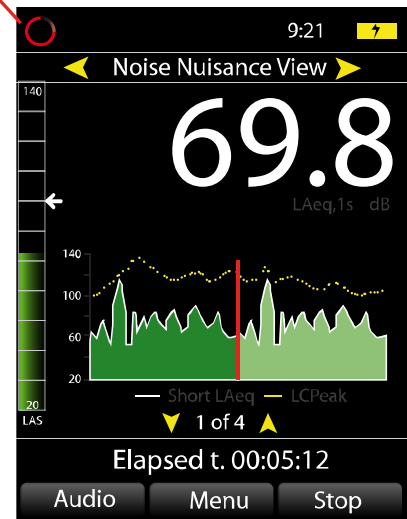
The main screen will now show the overall LAeq as the large number with the current 1 second LAeq and LAFmax shown below.

The graph will change colour from a dark green to a light green to show that the data is being recorded.

The case can be closed and locked ready for the user to make audio recordings.



Measurement
Running



Making a recording

Audio recordings are controlled by the Wireless RC:199 Remote Control.

Starting a recording

To start an audio recording, press the **Record** button on the Remote Control.

The red **Indicator Light** on the Remote Control will show when the key is pressed.

Recording Indicator on the lid of the case will flash blue and then turn red.

This can be seen on the top of the case and is labelled as the Record indicator.

When an audio recording is active, the graph on the instrument display will be coloured blue.

The noise level bar at the left hand side of the display will also be shown in blue and the Audio key will be highlighted.

The maximum length of a single audio recording is 5 minutes. This ensures that if the user forgets to stop the recording using the remote control, the memory of the instrument is not filled with excessive and possibly unwanted recordings.

If the recording reaches the 5 minute limit, the instrument will automatically stop the audio recording and store the information. The measurement of noise levels will continue as normal.

Stopping a recording

To stop an audio recording, press the **Stop** button on the Remote Control.

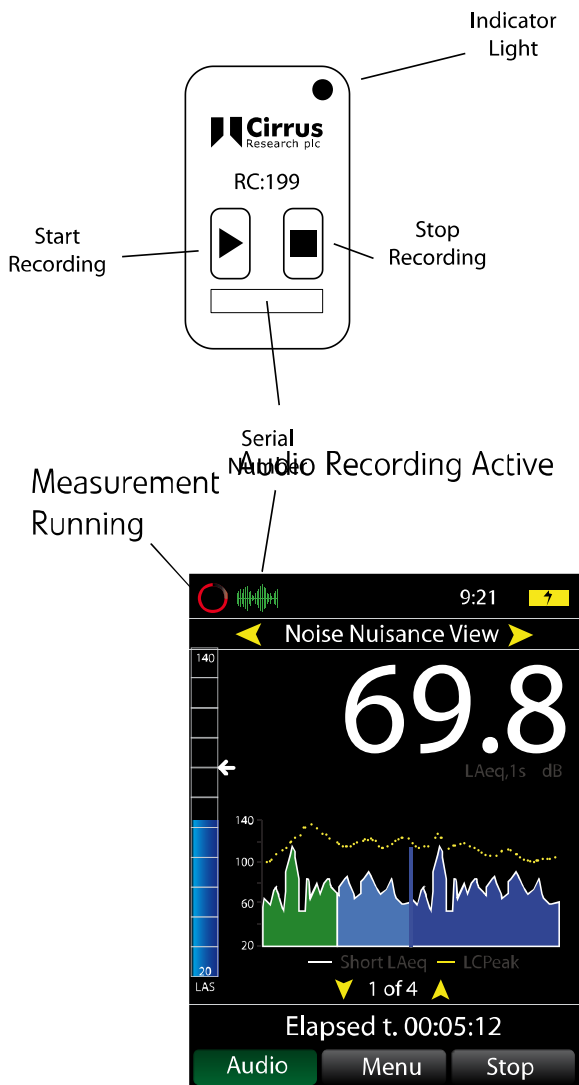
The Record indicator will flash blue and then go out. The audio recording has now stopped. The sound level meter will continue to measure and store the noise levels.

Pre-Trigger & Post-Trigger

The Trojan^{LITE} provides a Pre-Trigger and Post-Trigger function for the audio recordings. As standard, these are both set to 20 seconds.

When a recording is activated, the instrument will store the previous 20 seconds of audio from before the button was pressed and when a recording is stopped, the instrument will continue to store audio for a further 20 seconds.

When the Post-trigger is active, the Record indicator will not be lit but the audio will still be recorded.



Ending a measurement

To end a measurement, open the case and press the **Stop** button on the instrument. The measurement will be stopped and the data stored into memory.

If the instrument has been left unattended for more than 15 minutes with the case closed, the display will be switched off to reduce power consumption.

Press any key on the instrument to activate the display and then press the Stop button.

The instrument will show the overall LAeq,t and LAFmax values for the measurement.

Press the **Exit** key to return to the main screen.

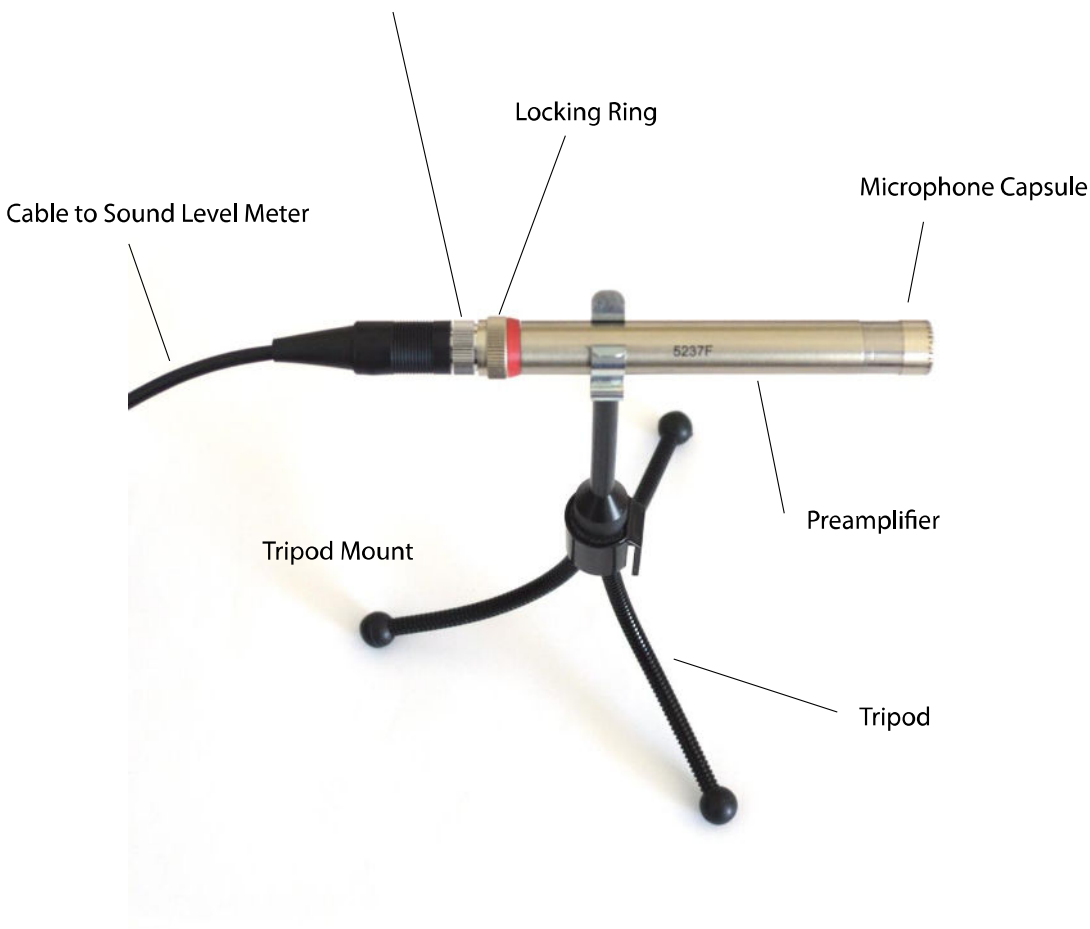
Packing away the instrument

Before packing the instrument away, switch off the instrument. Press and hold the power button on the side of the sound level meter until the instrument has switched off.

Disconnect the mains power supply from the socket.

The microphone and preamplifier can be stored in the case along with the wireless remote control units. This will protect the microphone from damage during transit and storage.

DO NOT TWIST THE CABLE OR PLUG



To remove the preamplifier from the cable, carefully loosen the Locking Ring until the cable can be removed.

Do not attempt to twist or turn the cable whilst it is connected to the preamplifier. This may damage the cable and prevent the instrument from working correctly.

Do not remove the microphone capsule from the preamplifier.

The microphone cable and mains power supply can be disconnected from the case if required. This is not essential and the cables can be stored in the backpack when connected to the main case.

Store the accessories such as the tripod in the backpack.

Downloading data to the NoiseTools software

The noise measurements and audio recordings are downloaded directly from the instrument into the NoiseTools software. This program allows measurements to be viewed and audio recordings replayed as well as reports created and analysis of the information to be made.

This section gives a brief overview of the software and the process to download, display and view measurements, as well as how to listen to an audio recording.

Connecting to a PC

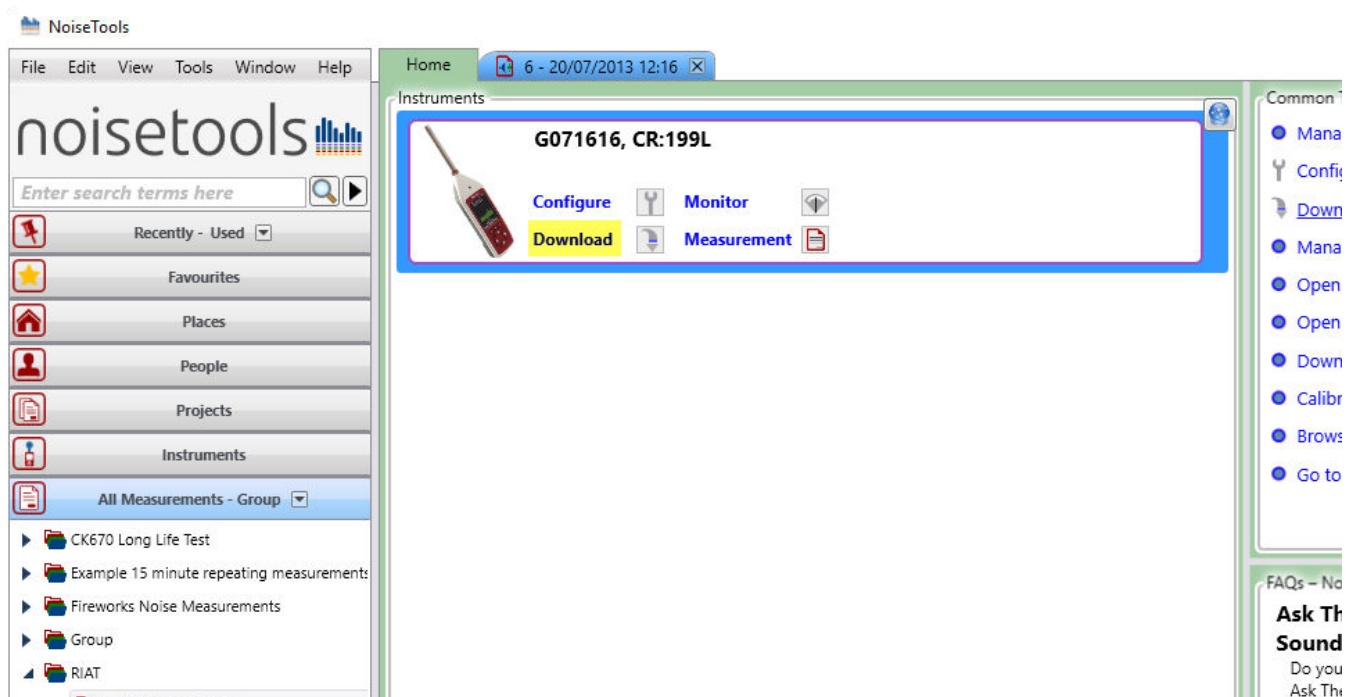
Data is downloaded from the sound level meter via a USB cable which is fitted to the unit. A USB cable is fitted to the Trojan^{LITE} to allow data to be downloaded without removing the instrument from the case.

The NoiseTools software should be installed and running before connecting the Trojan^{LITE} to the PC.

Connect the free end of the USB cable to a USB socket on the PC. The instrument will switch on and the NoiseTools software will detect the instrument ready for download.

Downloading measurements

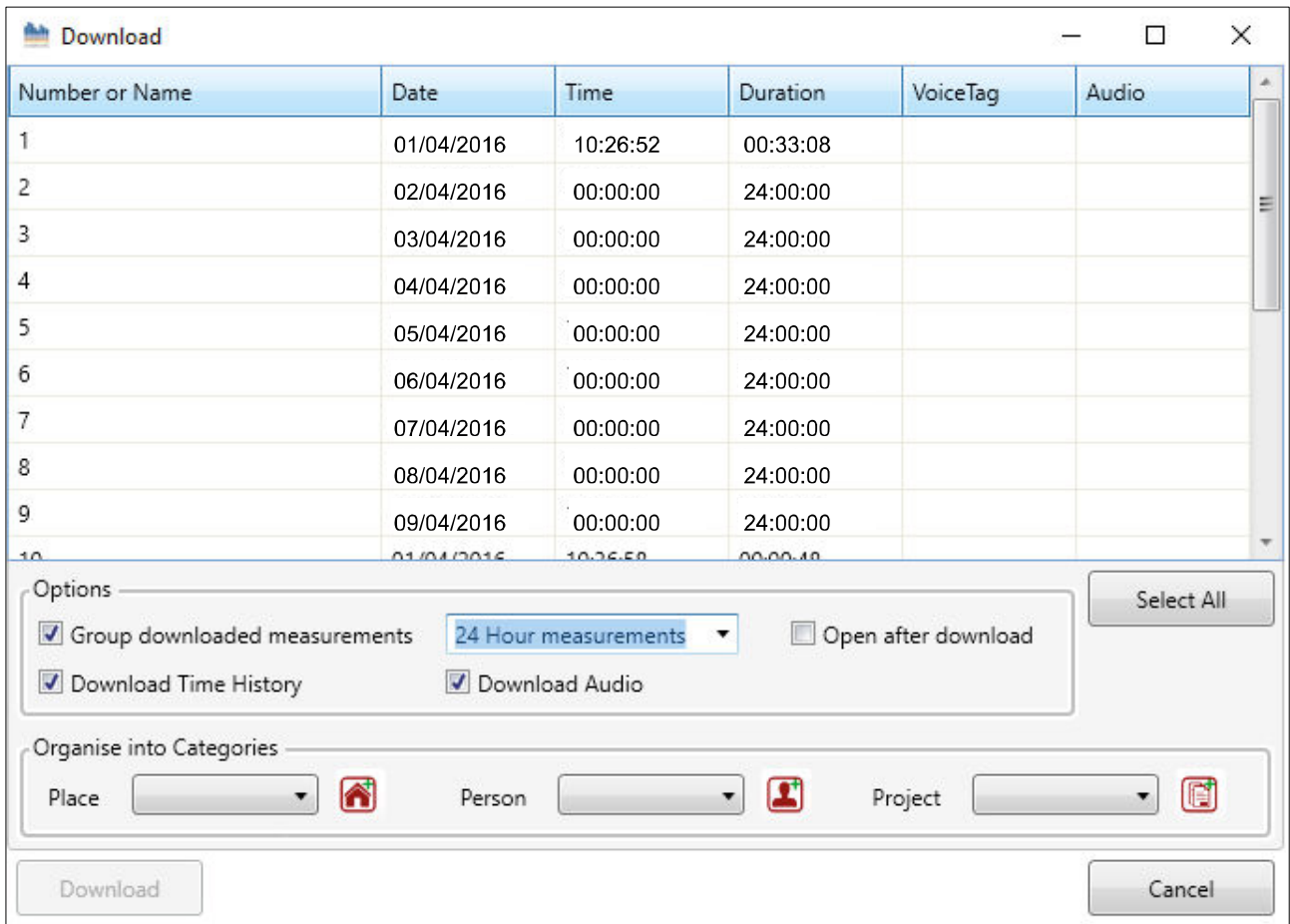
To start the download process, click the download button as shown below.



Selecting measurements

The download window will open and the list of measurements currently stored in the instrument will be shown as below.

When you have connected the instrument to the NoiseTools software, in the Download window you will see a series of 24 hours measurements as shown below:



To download the measurements, click Select All.

Allocate the measurements to a Place, Person or Project as normal.

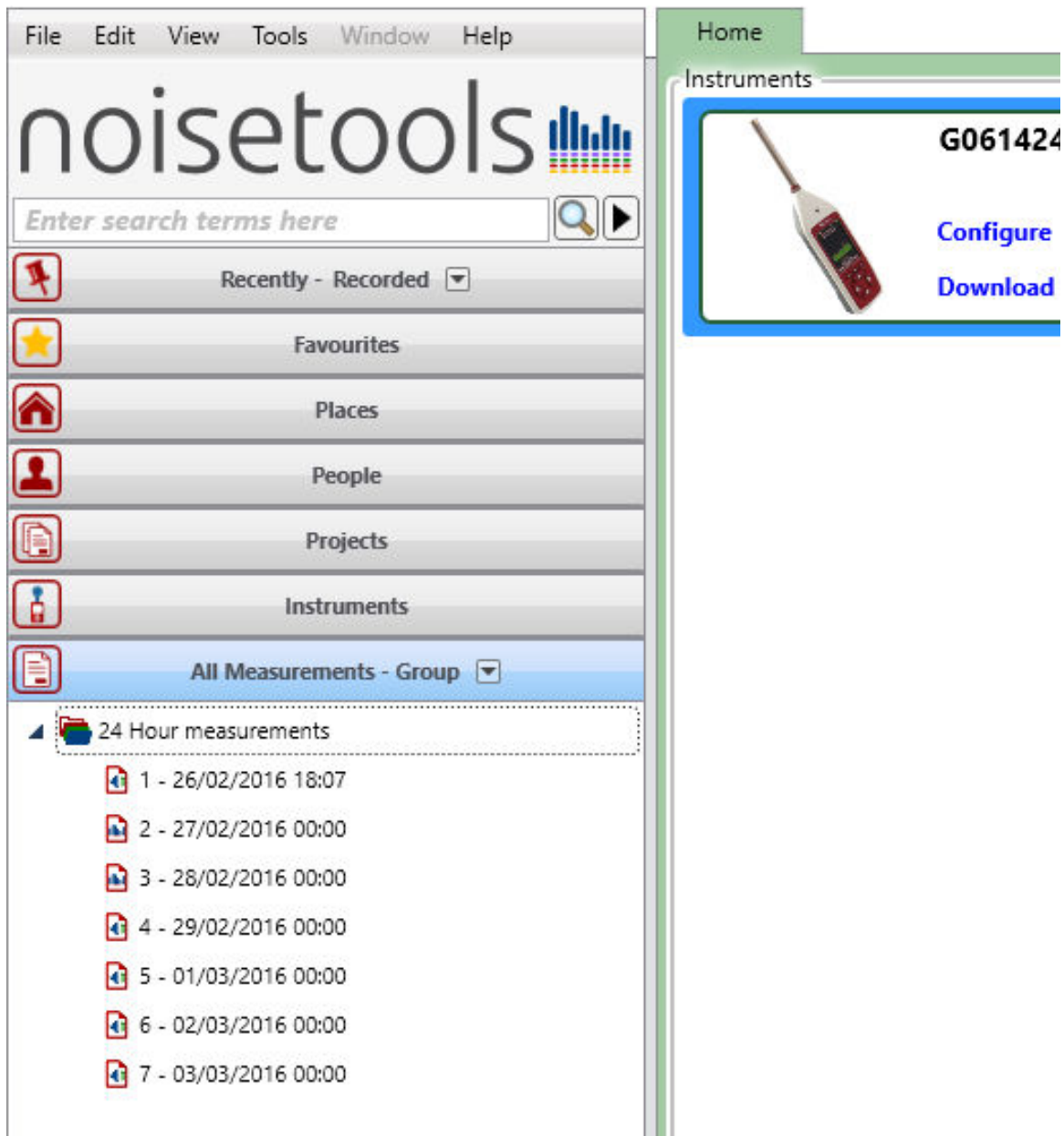
Tick the Group downloaded measurements box and enter a name for the group.

Typically this would be the location where the measurements have been made.

Ensure that the Download Time History and Download Audio boxes are selected and click Download.

Viewing the measurements

When the download is complete, the measurements will be shown in the measurement tree.



Select the All Measurement tab and choose Group. This will show the measurement groups that have been created.

Open the measurement group that have been created when the measurements were downloaded.

The individual measurements can be open as normal and all of the functions such as playback and analysis are available.

To open all of the measurements, select them all using the mouse and the Shift button on the keyboard. When all of the measurements have been selected, right click and choose Open Measurements.

Each of the measurements will open individually.

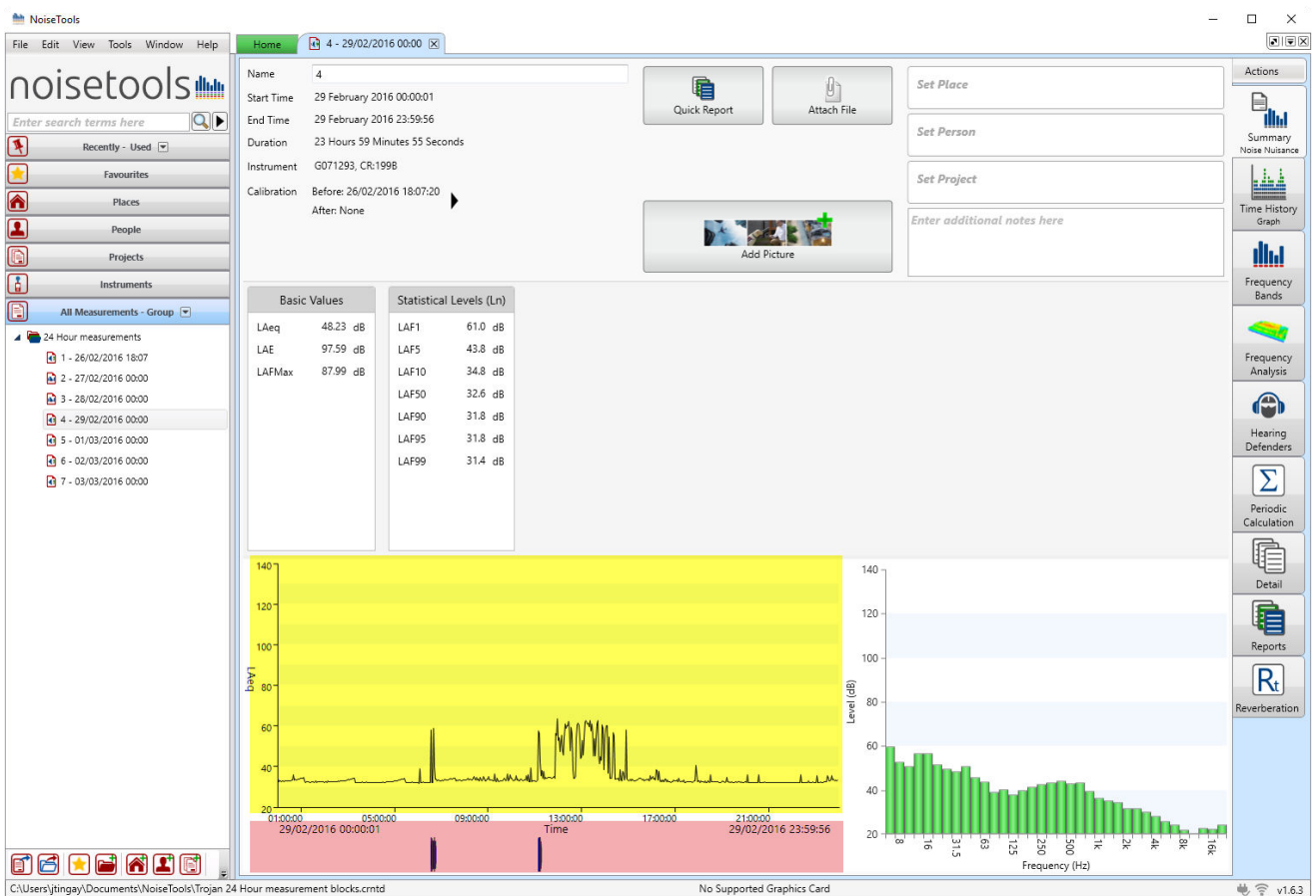
Viewing a measurement

After download, the measurement will be opened into the Noise Nuisance Summary screen.

This shows a summary of the measurement data with the information essential for Noise Nuisance provided.

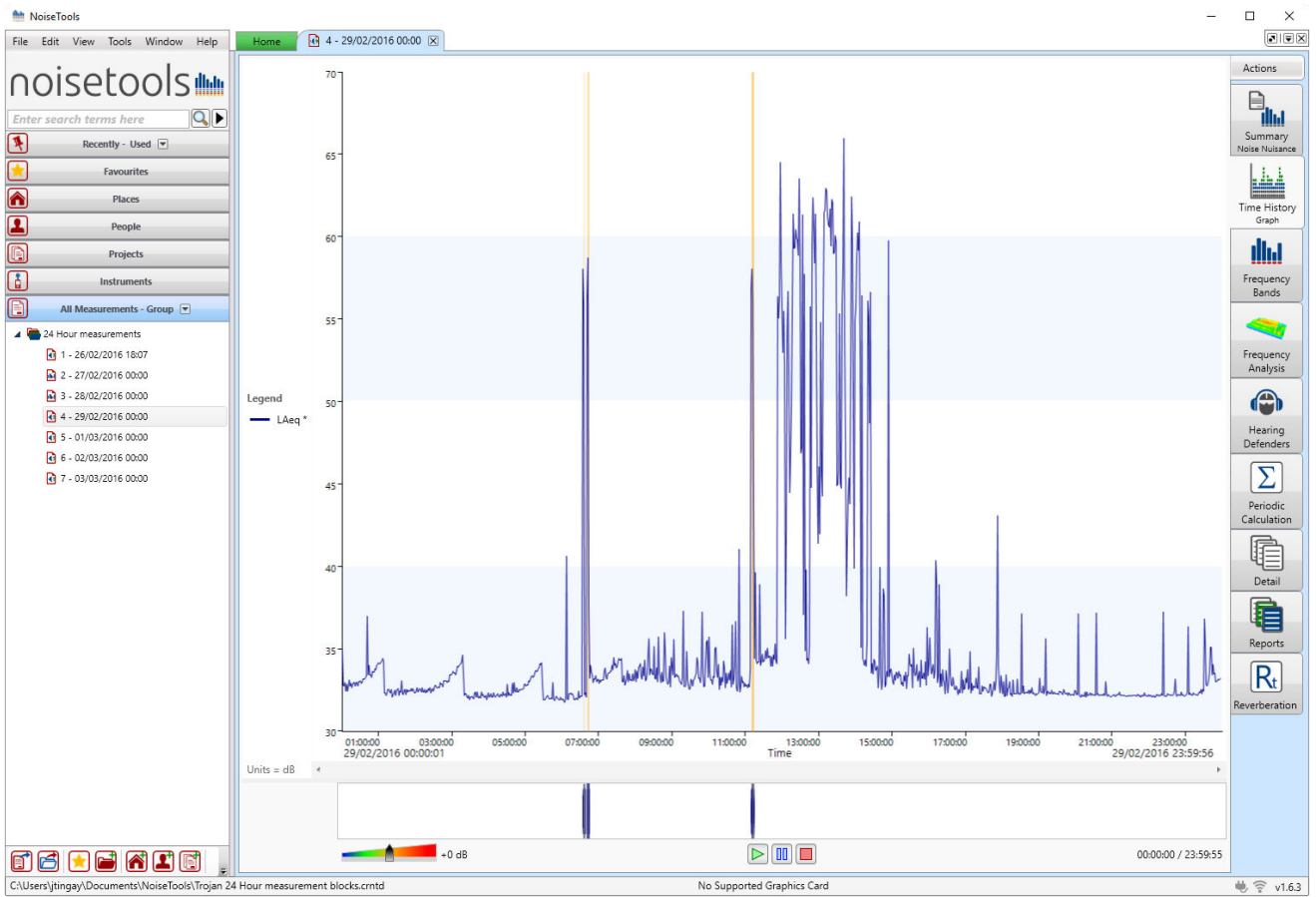
The screen shows the overall noise levels measured for the entire period along with a noise profile of the measurement (highlighted in yellow below) and any audio recordings shown below the noise profile (highlighted in red below).

The frequency bands (shown in green) may be visible depending upon the version of the instrument being used.



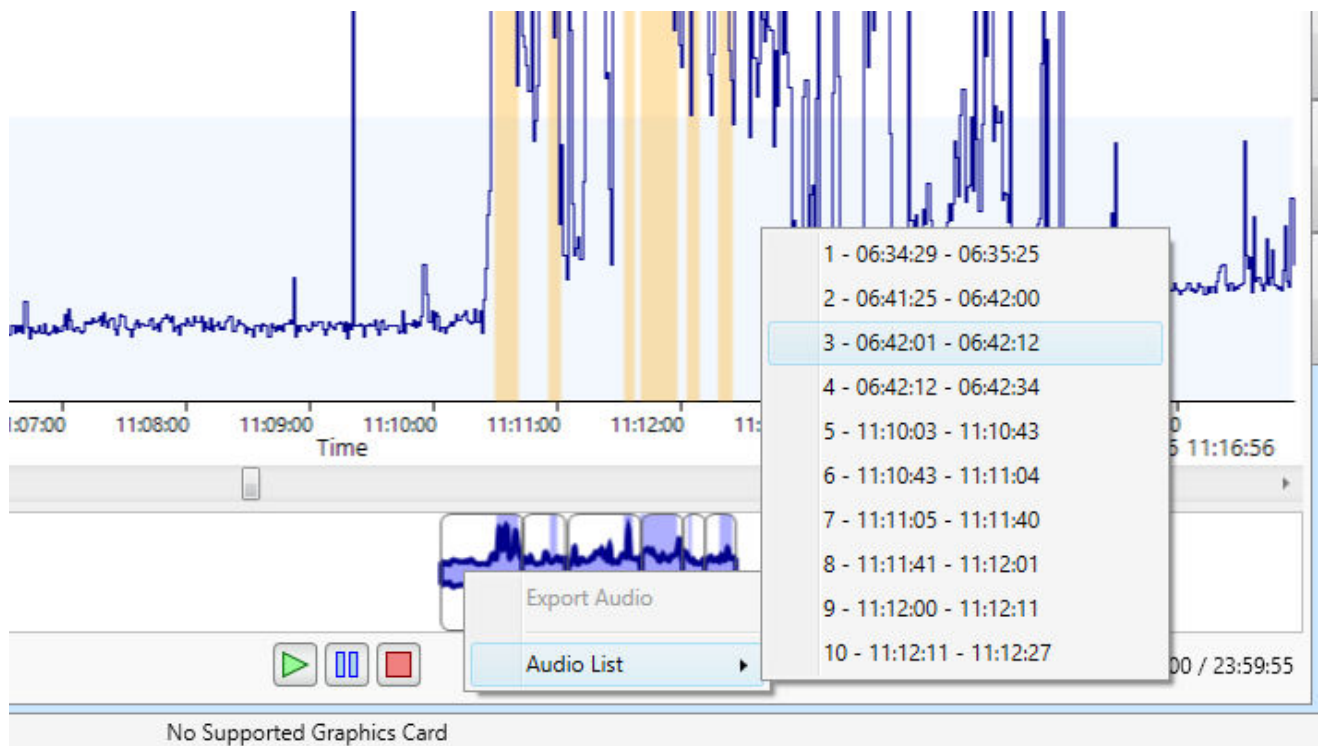
Selecting an audio recording

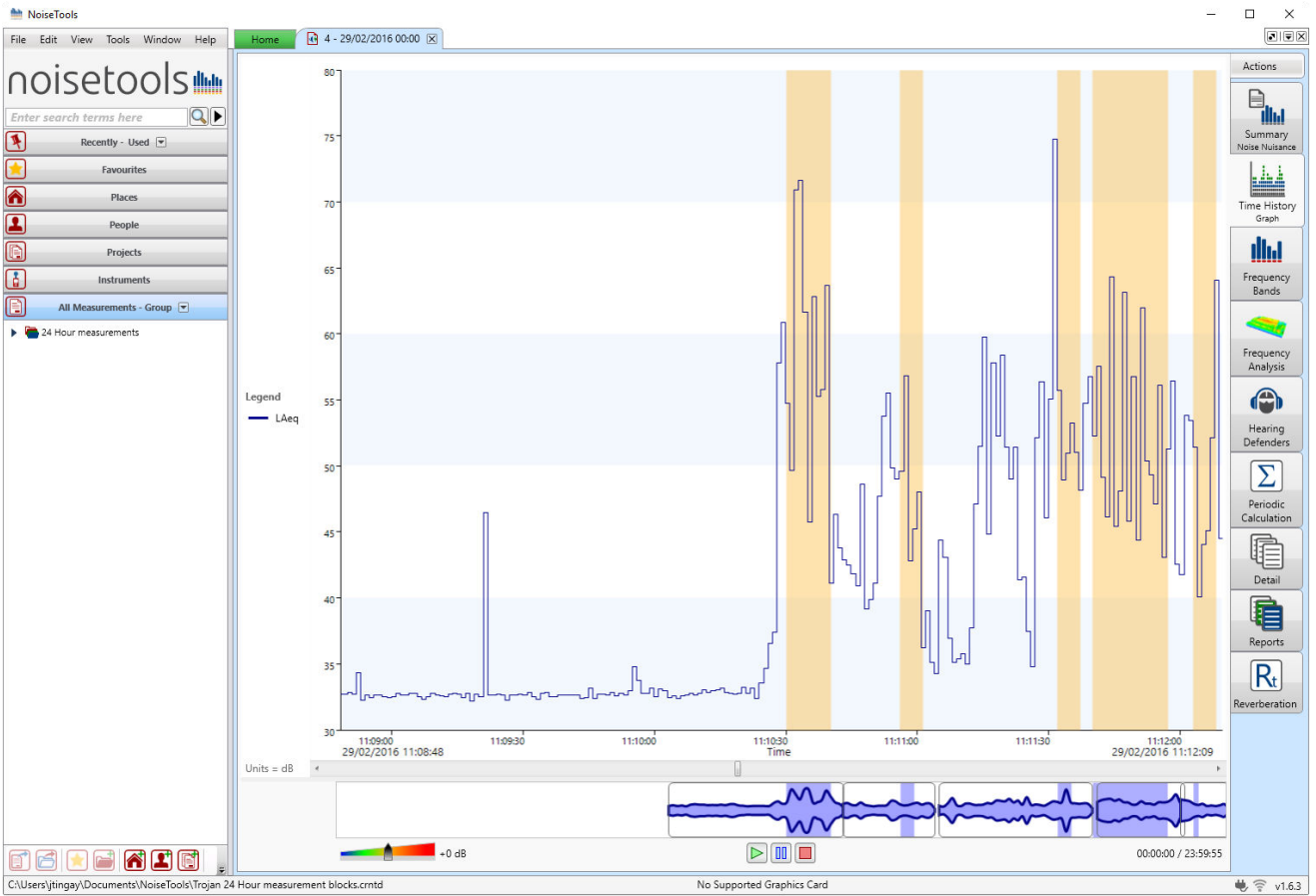
To replay and listen to any of the audio recordings, click on the recording and the display will move to the Time History display (below)



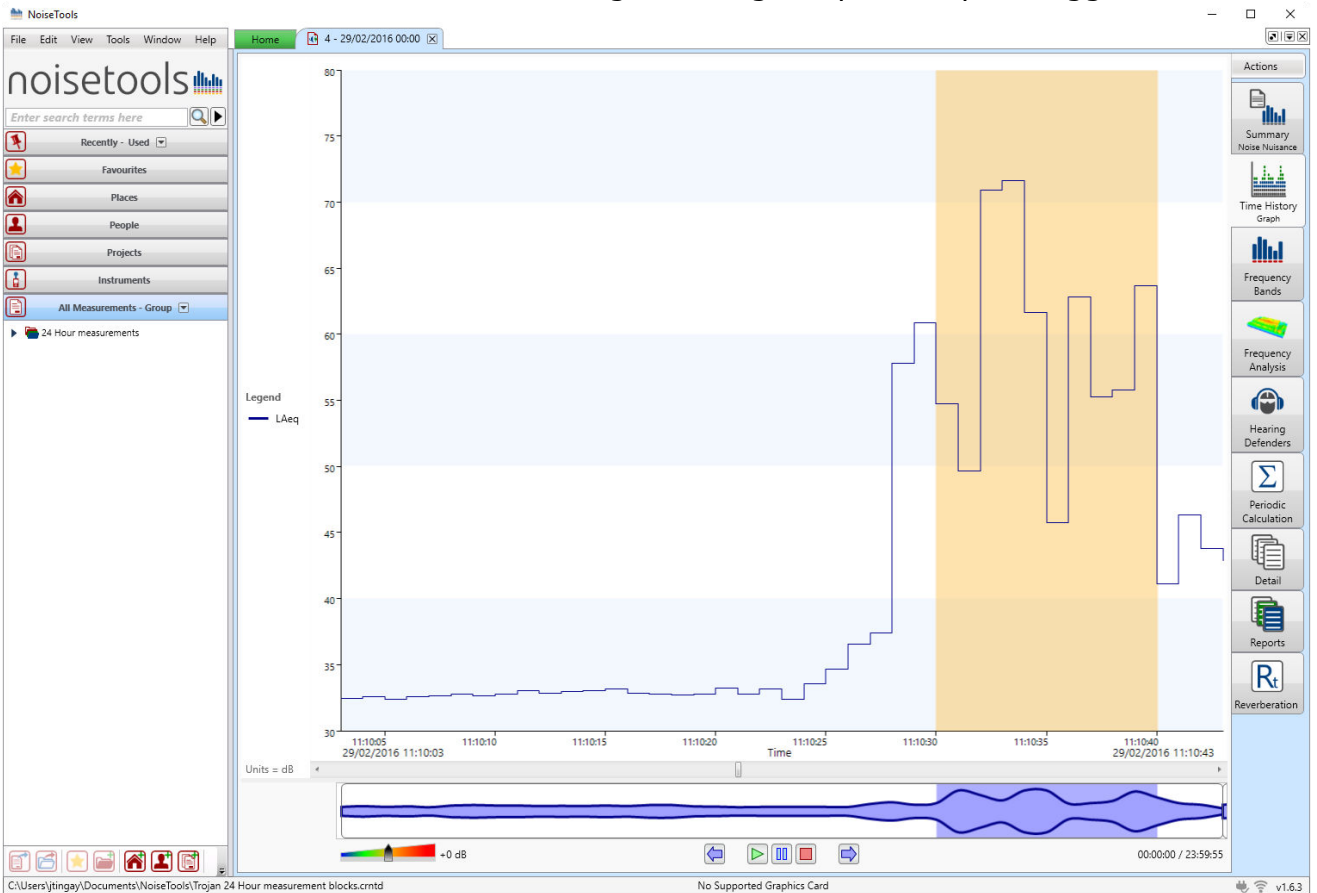
You can click onto any of the audio recordings at the bottom of the screen and NoiseTools will zoom into that specific recording.

Alternatively, right clicking on any audio recording marker will bring up the list of recordings. Selecting any will zoom to that specific recording.



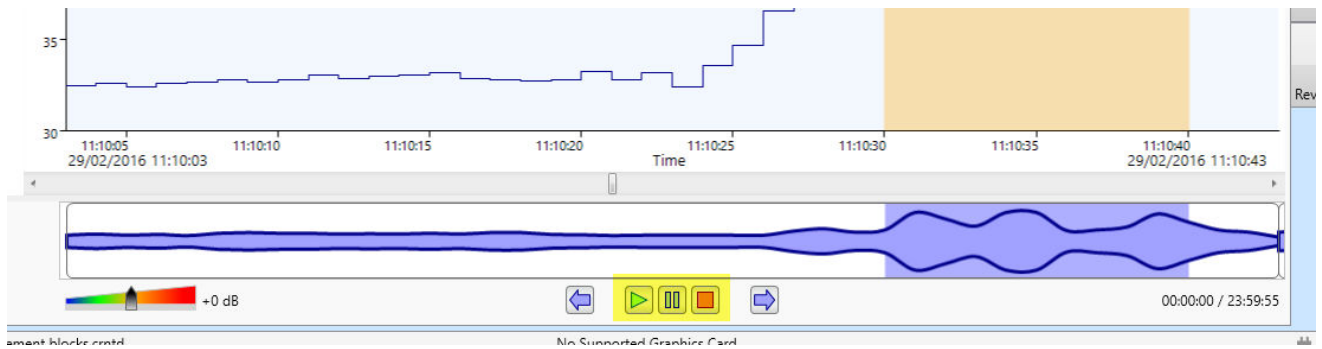


Click on the highlighted audio recording to zoom into the time around the recording. This will show all of the selected recording including the pre and post trigger times.

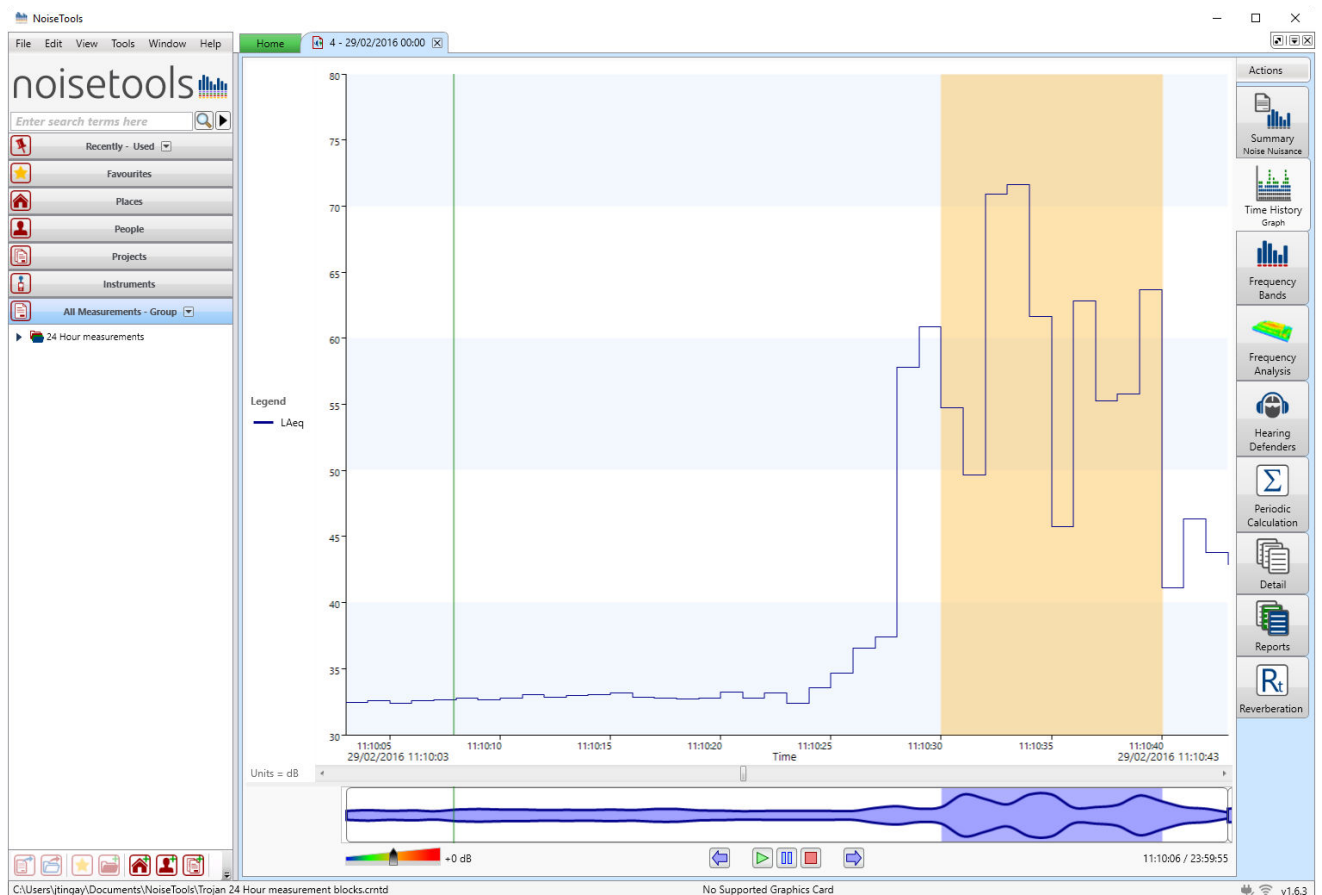


Replaying an audio recording

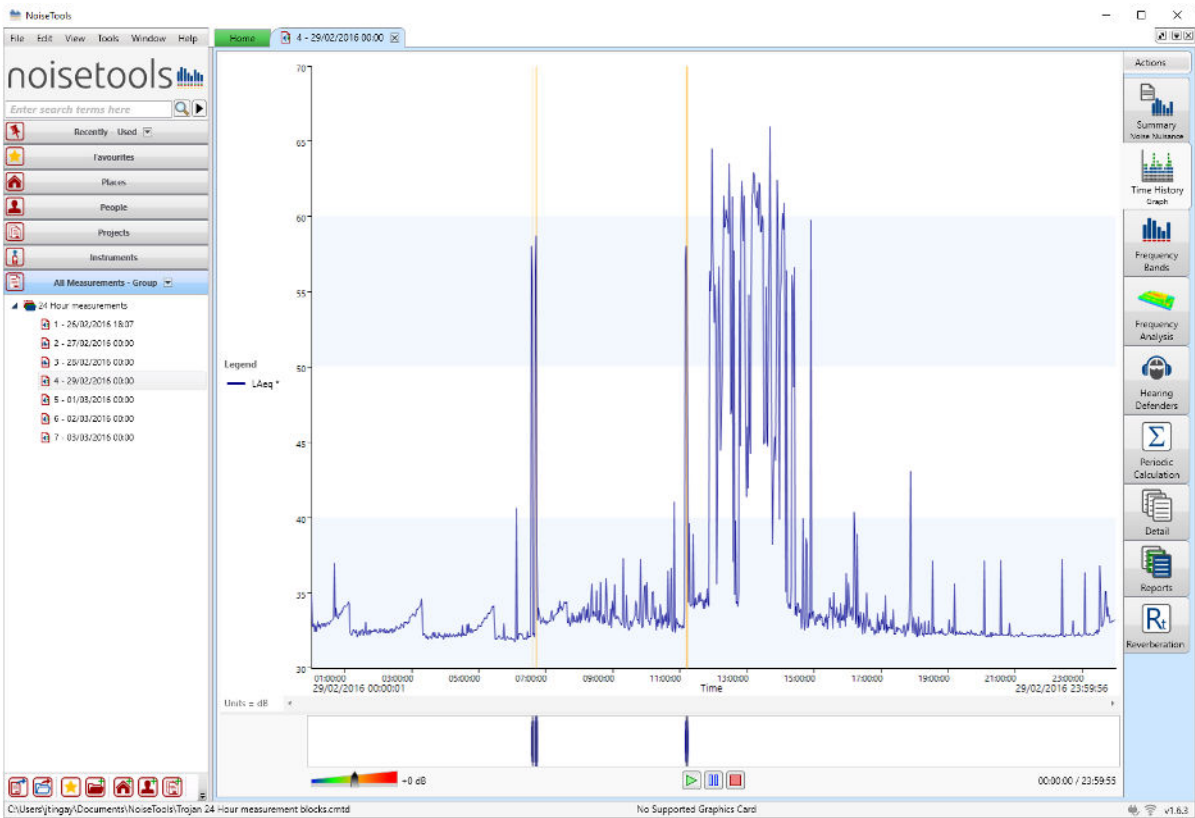
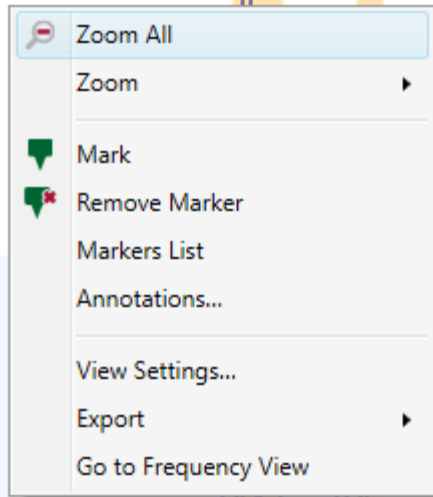
To listen to the recording, click on the play icon (highlighted below) at the bottom of the screen.



As the audio plays back, the current position will be shown by the moving green line.



To view the entire measurement, right click on the graph and select 'Zoom All' to view the whole measurement.



Appendix 1 Configuring the sound level meter for noise nuisance measurements

The sound level meter in the Trojan^{LITE} Noise Nuisance Recorder can be configured to meet the needs of each user.

In addition to the standard configuration options, there are four that are specific to the Trojan^{LITE}.

Please review these settings before deploying the unit. In most cases, the default settings can be used.

Instrument Settings - G071616, CR:199L

Serial Number	G071616	Current Time	28/06/2016 19:48:48
Type	CR:199L	Last Recalibration	31/08/2015
Version	2.9.2391 (2385)	Name	<input type="text"/>

These settings are only applied when in Noise Nuisance mode.

Audio Pre-Trigger Time: 20 Seconds

Audio Post-Trigger Time: 20 Seconds

Max Audio Duration: 5 Minutes

Measurement Timer: Off Repeat

Custom Timer: Duration

Interface

Integrating

Storage

Audio

Ln

Noise Nuisance

Advanced

Load from Instrument Save to Instrument Backup/Restore Close

Audio Pre-Trigger Time

This determines the amount of audio recording that is stored prior to the time when the Start button was pressed.

Available Options: 20 Seconds Set as default
Off

Audio Post-Trigger Time

This determines the amount of audio recording that is stored after the Stop button has been pressed.

Available Options: 20 Seconds Set as default
Off

Max Audio Duration

This determines the maximum duration of a single audio recording and can be used to reduce the amount of audio stored when the unit is deployed for long periods.

Available Options: 2 minutes
5 minutes Set as default
10 minutes
30 minutes
1 hour
2 hours
3 hours
4 hour

Measurement Timer

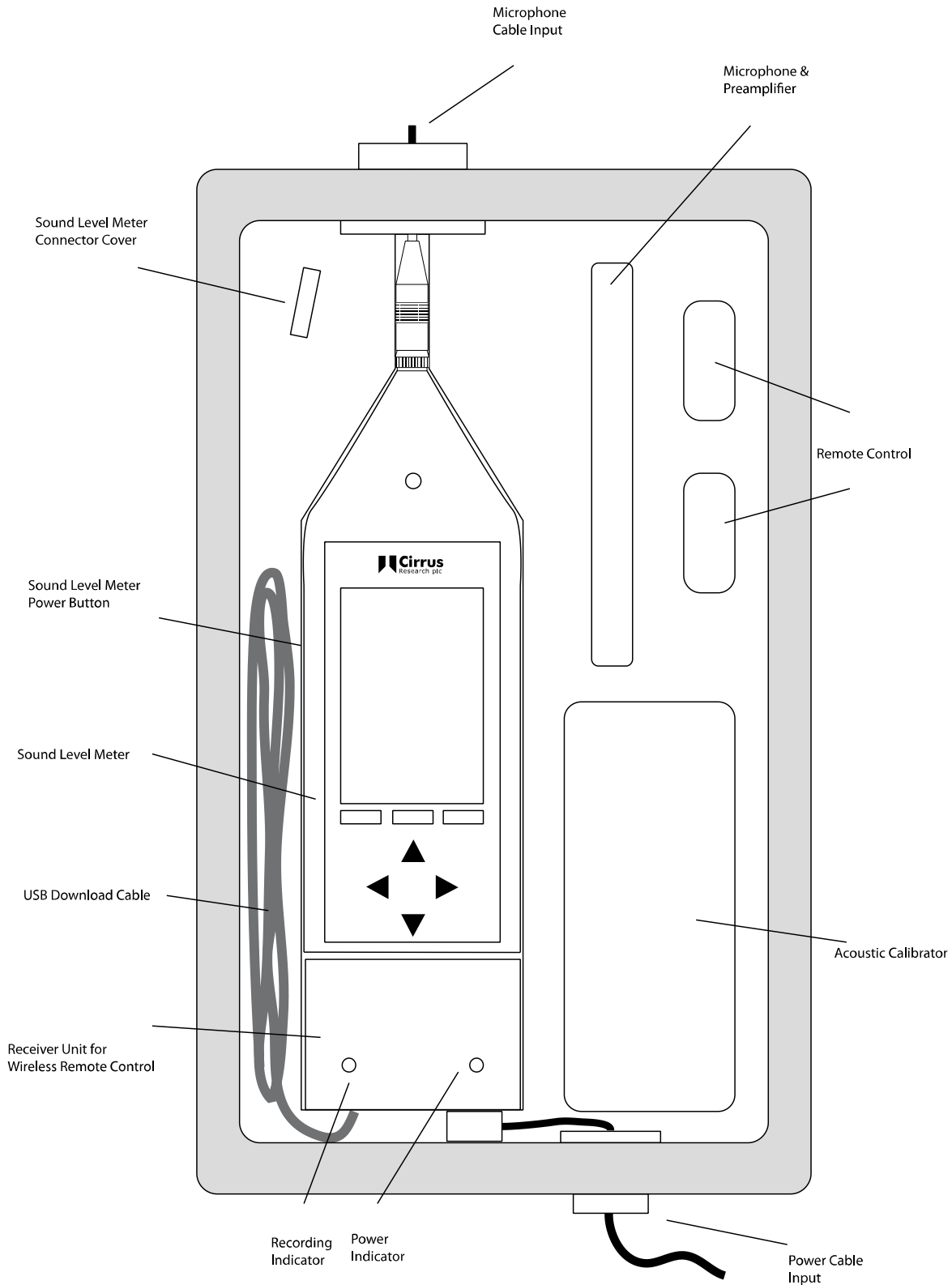
This option determines how the instrument will store the noise measurement data.

Available Options: 24 hour repeating measurements Set as default
Off

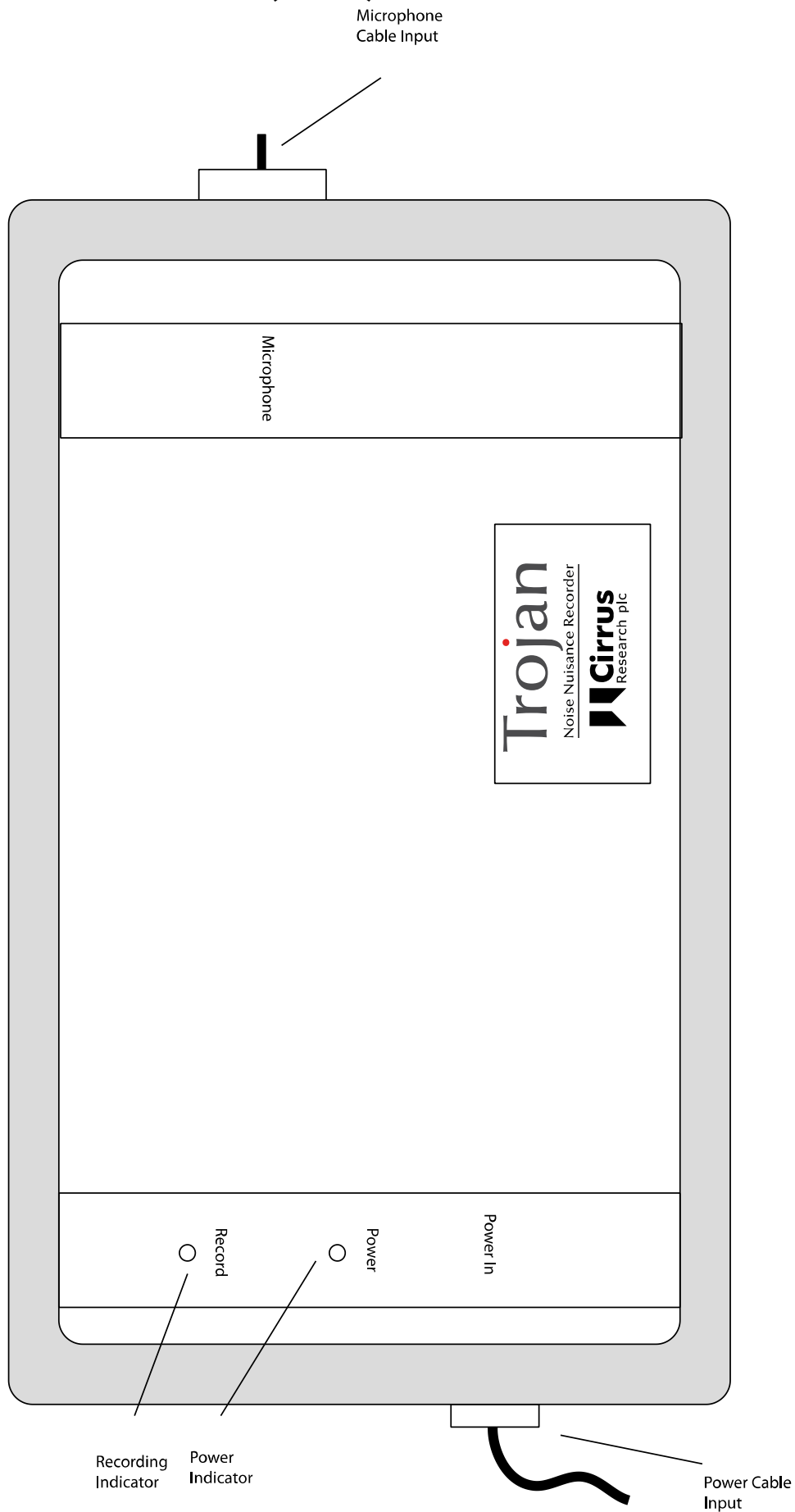
Appendix 2 Instrument layout

CK:199L Main Case (Open)

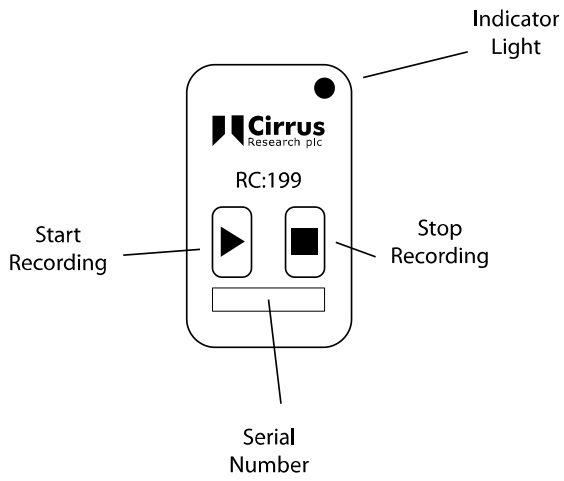
The main case for the Trojan^{LITE} Noise Nuisance Recorder has space to carry the main sound level meter and the primary accessories as shown below.



CK:199L Main Case (Closed)



RC:199 Remote Control Unit



Appendix 3 Adding a new remote control

The Trojan^{LITE} Noise Nuisance Recorder can support up to 40 individual RC:199 Remote Control Units.

This allow for new remote controls to be added or old units replaced.

To add a new remote control to the system, it must be paired with the receiver (the control box in the case with the status indicator lights).

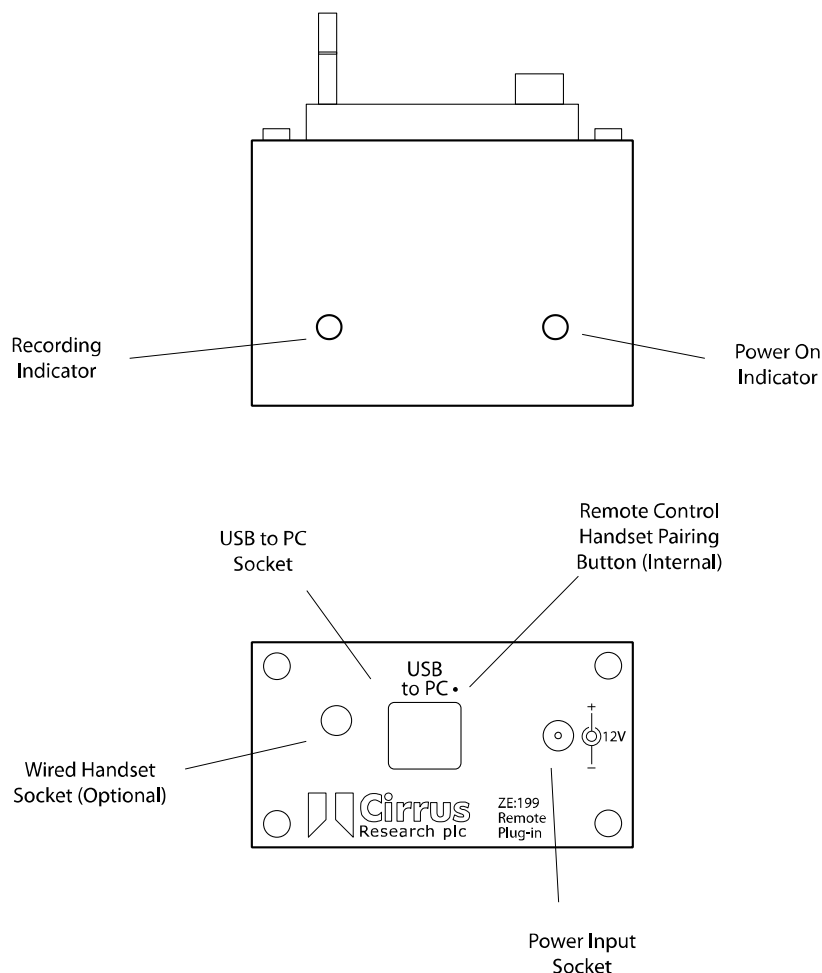
Pairing a new RC:199 Remote Control with the Receiver Unit

To add a new RC:199 Remote Control, you will need a Paper Clip or other similar small pointer.

1. Power up the Trojan^{LITE} with ZE:199 fitted and a 12V exterior power supply.

Ensure that the Trojan^{LITE} is not recording.

There is a small 1mm diameter hole on the main ZE:199 panel above the hole for the USB cable (see below)



Use a small device such as a paper clip or other blunt device with a diameter of less than 1mm and length of end over 4mms to gently action this switch.

3. Insert the paper clip to push the micro-switch briefly.

The Blue LED will flash when the micro-switch is pushed then once when switch released.

4. Push again.

The Blue LED will flash when the micro-switch is pushed then twice when the switch is released.

5. Push again.

The Blue LED will flash when the micro-switch is pushed then three times when the switch is released.

6. Push the STOP button on the RC:199 Remote Control.

The Blue LED will then illuminate. Press the STOP button again. The Blue LED will then go out and then flash once to indicate learning is complete for STOP.

7. Push the micro-switch briefly.

The Blue LED will flash when the micro-switch is pushed then once when switch is released.

8. Push again.

The Blue LED will flash when the micro-switch is pushed then twice when the switch is released.

9. Push again.

The Blue LED will flash when the micro-switch is pushed then three times when the switch is released.

10 Push again.

The Blue LED will flash when the micro-switch is pushed then four times when the switch is released.

10. Push the RECORD button on the RC:199 Remote Control.

The Blue LED will then illuminate.

Press the RECORD button again.

The Blue LED will then go out and then flash once to indicate learning is complete for RECORD.

11. Repeat the above procedure for each new transmitter.

Now test each transmitter to ensure the STOP and RECORD function works on the Trojan^{LITE} (a blue line on time history as well as the Red Led going on and off.)

CE Declaration of Conformity

Cirrus Research plc Hunmanby UK CE Certificate of Conformity



Manufacturer: Cirrus Research plc
Acoustic House, Bridlington Road
Hunmanby, North Yorkshire, YO14 0PH
United Kingdom
Telephone +44 1723 891655

Equipment Description

The following equipment manufactured after 1st January 2016:

CK:199L Trojan^{LITE} Noise Nuisance Recorder
CR:199L Sound Level Meter
CR:515 Acoustic Calibrator

Along with their standard accessories

According to EMC Directives 89/336/EEC and 93/98/EEC

meet the following standards

EN 61000-6-3:2007+A1:2011

Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

EN 61000-6-1:2007

Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments

Signed

Dated 1st April 2022

Martin Williams
Chief Engineer

Warranty Information.

1. Every new product is provided with a 12-month no-quibble warranty. This covers everything we provide against failure, poor workmanship and accidental damage.
NB - European Union law states a product has to be fit for purpose for 24 months after purchase. This two-year period covers failure and poor workmanship only.
 2. If the product is calibrated by Cirrus Research or an authorised calibration and service centre, then the initial 12-month warranty is extended by a further 12 months, with the same conditions, for up to 15 years in total.
 3. If a product has not been calibrated annually by Cirrus Research or an authorised calibration and service centre, then you may buy back into the warranty scheme for a small fee, plus the cost of calibration. This can only be done once during the life of the product.
 4. If a microphone capsule fails under warranty and is physically damaged, we will replace it with a refurbished capsule.
 5. If you don't wish to have a refurbished capsule, then you can trade in your damaged capsule for a new one, which will incur a fee.
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Cirrus Research Offices

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