Ideagen

Prevention engineering for workplace health - Proximity

Prevention engineering

We believe that risks can be better managed when they are measured.

For over 20 years we have seen our clients easily and quickly achieve compliance, while gaining absolute control of their operations and improve their productivity

01 Compliance

02 Absolute control

03 Productivity



Why proximity alerts

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2021/22 Fatalities

23 Struck By Moving Vehicle

15 Contact with moving machinery

2021/22 RIDDOR injuries

2,000 Struck Moving Machinery

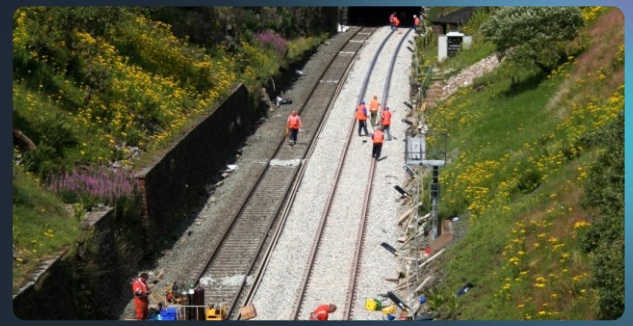
1,000 Struck moving vehicle



People Plant Interface top fatal injury in construction



1,300 forklift accidents per day in the UK



3 trackside workers killed in 2020-21 (ORR)

Regulations and good practice

The Workplace (Health, Safety and Welfare) Regulations 1992;

These regulations require that workplaces are organised to ensure that vehicles and pedestrians can move around safely

Inadequate planning and control has shown to be the root cause of many of the failures to comply:

- Ensure visibility of people, mobile plant and vehicles.
- Adequately define working areas
- Adequately manage high risk areas

Proximity - The key components



R-Link watch

The watch module is independent to the strap. R-Link is electronically assigned to individuals using RFID cards



Beacon

UWB and GPS enabled beacon to create configurable radius of exclusion



Charging Station & 2 Bay Gateway

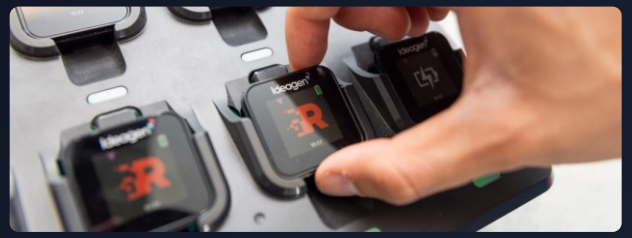
Charging station exists to charge watches and the gateway automatically sends data back to the analytics (via GSM, NBIoT, CAT-M1 or Wi-Fi)



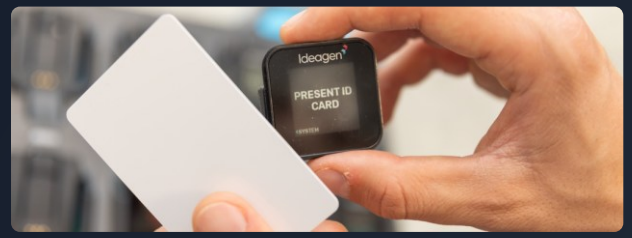
ID cards

Each pedestrian would have an ID card to personalise data. RFID writer used to assign to individuals

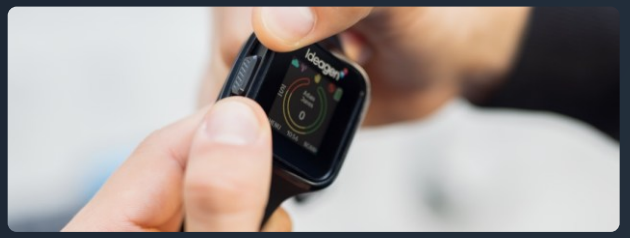
How it works



1. Collect: Unclip any R-Link with a green LED, indicating it is ready for use



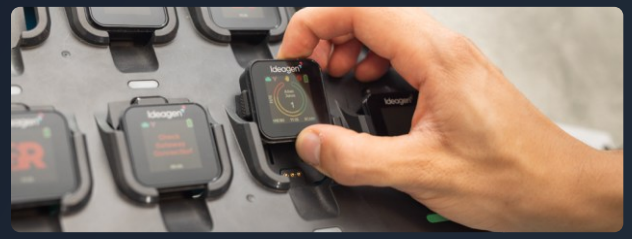
2. Assign: Follow the instructions on the screen and place an ID card against the screen to assign to the watch to a worker



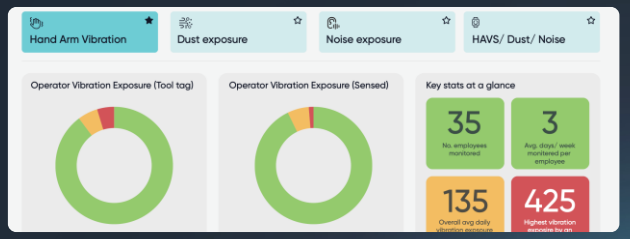
3. Protect: Insert R-Link module into a holder, snugly fit the strap around the wrist



4. Detect: Position beacons on all equipment around which an exclusion zone is desired. Watch wearers automatically alerted.



5. Return: At the end of a shift return the R-Link to a charging station to recharge. A gateway within 30m collects and transmits data



6. Reduce: View reports online or by email of individual and overall unsafe behaviour and work ways.

Wearable safety proximity warning system

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R-link beacon

- Creates an exclusion zone
- UWB Technology
- Hardwired or battery powered
- Configurable in the field



R-link pedestrian watch

- Alerts user in real time
- Haptic, audible and visual feedback
- Multiple risks on one devise
- Personally allocated



R-link driver watch

- Protected outside vehicle
- Be alerted or not to pedestrians
- Auto pair for small vehicles
- Allow access for safe close work
- Adjust beacon range in the field



Safe zone RFID tags

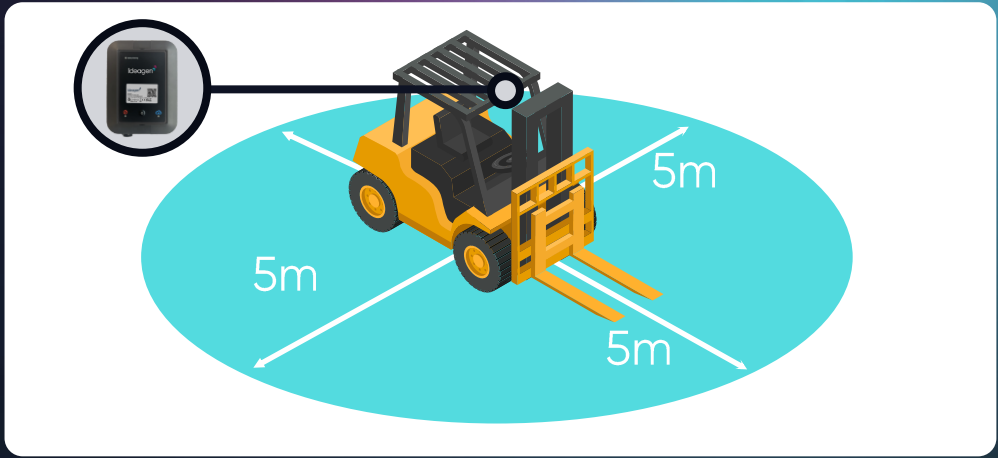
- Avoid false alerts in safe areas
- Watch tags on entry and exit of area
- Failsafe timeout for tag out misses
- Records of time in safe areas



Wearable safety analysis

- Automatic data collection and transmission
- Intelligent trend analysis
- Analyse by people or hazard
- Manage data from multiple risks n a single platform

Beacon positioning

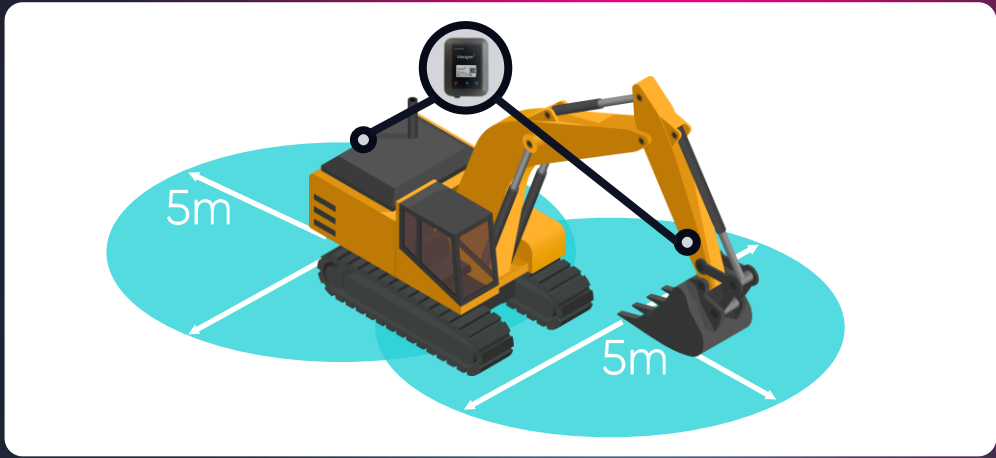


Employee is alerted when he strays too close.

Amount of time he is too close is recorded

Location of his alert is recorded

RAG unacceptable periods of proximity



For large vehicles use multiple beacons to give adequate coverage

For vehicles like forklifts one centrally would be adequate

Beacon flashes to notify those around that someone is too close

Beacon detection radii

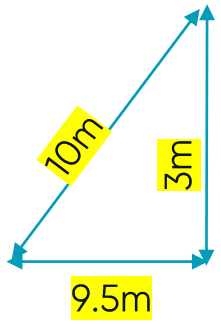
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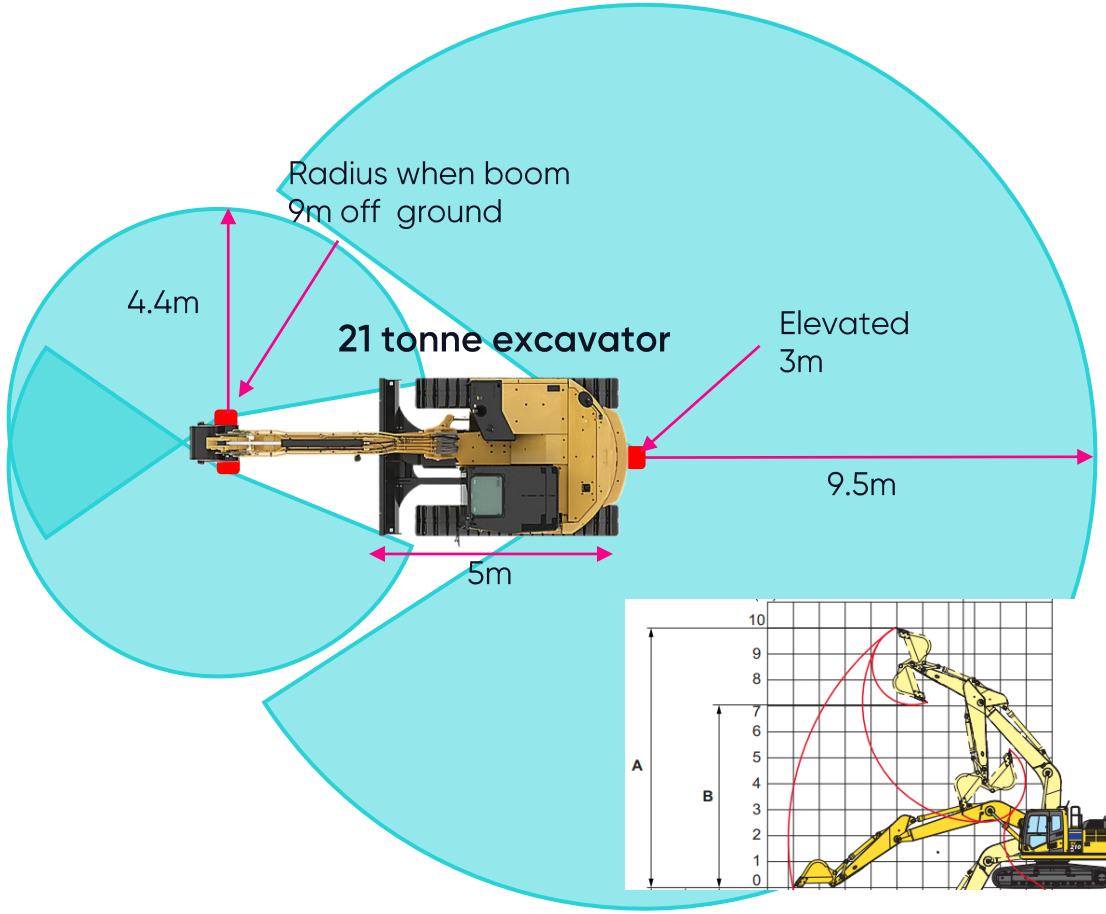
Detection radii will alter with position height.

Mounting above head height important to avoid blockage

After installation – walk the perimeter to validate detection

10m Beacon @ Boom Height	Detection Radii at G.L.
9m	4.4m
6m	8.0m
3m	9.5m



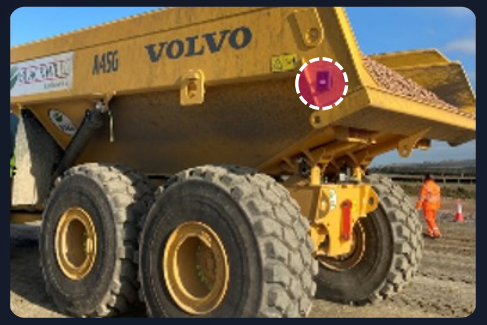


Beacon positioning

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Excavator



Dumper



Mini-digger



Roller



Telehandler



Bulldozer



Forklift



Reach truck

Simple metal stand offs

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Using stand off and cable ties / jubilee clips attach beacon directly to vehicles with guard rails or other narrow posts

Use jubilee clips for maximum robustness









Horizontal brackets

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Bracket provided with and without magnets







Vertical Pole

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Base plate provided with and without magnets

Important to ensure height of post is not an issue to vehicles use









Driver watch

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Beacon admin/ driver watch functions



1. Real-time alert for proximity breach
2. Active alerts from other machines when not driving
3. Auto-pair to a single beacon
4. Permit visible closed proximity work
5. Configure proximity detection radius

Safe-zone RFID tags

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Passive RFID tags are positioned at zones where workers are allowed to work safely within close proximity to machinery (such as walkways)

Operators scan to tag to enter and exit a safe-zone area

Tags are pre-programmed with a time-out function as a safe guard



Driver alerts

Flexible alerting status. Client can choose whether drivers are alerted to proximity incursions

If switched on, driver watch would beep and vibrate when someone comes into their exclusion zone

Ideal for scenarios where operators are working in driver blind spots



Allow close proximity working to specific colleagues

Grant access to beacons



Driver can choose to temporarily “GRANT ACCESS” to specific beacons

This caters for workers such as banksman, slingers and fitters

Applicable when thumbs-up protocol has taken place and worker is in safe line of sight for driver

This removes false alarms and allows work to commence without distraction

Beacons alarms reactivate when close proximity work has ceased

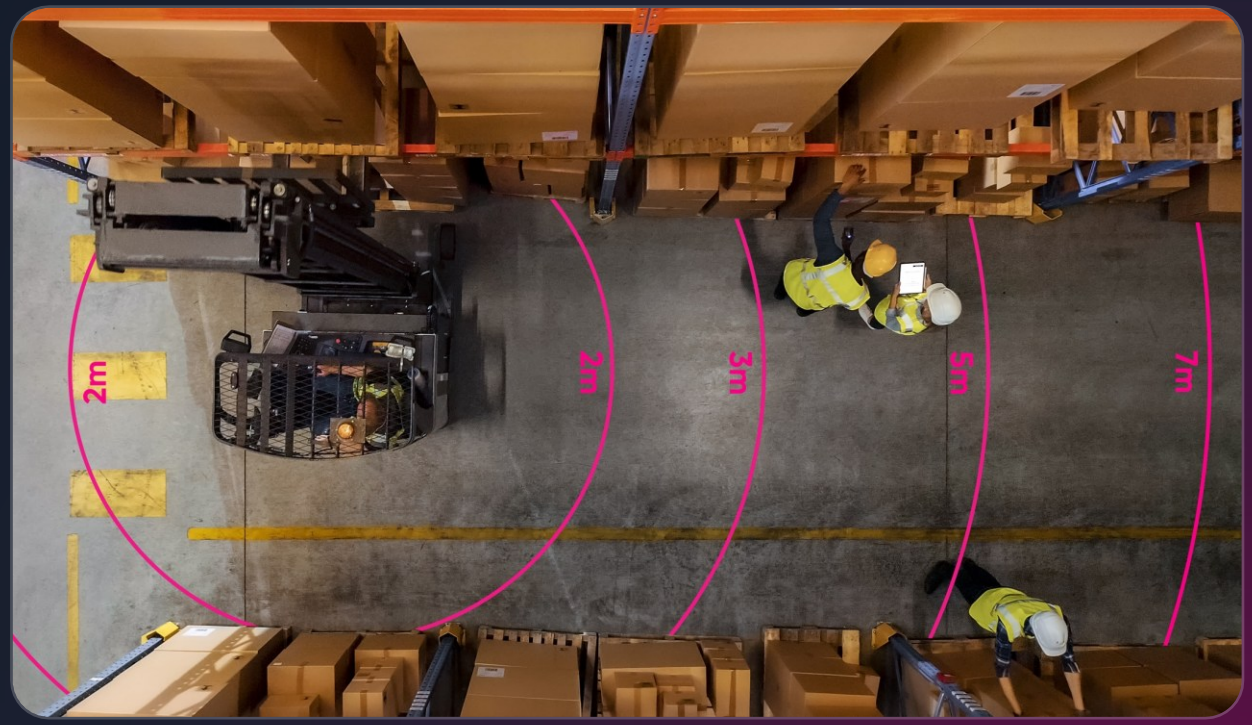
Digital audit trail of thumbs up and close proximity approval

Field configure beacon range

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Proximity range adjustment

- Authorised individuals can configure the proximity detection range to suit changing site layouts
- Interactive watch screen permits real-time beacon adjustment between 2m-10m
- Visual confirmation that desired zone distance is set



Single mode driver's watch

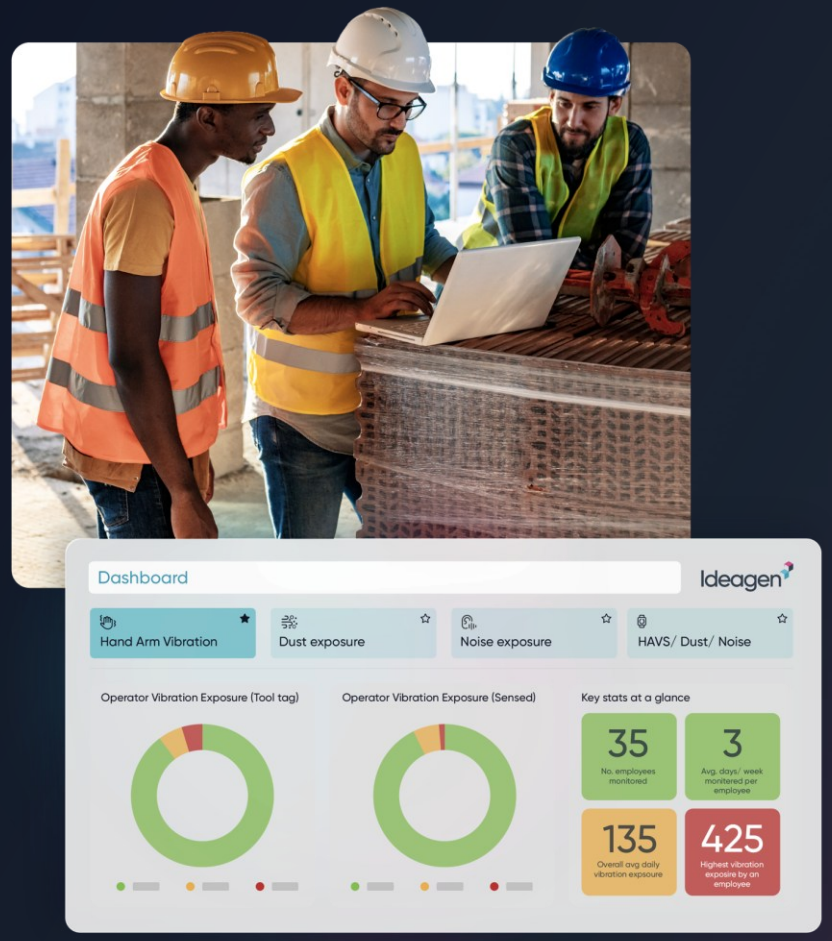
Auto detect



- To ease pairing to a beacon – the single mode setting can autodetect when within 1m of the beacon
- If beacon powered will be alerted when within 1m of the beacon and offered option to pair when you have "driver" credentials
- As a driver option exists to be alerted or not to pedestrians close to your beacon
- Option remains to pair by pressing RH button
- Can unpair when leaving beacon (through menu screen or through leaving the beacon's range for a defined period)

Wearable safety analytics

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1. Easily Share with all stakeholders with readily accessible on-line and auto e-mailed reports and alerts

2. Granular detail on unsafe behaviour: who was too close to what, where it happened and for how long

3. Clear and pertinent information to prioritise efforts on the hierarchy of controls

4. Record and monitor the impact of control measures and interventions

5. Secure access to intuitive analytics hosted on a robust and GDPR compliant scalable cloud platform

Wearable safety analytics

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Manage multiple risks in a single location

Vibration

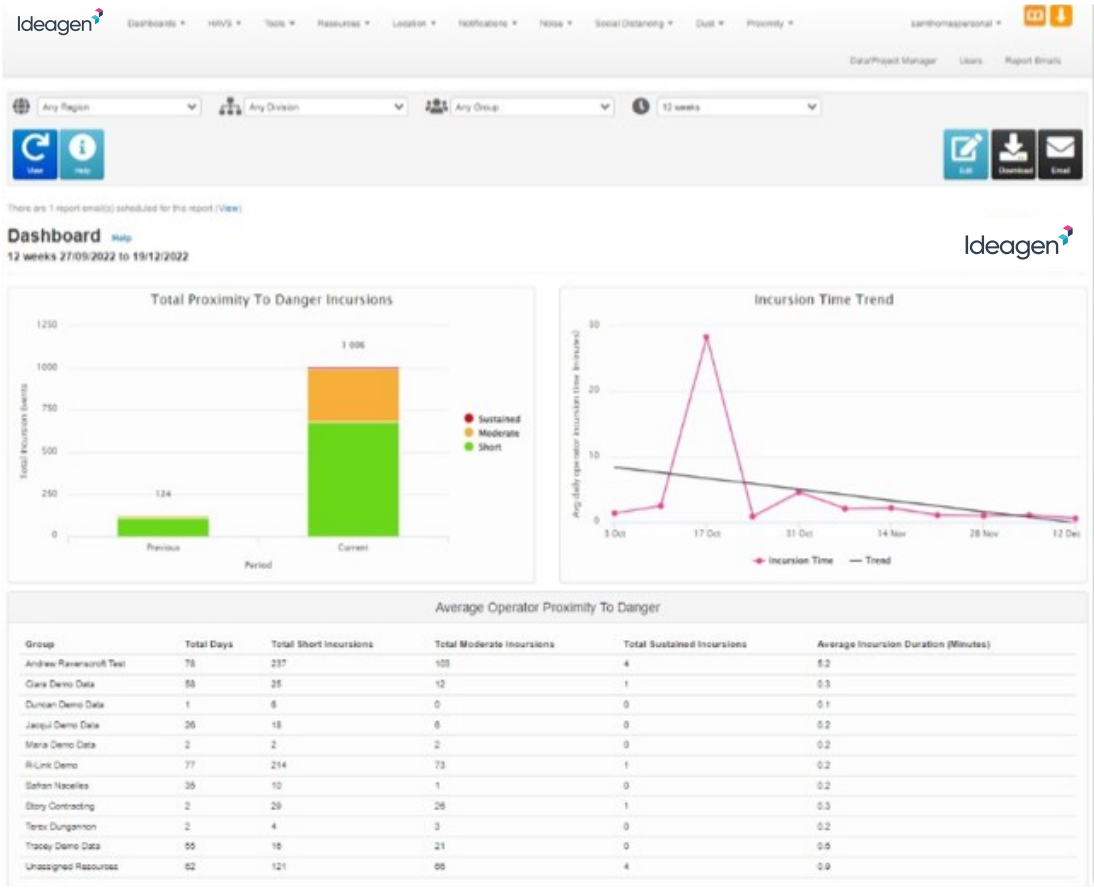
Noise

Dust

Proximity

View trend data on total proximity exposure over time

League table on proximity events by operational location



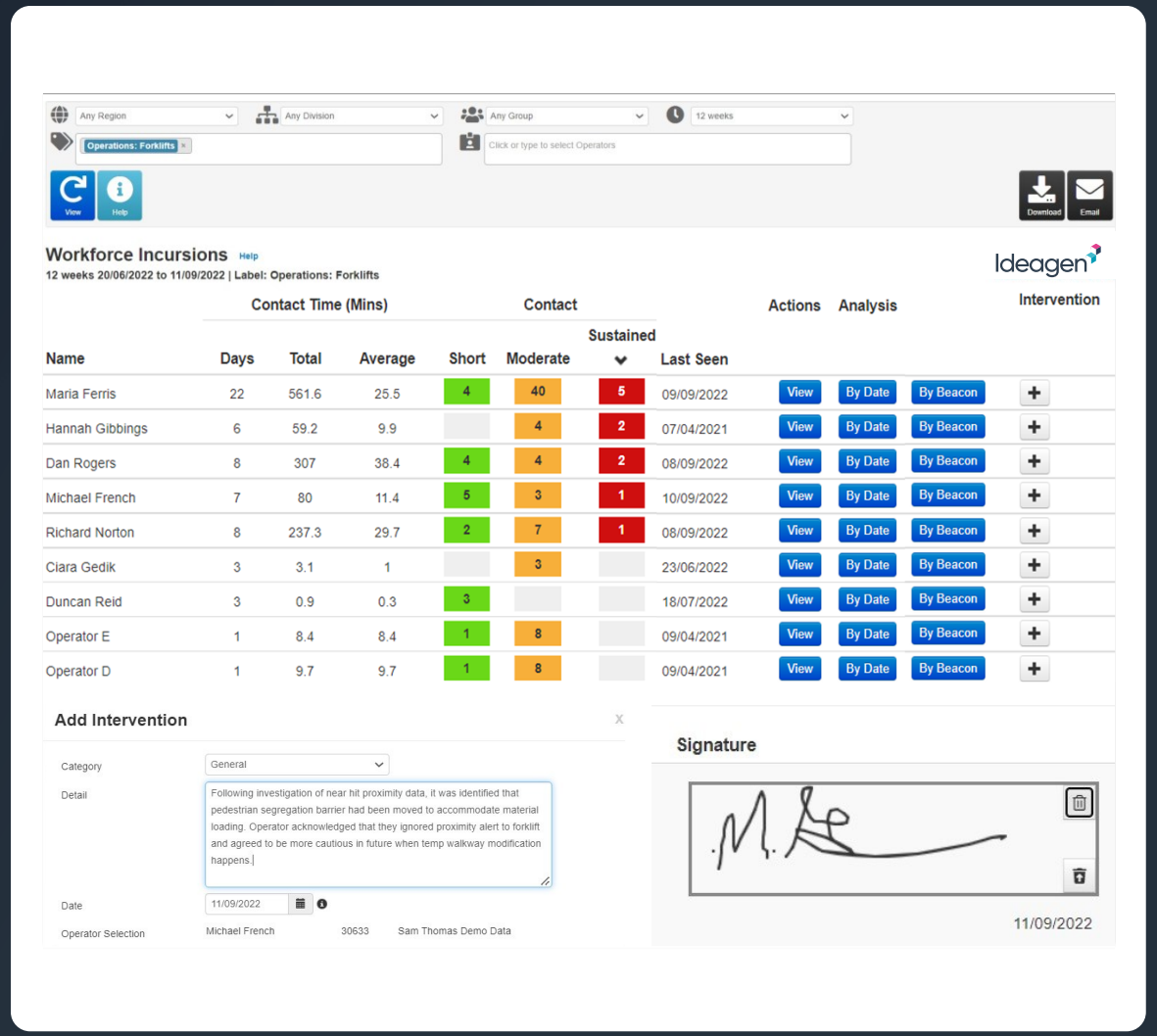
Wearable safety analytics

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Risk profile insight per individual on a Red-Amber-Green basis

Use on a sampling basis to get a view of typical plant interactions

Drill into granular detail to understand **near hit** analytics



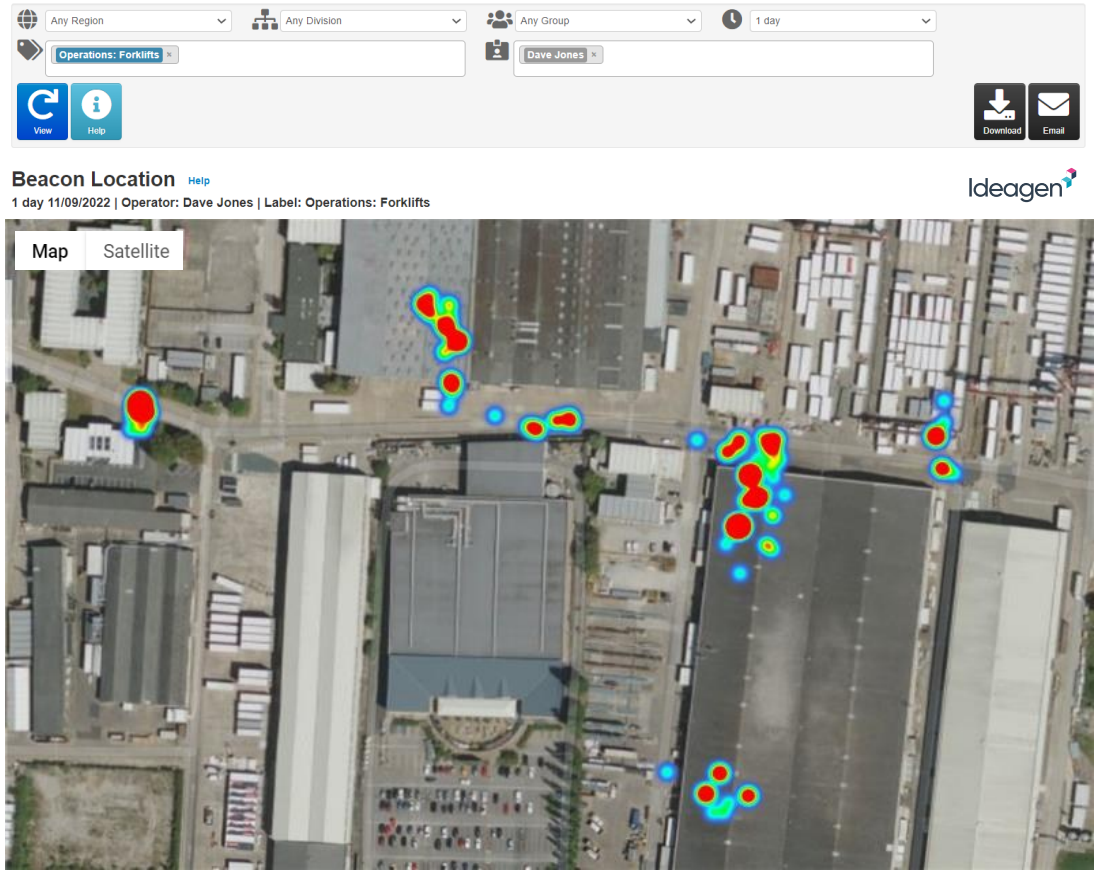
Wearable safety analytics

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Intelligent heat mapping to show high risk incursion zones

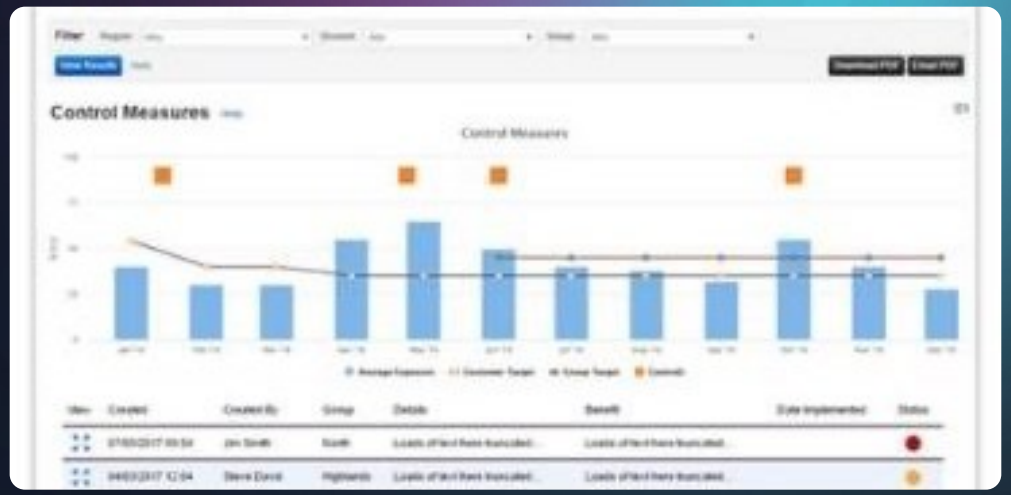
GPS data is logged via the plant beacon

Easily filter by worker or machine



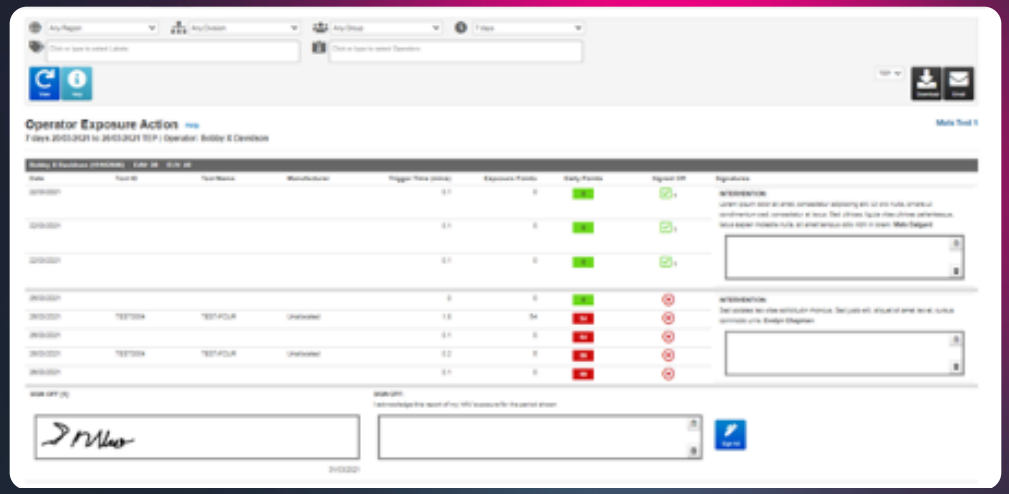
Evidence your prevention engineering

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Record & Monitor Control Measure Success

Log applied control measures and track their effectiveness against monitored risk data.



Log & Authenticate Interventions

Log intervention notes allocated to individual employees and electronically sign to acknowledge.

Ideagen Wearable Safety

History and credentials

140,000+ UK operators supported by Ideagen Wearable Safety **1,300 Customers**

Balfour Beatty · LAING O'ROURKE · CATERPILLAR · NetworkRail · FORTH PORTS SCOTLAND · BAE SYSTEMS · >100 local authorities

Reports & Research Papers

- Institute of Occupational Medicine assessment of **Wearable safety** watch real-time vibration data.
- Largest data analysis in the UK on Hand Arm Vibration exposure risk data.
- International Journal of Industrial Ergonomics – Use of wearable technologies to assess the human response to vibration

2001	Established from Edinburgh University.
2008	Launched a tool mounted HAV monitor.
2014	Introduced cloud based secure analytics & auto data management
2016	Launched a wrist worn industrial wearable
2019	IoT gateway for live data and location tracking
2022	Internationally scalable ecosystem for HAVs noise, dust, MSD

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