



Prevention Engineering for
Workplace Health

NOISE

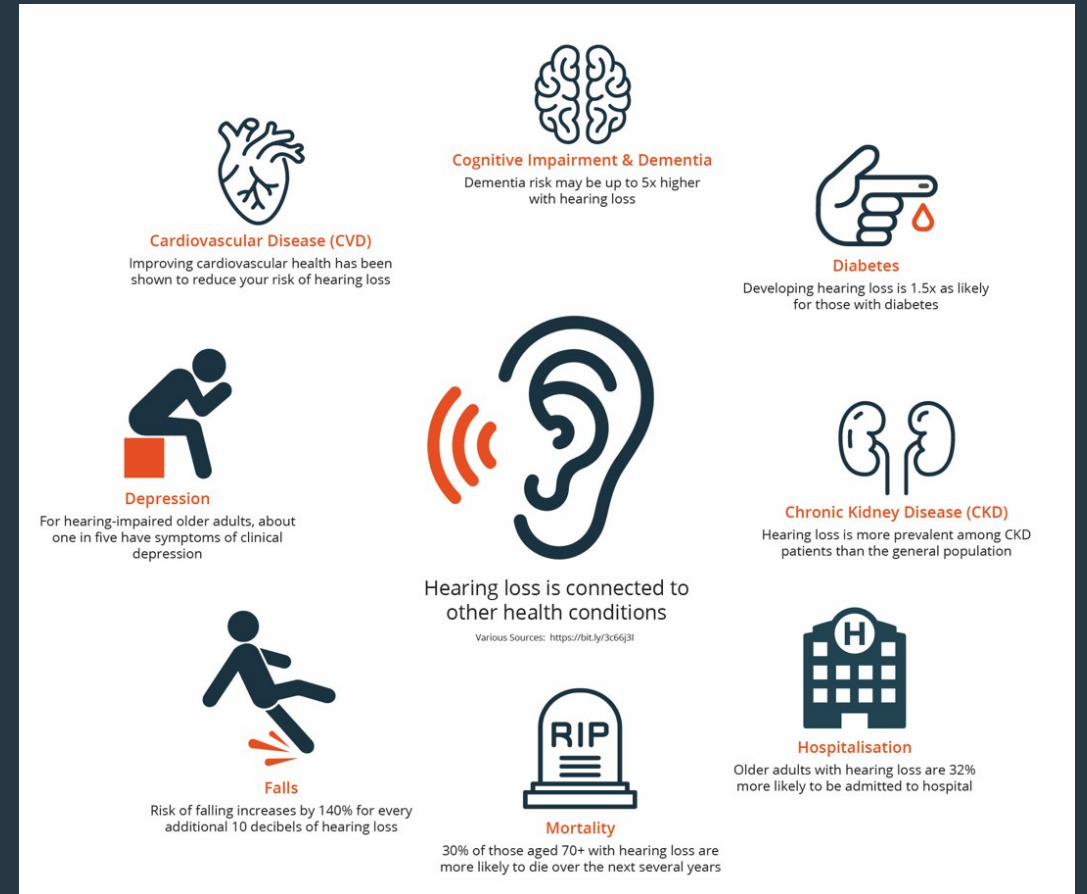


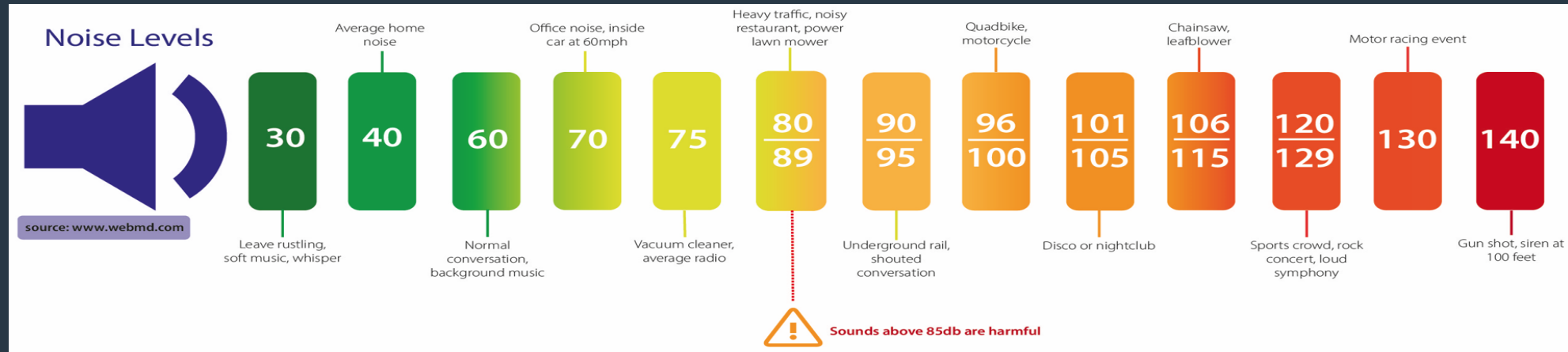
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Introduction

The Why

- ! WHO – Global Health Crisis – Top 5
- ! Costs UK Economy £25 billion per year – *1/5th total annual health spend!*
- ! Affects 1 in 6
- ! Permanent
- ! Preventable
- ! *** Largest modifiable risk factor for dementia, potentially responsible for 9% / 80'000 cases!!!





HSE Thresholds*

- Lower exposure action values ($L_{EP,d}$ of 80dB, L_{Cpeak} of 135dB)

1. Inform, instruct and train employees
2. Provide hearing protection on request
3. Maintain equipment provided to reduce risk/exposure

- Upper exposure action values ($L_{EP,d}$ of 85dB, L_{Cpeak} of 137dB)

1. Reduce exposure by a program of technical/ organisational measures
2. Provide hearing protection to all exposed
3. Provide health surveillance

Acceptable levels of protection

Hearing protection is vital, but situational awareness is critical. Be mindful of over protecting*!

2021/22 Fatalities

- 23 Struck by moving vehicle
- 15 Contact with moving machinery

2021/22 RIDDOR Injuries

- 2,000 Struck by moving machinery
- 1,000 Struck by moving vehicle



Summary of Protection Rating Statements :

Noise level at the ear (L'_A value)	Protection Rating statement
Below 70 dB(A)	Over-protection
70 to 80 dB(A)	Good
80 to 85 dB(A)	Acceptable
Above 85 dB(A)	Under-protection

Dosimeters

How to use a Dosimeter

Sign out at the start of your shift, if compatible, pair with your R-Link watch
Wear as near to your ear as possible, attached to your jacket or PPE
Wear all shift to ensure all noise data is captured
Return to charger at the end of your shift

Why use a Doimeter?

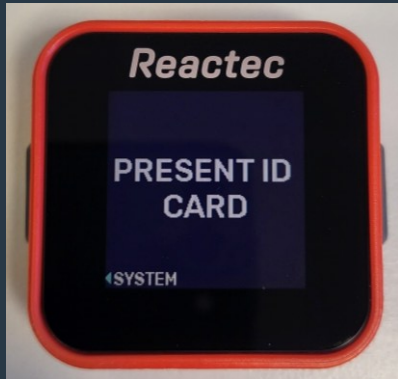
Personal

When paired with the R-Link watch they can collect personal noise exposure data and provide real time alerts

Collective

Rotate them across different areas to provide information on base line noise exposure levels, informing risk assessments
Target your noise monitoring by identifying workers in high risk areas

Pairing to the watch



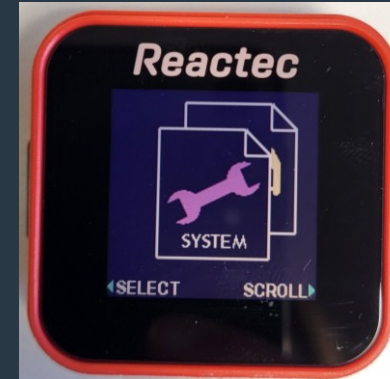
Pick an R Link watch which is ready for use

The "R" logo displays on the watch when it is ready for use.



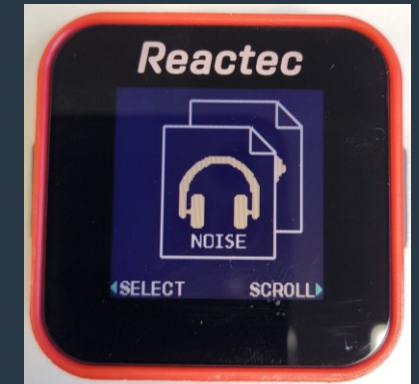
Present your Operator ID card

Once you present your ID card, the watch will be assigned to you and will display your name and current HAV points



To pair with a noise dosimeter, go to the Menu

Press the Left button which says "Menu".



Press the right button to scroll

Pressing the right button will display the next Menu item, when you land on "Noise", press the left button "Select".

Pairing to the watch cont.



**You will be given two
Pairing options**

Press the left button or "Select" to proceed pairing with your noise dosimeter.



**R Link watch will start
searching for your
noise device**

Make sure to switch on the noise dosimeter and place it close to your watch.



**When your device is
found, select "Stop"**

Press the right/"Stop" button. The next screen will say list the device it found, Press the left/ "Select" button.



**The pairing process
will begin**

The watch will initiate pairing with your noise dosimeter.

Pairing to the watch cont.



Watch will inform when pairing is complete

Once paired, make sure to keep the watch and your noise dosimeter on your person, so your noise data is regularly sent to your watch.



Correct placement of the noise device is essential

To make sure that the device captures your noise exposure, mount it on one of your shoulders so it is close to either of your ears.



The watch will toggle between HAV and Noise screens

Once paired, the watch will switch between displaying HAV details and Noise details (5 seconds per screen).



Alert and Alarms

When noise exposure exceeds 80 or 85 dB(A), you will receive 5 sec & 20 sec haptic alarm, respectively. Acknowledge these after you put on PPE.

Smart Alert

Smart Alert Components

Earplug



Active Noise Monitoring
Real-time noise alerts
EN 352-2 2020 certified

Dock



Wall / Desk mounted
Charge Earplugs
Data Sync (WiFi)

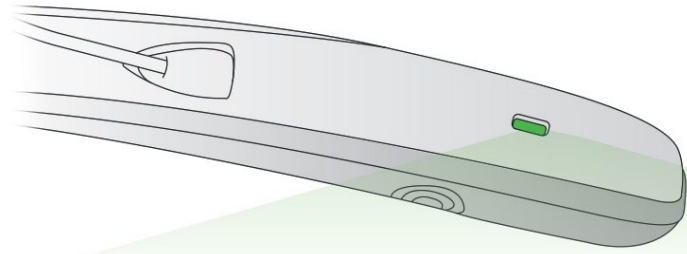
Analytics Platform



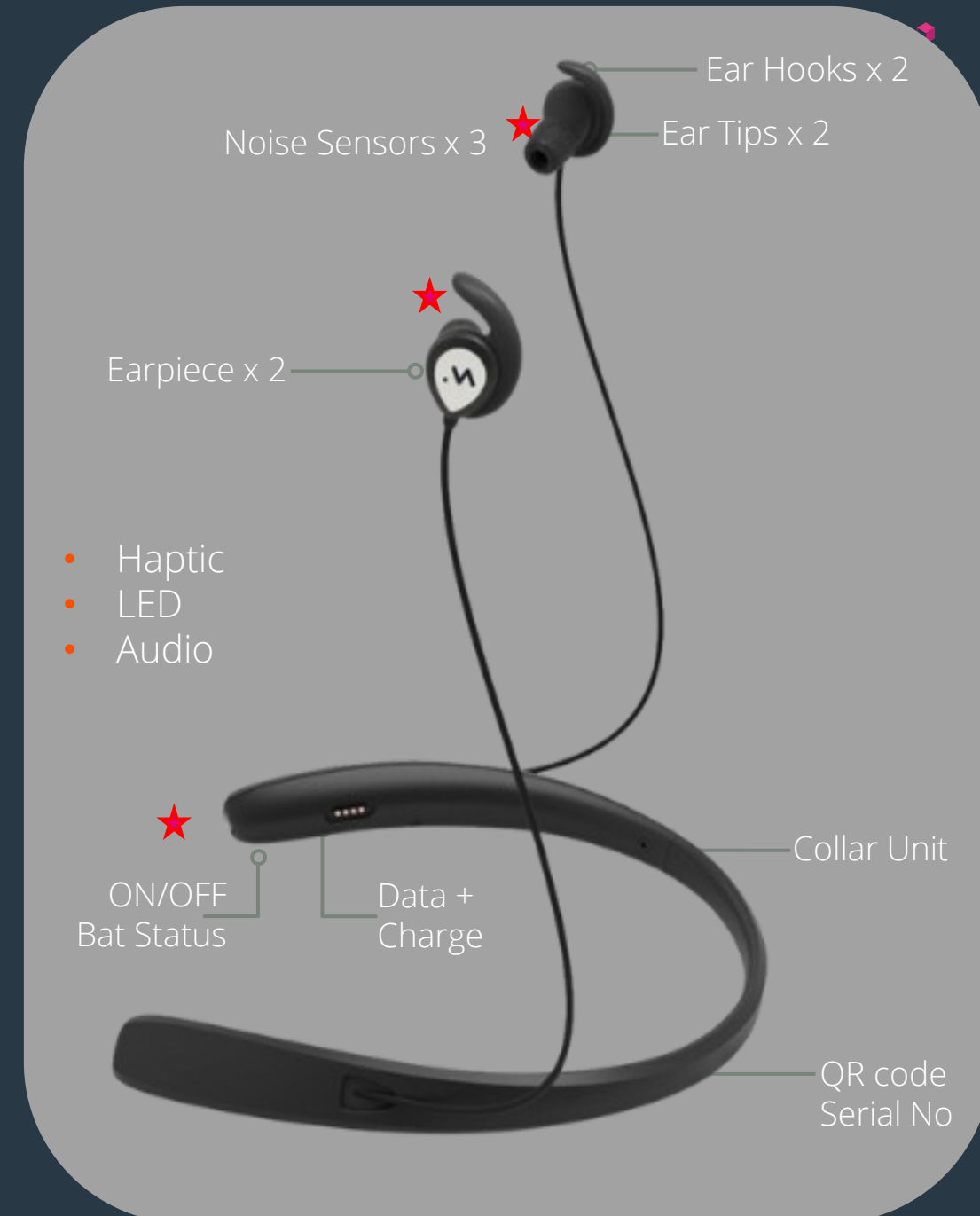
Noise exposure insights
GDPR compliant, user focussed data
Compatible with existing Reactec Analytics platform

The Earplug

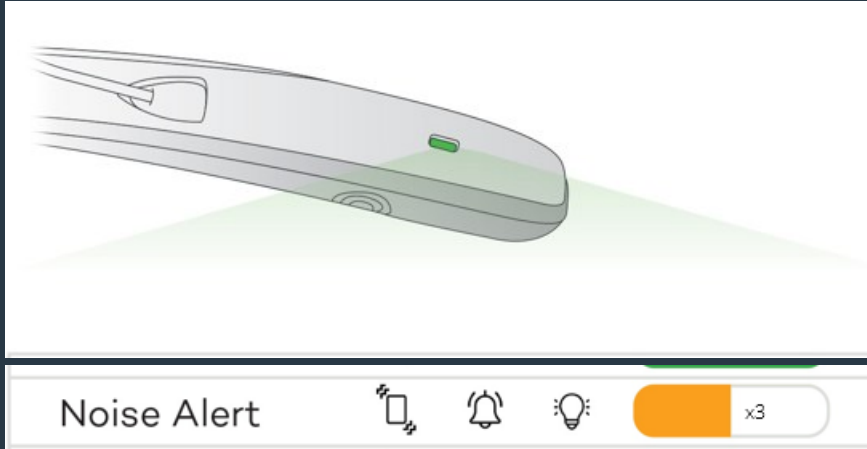
Earplug warnings



Safe				Continuous blink
Noise Alert				 x3
Exposure Alarm				 x9

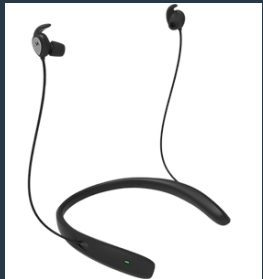


Noise Alerts

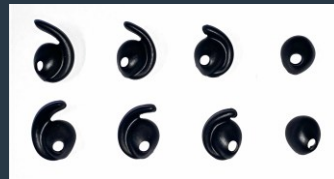


Alert will happen when either noise sensor in the earpieces, exceeds the alert threshold of 85dB (based on earpieces being correctly fitted)

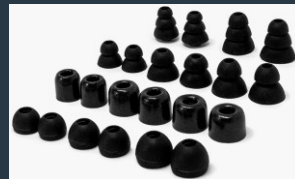
Recommended actions include:



Check earpieces are in ear



Check fit and re-fit earpieces if required



Use additional ear protection



Move away from source of noise where possible

Noise Alarms



An alarm will happen when equivalent average noise level exceeds the action value of 85dB (based on an 8 hour working day)

On receiving an alarm, you should:

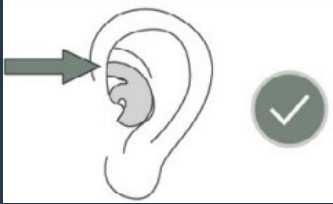


Contact your Supervisor/Safety Rep/Manager for specific advice on what to do



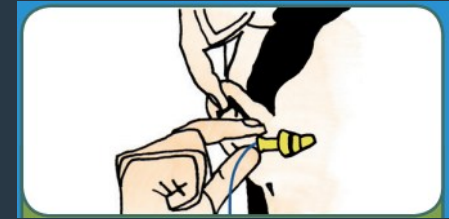
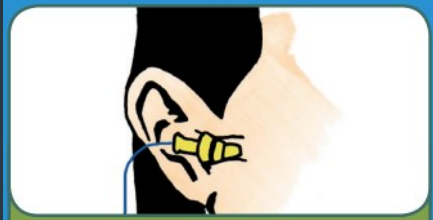
Lower noise level to <70dBA for the rest of the day

Fit Training



Start with medium ear tips & an ear hook that fits snugly

While holding the ear tip, reach your hand over your head & gently pull the top of your ear up & back to straighten out your ear canal

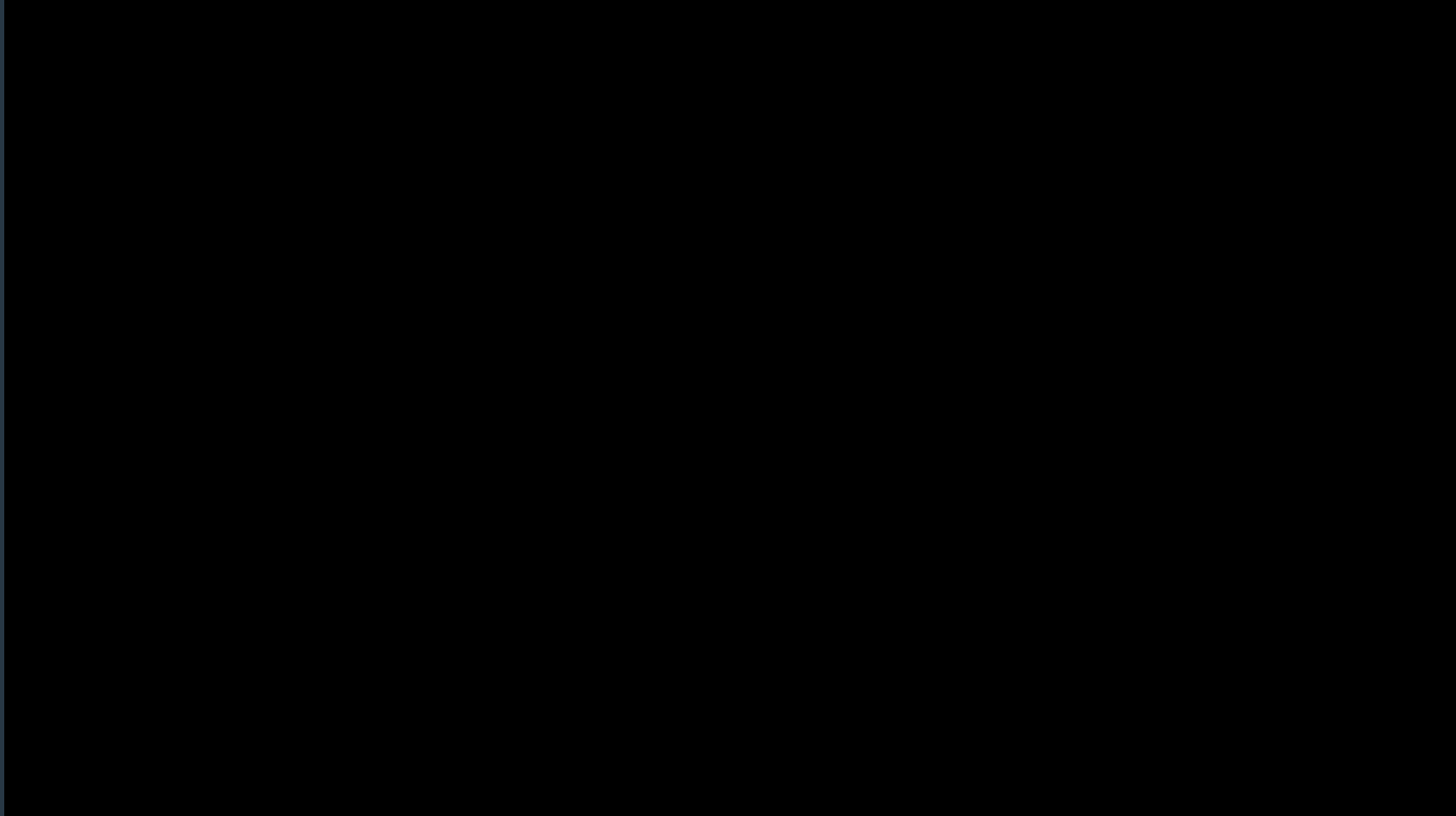


Insert the ear plug until you can feel it sealing. It should be comfortable but snug. If not snug, try another ear tip. When properly inserted, the earpiece will sit snugly and will only come off when the earpiece is twisted while slowly pulling away

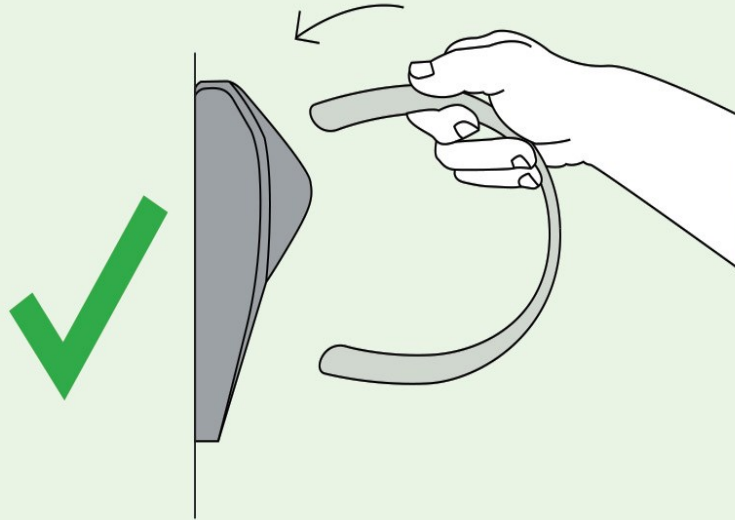
In the presence of a steady noise & with ear plugs inserted, alternatively cover & uncover the ears with tightly cupped hands. With properly fitted plugs, noise should seem nearly the same whether or not the ears are covered.



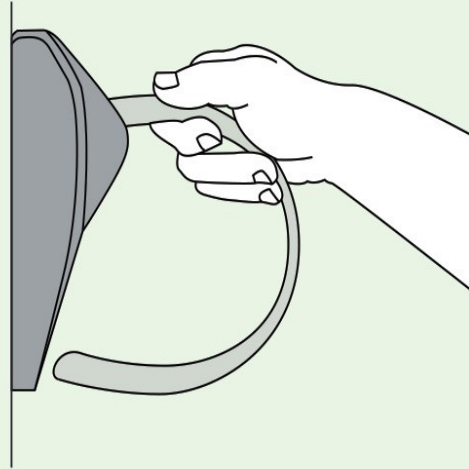
Fit Training



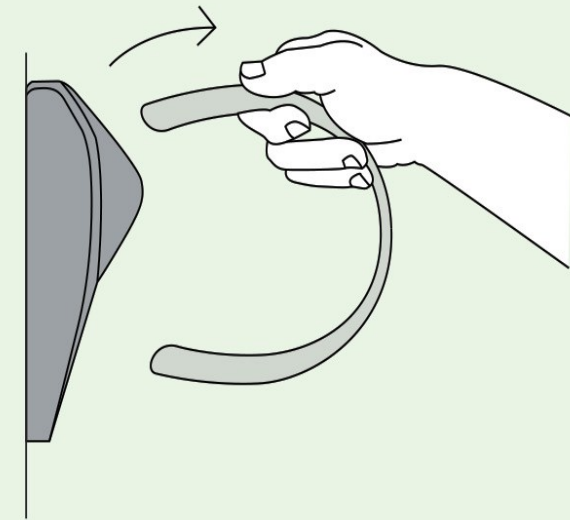
Using the dock



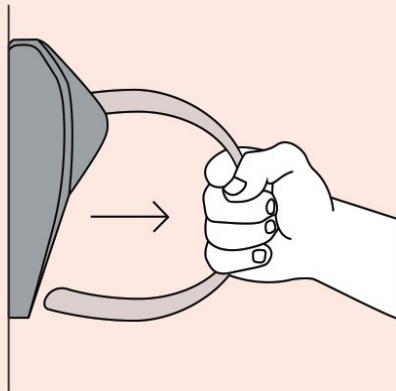
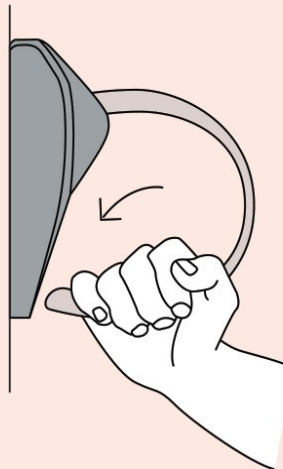
1. Hold the top part of earplug.



2. Make sure it is fully inserted.

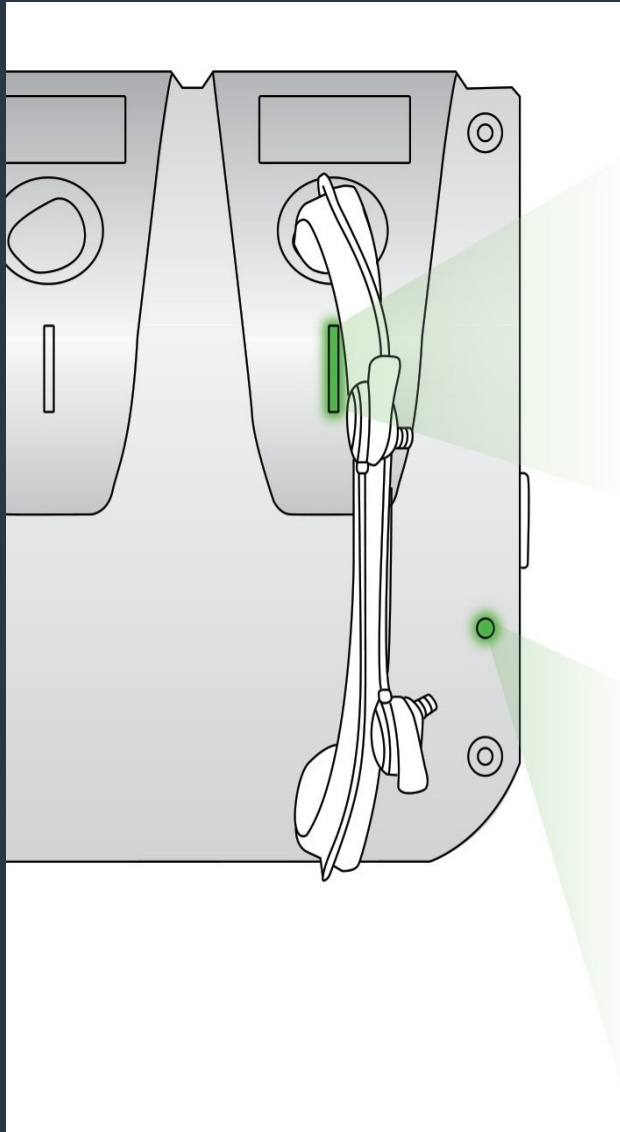


3. Remove in a curved motion.



DO NOT hold the middle or the lower part of the earplug when extracting or inserting. It can damage the earplug.

Using the dock cont.



The diagram shows a side view of the dock. A green rectangular LED on the earplug is highlighted with a green callout cone. A small green circular LED on the dock is highlighted with a green callout cone.

Earplug status

	Solid lights	Blinking lights
	Fully charged	
	Charging	
	Waiting to transfer data	
	Data transfer in progress (do not remove)	

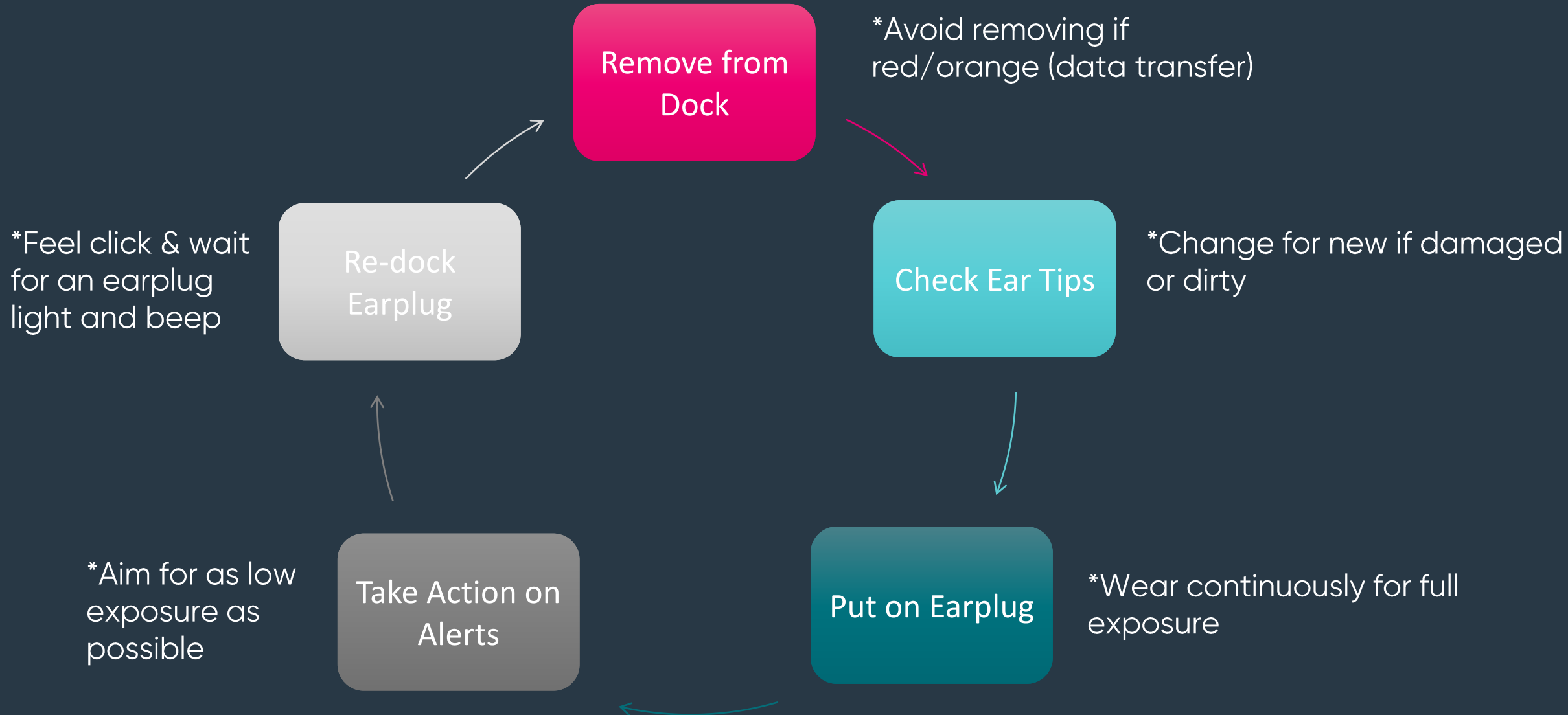
Dock status

	WiFi pairing mode
	Paired with WiFi. Searching for router
	Connected to router & cloud
	Connected to WiFi router but no cloud
	Data transfer in progress

Using the dock cont.



Daily routine

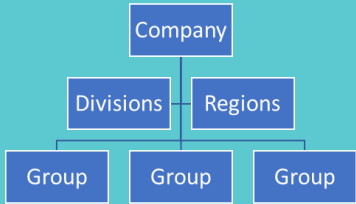


Analytics Platform

Checklist for Managers

1

Set up
Group
Structure



2

Set up
Users,
Alerts &
Operators



3

Set up
Noise
Parameters



4

Set up
scheduled
reports
and
operator
messaging



5

Set up
operator
cards, tool
tags &
assign
devices



Key Reports – a snapshot

Key Reports for Smart Alert users

Key Reports for Dosimeter users

The screenshot displays the Reactec Risk Reports Menu. The left sidebar contains a 'RISK REPORTS MENU' with options: Recently Visited, Favourites, Hand Arm Vibration, Noise (highlighted), Dust, Proximity, Combined Risks, Location, Resources, and Notifications. The main content area is divided into two columns: 'Noise Smart Alert' and 'Noise Dosimeter'. Each column lists six reports with star and icon icons. The 'Noise Smart Alert' reports are: 'Operator Average Noise Exposure (Smart Alert)', 'Operator Daily Noise Exposure (Smart Alert)', 'Workforce Noise Exposure Analysis (Smart Alert)', 'Workforce Average Noise Exposure (Smart Alert)', and 'Operator Noise Exposure Action (Smart Alert)'. The 'Noise Dosimeter' reports are: 'Operator Average Noise Exposure', 'Operator Daily Noise Exposure', 'Workforce Noise Exposure Analysis', 'Workforce Average Noise Exposure', and 'Operator Noise Exposure Action'. A 'Click to see more reports' button is located at the bottom of the 'Noise Dosimeter' column. The bottom of the screen shows a status bar with 'HAVS / Dust / Noise' and a legend for BAV (green), EAV (orange), and ELV (red). On the right side, there is a 'Reactec Internal Demo' section showing a '0.7' value for 'Average days/week monitored per employee' and a '42' value for 'Highest individual avg. daily vibration exposure'.

Reactec

RISK REPORTS MENU

- Recently Visited
- Favourites
- Hand Arm Vibration
- Noise**
- Dust
- Proximity
- Combined Risks
- Location
- Resources
- Notifications

Noise Smart Alert

- ☆ Operator Average Noise Exposure (Smart Alert)
Average Noise Exposure details for a selected period for each monitored operator
- ☆ Operator Daily Noise Exposure (Smart Alert)
Daily Noise Exposure details against each monitored operator
- ☆ Workforce Noise Exposure Analysis (Smart Alert)
Daily Noise exposure graph for each monitored operator within specified date range
- ☆ Workforce Average Noise Exposure (Smart Alert)
Noise Exposure graph averaged for all monitored operators along with trend of Noise exposure
- ☆ Operator Noise Exposure Action (Smart Alert)
Report detailing Noise exposure for each operator along with ability to add actions taken & acknowledgements

Noise Dosimeter

- ☆ Operator Average Noise Exposure
Average Noise Exposure details for a selected period for each monitored operator
- ☆ Operator Daily Noise Exposure
Daily Noise Exposure details against each monitored operator
- ☆ Workforce Noise Exposure Analysis
Daily Noise exposure graph for each monitored operator within specified date range
- ☆ Workforce Average Noise Exposure
Noise Exposure graph averaged for all monitored operators along with trend of Noise exposure
- ☆ Operator Noise Exposure Action
Report detailing Noise exposure for each operator along with ability to add actions taken & acknowledgements

[Click to see more reports](#)

Reactec
Prevention Engineering for Workplace Health

Reactec Internal Demo

AVS) Points

0.7
Average days/week monitored per employee

189 **42**
EP) (SEP)

Highest individual avg. daily vibration exposure

HAVS / Dust / Noise

BAV EAV ELV

Key Reports – Dosimeters

Operator Average Noise Exposure [Help](#)

ABC Construction

30 days 20/02/2025 to 21/03/2025

Group	Operator ID	Name	Days Monitored		Avg Daily Exposure				Current Levels		Exposure Thresholds		
			Previous	Current	Previous		Current		LAV	UAV	BAV	LAV	UAV
					Exposure dB(A), LEP,d	SNR(dB)	Exposure dB(A), LEP,d	SNR(dB)					
Grinding shop	Reactec005	Kevin Grant	0	10	0	0	86.6	0	80	85	2	1	7
Grinding shop	Reactec006	Joanne McNeil	0	6	0	0	82.2	0	80	85	2	4	
Grinding shop	Reactec003	Jonathan Loney	0	6	0	0	81.4	0	80	85	2	4	
Grinding shop	Reactec002	Mike Welby	0	8	0	0	81.3	0	80	85	2	6	
Grinding shop	Reactec004	Gwen Rigg	0	10	0	0	80.6	0	80	85	2	8	

The SNR Column shows the average of SNR values manually entered against that Operator based on HPD provided to them

Breakdown of number of monitored days based on the day's ($L_{EP,d}$).
Green when <80 dB(A)
Amber when >80 dB(A)
Red when >85 dB(A)

Key Reports – Dosimeters

Operator Daily Noise Exposure [Help](#)

30 days 20/02/2025 to 21/03/2025

2 measured data points: one for Daily Noise Exposure ($L_{EP,d}$) and another for Peak Exposure* measured for the monitored duration.
SNR is the value entered against the Operator

ABC Construction

Date	Day	Group	Operator ID	Name	LAV	UAV	Exposure dB(A), $L_{EP,d}$	SNR (dB)	% of ELV	Peak Exposure dB(C)	View Details	Interventions
19/03/2025	Wed	Grinding shop	Reactec005	Kevin Grant	80	85	<div><div></div></div> 89.5	0	284%	127.7	Details	+
20/03/2025	Thu	Grinding shop	Reactec005	Kevin Grant	80	85	<div><div></div></div> 89.4	0	274%	131.3	Details	+
13/03/2025	Thu	Grinding shop	Reactec005	Kevin Grant	80	85	<div><div></div></div> 88.6	0	229%	128.6	Details	+
14/03/2025	Fri	Grinding shop	Reactec005	Kevin Grant	80	85	<div><div></div></div> 88.2	0	207%	136.1	Details	+
18/03/2025	Tue	Grinding shop	Reactec005	Kevin Grant	80	85	<div><div></div></div> 86.2	0	132%	135.4	Details	+

Clicking on "Details" gives you environmental noise level readings throughout the monitored day

Clicking on the + allows to add Intervention

*Peak Exposure - The highest instantaneous sound level, often associated with sudden, impulsive noises

Key Reports – Smart Alert

Operator Average Noise Exposure (Smart Alert) [Help](#)

30 days 16/09/2025 to 15/10/2025



A1. Reactec Internal Demo

Group	Operator ID	Name	Days Monitored		Avg Daily Exposure				Current Levels		Exposure Thresholds		
			Previous	Current	Previous	Ambient dB(A), LEP,d	Current	Ambient dB(A), LEP,d	LAV	UAV	BAV	LAV	UAV
					Highest In Ear dB(A), LEP,d		Highest In Ear dB(A), LEP,d						
Duncan Demo Data	914311	Duncan Reid	19	13	76.3961669207679	77.7	82.7	80	80	85	6	4	3
Unassigned Resources	TS002	Gwen Rigg	0	2	0	0	74.3	74.8	80	85	2		
Andy Demo	AMING	AndyMinG Green	0	11	0	0	74.2	75	80	85	10	1	
Gary Demo	Gary01	Gary Smith	11	10	75.0096012577722	75.9	73.8	76.6	80	85	10		
Maria Demo	15092022	Maria Ferris2	13	20	66.271183875543	83.3	73.5	73.3	80	85	18	2	

Average Daily Personal Noise Exposure ($L_{EP,d}$).
Based on the highest daily exposure from R or L ear

The extent of protection is determined by how much lower the Highest in Ear is compared to Ambient

Breakdown of number of monitored days based on the day's ($L_{EP,d}$).
Green when <80 dB(A)
Amber when >80 dB(A)
Red when >85 dB(A)

Key Reports – Smart Alert

Operator Daily Noise Exposure (Smart Alert) [Help](#)

30 days 16/09/2025 to 15/10/2025



Reactec Internal Demo

Date	Day	Group	Operator ID	Name	LAV	UAV	Highest In Ear Exposure dB(A)	% of UAV	Left Exp dB(A), LEP,d	Right Exp dB(A), LEP,d	Ambient Exp dB(A), LEP,d	View Details	Interventions	
14/10/2025	Tue	Duncan Demo Data	914311	Duncan Reid	80	85	<div><div></div></div>	86.8	150%	84.9	86.8	84.7	Details	+
30/09/2025	Tue	Duncan Demo Data	914311	Duncan Reid	80	85	<div><div></div></div>	86.3	135%	81.2	86.3	75	Details	+
17/09/2025	Wed	Duncan Demo Data	914311	Duncan Reid	80	85	<div><div></div></div>	85.8	120%	79.1	85.8	74.5	Details	+
15/10/2025	Wed	Duncan Demo Data	914311	Duncan Reid	80	85	<div><div></div></div>	84.8	97%	84.9	83.4	83.3	Details	+
13/10/2025	Mon	Duncan Demo Data	914311	Duncan Reid	80	85	<div><div></div></div>	84.4	86%	82.7	84.3	78.8	Details	+
14/10/2025	Tue	Maria Demo	15092022	Maria Ferris2	80	85	<div><div></div></div>	83.1	65%	81.3	83.1	81.2	Details	+
23/09/2025	Tue	Duncan Demo Data	914311	Duncan Reid	80	85	<div><div></div></div>	82.5	56%	74.5	82.5	74	Details	+

% of UAV is based on highest in ear

3 data points for Daily Noise Exposure ($L_{EP,d}$). Based on noise levels measured at L ear, R ear and collar

Clicking on "Details" gives you all 3 noise level readings throughout the monitored day

Clicking on the + allows to add Intervention

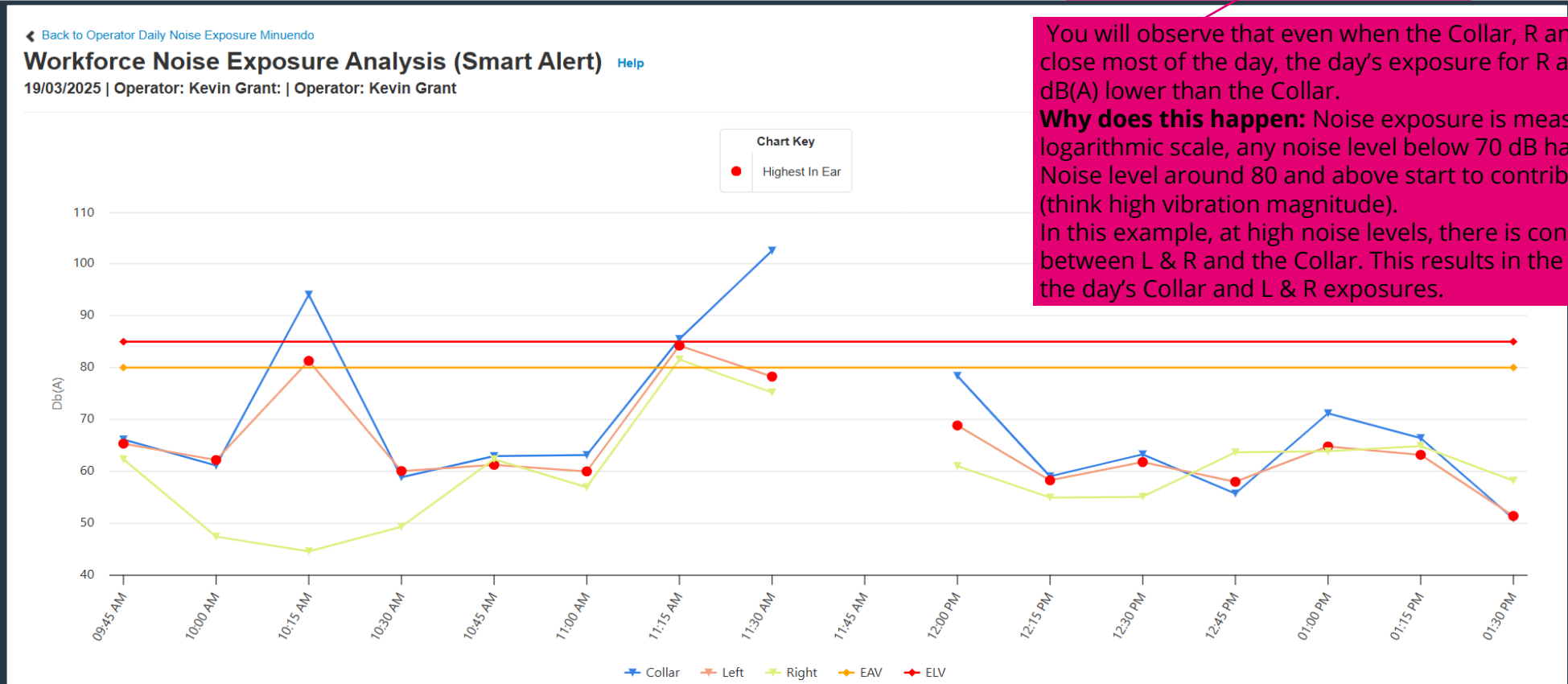
Key Reports – Smart Alert

Operator Daily Noise Exposure (Smart Alert) [Help](#)

ABC Construction

19/03/2025 | Operator: Kevin Grant:

Date	Day	Group	Operator ID	Name	LAV	UAV	Highest In Ear Exposure dB(A)	% of UAV	Left Exp dB(A), LEP,d	Right Exp dB(A), LEP,d	Ambient Exp dB(A), LEP,d	View Details	Interventions	
19/03/2025	Wed	Grinding shop	Reactec005	Kevin Grant	80	85	<div></div>	71.9	5%	72	68	88.2	Details	<div>+</div>



You will observe that even when the Collar, R and L readings are close most of the day, the day's exposure for R and L are 15 to 20 dB(A) lower than the Collar.

Why does this happen: Noise exposure is measured on a logarithmic scale, any noise level below 70 dB has negligible impact. Noise level around 80 and above start to contribute to exposure (think high vibration magnitude).

In this example, at high noise levels, there is considerable difference between L & R and the Collar. This results in the difference between the day's Collar and L & R exposures.

In Summary

Remember...



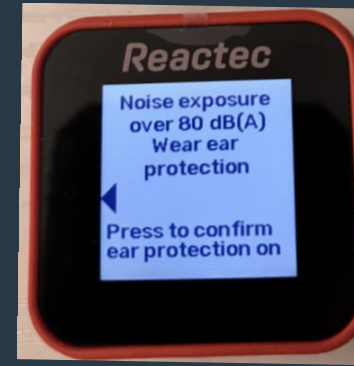
1

NIHL is permanent & preventable



2

Pair your compatible device with your watch for real time alerts



3

Protect yourself – pay attention to alerts & alarms



4

Wear the device all shift – not just when "it's noisy"



5

Return to charge at the end of shift