



MPAC128 and MPAC128-ATEX

Megger Professional Accoustic Imager

User Guide

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For Patent information about this instrument refer to the following web site:
megger.com/patents

This manual supersedes all previous issues of this manual. Please visit the Megger website to ensure that you are using the most recent issue of this document. Destroy any copies that are of an older issue.

Declaration of Conformity

Hereby, Megger Instruments Limited declares the MPAC128 and MPAC128-ATEX professional acoustic cameras have been built in conformity with the following European Directives where they apply:

2011/65/EU

2014/30/EU

2014/34/EUh

Hereby, Megger Instruments Limited declares that radio equipment manufactured by Megger Instruments Limited described in this user guide is in compliance with Directive 2014/53/EU. Other equipment manufactured by Megger Instruments Limited described in this user guide is in compliance with Directives 2014/30/EU and 2014/35/EU where they apply.

The full text of Megger Instruments EU declarations of conformity are available at the following internet address:

megger.com/company/about-us/eu-dofc

This was originally supplied by Bernard so I will not change without his agreement. I have added the MPAC section

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1. Introduction

This guide explains how to use the Megger professional acoustic cameras MPAC 128 and MPAC 128-ATEX.

Please read the guide carefully before you start using the cameras.

1.1 Product description

MPAC 128 and MPAC 128-ATEX are hand-held professional acoustic imagers that support both audible and ultrasonic frequencies. The MPAC 128-ATEX has a **II 3G Ex ic IIC T5 Gc** explosion-proof rating.

The cameras use microphone array beam forming technology to acquire, measure and visually display the sound source data, overlaid on a real time high definition video image. By integrating the sound source data with the video image, the changing sound source is dynamically displayed on the screen in the form of a “sound map”.

Both the MPAC 128 and MPAC 128-ATEX Professional Acoustic Cameras aid the detection of air or gas leaks in both compressed and vacuum systems, even in noisy industrial environments. When used in power systems, they can help to safely and quickly identify partial discharge where dielectric breakdown is occurring.

The cameras are designed and built for use in industrial applications where both moisture and dust may be encountered, with the case built from a strong and durable machined aluminium alloy.

The instruments are simple and convenient to operate. They require adjustment of only two parameters: the measurement frequency range and the dynamic range. They offer both picture and video capture modes, making data recording easy and flexible. Test results are can be downloaded from the removable micro SD card, or via the USD-C port, to allow for analysis and report generation.

Please ensure all the safety warnings within this manual are read and understood before operating the cameras.

1.2 Company web site

Occasionally an information bulletin may be issued via the Megger web site. This may concern new accessories, new usage instructions or a software update. Please occasionally check on the Megger web site for anything applicable to your Megger instruments.

www.megger.com

2. Safety Warnings and Standards

These safety warnings must be read and understood before the instrument is used. Retain for future reference. The cameras should only be operated by suitable trained and competent people.

2.1 Warnings, Cautions and Notes

This user guide follows the internationally recognised definition of warnings, cautions and notes. These instructions must be adhered to at all times.

Description
WARNING : Indicates a potentially dangerous situation which, if ignored, could lead to death, serious injury or health problems.
CAUTION : Indicates a situation which could lead to damage of the equipment or environment
NOTE : Indicates important instructions to be followed to perform the relevant process safely and efficiently.

2.2 Explosion-proof note clause MPAC128-ATEX

- This equipment is explosion-proof, its grade is **II 3G Ex ic IIC T5 Gc**. It must be used in accordance with the explosion-proof marks in explosive environments.
- When using in an explosive environment, do NOT remove or replace batteries or recharge the battery pack.
- In an explosive environment, do NOT connect any USB devices, external power supplies, chargers or other peripherals
- In an explosive environment, ensure that the silica gel baseplate stays firmly in place.
- Do NOT insert or remove the micro-SD card or connect the headset in an explosive environment.
- The electrical accessories provided with the MPAC128-ATEX are not to be used in an explosive atmosphere.

2.3 Safety warnings

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- There are no user-serviceable parts inside the cameras; all servicing must be referred to Megger approved service centres.
- Check the camera for damage before use. The camera must NOT be used if any part of it is damaged.
- The camera must NOT be used in the case of malfunction or abnormal heat.
- Do NOT place or store the camera near a heat source, flame or in a high temperature environment.
- Do NOT charge the camera in a high temperature environment (over 45 °C).
- This camera contains a Lithium Ion battery.
 - The battery is NOT user-serviceable. All servicing must be referred to Megger approved service centres.
 - Do NOT charge the battery in a high temperature environment (over 45 °C).
 - In the event of a battery cell leaking, do not allow the released fluid to come into contact with the skin or eyes.
 - If contact has been made, wash the affected area with plenty of water and seek medical advice immediately.

Safety Warnings and Standards

2.3.1 Installation category definitions:

CAT IV - Measurement category IV: Equipment connected between the origin of the low-voltage mains supply and distribution panel.

CAT III - Measurement category III: Equipment connected between the distribution panel and electrical outlets.

CAT II - Measurement category II: Equipment connected between the electrical outlets and user's equipment.

Measurement equipment may be safely connected to circuits at the marked rating or lower. The connection rating is that of the lowest rated component in the measurement circuit.

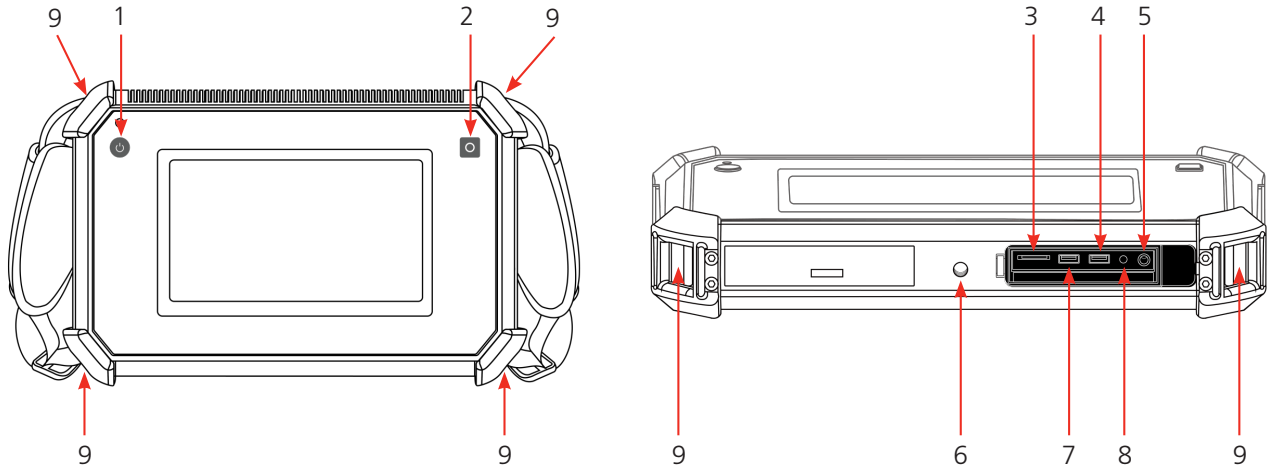
2.4 Safety, Hazard and Warning symbols on the instrument

This paragraph details the various safety and hazard icons on the instrument's outer case.

Icon	Description
	
	Caution: Refer to user guide.
	UK conformity. This equipment complies with current UK legislation
	EU conformity. Equipment complies with current EU directives.
	Equipment complies with current 'C tick' requirements.
	Do not dispose of in the normal waste stream.

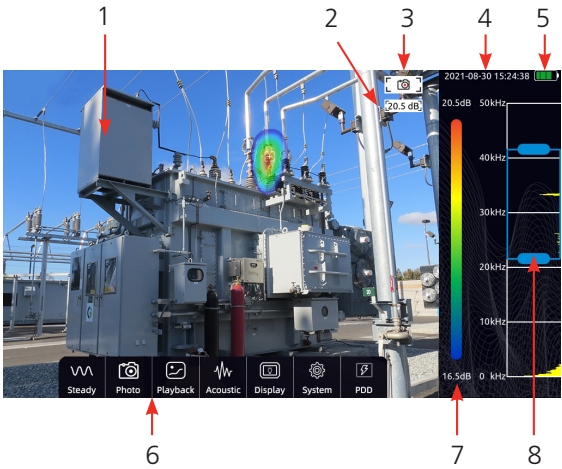
3. Instrument Overview

3.1 Instrument layout



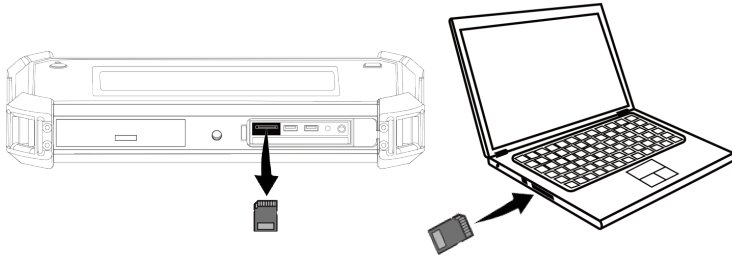
Item	Description	Item	Description
1	Power button	5	Headphone socket
2	Hot key	6	Threaded tripod mount
3	Micro-SD card slot	7	USB-C Communication socket
4	USB-C Charging socket	8	Charging indicator LED
		9	Hand straps and shoulder strap points

3.2 Software interface



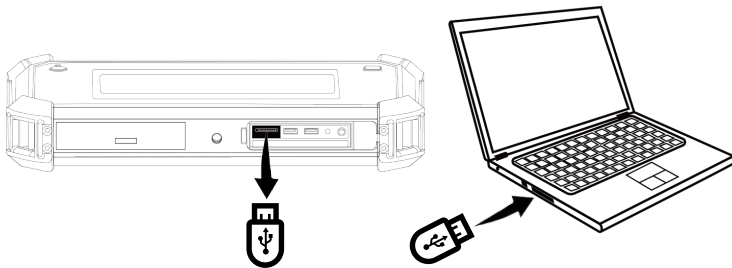
Item	Description	Item	Description
1	Video image display	5	Battery status indicator
2	Sound pressure level	6	Menu bar
3	Photo/Video mode icon	7	Dynamic range quick setup
4	System time and date	8	Spectrum and frequency range box

3.4 Micro-SD card slot



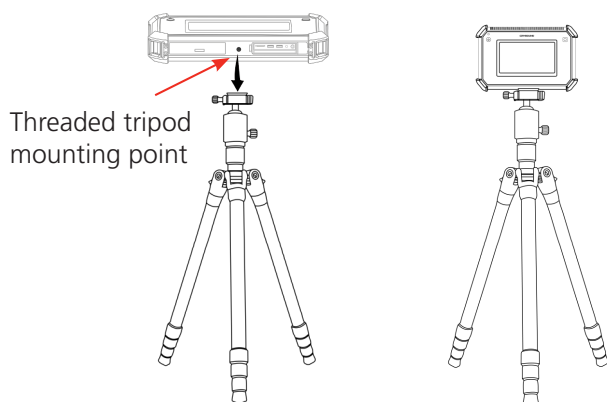
- Do not remove or insert the micro-SD card when video recording.
- After taking photos and recording videos, please wait until the data is saved successfully before inserting and
- Do not remove or insert the micro-SD card when browsing and marking data in the playback menu. Test data may not be correctly identified and displayed in the playback menu.

3.5 USB-C communication socket



- Do not remove or insert the USB-C flash drive when video recording.
- After taking photos and recording videos, please wait until the data is saved successfully before inserting and
- Do not remove or insert the USB-C flash drive when browsing and marking data in the playback menu. Test data may not be correctly identified and displayed in the playback menu.
- Inserting either the USB-C flash drive or micro-SD card will initiate an automatic transfer of the images and videos stored in the cameras internal memory.
- The stored files can be transferred to the Acoustic Analysis software or downloaded for storage on a PC or laptop.

3.6 Tripod



CAUTION : ensure tripod and mount screws are tight and secure before use.

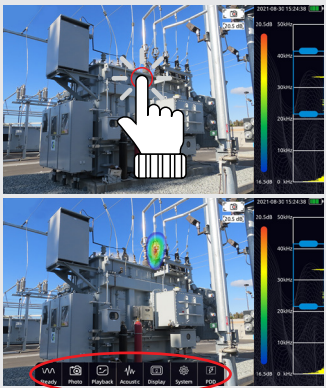
3.7 Hand straps and shoulder strap



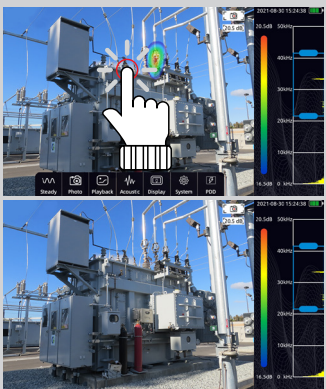
Caution: ensure all strap connections are fitted correctly and secure before use.

3.8 Function menu bar

1. Touch the video display area of the screen to reveal the function menu bar.
 - If untouched, the menu will stay visible for about 5 s







2. Touch the video area to toggle the function menu bar on and off.



3.9 Menu Icons




Item	Description	Item	Description
	Turns on focus mode (PD Only)		Acoustic settings menu
			Display settings menu

Instrument Overview


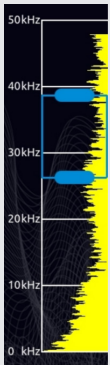
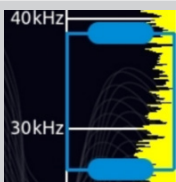
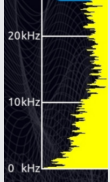
	Toggle photo/video modes		System settings menu
	Playback: access stored videos and images		Toggle Gas Leak and PD modes

3.10 Dynamic range

the slider is on left

<p>Touch the colour dB bar on the main interface to toggle the dynamic range slider bar on and off</p>	
<p>Dynamic range slide bar will stay visible for about 5 s. Touch and move the slider (right) to adjust the dynamic range.</p>	
<p>Touch the colour dB bar to close</p>	

3.11 Test frequency range

<p>Define the upper and lower limit of the frequency range by touching and sliding either of the box handles (right). Maximum spread: 20 kHz</p>		
<p>Touch and slide the centre of the selection box to move the defined range into position.</p>		

3.12 Focus

When the measurement environment is noisy or there are multiple gas leaks/PD occurrences, the focusing function can be used to display data on measurements within the focus ring only, eliminating interference.

Double-tap the centre of the focus ring to reduce the size for pinpoint location. Double-tap again to restore the focus ring to its initial size. Focus is switchable in PD mode and always on in gas leak mode.

3.13 Video and photo

Select the photo/video button on the function menu bar to switch between Photo (still picture) mode and Video mode.



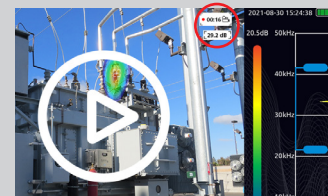
The icon in the upper right corner of the video image display indicates the current mode selected.



- a. In Photo mode, press the hot key (right) to save the displayed image
- b. In Video mode, press the hot key (right) to start recording and press again to stop; video recording will automatically stop after 5 minutes, Video is automatically saved.



During video recording, the elapsed time of the recording is next to the video icon.



Saved Photos and Videos named by date and image number for that day.

3.14 Playback

Pictures and recorded videos can be viewed, deleted or have details added or deleted in the playback window.

Touch a Photo or Video to load the full-size image or play the video.



Touch multi-select (right), followed by the list icon (right) to select all the videos or photos. All will become highlighted. Individual photos and videos can be de-selected by touching them.



To delete all selected images and videos, press the delete (bin) icon in the top right hand corner



Instrument Overview

To add detail information to selected images, press the pen icon. A separate details box will appear. Press the save icon to save updated details.



Press the information button to display used and available storage space.



The current file directory is shown on the screen. The arrow next to the directory name will bring up a list of available directories that can be selected. Files can then be accessed or saved to the this directory



The + icon, next to the directory name, allows a new directory to be created. A box will appear that allows the director name to be entered, along with other details relating to the site. The save icon must be pushed to save the updated details.



The All slide slider will select all the Photo and Video files to be copied into a new folder created on the micro SD card. This is to make accessing the individual photo or video files easier when downloading



The copy icon allows either individually selected Photo or Video files to be copied to the "All" folder, created on the micro SD card



3.15 Picture Playback

With a Photo or Video selected and displayed on the screen, pressing the < or > arrows will display the previous or next image.

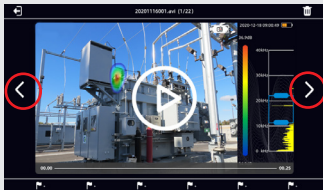


Double tapping a Photo will activate the zoom feature. After enlarging, touch and slide the zoomed image to view specific parts of the original image; double-tap the picture again to restore it to its original size. The zoom feature only operates with saved Photo images.

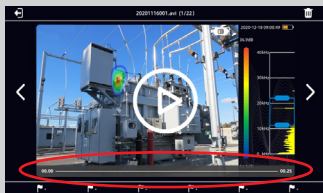


3.16 Video playback

With an Photo or Video selected and displayed on the screen, pressing the < or > arrows will display the previous or next image.

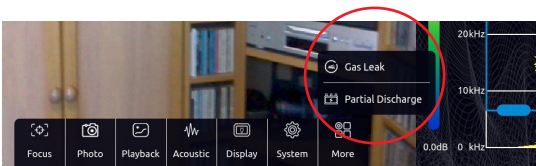


Select a video file from the playback main screen
Video playback starts automatically. Tap the screen to stop or restart playback.
Slide the progress bar below the video to navigate the playing position.



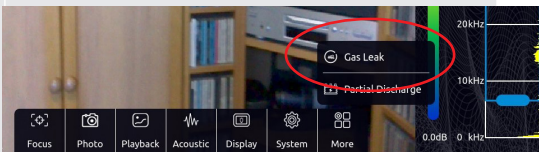
3.17 More Functions

The More menu function allows the user to switch between gas leak and PD measurement modes



3.17.1 Gas leak

Selecting Gas Leak mode brings up the gas leak menu.

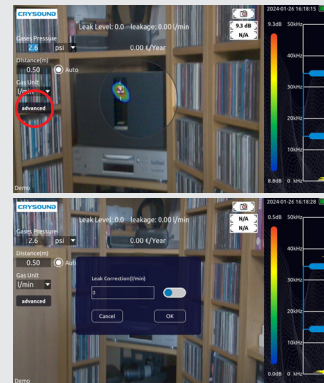


Instrument Overview

All displayed variables for gas leakage measurement and calculation can be edited.

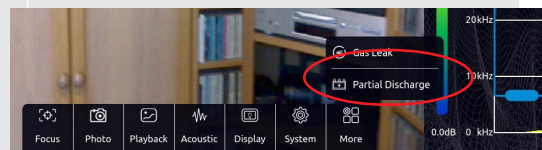


Tapping the Advanced button brings up the leak correction variable box.

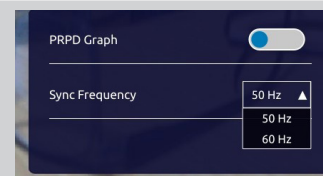


3.17.2 Partial Discharge

Selecting Partial Discharge mode brings up the partial discharge menu.



From here, the PRPD (phase resolved partial discharge) Graph can be switched on or off. The characteristics of the graph The prevailing electrical supply frequency should be set (50 Hz or 60 Hz)



3.18 Tagging

3.18.1 Photo and Video tagging

In Playback mode, tap a Video or Photo to bring up the Tagging menu across the bottom of the screen.

Touch the label icon on the far left to add or edit the electrical or gas related parameters, relating to the file.



Touch a flag icon to mark a video or picture for tagging with an image, an audio recording or text.



3.18.2 Image tagging

An image tag can add a photograph image as the tag content, the picture content can be nameplate, character tag, etc.

Touch a flag icon to select image markers. Select Image The visible light camera become active and the image is displayed. Select the image to capture and press the hot key to take the photograph. This can then be saved, retaken or discarded by tapping the return icon.

3.18.3 Audio tagging

Audio tag can record an audio file as the tag content.

Touch the flag icon and select Audio

Ensure the microphone Press the hot key on the right to record an audio using the front microphone array. Recorded audio files can be played back using the provided headphones. Press the hot key to save the audio file.

To improve sound recording, microphone arrays can be placed close to the source.

3.18.4 Text tagging

Touch the flag icon and select Text, and then touch the keyboard icon.

Text tag can be used to input a description. The instrument supports keyboard input and two-dimensional code scanning.

Touch the input box to display the keyboard and type relevant information to be saved.

Touch the input box to display the keyboard.

3.18.5 QR Code tagging

Touch the flag icon and select the text and then tap the two-dimensional code scan icon.

The device will start the camera to scan the QR code automatically.

When scanned successfully, the contents from the scanned QR code will be displayed.

Touch the Save button to save the content or touch "Rescan" to scan the code again

3.19 Acoustic

3.19.1 Dynamic range

Use the slider or touch the palette bar on the right of the screen to adjust the dynamic range.

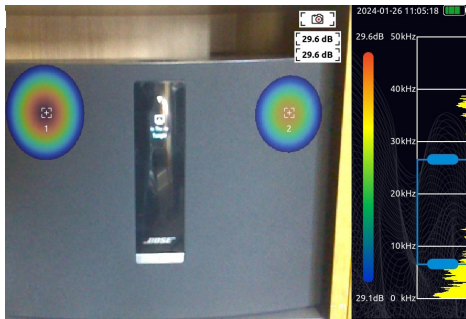
Instrument Overview



3.19.2 Cursor and SPL (Sound Pressure Level)

Up to three cursors can be made active at the same time.

The Cursor & SPL (Sound Pressure Level)function is displayed on the default Acoustic menu. Between 1 and 3 cursors can be selected to be displayed on the video screen with their cursor numbers below. The image energy at each cursor position will be displayed to the upper right: the sound pressure level at cursors 1, 2 and 3 will be displayed from top to bottom.



3.19.3 Record sound while recording video

Touch the "Record sound on video" button to toggle audio on or off while recording video.

3.19.4 Steady

Touch the "Steady" mode button to toggle the steady mode on or off.

When the steady mode is turned off, the sound processor increases the response time to ensure transient signals are captured and fast changes of sound source can be identified. It is particularly suitable for locating rapidly changing partial discharge sound sources.

With the steady mode on, the sound processor has a dampened response to ensure changing sound sources are displayed as a relatively stable images. This helps pin-point location of stable sound sources.

3.19.5 Monitor: ultrasonic monitoring

The equipment can modulate ultrasonic signals into the audible frequency band. The signal can be monitored as an audible sound using the headphones.


Tap Monitor to display the modulation controls. Tap the Switch button to turn the modulation on or off. Touch and move the reference frequency slider to find the best audible signal. It is recommended to use a frequency of about 38.6 kHz for near modulation and monitoring.

3.19.6 Self-check

The MPAC cameras have a built in self-test. This checks internal measurement components and the correct operation of the microphone array. In the event of any issue, contact a Megger Approved Service Centre.

It is recommended the self-check is run on a regular basis to ensure optimum performance.

3.20 Display

	Brightness	The brightness can be adjusted using the slider along with the colour palette. When used outdoors, it is recommended to increase the brightness for better visual clarity. When used indoors, reduce the brightness for a longer battery life. To change colour palette, select one of the 3 options available.
	Rainbow	to use rainbow palette.
	Ironbow	to use ironbow palette.
	Grayscale	to use grayscale palette.

3.21 System

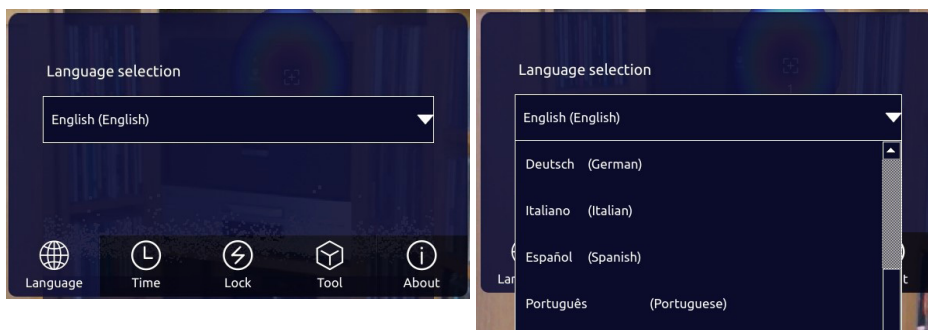


3.21.1 Language

Multiple languages are supported by the MPAC cameras.

To display the current languages, tap the Language icon from the System menu bar.

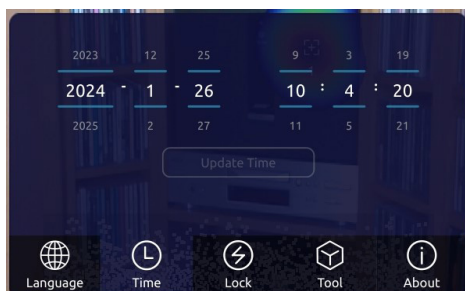
The current language is displayed and a drop-down list of available languages can be accessed. Tap the required language.



3.21.2 Time

The system date and time is user-adjustable using simple scroll wheels.

When a system date or time is changed, touch Update Time to save.



3.21.3 Lock

The Auto-Sleep function can be turned on to save battery.

Instrument Overview

After selecting the Auto Sleep time from the drop-down menu, the device will automatically enter sleep mode if there is no user input for the specified time. When the device is in sleep-mode, the power indicator will flash.

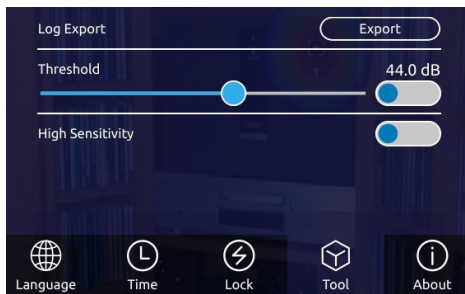
Press the power button to exit sleep-mode.

The device will shut down automatically if the auto-shut down function is enabled. After selecting the shut down time from the drop-down menu, the device will automatically shut down if there is no user input for the specified time.

3.21.4 Tool

Log Export function: Touch "Export" and confirm "OK" to export the equipment operation log to the SD card. The equipment operation log is used by the manufacturer to diagnose the equipment status, and users generally do not need to use it.

High Sensitivity is enabled when the button is turned on, and the sensitivity threshold can be set by touching and moving the Threshold slider. This shifts the sensitivity band lower and will consequently limit the imaging values for higher sound map energy.

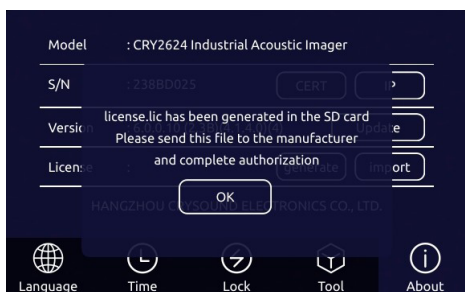


3.21.5 About

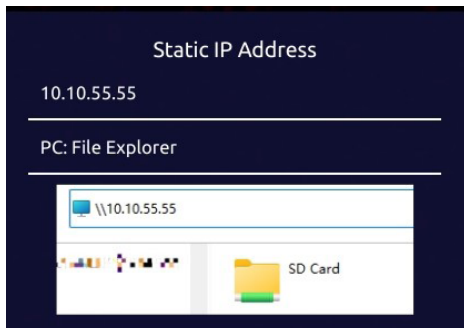
Displays the device model, serial number, software version and licence manufacturer information



Press "Update", to see the available packages saved on the external storage device (USB-C flash drive/micro- SD card). Updates are released via the Megger website and can be downloaded free of charge.



A user licence for the camera, if required, can be imported using an external storage device. If a licence has expired, the internal licence can be exported to the external storage device to be sent to Megger for authorisation.



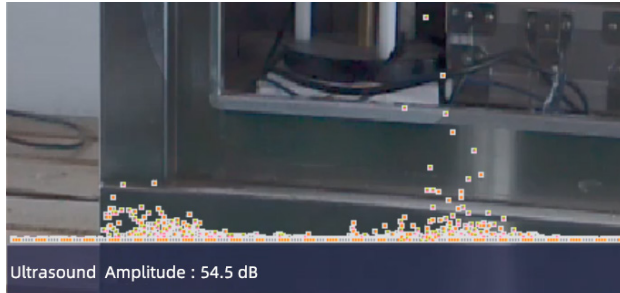
Press "IP", to show the static IP address of the camera. Using a USB-C to ethernet cable, the camera can be connected directly to the PC/laptop to access the stored files.

3.22 Partial discharge spectrum

Select Partial Discharge from the More option on the function menu to open the partial discharge spectrum setting menu.

Touch the PRPD Graph button to open and display the partial discharge spectrum. The Sync Frequency can be selected as 50 Hz or 60 Hz.

The partial discharge spectrum is as shown in the image below. Observing the characteristics of the spectrum can help users identify the discharge type. The internal algorithm will calculate and display discharge types when identified: Surface, Corona etc.



3.23 Estimation of gas leakage

Select Gas Leak from the More option on the function menu to open the gas leak setting menu. Note: Selecting Gas Leak will turn on "Focusing" by default to avoid interference.

Touch the gas leak button to select. Completing the input variables shown will allow the camera to carry out volume and cost calculations for the measured leak.

When measuring gas leaks, there are options to input the gas pressure and distance to the leak. The user needs to input the gas pressure and select measurement units and set the distance (in meters) to the measured leak, or set distance to Auto. The software will calculate and display the leakage level, leak rate and approximate cost per year. The gas leakage levels are divided into 7 levels and the corresponding leakage ranges for reference are shown below:

Leakage Level	Leakage Range (Unit: ml / s)	Leakage Range (Unit: L / min)
0	<0.167 ml/s	<0.01 L/min
1	>0.167 ml/s <1.667 ml/s	>0.01 L/min <0.1 L/min
2	>1.667 ml/s <16.667 ml/s	>0.1 L/min <1 L/min
3	>16.667 ml/s <166.667 ml/s	>1 L/min <10 L/min

Instrument Overview

4	>166.667 ml/s	<1666.667 ml/s	>10 L/min	<100 L/min
5	>1666.667 ml/s	<16666.67 ml/s	>100 L/min	<1000 L/min
6	>16666.67 ml/s	<166666.7 ml/s	>1000 L/min	<10000 L/min

3.24 Measurement advise

3.24.1 Capture sound source

a) Observe whether there are prominent spectral signals or spectral spikes in the spectrum diagram. If there are, move the select box to include the frequency range where the prominent spectral signal or frequency spike is, and then observe if any sound source appears in the cloud image.

b) Adjust the dynamic range to a larger value, the device may simultaneously capture more than one sound source in the screen. When the SPL of multiple sources in the picture differ significantly, the relatively small dynamic range parameter may cause the larger sources to drown out the smaller one.

3.24.2 Reflected sound

When unable to determine if the sound source is an actual sound source or a reflection, move to view the sound source from different test positions. If the sound source remains steady, this indicates an actual sound source. A reflection may move or disappear when measured from different angles.

3.24.3 Noise interference

a) It is easy to be disturbed by environmental noise in the low frequency band. If possible, it is recommended to use mid to high frequency signals to identify the location of sound source.

b) A relatively narrow band range is always recommended to minimise or eliminate interference noise.

4. Maintenance.

NOTE : There are no user replaceable parts within this product.

4.1 General maintenance

Keep acoustic sensor holes clean and prevent dust accumulation; if the holes have dust, blow air gently to clean using a lens cleaner blower/brush or similar.

When not in use for a long period of time, charge the battery and store at room temperature in the supplied carry case.

Regular inspection and charging can effectively increase service life of the battery.

4.2 Cleaning

Disconnect from mains power / charger.

Wipe the instrument with a clean cloth dampened with either water or isopropyl alcohol (IPA).

Do not use abrasive cleaners as damage may occur.

4.3 Battery information

4.3.1 Battery icon information

The battery icon has 4 segments.

When fully charged, all 4 segments are displayed.

4 segments indicates approximately 4.0 hours of use at full load.

3 segments indicates approximately 2.5 to 3.0 hours of use,

2 segments approximately 1.5 to 2.0 hours

1 segment between 0.3 to 1.0 hours at full load.

When the battery charge drops below 30%, a warning is displayed.

4.3.2 Battery charging

To charge the camera, plug the USB power adaptor into the mains supply socket. Using the supplied USB-C charging cable, connect to the camera using the USB-C charging socket.

Do not charge the battery in temperatures greater than 45°C.

After inserting the charger, the charging indicator LED lights to indicate the camera is charging. When fully charged, the indicator light goes off.

Keep the camera turned off whilst charging.

NOTE : The Megger MPAC cameras require a charge pack generating greater than 15 W

Specifications

5. Specifications

Specification	Detail
Microphone array	
Microphone array:	128 channels MEMS microphone
Effective test bandwidth:	2 kHz-48 kHz
Sound image FOV:	62°
Sound image frame rate:	> 25 FPS
Test sound pressure level range:	30 dB to 120 dB
Leak detection rate:	10 m 5 bar 0.92 ml/s 0.5 m 5 bar 0.55 ml/s 0.5 m 0.15 bar 1.6 ml/s
Measurement range:	0.3 m - 120 m
Camera	
Camera FOV:	62°
Camera focal length:	3.04 mm fixed focal length
Camera pixel:	8.0 MP
Display	
Resolution:	1024 x 600
Size:	178 mm (7 inch)
Touch screen:	Capacitive touch screen
Brightness:	Adjustable
Storage	
Internal storage:	about 8 GB
External storage:	USB-C memory stick or micro-SD memory card. Max 64 GB
Data storage format:	.jpg (picture) and .mp4 (video)
Battery	
Battery capacity:	6600 mAH @ 7.2 V
Battery life:	Approximately 4.0 h under full load
Charge:	USB-C Port. USB PD protocol supported
Power consumption:	15 W for battery charge, 29 W for maximum power consumption
Interface	
USB 3.0 Type-C USB host port	
3.5 mm headphone socket	
Operating environment	
Operating environment:	-20°C to +50°C 10% to 95% no condensation
Storage temperature:	-20°C to +60°C
Charging temperature:	+10°C to +45°C
IP Rating:	IP54
Mechanical	
Size:	272 mm x 174 mm x 42 mm
Weight:	1.7 kg

6. Accessories and Equipment

6.1 Included accessories

Item	
Hand straps	
Shoulder strap	
Power adaptor	
USB-C Charging cable	
Headphones	
USB-C/USB-A Memory stick	
Printed user guide	
Lens blower/brush	
Protective carry case	

7. Terminology

USB Power Delivery (USB PD)	A power delivery protocol based on USB3.1, which is often used to transmit higher power using a USB interface.
Decibel (dB)	A ratio used to express the magnitude of sound waves compared to a reference level at 0dB.
Sound Pressure Level (SPL)	A physical quantity used to express the magnitude of sound waves, in decibels (dB). Also expressed as dBSPL.
Audible domain	The frequency range of sound that can be perceived by human ears normally 20 Hz to 20 kHz.
Ultrasonic	Frequencies higher than the human ear can perceive, normally >20 kHz.
Sound image	The two-dimensional data table representing the intensity distribution of sound sources in the space plane after the signal collected by microphone array is calculated by the sound source location algorithm.
Palette	The colour data used in the colour mapping of a sound cloud chart.
Sound cloud image or sound map	The sound pressure level data of each resolution point on the sound image is mapped on the palette (according to a conversion formula) to form a colour image, which is superimposed over the visible image to form a sound cloud image or sound map.
Test frequency range	When a defined frequency range is selected within the full frequency range supported by the device, the device will measure and display a sound cloud image/sound map that is within the defined range. Sound outside this frequency range will not be displayed.
Frequency peak	Denotes a strong sound energy distribution at a particular frequency.
Dynamic range	The scale of the intensity of the sound source that can be shown on the sound cloud image/sound map.
Field of view	For the camera and the microphone array, the solid angles subtended by the edges of their respective images to the face of the instrument.

8. Calibration, Repair and Warranty

Warranty Period: Two years from the date of purchase.

Megger operate fully traceable calibration and repair facilities to make sure your instrument continues to provide the high standard of performance and workmanship that is expected. These facilities are complemented by a worldwide network of approved repair and calibration companies, which offer excellent in-service care for your Megger products.

Within two years from the date of purchase, we provide free warranty service for abnormal, and malfunction caused by product quality. Free warranty service does not include the non-product quality problems caused by improper use, accidental drop, etc.

In case of equipment failure caused by improper use or accidental drop, we promise to provide maintenance service at cost price.

The equipment has been calibrated when delivered to the user. However, in the long-term use process, we suggest that you send the equipment to our office every two years for equipment calibration, testing and maintenance.

For service requirements for Megger instruments contact:

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8.1 Return procedure

WARNING : DO NOT remove the battery cells before shipping this instrument. The MFT-X1 can only be shipped via land or sea freight with the Lithium-ion batteries installed. The MFT-X1 cannot be shipped by Air freight. Faulty battery modules MUST NOT be shipped to Megger or anywhere else.

1. When an instrument requires recalibration, or in the event of a repair being necessary, a Returns Authorisation (RA) number must first be obtained from one of the addresses shown above. The following information is to be provided to enable the Service Department to prepare in advance for receipt of your instrument and to provide the best possible service to you:
 - Model (for example, MPAC128).
 - Serial number (found on the display in the system/about menu, on the instrument label or on the calibration certificate).
 - Reason for return (for example, calibration required, or repair).
 - Details of the fault if the instrument is to be repaired.
2. Make a note of the RA number. A returns label can be emailed or faxed to you if required.
3. Pack the instrument carefully to prevent damage in transit. Use the original carry case if possible.
4. Before the instrument is sent to Megger, freight paid, make sure that the returns label is attached or that the RA number is clearly marked on the outside of the package and on any correspondence. Copies of the original purchase invoice and packing note should be sent simultaneously by airmail to expedite clearance through customs. In the case of instruments which require repair outside the warranty period, an immediate quotation can be provided when obtaining the RA number.
5. Track the progress on line at www.megger.com.

9. Decommissioning

9.1 WEEE Directive



The crossed out wheeled bin symbol placed on Megger products is a reminder not to dispose of the product at the end of its life with general waste.

Megger is registered in the UK as a Producer of Electrical and Electronic Equipment. The Registration No is WEE/ HE0146QT.

For further information about disposal of the product consult your local Megger company or distributor or visit your local Megger website.

9.2 Battery disposal

The crossed out wheeled bin symbol placed on a battery is a reminder not to dispose of batteries with general waste when they reach the end of their usable life.

For disposal of batteries in other parts of the EU contact your local Megger branch or distributor.

Megger is registered in the UK as a producer of batteries (registration No.: BPRN00142).

For further information see www.megger.com

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