

PROSARIS

User manual

OL1 Ultrasonic Leak Detector



Limited warranty and limitation of liability

This Prosaris product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling.

Resellers are not authorized to extend any other warranty on the behalf of Prosaris. To obtain service during the warranty period, contact Prosaris directly with a description of the problem.

This warranty is your only remedy. No other warranties, such as fitness for a particular purpose, are expressed or implied. Prosaris is not liable for any special, indirect, incidental, or consequential damages or losses, arising from any cause or theory. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

UL Condition

The performance of the product, such as accuracy or functional safety, has not been evaluated and the product is not intended to be used for life safety applications.

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1 Introduction

The ProSaris OL1 is a portable directional ultrasonic leak detector primarily used to detect, locate, and measure leaks in compressed gas and vacuum systems.

The OL1 connects with any Android device and through an app downloaded onto the Android device, captures a live-view image of the scanned process or industrial system.

The OL1 attaches to the back of the Android device by magnet and connects via cable.

The OL1 has a proprietary arrangement of sensor arrays which detect ultrasonic noise and uses this data to provide visual direction and location of the sound source directly onto the visual display of the area under assessment.

When provided with input data, an estimation of both leak volumetric flow and financial loss associated with the wasted energy related to the leak can be calculated.

The OL1 is provided with a sealed rechargeable battery which powers the device (power is not drawn from the Android until the OL1 is below minimum levels). An external battery charging cable is provided with the device.

All leak event record data are stored on the Android device and ProSaris Leak Management application backend, which is accessible to each user (subject to subscription tier).

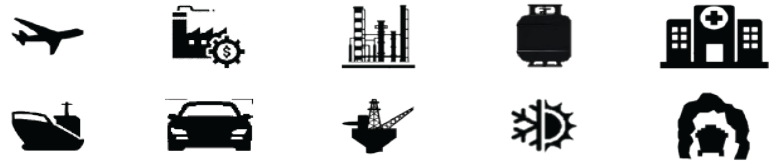
1.1 Applications

The OL1's main applications are:

- Compressed air leak detection, location and quantification
- Compressed process (non-hazardous) gas leak detection, location, and quantification
- Vacuum leak detection

The OL1 is not intended to be used for life safety applications.

Industries served include:



2 How to contact Prosaris

To contact Prosaris, use one of the following email addresses below or visit us at www.prosaris.ca.

Tech Support: support@prosaris.ca

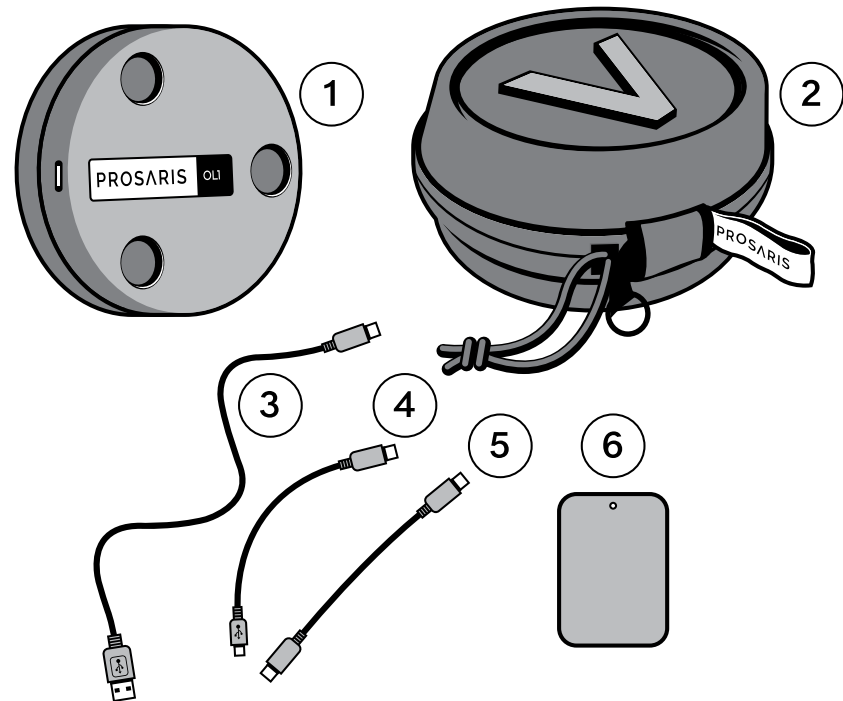
Industry Sales: sales@prosaris.ca

General Inquiries: info@prosaris.ca

3 Before you start

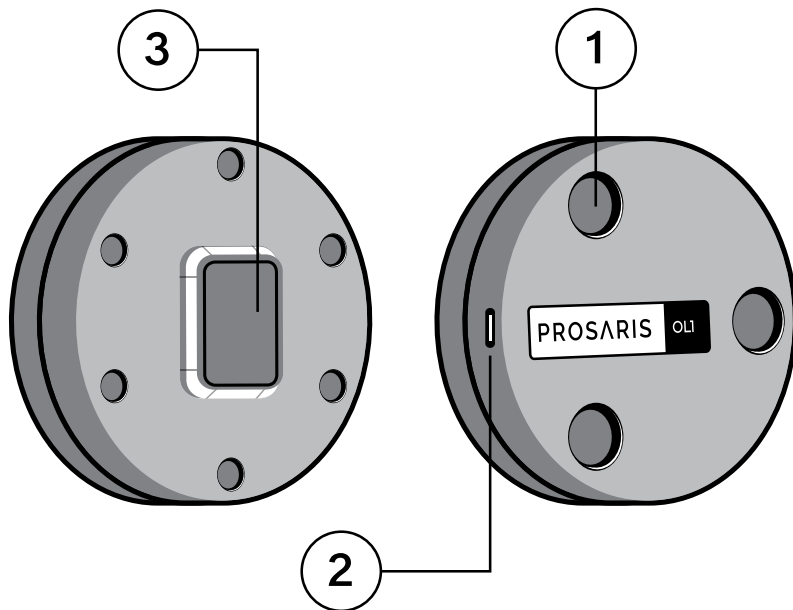
3.1 Package contents

#	Model	Description
1	OL1	Ultrasonic Leak Detector
2	OL1 Soft Case	Prosaris soft carrying case for the OL1
3	OL1 Charging Cable	Approved USB-C to USB-A charging cable for the OL1 (45cm)
4	OL1 Connecting Cable 1*	Approved USB-C to microUSB cable connecting the OL1 device to your Android device
5	OL1 Connecting Cable 2*	Approved USB-C to USB-C cable connecting the OL1 device to your Android device
6	OL1 Mounting Plate	Adhesive mounting plate for attachment to your mobile device



* Note: Use of any other cable has not been tested or approved

3.2 Device overview



1. Microphone array

The OL1 has three arrays consisting of 8 MEMS microphones each, protected by a dust and water-resistant cover. Take care to prevent any object from coming in contact with these covers.

2. USB-C port

The OL1 charges and connects to your device with a single USB-C port. Take care to prevent dust or water from accumulating in the port and to ensure that the connection pins are not damaged.

3. Magnet

The OL1 has a neodymium magnet that allows it to easily attach to your device. Always follow the magnet safety guidelines in Section 3.4.

3.3 Terms to know

Use this section to familiarize yourself with the terms that are unique to the Prosaris OL1 device and signal strength measurements.

Loss (\$/year): The *Prosaris Leak Management* app estimates the compressed air dollar loss per year through lost energy. This value is based on user defined parameters and is an estimation only.

Decibel (dB): Decibel indicates the intensity (loudness) of the sound and is expressed in terms of dB. During the detection of a new leak, the Prosaris OL1 displays the dB that is being currently measured along with the peak dB that has been detected for a sustained period.

Distance (m or ft): The distance between the leak source and the Prosaris OL1. Our dB estimation algorithms adjust the measured dB to estimate what the reference dB would be at the ideal distance. This allows you to estimate leaks from a range of distances (up to 2m or 6.5ft).

Field-of-View (FOV): The real-world environment that is visible through the tablet's camera. The leak does not have to be within the FOV to start and complete leak detection.

Flow (m³/hr or cfm): The *Prosaris Leak Management* app provides an estimate of the flow escaping through from detected leak source by using measured dB data and user specified leak parameters.

Leak Event Record: An instance of a leak that was detected, with its details being stored for later viewing and editing.

Ultrasound: Equipment leaks generate sound signatures in ultrasonic ranges (>20kHz). The human ear cannot perceive sound in this range but the sensitive microphones in the OL1 can.

3.4 Safety



WARNING

To prevent personal injury and for safe operation of the product:

- Do not put the device near heat or fire.
- Do not incinerate the Prosaris OL1 and/or battery.
- Do not disassemble or crush the device.
- Connect the charger to the power outlet before connecting to the device.
- Only use USB AC power adapter with fixed prongs and designed for use in the United States and Canada, or charge via your computer's USB port.



CAUTION

To prevent damage to the battery:

- Do not expose battery to heat sources or high- temperature environments such as an unattended vehicle in the sun.
- Always operate in the specified temperature range.
- Do not store the device on the charger for more than 24 hours as this may reduce battery performance and/or life.
- Do not store the device for extended periods of time in an environment where the temperature is outside the temperature range of -20°C to 50°C as this may reduce battery performance and/or life.
- Store the device in a cool, dry place if it is not in use for extended periods of time.
- Charge the battery initially for a minimum of 8 hours.
- Do not charge the battery when the ambient temperature is not in the range of 0°C to 45°C.

The OL1 uses a 1500mAh lithium-polymer battery.

The battery charges directly from a USB power adapter or computer (see Section 4.1).

Test Compliance - The cells comply with all UL 1642 single-cell tests except the impact and crush tests, and IEC 62133.

3 Before you start



CAUTION

The OL1 uses a magnet to attach to your device.
Please take care of the following recommendations:

- Do not place the OL1 device near any sensitive magnetic media such as computer disks, credit cards and tapes.
- Keep OL1 device away from pacemakers and any other internal medical devices.
- Keep OL1 device away from tools and other metal objects.
- Do not ingest or inhale the magnet. Seek immediate medical attention if any magnet(s) are swallowed or inhaled.
- Do not place in nose, mouth, or any other part of the body.
- Swallowed magnets can stick to intestines causing serious injury (necrosis) or even death.
- Keep out of reach of all children.
- Neodymium Magnets are brittle. They can break or splinter in a collision. Broken magnets are sharp. If the protective cover becomes damaged, cease use immediately and contact ProSaris

4 Initial setup

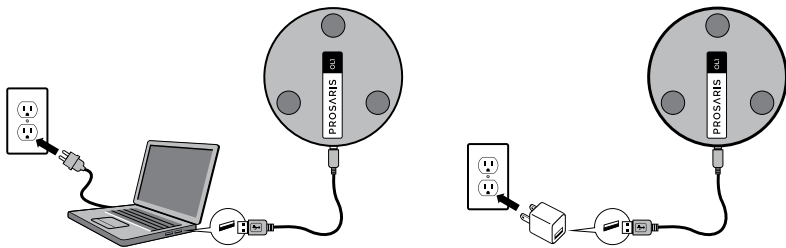
4.1 Charge the device

The OL1 ships with limited charge to preserve battery life. Before your first use, fully charge the battery by leaving it to charge for a minimum of 8 hours.

The Prosaris Leak Management app will indicate the battery life of the OL1 in the upper right-hand corner of the app. Be sure not to confuse this with your Android device's battery life, which may or may not be shown depending on your device.

To charge the OL1, use the included USB-C to USB-A charging cable. Plug the USB-C end into the device and the other into a USB power adapter that is plugged into a wall outlet.

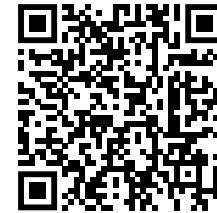
Using any charger with a lower amperage rating will cause the OL1 to charge more slowly and may decrease battery life.



4.2 Download the app

The Prosaris Leak Management app is required to operate the OL1 and is available on the Google Play store. To download the app, follow the below steps:

- Open the Google Play store on your Android device.
- Search for "Prosaris Leak Management" (or scan the QR code below).
- Tap "Download" to begin the download from the store.
- The app will now be available on your device's home screen.



Note:

- The Prosaris Leak Management app requires a device running Android OS (Android 7.0 or later).
- You will require a Google Play account to download the app.

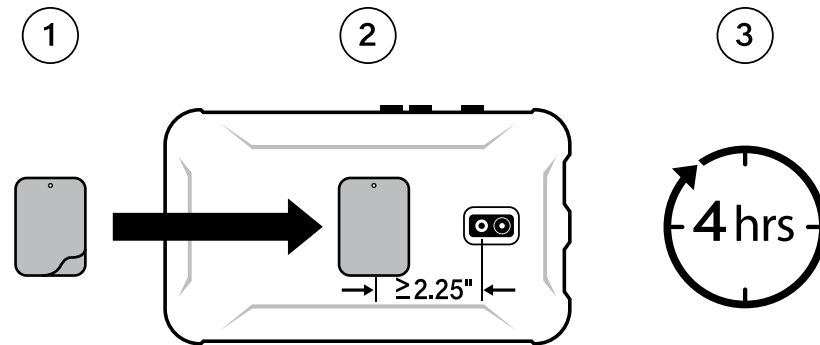
4 Initial setup

4.3 Affix the Mounting Plate

To attach the OL1 magnetically to your device, you must first affix the Mounting Plate.

Affix the Mounting Plate in the center of the back surface of the device where possible, without obscuring the device's camera. The device must be used in landscape orientation while using the ProSaris Leak Management app.

- Clean the location with an alcohol wipe, making sure to remove any dirt, grime, or lint.
- When the location has dried, remove the backing and make sure the area is clean and dry. Depending on your device, the mounting plate may be oriented portrait or landscape. Ensure the center is at least 2.25 inches from the center of the device's camera. Affix the Mounting Plate, pressing firmly to ensure strong adhesion. Make sure that the Mounting Plate is aligned vertically and horizontally.
- For best performance, allow the adhesive to dry for at least 4 hours before attaching the OL1.

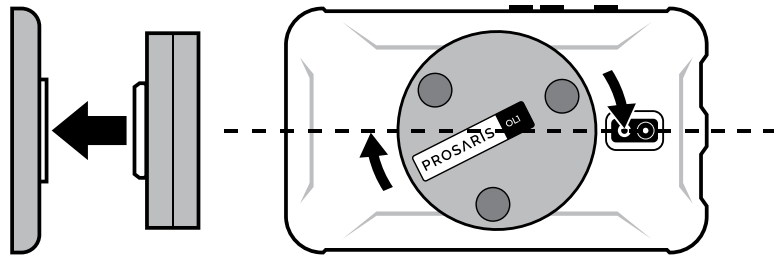


5 Basic Operation

5.1 Attach the OL1

The OL1 attaches magnetically to your device via the included Mounting Plate.

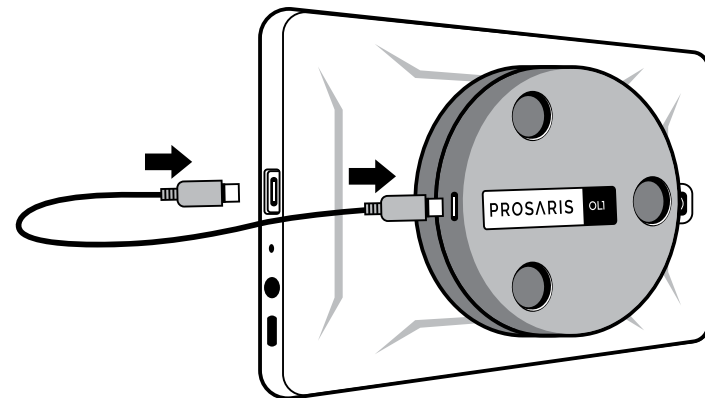
1. Attach the OL1 to your device by placing the magnet of the OL1 on your device's mounting plate.
2. Ensure that the "PROSARIS" logo on the OL1 is Horizontal on your device when in landscape orientation.



5.2 Connect the OL1

Connect your tablet to the OL1 via the included cable. Depending on your device, you may have to use a different cable.

Ensure that the cable between the OL1 and your device is straight, with no bends or kinks. Connect the cable to the Android device first, and then the OL1. When you first connect, you will have to grant permission for your device to handle the OL1 USB UART connection. You can also choose to have the Prosaris Leak Management app launch automatically every time the OL1 is connected.



5 Basic operation

5.3 Launch the app

The Prosaris Leak Management app enables the functionality of your OL1 device. After installing the app, you can launch the app by tapping on the icon on your Android device's home screen.

When first using the Prosaris Leak Management app, you will be asked to allow the device to use your Android camera. The app will still work if denied, but it will be unable to provide a visualization of the leak location or record pictures and video of the leak source details.

Tap "Allow" to use the Prosaris Leak Management app with full functionality.

Next the Prosaris Leak Management app will ask permission to use the GPS location of your Android device. This supports the leak record management aspects of the app.

Tap "Allow" to use the app with full functionality.

You may then be asked to acknowledge that the app is running in "Full Screen Mode" with device buttons hidden. Acknowledge by swiping up from the bottom of the screen and tapping "OK".

5.4 Registration

If you do not have an account, tap "Register" to be guided through the account registration process. You will be asked to provide your name and email, as well as other pieces of information to help us provide you with the best user experience.

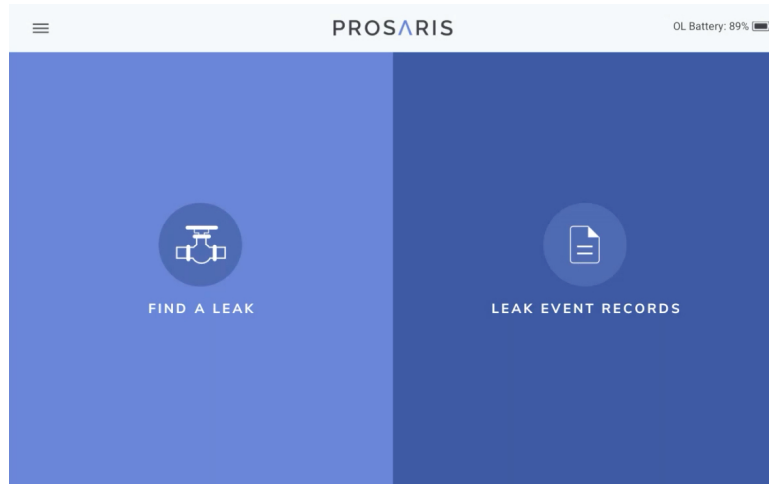
Once you have registered, you will be able to log in to the app.

5.5 Logging in

Please enter your email and password and tap "LOGIN". If you do not already have a Prosaris account, tap "Register". If you have forgotten your password, tap "Forgot Password?"

5 Basic operation

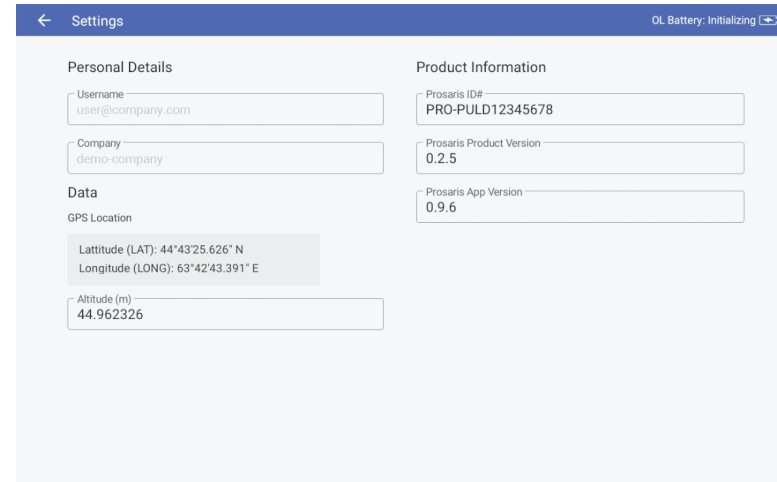
5.6 Home screen



Now that you have logged in, every time you reopen the app you start from the above "Home Screen", until you decide to log out.

From this screen, you can start finding new leaks immediately by tapping "FIND A LEAK", you can view leak records by tapping "LEAK EVENT RECORDS" (subject to subscription tier) and change user settings by tapping the triple bar menu in the top left corner.

5.7 Settings menu



This "Settings" menu contains key information about your Prosaris app and device, as well as the information about the signed-in user.

5.8 Firmware updates

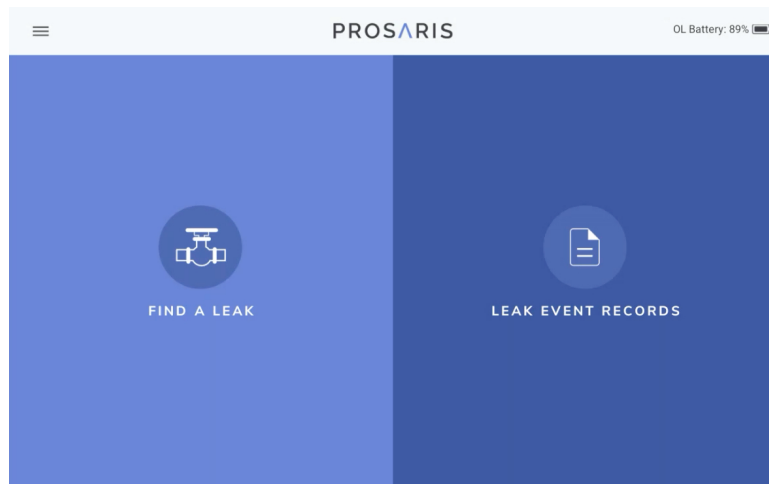
The functionality of your device can be improved by upgrading its embedded software, or firmware.

Firmware updates will be periodically pushed to your device through the app. If a new firmware version is available and you're connected to the Internet, your app will automatically download and apply the update.

Make sure that your tablet or phone does not go to sleep or shut off its screen during the update process. You can increase the time before sleep in the settings menu of your tablet or phone.

6 Leak Detection

6.1 Begin Leak Detection



To start finding your leaks, tap "FIND A LEAK".

6.2 Enter Leak Parameters

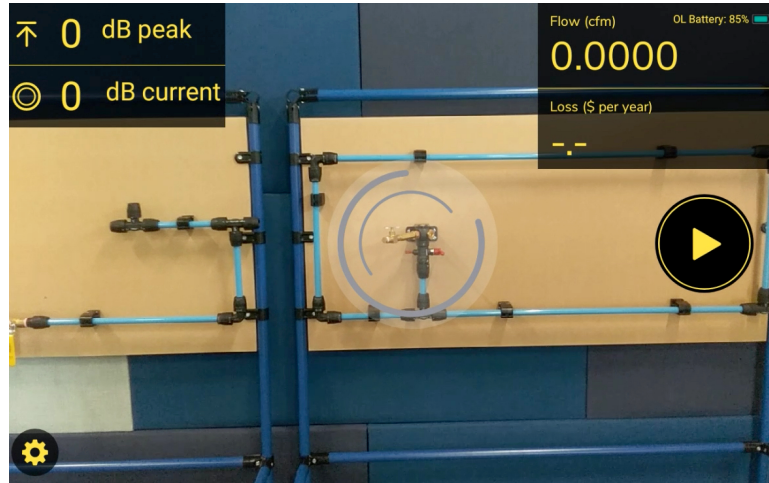
The app will take you to the "Leak Data Input" screen which allows you to pre-populate leak parameters which are critical to quantifying the size and impact of the leak. Use "Flow" to enter characteristics of the gas you are interested in. "Energy Loss" is specific to air efficiency. Use it to enter compressor operating conditions and energy cost. For other gases of interest, cost of gas under "Flow" enables dollar loss.

You can switch between Metric and Imperial units using the toggle at the top right of the screen.

Tap "Begin" to move to the leak detection screen.

6 Leak detection

6.3 Detection screen



The Detection screen displays key information.

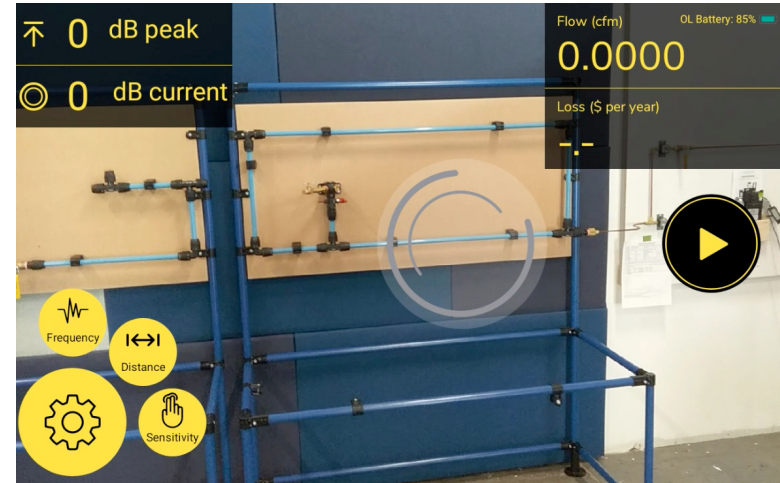
dB peak and dB current measure signal strength at the point of detection.

Flow and Loss of the leak are quantified in real-time.

The battery life of your OL1 is indicated in the top right.

The Detection Settings cog button is in the bottom left.

6.4 Detection settings



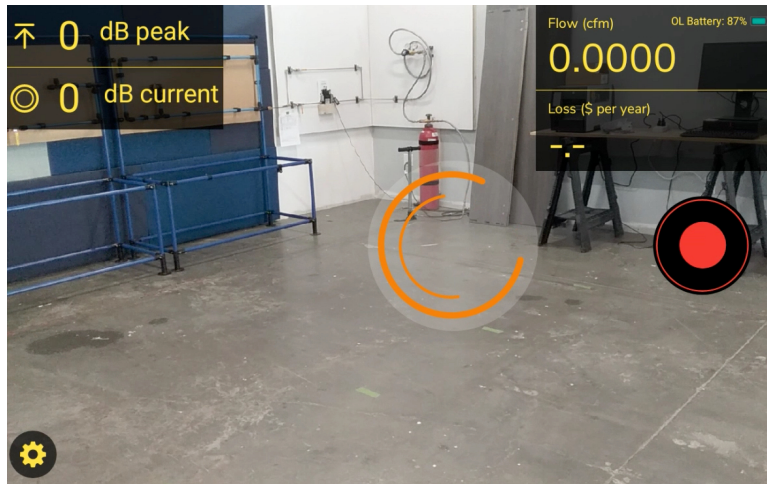
To get the most accurate readings for your environment, you can adjust your detection settings.

Tap the "Settings" cog button to open the settings menu. You are then able to adjust Sensitivity, Frequency, and Distance separately.

To adjust each, select their button and drag the slider to the desired level. Tap the X to close.

6 Leak detection

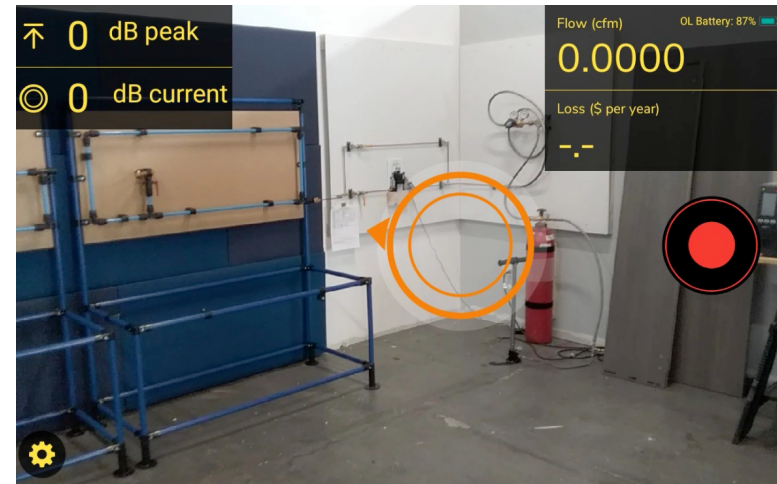
6.5 Begin detection



Tap the "Start" button to begin leak detection.

Your device will start searching for a leak by listening for the ultrasonic noise that a leak emits.

6.6 Leak direction



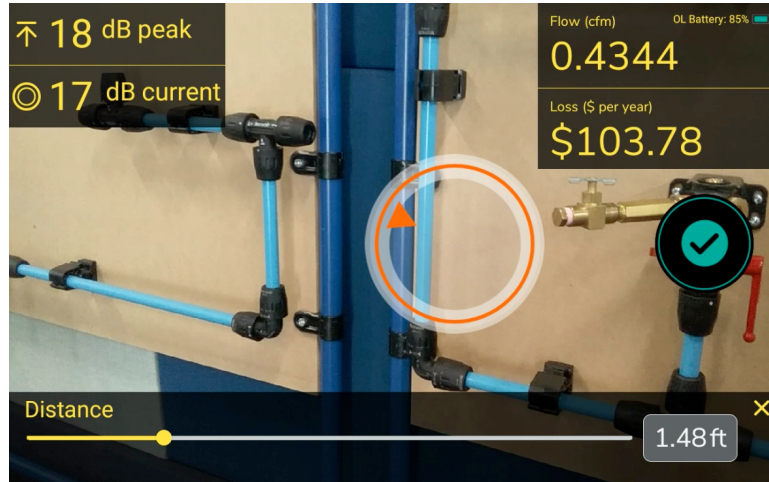
When a leak is detected and located, an arrow will appear with the direction of the leak location

Follow the arrow and scan your area of interest for potential leak sources.

You can return to the "Leak Parameters" screen by using your mobile device's "Back" button.

6 Leak detection

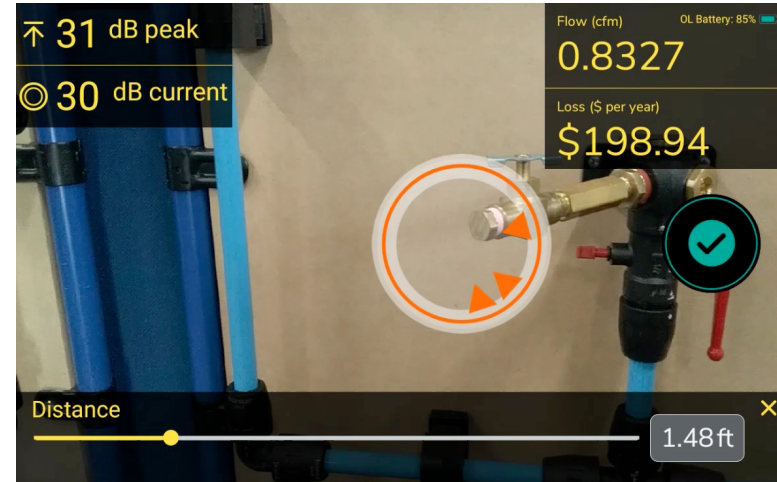
6.7 Getting on-target



Your OL1 and app work together automatically to provide confidence that the leak is in view and on target.

When the leak is in view, the arrow will move to the inside of the circle.

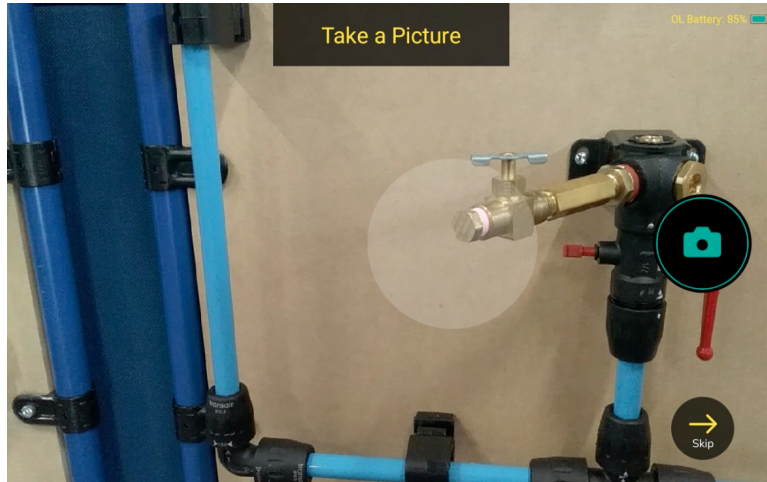
Circle around the suspected leak source to confirm.



When you are on-target, three arrows will appear to help you center the leak source in the circle. Enter your approximate distance from the leak for the most accurate readings.

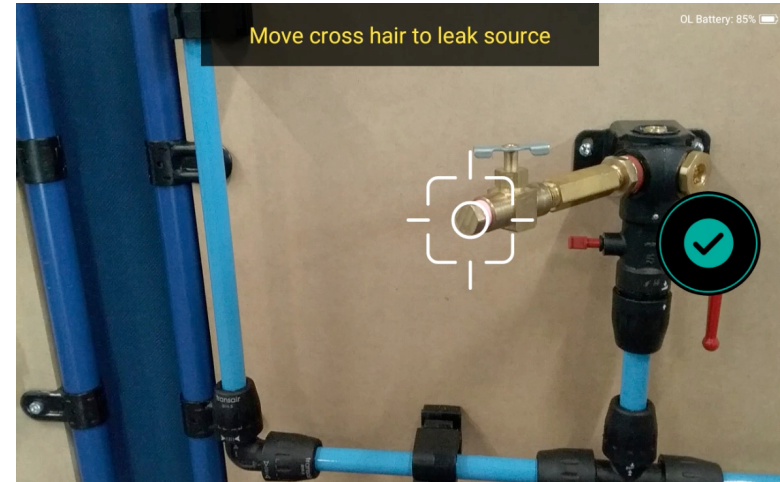
6 Leak detection

6.8 Finish leak detection



When confident you have located and quantified the leak, confirm your distance from the leak and tap the check button to finish leak detection.

You can tap "Skip" to move to the Leak Record screen without taking a picture.



If you have a Premium or Enterprise subscription, you can take a photo of the leak to reference later. Drag the crosshairs to the leak source and tap the check mark.

7 Leak Management

7.1 Creating leak records

← Edit Leak ID - #210804016 (08/04/2021) OL Battery: 85%

LEAK PARAMETERS LEAK SOURCE LOCATION AND STATUS

Leak Parameters

Main Gas/Component of Interest: Air

Cost of Gas (\$/ft³) - if applicable: 0.00

Service: [Dropdown]

Ambient Temperature (°F): 72

Pressure (psig): 100

Distance (ft): 1.48

Flow (CFM): 0.8327

Peak dB: 31

Loss (\$/year): \$198.94

Note: Changing the leak parameter settings will update the Flow / Loss calculation.

Delete Save Changes Cancel

Leak Management is available to users with a Premium or Enterprise subscription.

After finishing leak detection, you will move to the leak record screen. Use the three tabs at the top to record data about the leak. Leak Parameters records gas characteristics. Leak Source records leak characteristics. Location and Status records location and corrective actions.

"Leak Parameters"

Record characteristics of the leak and/or adjust characteristics to refine quantification.

"Leak Source"

Provides equipment and component details. Use the "Equipment Tag" field to recognize and input equipment tag IDs. Use the two photo fields to capture both a close-up of the leak source, as well as a location reference to aid later action/resolution.

"Location and Status"

Record location, user details, leak event status, and corrective actions.

7 Leak management

7.2 Viewing leak records

After saving the leak record, you can view all your other saved records. You can also access your records from the Home screen by tapping on the "VIEW RECORDS" section.

To open a record, tap on its row.

Tap the "Back" arrow to go back to the Home Screen and start detecting a new leak.

7.3 Editing leak records

To edit a record, first select the record you wish to edit from the "View Records" screen.

In the record view, you can change the leak event data just as you did when it was first recorded, letting you double check your numbers at the end of the day.

To save your changes, tap the "Save Changes" button. To delete a record, tap the "Delete" button and confirm that you want to delete the record.

7 Leak management

7.4 Leak management dashboard

For Premium and Enterprise users, you can access your ProSaris Leak Management dashboard by going to <https://dashboard.prosaris.ca> and logging in with the same email and password you use to log in to the ProSaris Leak Management app.

Here, you can view, edit, and export all of your leak records. If you are an Enterprise user and an administrator, you can view all records created by your team.

8 Specifications

For complete and up-to-date device specifications, visit www.prosaris.ca.

PROSARIS

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