DXmic

![HWM logo]

DXmic User Manual

Version 2

💧

CLEAN WATER

⚠️ **Warning:** This manual contains important safety and operating information.

Please read, understand and follow the instructions in the manual.

DXmic

Contents

DXmic

Introduction

The DXmic is an advanced, electronic ground microphone designed to amplify the noise generated by water escaping from buried supply pipes under pressure. Identifying the position of the loudest leak noise indicates the position of the actual leak itself.

The DXmic system comprises a lightweight portable amplifier module complete with battery charger, options of wired or wireless (Bluetooth) headphones and an acoustically shielded ground microphone foot. As an optional extra, a hand-held listening probe is available. This comes with a tripod foot and two probe rods for sounding in soft ground.

The DXmic has a touch screen LCD display and the advanced, easy-to-use features of the DXmic enable the operator to pinpoint leaks faster and with more confidence than ever before.

Key features

• Sliding scale filter selection
• Backlit multi-function LCD touchscreen showing:

- Graphical and digital noise levels
- Dynamic sensitivity (signal strength)
- Settings and operation mode

• Levels of leak noise can be recorded for comparison in a histogram profile, Minimum Level profiling
• IP65 enclosure
• Wired or wireless (Bluetooth) headphones with volume control (Option)
• Lightweight, easily portable system
• On / off button (Weatherproof)
• Versatile – ground microphone and hand probe configurations
• Military specification connectors
• Robust construction for field use
• Rechargeable batteries (up to 25 hours use)
• Ear protection filter for loud and sudden noises to protect the users hearing
• Recording and playback of sound samples (pro feature)
• Interaction with DXmic Pro App on Android (pro feature)

DXmic

Warnings

Lithium ion batteries

The batteries supplied and fitted to the DXmic units are rechargeable lithium ion. Do not short circuit or overcharge these batteries. Any misuse of these batteries may result in explosion or fire. They must not be used in any other application or used with any other equipment. Only batteries supplied by HWM Water must be used.

FCC warning statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

Industry Canada warning statement:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.

DXmic

Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire

de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

DXmic

System Description

Control unit – robust for field conditions

The DXmic is easily portable, and can be carried by either hand or shoulder-strap. Its injection-moulded housing is purpose-designed to provide long-term field durability and effective protection under realistic site conditions and is environmentally rated to IP65.

The control unit has a membrane On/Off button, with push-key operation, and a backlit multifunction touchscreen LCD display. The interface to the headphones, charger and USB port are environmentally protected to IP65. The connection to microphone is via military-specification connector.

Versatile leak noise sensing

The acoustically shielded ground microphone foot provides isolation from airborne noise interference and can therefore be used in wet and windy conditions.

Standard equipment list:

1. DXmic module with adjustable carry strap.
2. Acoustically shielded ground microphone foot.
3. Wired or wireless headphones.
4. Lithium ion battery pack and battery charger.
5. Carry case.
6. Cables.
7. Manual.

NOTE: Original XMic to sensor connection is not compatible with DXmic.

DXmic

Optional Additional Equipment

A handheld sensor unit can be added to the system as an option, providing the operator with the facility to use this as a smaller ground microphone with its tripod; or to use it with probe rods to sound fittings in deep chambers or to use in soft ground.

DXmic with optional hand probe and tripod

Equipment list including optional extras:

1. Control/amplifier module with adjustable carry strap.
2. Combined hand probe and ground microphone with integral cable.
3. Two 400mm stainless steel rods.
4. One short legged tripod.
5. Wireless headphones.
6. Lithium ion battery pack and charger.
7. Portable car charger cord.
8. Carry case.
9. Cables.
10. Manual.

DXmic

DXmic Overview

Number	Description
1	On/Off button
2	Settings
3	Microphone gain control
4	High pass filter mode
5	Low pass filter mode
6	No filter mode
7	Adjust band width
8	Adjust band position
9	Minimum level profiling mode
10	Carry strap
11	Headphone volume control
12	Mute
13	Battery charge state
14	Charging LED

DXmic

Number	Description
14	Sensor connection
15	USB port (USB micro, cable not included)
16	Charging connector
17	Headphone jack
18	Battery compartment
19	Connector cover
20	Headphone cover

DXmic

Preparing the DXmic for Use

The battery pack for the DXmic is supplied within the control unit.

Battery charging

To charge the batteries, lift the rubber connector cover cap the charge lead from the charger to the battery charging connector on the top of the DXmic. Plug the charger unit into the mains supply.

Note that the battery will not charge through the USB port.

While the batteries are charging with the device in standby, the charging LED on the front of the DXmic will be flashing red. The LED will flash green when the batteries are fully charged. The time required to charge the batteries from flat is approximately 8 hours.

The On/Off switch can be pressed while the unit is on charge to see how much charge is in the batteries at any time. When fully charged the battery, icon located in the top right corner of the screen will appear completely dark.

Firmly push the rubber connector cover back into position to protect the connectors when not in use.

NOTE: You can only charge the DXmic between 0°C - 45°C.

In-case charging

It is possible to charge both DXmic and Bluetooth headphones while safely stored in the case using the internal cable system.

USB socket for Bluetooth headphones charger

DC plug for DXmic

DXmic

The DXmic case comes equipped with an internal USB socket and DC power plug. The USB socket can be used to connect the USB charging cable for Bluetooth headphones. The DC power plug can be directly connected to DXmic.

In order for the devices to charge, a power adapter (either the plug-top power supply or the 12V cigarette lighter adapter) has to be connected to the barrel connector on the side of the case.

Battery replacement

Although the batteries are rechargeable, they may eventually need to be replaced.

Only batteries configured to the correct specification and type must be used, these are available from HWM Water.

To replace the batteries, switch the unit off and unscrew the six screws on the underside of the unit using a 2mm hex socket (Allen Key). Unplug the battery connector by depressing the connector locking mechanism and remove the battery pack. Connect the new battery pack, then replace the cover using the six screws and lightly tighten to 0.3Nm.

DXmic

Using the DXmic

Select the sensor attachment required, either the acoustically shielded ground microphone foot, or the optional handheld microphone unit with probe rods or tripod, which must be screwed into the bottom of the microphone housing.

Microphone foot warning

The Microphone foot has a sensor attached that can be seen from the bottom of the unit. Users must not attempt to unscrew this sensor as this will break internal components of the microphone resulting in irreparable internal damage. Sensor replacement is then the only option. Any necessary repair or dismantling of the foot must be carried out by HWM Water or by an authorised distributor.

If the sensor does become loose it should be tightened manually so that it is "finger tight". Excessive force will cause damage.
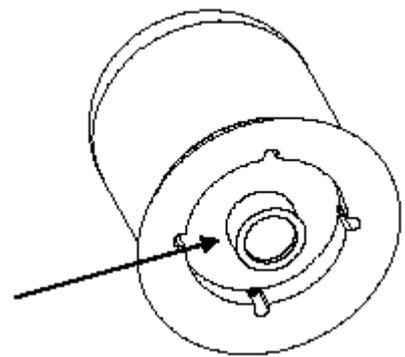
Sensor: Do NOT attempt to unscrew

Hand probe

For normal soft ground surfaces, the single pointed extension rod should be connected - do not over-tighten the screw thread. For direct contact with underground fittings via access covers it may be necessary to use the second extension rod. To do this, remove the single rod and connect the extension rod - replacing the pointed rod again. If the rods have been over-tightened, spanner slots allow easy removal.

Ensure headphones are paired / connected.

DXmic Controls

The DXmic is fitted with a LCD touchscreen for fingertip operation. Avoid operating with hard or sharp material such as a ball point pen or a mechanical pencil except a polyacetal pen (tip R0.8mm or greater).

DXmic Switch On/Off

Switch the unit on with a long (2 sec) press of the On/Off button on the front of the DXmic. The unit will switch on and remain switched on until this same button is long pressed again, or is left unused for a long period of time (1 hour from last interaction).

DXmic

Microphone Gain Controls

The microphone input level can be increased or decreased with the gain controls. To adjust the gain, use the **+** and **−** buttons on the left-hand side of the screen.

NOTE: Modifying the gain **WILL AFFECT** the noise level measurement.

Headphone Controls

Once paired the headphones will remain on. To switch them off press the mute button as shown left, found in the top right of the main display screen. When muted the button appears green. To adjust the volume, use the **+** and **−** buttons either side of the headphone icon, on

the right-hand side of the screen.

NOTE: Modifying the volume **WILL NOT AFFECT** the noise level measurement.

High Contrast Display

You can view the LCD display in high contrast where the screen appears black and white. To do this, select Settings, and then Display. Here you can adjust the brightness, select high contrast, or choose to invert the high contrast colours.
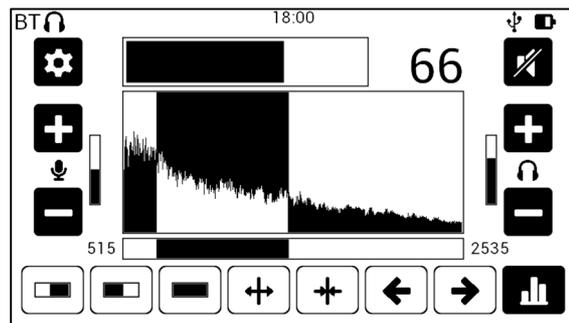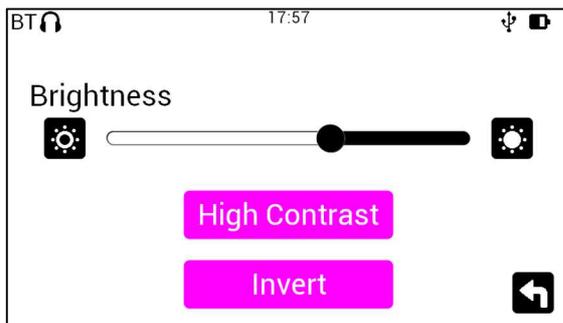
Headphone pairing

The DXmic is compatible with wireless Bluetooth headphones. To pair your headphones with the device, go to 'Settings' and select 'Bluetooth'. Switch Bluetooth 'ON' and press 'Pair'. Set headphones into pairing mode by holding down the power button until the LED flashes red and green, and the headphones will audibly say 'Pairing'. Press 'OK' and select your headphones from the display list. The Bluetooth display will now read 'Status: Connected'.

DXmic

NOTE: If you use other headphones, the pairing mode may be different. Refer to manual for headphones.

When headphones are paired, a small headphones icon will appear in the top left corner of the display screen.
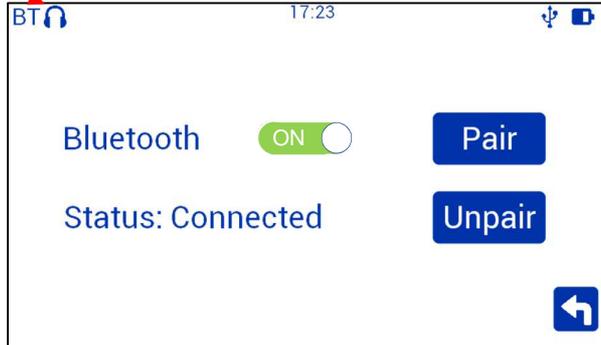
Alternatively, you can plug wired headphones into the headphone jack located under the rubber headphone cover on top of the DXmic control unit to listen to audio. You can later temporarily mute the headphones by pressing the 'mute' button on the main display screen. Firmly push the rubber headphone cover back into position to protect the jack when not in use.

Gauge view

It is possible to have an alternate view of survey mode (the main display screen) as a gauge with needle. To do this, tap the graph in the centre of the screen and the display will change. Tap once again to change back to the graph and bar view.
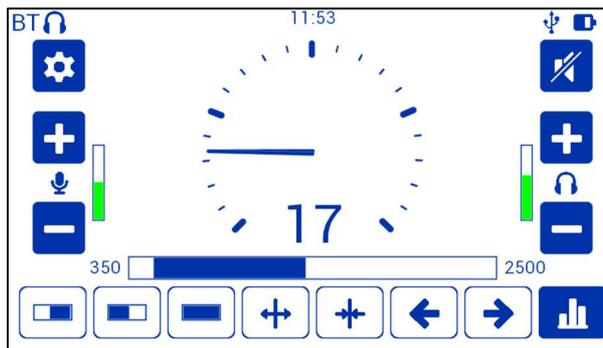
Hearing Protection Feature

The DXmic has built-in functionality designed to turn off the headphones' output in case of sudden loud noises which could damage the hearing.

DXmic
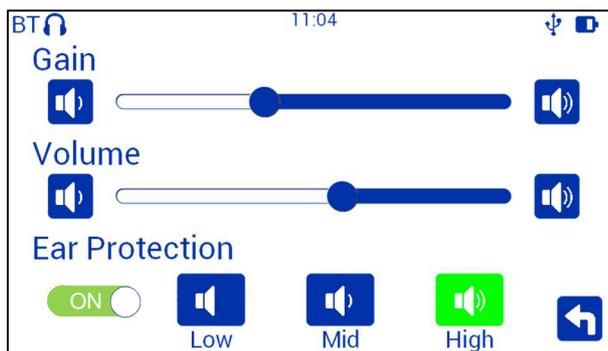
To adjust hearing protection, go to 'Settings' and select 'Audio'. Then switch hearing protection 'ON' and select the threshold you want.

The hearing protection filter has three different threshold settings:

1. LOW – cuts the output at level 70
2. MID - cuts the output at level 80
3. HIGH - cuts the output at level 90

NOTE: A small audio delay has been introduced in the signal path to allow DXmic to react to loud noises. The perceived delay might slightly increase when Bluetooth headphones are used. Please note that this delay does not compromises measurement quality (or recording quality on DXmic Pro).

DXmic

Filter Selection

To clarify the leak noise, background or unwanted noise frequencies can be filtered out using a combination of the controls on the DXmic. Unwanted frequencies can be filtered out via the bandpass, bandwidth and filter position buttons.

There are two modes of operation – survey mode and minimum level profiling mode (MLP)

Survey Mode

In survey mode, the gain level can be adjusted for optimum volume and the filters can be adjusted to reduce unwanted ambient noise. To locate the position of an underground leak the microphone is placed on the ground above the line of the suspect pipe and the readings observed.
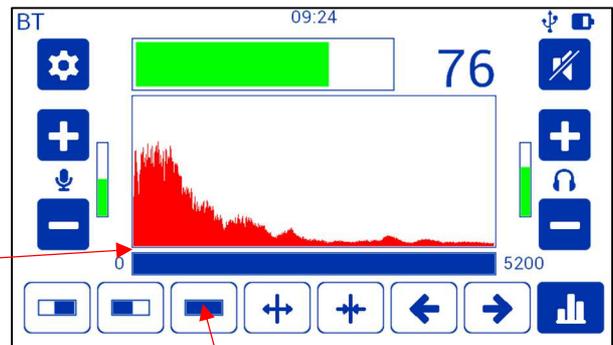
All filter settings are located along the bottom edge of the main display screen.

Survey Mode Screens

Unfiltered Noise
This is the initial default screen, which appears when the DXmic is switched on. This screen shows when no filters are applied.

The frequency spectrum indicator bar shows that all frequencies are available.
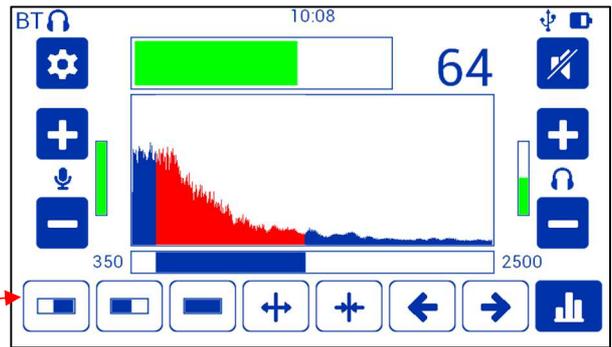

Unfiltered noise reset button.

DXmic

Pre-set Filter for High Frequencies Only.
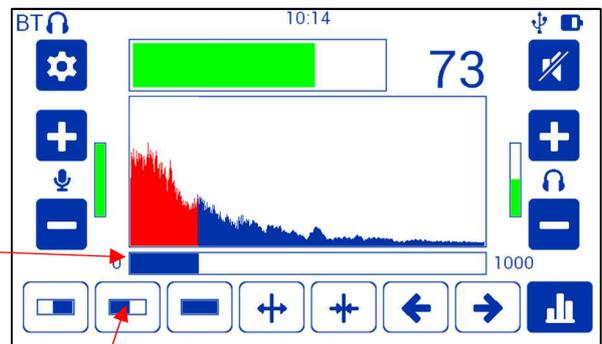
Used on metal pipes

High pass filter

Pre-set for Filter for Low Frequencies.

For Plastic (medium density polyethylene (MDPE)) pipes.

The frequency spectrum indicator bar shows both medium and low frequencies are allowed through.
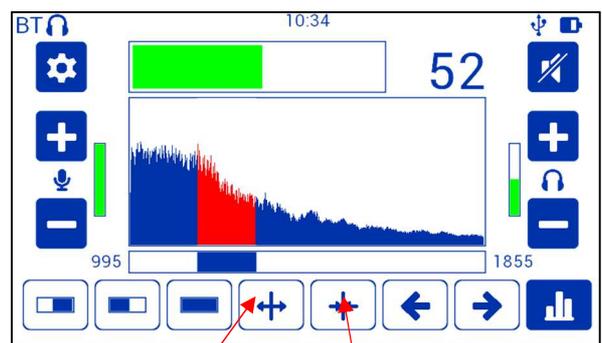
Low pass filter

Adjustable Filters – Bandwidth

The bandwidth of the frequencies allowed through can be adjusted using the double-headed arrow buttons. The dark blue section of the frequency spectrum indicator bar will either become wider or narrower.
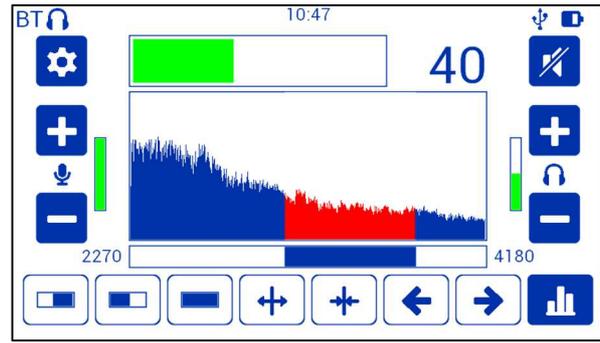
Expand bandpass   Reduce bandpass

Adjustable Filters – Bandpass Centre Frequency.

The position of the centre frequency can be adjusted up or down the spectrum using the left and right arrows

Adjust position

MLP Mode

MLP (**M**inimum **L**evel **P**rofiling) is performed by stepping along the line of the suspect pipe and recording the sound levels. The ground microphone is placed on the ground and the sample button pressed momentarily. The DXmic then records the minimum noise over three seconds.

As each measurement is taken the histogram graph is built up showing the difference between each reading visually and numerically, making noise level comparison a simple task.
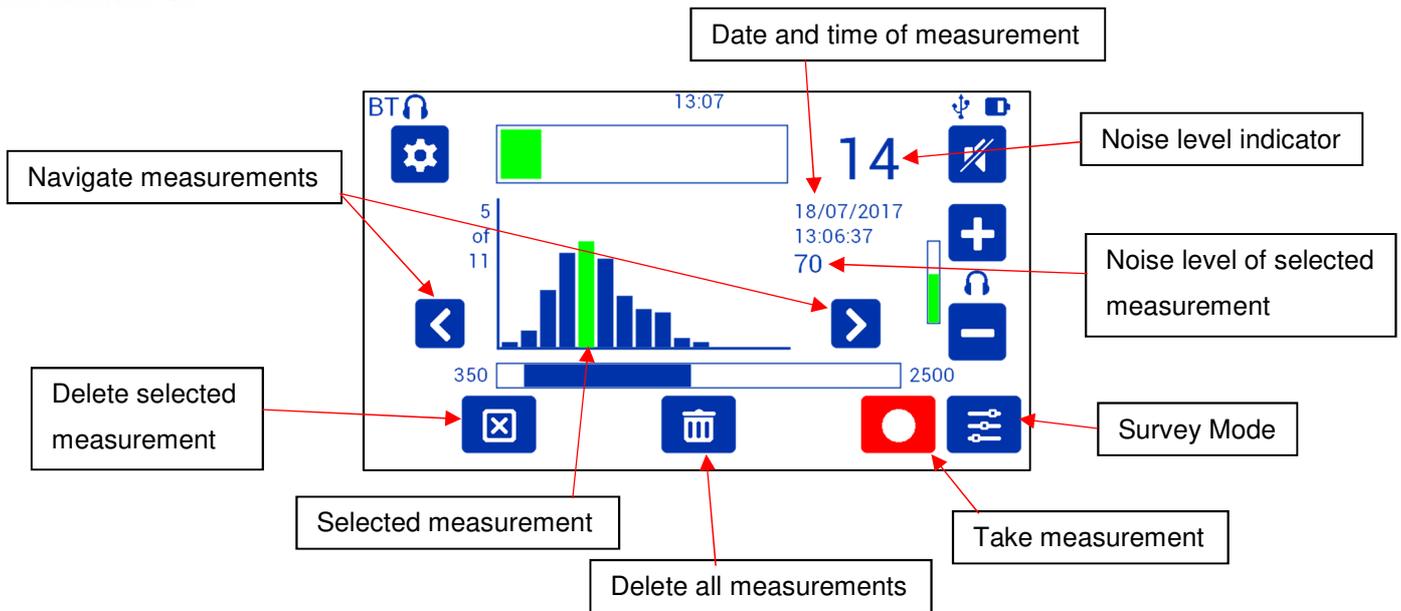
For each measurement taken a number appears to the right of the histogram. This noise level value is a relative indicator for each measurement. Once several readings have been taken the operator can select a sample by pressing the **<** or **>** buttons either side of the graph. The numerical noise level value is then shown for each measurement.

DXmic can store up to 100 measurements.

MLP Mode Screens

Once filters have been selected go to the MLP (**M**inimum **L**evel **P**rofiling) screen by pressing the 'MLP Mode' button in the bottom right hand corner, to carry out a leak noise comparison. The following screen will appear:

DXmic

Navigate measurements

Date and time of measurement

Noise level indicator

Noise level of selected measurement

Delete selected measurement

Selected measurement

Delete all measurements

Take measurement

Survey Mode

Each time the red record 'Take measurement' button is pressed, the leak noise acquired in the previous three seconds is recorded and displayed as a vertical bar on a histogram. In the example above, eleven consecutive readings have been taken by stepping the ground microphone along the length of the pipe and pressing the sample button at each position. This indicates the greatest leak noise acquired and the probable position of the leak.

DXmic

Recording and Playback of Audio Samples

Start/stop audio recording   Play/pause selected sample

DXmic Pro allows the user to record sound samples when in MLP mode. To start an audio sample recording press the red microphone button. Up to two minutes of sound can be recorded per sample. The recording can be stopped by pressing the stop button, noise level information will be stored with it. The audio recording will appear as a bar in the graph. When a measurement with an audio recording is selected from the graph the recording length will appear under the noise level indicator.

To playback an audio sample navigate the bar graph and select a sample with audio recording and press the play button. The playback will loop when the end of the recording is reached. It is possible to stop or pause the playback at any time.
During playback it is possible to access the filter selection screen and modify the filter configuration.

Warning: deleting measurements with an audio recording also deletes the audio recording.

DXmic

Measurement Geolocation

When the DXmic Pro is used together with DXmic Pro App, geographic location data can be added to the information recorded when taking a measurement.

If a measurement or recording is performed while connected to the mobile device app, DXmic Pro will request location information to the mobile device. DXmic Pro will wait for 10 seconds for a response from the App, during this period of time it won't be possible to take measurements or perform audio recordings. While the request is pending, a geotag symbol will appear on the top right corner of the display. If the App successfully responds, the location information will be stored on DXmic, a geotag symbol will appear near the measurement/recording information.

To learn on how to setup a connection with your mobile device, please refer to next Section «DXmic Pro App».

DXmic Pro App

DXmic Pro App is a mobile device application running on Android. It can be downloaded from the Google Play store:

https://play.google.com/store/apps/details?id=com.hwm_global.dxmicapp

DXmic Pro App allows the user to connect their mobile device to the DXmic Pro to retrieve and share data and audio recordings. The App also enables DXmic Pro to collect location information from the mobile device to complement measurements and sound recordings (see previous section «DXmic Pro Functionality»).

In order for the app to work correctly, it is necessary for the DXmic Pro to remain in a power on state and have Bluetooth functionality activated (The display should show "BT" in the upper left corner, Bluetooth can be enabled in the settings page under "Bluetooth").

Mobile Device Pairing

In order to connect to the Mobile App, it is first necessary to pair the DXmic Pro to the mobile device, this is done directly on the mobile device. First of all, make sure that the DXmic is on and that Bluetooth functionality is enabled (The display should show "BT" in the upper left corner, Bluetooth can be enabled in the settings page under "Bluetooth"). Open the mobile device settings and browse the menu to reach the Bluetooth settings page. When the Bluetooth

DXmic

is enabled this page should show all devices present around the device, DXmic should show up with a name like "DXmic-xxxxx", where "xxxxx" is the device serial number. Select your DXmic Pro from the list and wait until the pairing process ends.

Connection to DXmic Pro

To connect to DXmic Pro, launch the DXmic Pro App on your mobile device. The App will show a list of paired DXmic Pro. If no device is shown make sure your DXmic is correctly paired to your mobile device (see above). Select the DXmic Pro you want to connect to and tap on "Connect". After a successful connection the App will stay connected to the DXmic Pro until the App is closed or DXmic Pro is turned off. Connection will be maintained even if the App is put in background or the mobile device screen is locked.
A mobile phone symbol is shown in the upper left corner of DXmic Pro display when the connection with the App is active.

NOTE: If for any reason the connection is interrupted or the DXmic Pro is switched off during connection, it will be necessary to re-establish connection manually, DXmic Pro App will not automatically reconnect.
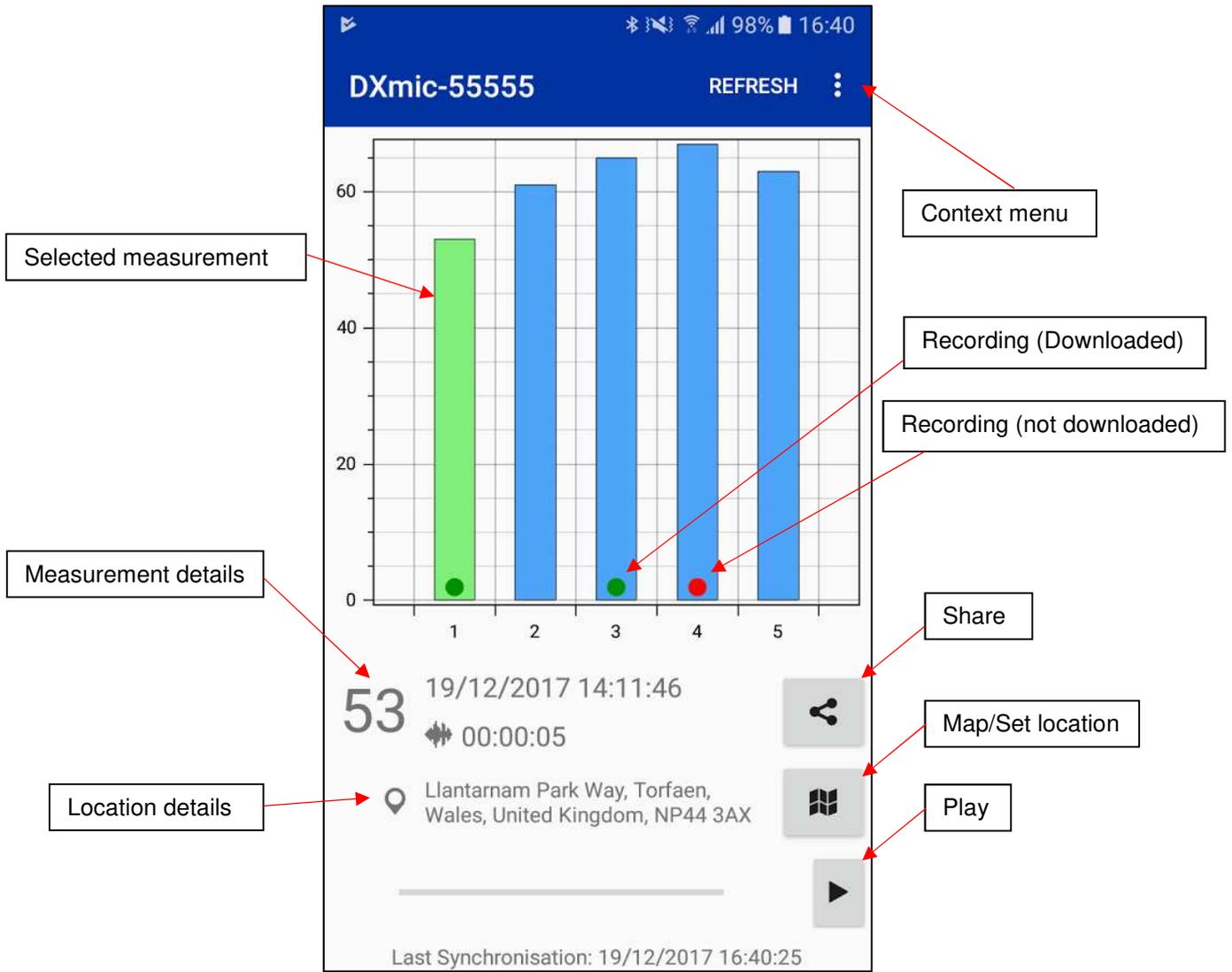
Browsing Data

After successful connection, the App will show a screen with the retrieved data similar to that on the DXmic Pro. Select a bar in the graph to visualize the measurement details, it is possible to scroll and pinch to zoom in and out the bar graph.
If a measurement contains location data, the location address will be shown, tap on this field to display coordinates.
Audio recordings are represented in the graph as bars with a dot at the bottom. If the dot is green, the recording has already been downloaded on the mobile device, if it is red, it has not been downloaded yet.
The App will only show the data gathered during the last connection or refresh. To obtain new data from DXmic Pro, tap on "Refresh" in the upper right corner.

DXmic

Context menu

Selected measurement

Recording (Downloaded)

Recording (not downloaded)

Measurement details

Share

Location details

Map/Set location

Play

**Downloading Recordings and Playback**

Upon successful connection, you will be asked if you want to download all new audio recordings.
If the "skip" option is selected, all new recordings will be shown in the graph with a red dot.
Selecting a recording from the graph will allow the user to play the audio sample by pressing
the play button. If the selected recording has not been downloaded yet, it will be downloaded.
During the download process, DXmic Pro will enter file transfer mode.
All downloaded recordings are accessible by selecting "Manage Recordings" in the context
menu.
In the record management page, it is possible to listen to all downloaded samples. Keeping the
finger on a file in the list will enable the "Delete" option for that file. Files can be deleted in bulk
by selecting "Delete All" from the context menu.

DXmic

Map Screen

The map screen is accessed by pressing the "Map/Set location" button. The previously selected measurement will be shown on the map in the centre of the screen, other measurements are also shown.

If the selected measurement does not have any location information, the map screen will show you your current location or the location of another measurement (if any is present). In this case it is possible to set the position by moving the pin on the map and tapping on "Set" in the upper right corner.

If the selected measurement already has location information, it is possible to modify it by tapping on "Modify" in the upper right corner. To set the new location move the pin on the map and tap on "Set".
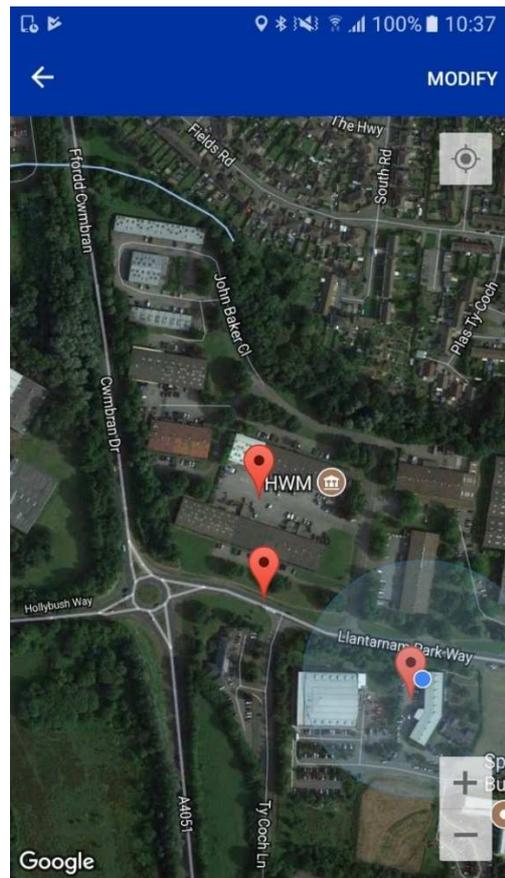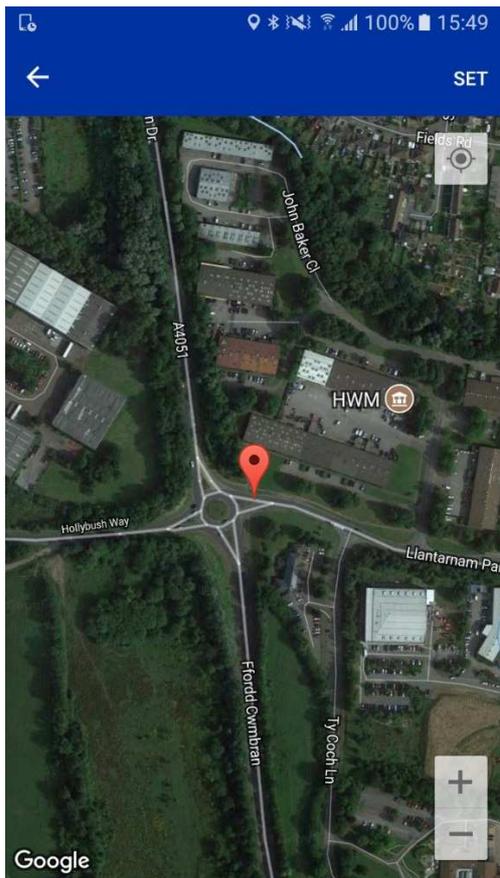

Sharing data

The DXmic Pro App allows the user to share measurement data and recordings via email or using our cloud based web portal DataGate.

DXmic

Tapping the "Share" button will summon the Share screen. Here it is possible to select which measurement to share by tapping on the bars in the graph. It is possible to enter a name for the set of selected measurements; this name will be used to generate the email subject and/or the sub-account name on DataGate.

Tap on the "Email" button to share the measurement via email. The data of all selected measurements will be compiled into an email, recordings will be added as attachments. The App will ask you if you want to download the missing recordings if any of the selected measurements contains a recording that has not been downloaded. The email is generated and sent using the default email application on your mobile device.
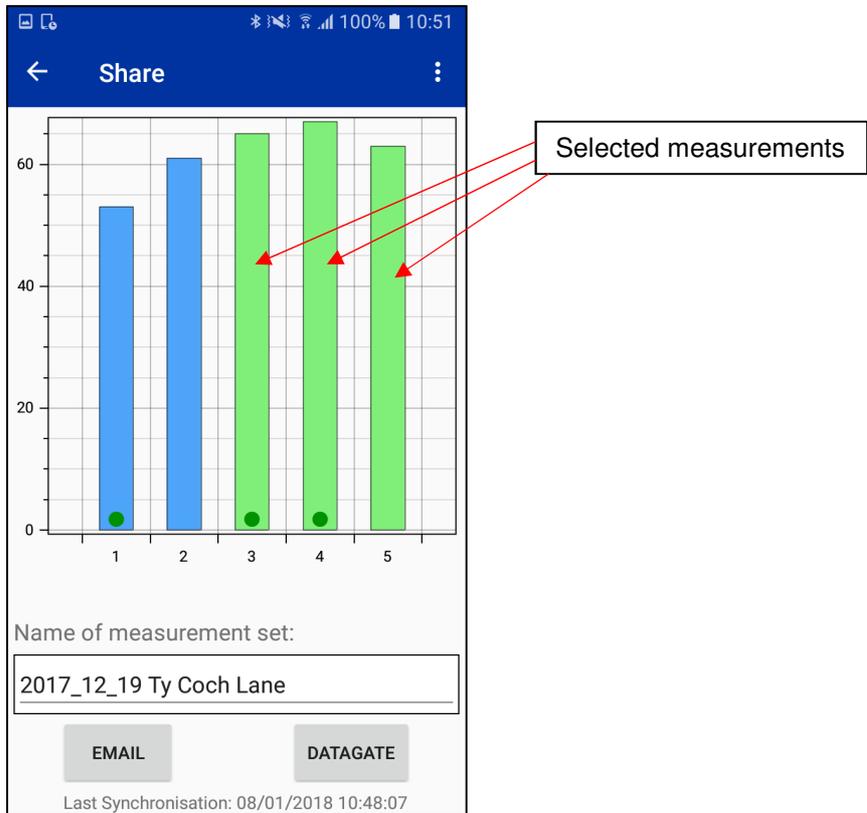
Tap on "DataGate" to upload data and recordings to your DataGate account.

You will be asked to enter your DataGate credentials and the server settings.

DXmic
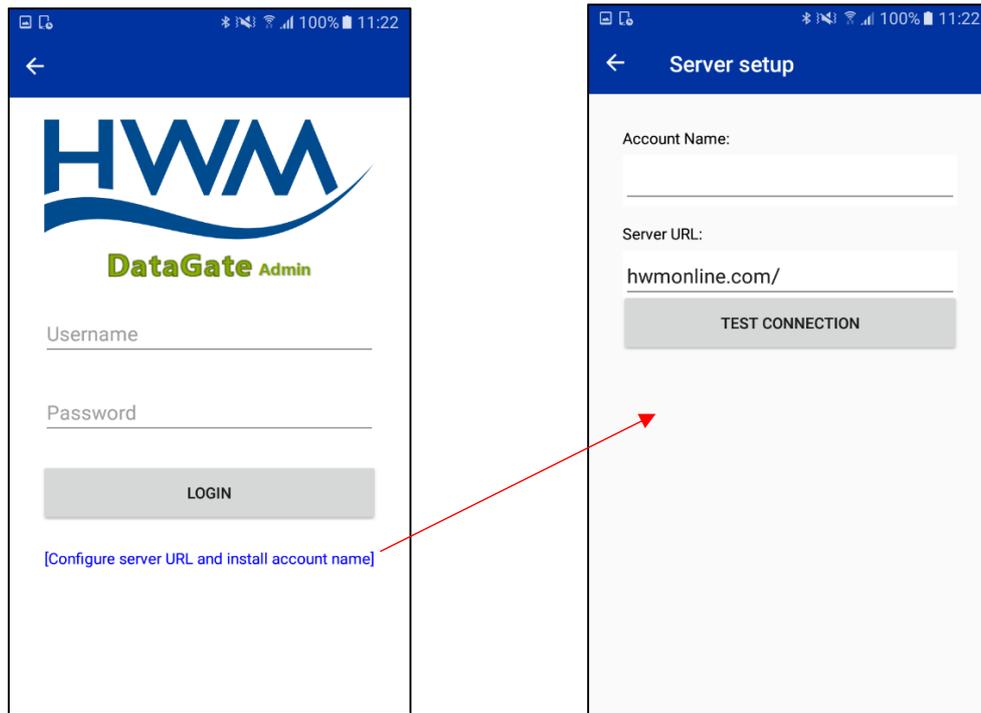
On DataGate your measurements will be grouped in sub-accounts, also called DMA (District Metered Area). It is either possible to create a new DMA containing the selected measurements, or to append the measurements to an existing DMA. Tap on "Upload to DataGate" to upload the data. It is possible to share a link to the DMA via email after the data has been uploaded.

DXmic

DXmic

Touch Screen Calibration

To calibrate the touch screen, turn off the DXmic by pressing the push button for three seconds. Push the button again to turn on the device. Keep the button pressed until after the splash screen disappears, the calibration screen will appear. Tap the flashing dots as accurately as possible to complete the calibration process.

Software Update

You can obtain the latest firmware for DXmic by downloading the latest version of the Installation and Diagnostic Tool (IDT) from HWM website www.hwmglobal.com.

To perform the firmware update, install the latest version of IDT on your PC. Connect the DXmic to the PC using a USB micro cable (not included), open IDT and click on "Read Device". If a newer firmware is available a message will appear asking you if you want to update the software. Click on "OK" to perform the update.

The update might take several minutes to complete, during the update do not disconnect the USB cable and do not quit IDT.

WARNING: all measurements data (and audio recordings DXmic Pro) will be lost after the update.

DXmic

<p style="text-align:center"><u>Guidance to Effective Acoustic Leak Detection</u></p>

All acoustic leak detection methods are based on the premise that normal water passage through pipelines takes place noiselessly. When the water passage is disturbed a noise is created. Causes can include partial pipe blockages, sudden changes in pipe diameter, abrupt changes in pipe direction, pumps or meters installed in the pipeline, consumer usage or pipeline damage. Pipeline damage can include holes, cracks or splits, complete pipeline rupture, leaking joints or leaking valves.

Careful application of leak detection techniques will enable the operator to eliminate detected noises generated by poor pipeline design or consumer usage and to identify leakage due to pipe system damage.

The strength and clarity of noise generated by leaks will be affected by the water pressure, the size and shape of the orifice allowing leakage, the type of ground material around the pipeline, the type of ground cover over the pipe, the diameter, wall thickness and material of the pipeline and the quantity of water leaking.

A small orifice or hole and high water pressure generally produces a higher frequency noise. Often the noise level increases around valves, pipe elbows, T-connections and pipe ends, etc… since the partial obstruction increases pressure and creates some further disturbance in the water path.

Leak noise is transmitted along the pipeline both through the water and the pipe wall as well as into the ground around the pipe. The noise travels much better through "hard" materials: further along metallic pipes than asbestos cement pipes which themselves are better than plastic pipes. Ground material generally provides a poorer travel path than the pipeline itself. Soft sandy ground provides a worse travel path than well compacted ground with a hard-paved surface covering.

The leak noise can change in strength and pitch as it travels along the pipe or through the ground. The deeper the pipe is buried and the softer the ground the more the noise will be dampened.

When a leak is produced in a metallic pipe the leak noise will transmit well through the pipe. It does not travel so well through a plastic pipe. This means that a leak noise can be heard further away on metal than on plastic. Also bear in mind that the further you go from a leak noise source the more difficult it is to pinpoint that leak noise accurately.

Background noise can interfere with leak detection. Traffic and machinery noises can travel for considerable distances through both air and ground material and often occur in the same

DXmic

frequency bands as leak noise. Sometimes it is necessary to use leak detection techniques at night when interfering noises are less.

It is very important to adopt a methodical approach when using any instrument for acoustic leak detection. It is necessary to practice the technique in order to distinguish between different sounds, recognising background or interfering noises, so that they can be eliminated. It is also essential that other (non-leakage) system noise sources such as consumer draw-off or partially closed valves be eliminated by logical site inspection practices prior to any excavation taking place.

Surveying

The leak location can be narrowed down by listening at accessible contact points such as meters, hydrants, valves and stop-taps. These provide good points of sound pick-up, particularly if the pipe is metallic. Use the hand-probe/extension rod to listen at these points.

If there are no accessible contact points or if the pipe is of non-metallic material, use the microphone foot for listening, placing the foot over the pipe route in the area of the suspected leak. Move along the pipe route listening at each accessible pipefitting
Or at regular positions on the ground until you have identified the area of maximum noise level.
Note: When you are listening on pipe-fittings the location of the point of maximum noise will probably not indicate the leak position, only the fitting closest to the leak. The noise level will also appear stronger where there is less thickness of ground or other material for it to pass through. The leak noise will follow the path of least resistance.

Pinpointing the leak position

Pinpointing the leak position involves a process of comparing a number of leak noises. Select the most suitable sensor device; the microphone foot for hard ground surfaces or the hand probe for soft ground.

Operate the ground microphone and adjust the headphone volume control to a comfortable listening level. Once you have listened to the noise through the headphones, mute the headphones and move the microphone foot or hand probe to the next test position.

Repeat the sequence to listen to each of the test locations moving along the pipe route in the direction where signal strength is increasing. If the leak noise level falls you have passed the leak and should go back and reduce the distance that you move between measurements. The

DXmic

loudest leak noise will then indicate the location of the leak bearing in mind the ground conditions already mentioned.

DXmic

DXmic Technical Specification

Control Unit

Processor: 144MHz 32 bit

Input impedance: 1MOhm

Output impedance: 6 to 16 Ohms

Amplification: 46dB

Frequency range: 20 to 5200Hz

Distortion: Better than 1%

Battery: 2 x Lithium ion 1.8Ah rechargeable batteries

Battery life: Minimum 15 hours (with maximum backlight)

Minimum 25 hours (with power saving)

Battery charge: Maximum 8 hours

Charger: Universal 110-240V AC mains charger with 12V DC output

Weight: 600g

Dimensions: 193mm x 109mm x 60mm

Environmental rating: IP65

Operating temperature range: -15°C - 50°C

Operating humidity: 0 – 95% non-condensing

Connections: Military specification connector (probe), 3.5mm jack (wired headphones),

USB Micro (PC data transfer, NOT FOR CHARGING), DC jack plug socket.

Keypad: LCD Touchscreen

Display: 5'' TFT LCD

Signal level display 0 – 99

DXmic

Microphone

High sensitivity piezo-electric sensor mounted in windproof, nitrile rubber housing

Low noise 1.5m cable (detachable)

Weight: 2.9kg

Hand Probe Attachment (Optional Upgrade)

The hand probe option includes the tripod foot and two stainless steel probe rods with magnetic

contact (each 400mm in length)

Combined weight of rods 162g

Headphones

Studio quality headphones supplied as standard. Aviation quality headphones or wireless

Bluetooth headphones are available as requested.

Cleaning

Equipment can be wiped with a cloth using a mild soap solution and thoroughly dried before storing.

DXmic

<u>Warranty</u>

All equipment is warranted by HWM Water Ltd to be free from defects in materials and workmanship for a period of one year (unless otherwise stated) from the date of shipment to the original customer. This warranty is only valid if the equipment has been installed and used in the correct manner as described in this manual.

Repair or replacement (at HWM Water's discretion) will be made without charge provided the above conditions have been met.

If any problems occur, notify HWM Water Ltd or its authorised representative giving full details of the problem, and the model and serial number of the equipment. You will receive technical advice and/or shipping instructions depending upon the nature of the problem.

DXmic

SIMPLIFIED DECLARATION OF CONFORMITY

This simplified EU declaration of conformity referred to in article 10(9) shall be provided as follows:

Hereby, HWM Ltd declares that the radio equipment type transceiver is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at www.hwmglobal.com

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www.hwmglobal.com   MAN-150-0001-B (DXmic User Guide).docx