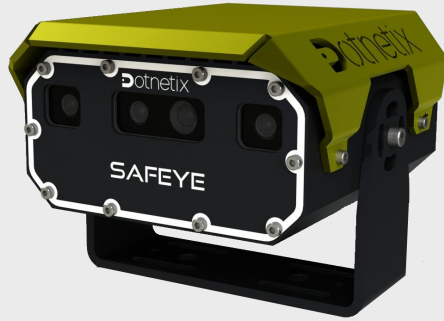


DotNetix
making machines see

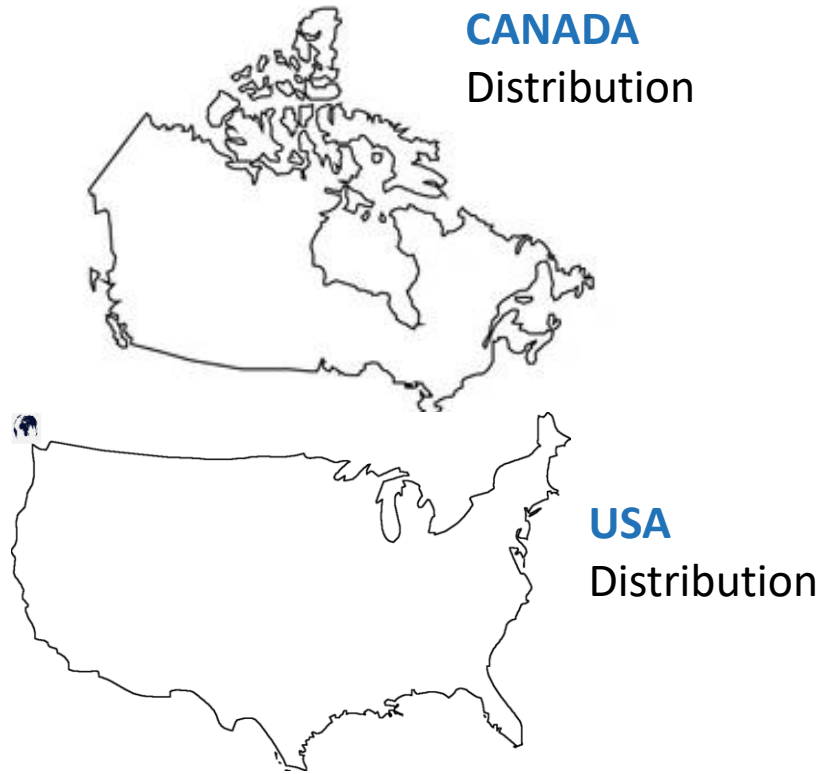


SAFEYE

INDUSTRIAL/MINING SAFETY
MACHINE VISION

Dotnetix is a South-African based safety equipment manufacturing company focused on solutions for industrial, mining, and construction markets.

Dotnetix developed the worlds first long range AI, 3D camera pedestrian detection system for mining and industrial applications.



Since 2017, Dotnetix has been leading the development of affordable intelligent long range camera systems for pedestrian detection. Dotnetix has been committed to increasing the safety of workers in their working environments whether in mining, industrial or construction.

Dotnetix has over 25 years' experience in the development of complex solutions for industrial and commercial applications.

MAKING MACHINES SEE

Keeping people safe
Keeping people working
Efficient production







SAFEYE – Machine vision (AI) system that detects and differentiates pedestrians, machines like ADTs, Dump trucks, Forklifts, Cars and other machines.

SAFEYE – Stereoscopic vision system to measure distance to the objects detected.

SAFEYE – Collision avoidance algorithms built-in.

SAFEYE – Automated warnings to operators.

SAFEYE – Reduces potential accidents with pedestrians and other machines

NO RFID Tags required to detect pedestrians



Deep Neural Networks (AI)

Object detection is a computer technology related to computer vision and image processing that deals with **detecting** objects of a certain class (such as humans, buildings, or cars) in digital images and videos.

Artificial Intelligence (AI) Algorithms are used that are referred to as **Deep Neural Networks**.





FEATURES: – Pedestrian or Vehicle Detection



SAFEYE MAKES THE OPERATOR AWARE OF
OTHER MACHINES AND PEDESTRIANS

Multicamera Controller

7 Inch Display with audible and visual alerts to the operator



Multicamera Controller

Management of the multi camera system



Front



Rear



Left



Right

SAFEYE Machine vision

Features

- Surface Mining – Dynamic Zones
- Detection range 30 meters
- Audible and Visual Warnings
- Multi camera system
- Up-to 4 cameras
- GPS and Speed Information
- Supports Dynamic zones
- 4x Relay Outputs
- 4x Inputs
- CAN bus In/Out
- Isolated Power
- 9-36VDC

Mini-hub Configuration

7 Inch Display with audible and visual alerts to the operator



Mini-hub
Up-to 2x cameras



Front



Rear

SAFEYE Machine vision

Features

- Surface Mining
- Detection range 30 meters
- Audible and Visual Warnings
- Multi camera system
- Up-to 2 cameras
- Supports only static zones
- Isolated PSU
- 9-36VDC
- No GPS logs
- No Output Relays
- No Inputs
- Remote monitoring supported

Mini-hub Configuration

7 Inch Display with audible and visual alerts to the operator



Mini-hub
Up-to 2x cameras



Front

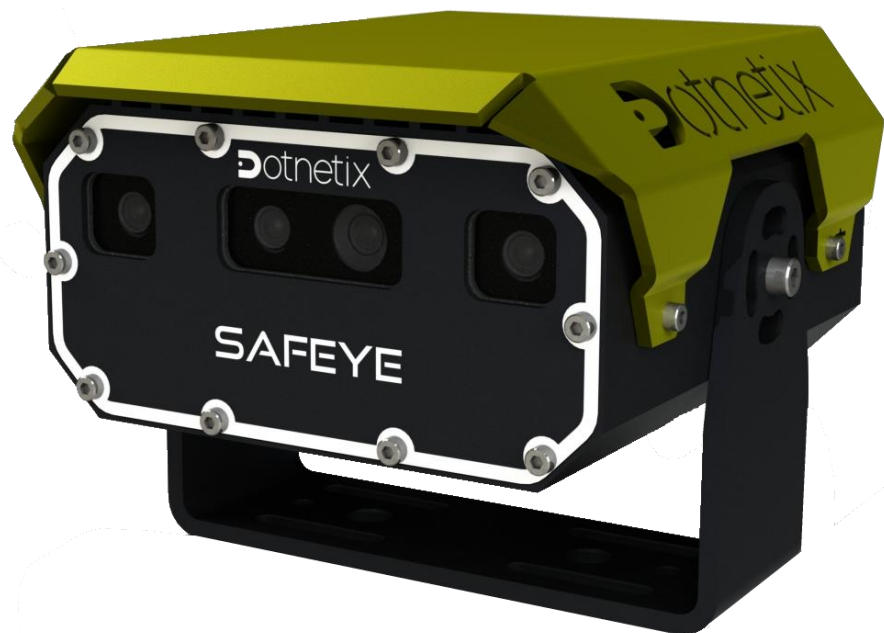


IR Illuminator

Features

- Surface Mining
- Detection range 30 meters
- Audible and Visual Warnings
- Multi camera system
- Up-to 2 cameras
- Supports only static zones
- Isolated PSU
- 9-36VDC

- No GPS logs
- No Output Relays
- No Inputs
- Remote monitoring supported



Standard

Artificial Intelligence

Stereoscopic 3D vision – Distance

Video recording: SSD 128GB

IP69k ruggedized housing (Ceramic coated)

Adjustable bracket

Hardened glass cover

Optional

- Integrated heater element | Temp -30°C
- CAN Bus output (OEMs)

Installation Examples – Ports



- 1  Reverse/Side detection
- 2  Display
- 3  Multi camera controller
- 4  Forward detection



1



Reverse detection

2



Display

3



Mini-Hub

Installation Examples – Dump trucks



1



Reverse/Side detection

2



Display

3



Multi camera controller

4



Forward detection



1



Reverse detection

2



Display

3



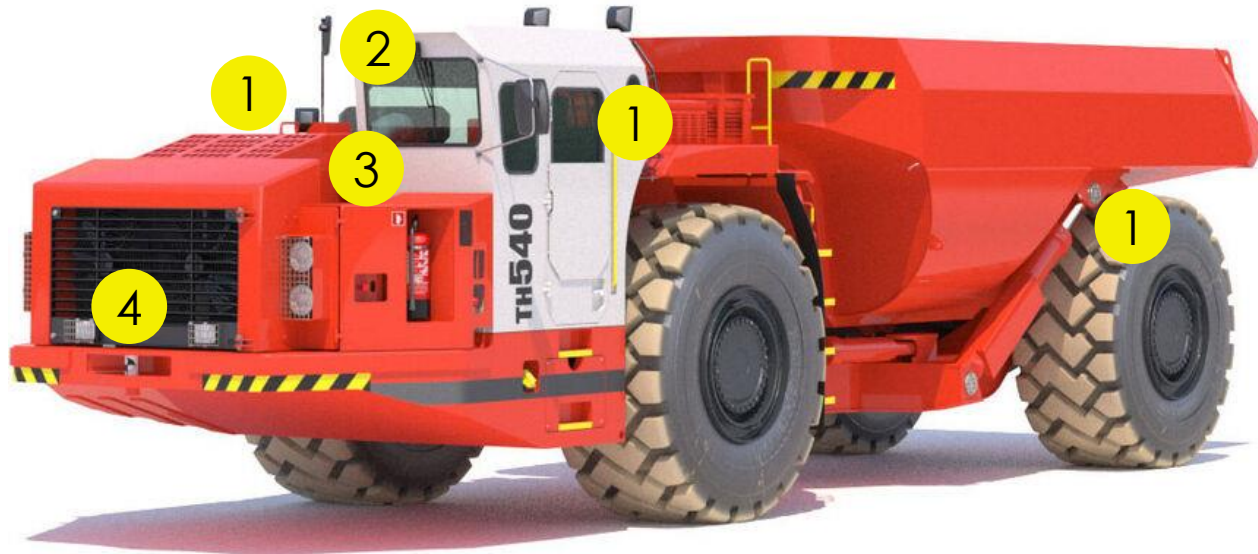
Multi camera controller

4



Forward detection

Installation Examples: Mining Underground



1



Reverse/Side detection

2



Display

3

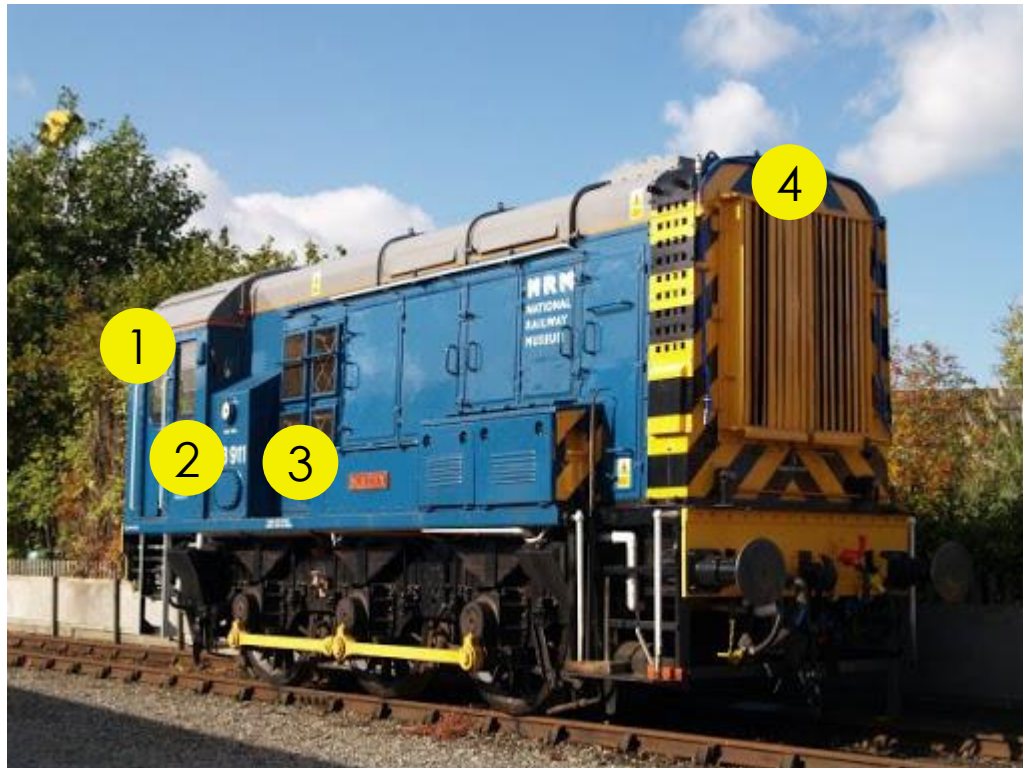


Multi camera controller

4



Forward detection



1



Reverse detection

2



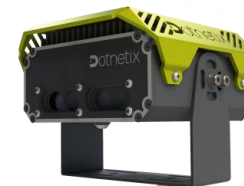
Display

3



Multi camera controller

4



Forward detection



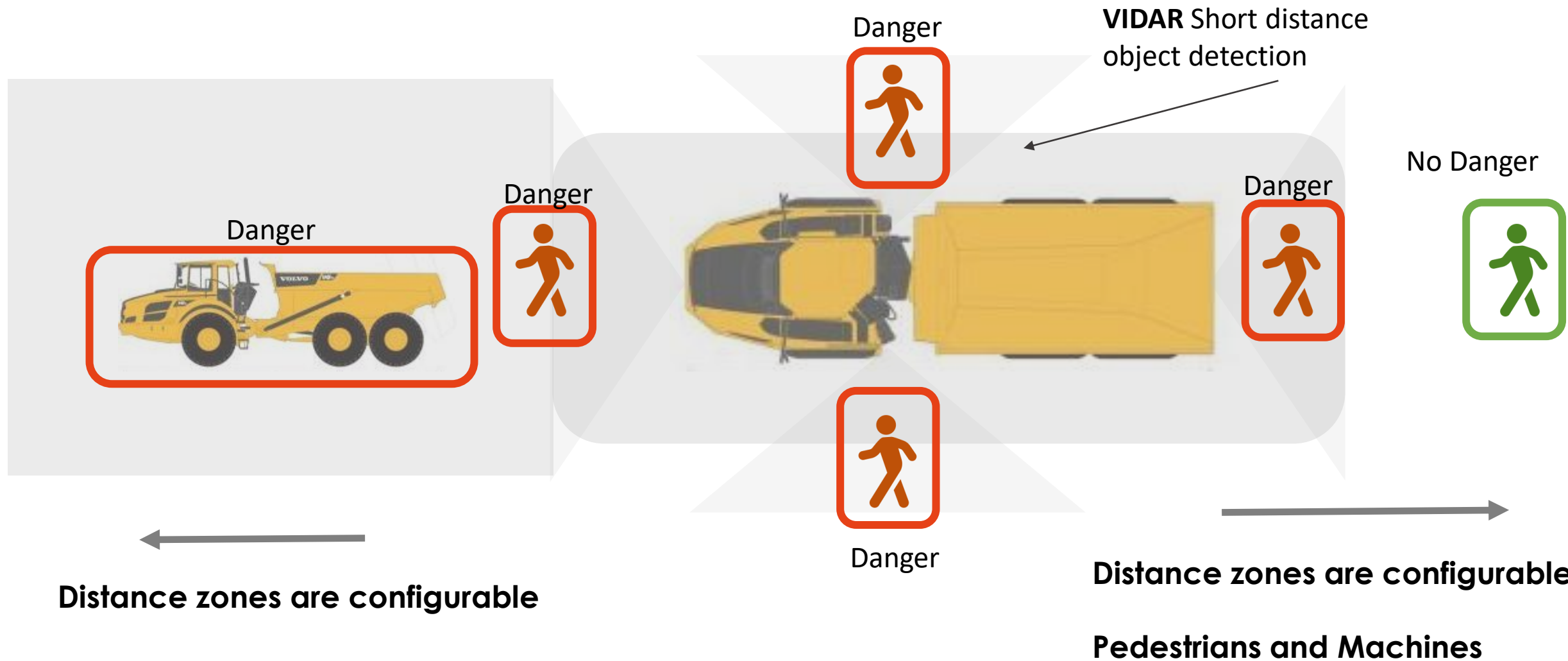
SAFEYE can detect persons and other machines in front or to the sides of the machine



Video display
Audible and visual warning to operator



SAFEYE –
Detects person



Single Camera Display



The detection zone is automatically increased when the vehicle is travelling at higher speed compared to travelling at low speed.

This allows the system to only detect objects that are dangerously close to the vehicle.

SAFEYE automatically measures the vehicle speed using GPS technology and dynamically calculates the stopping distance and warning zones of the vehicle.

Before the object enters the danger zone where the vehicle would be unable to avoid an accident, the operator is warned to decrease speed or change direction.

This allows the operator to react responsibly and avoid an accident.

Only is available on the multi-camera controller.

FEATURES: Dynamic zoning



Travelling at High Speed



Warning Zone (Warn for all objects)



Travelling at Slow Speed

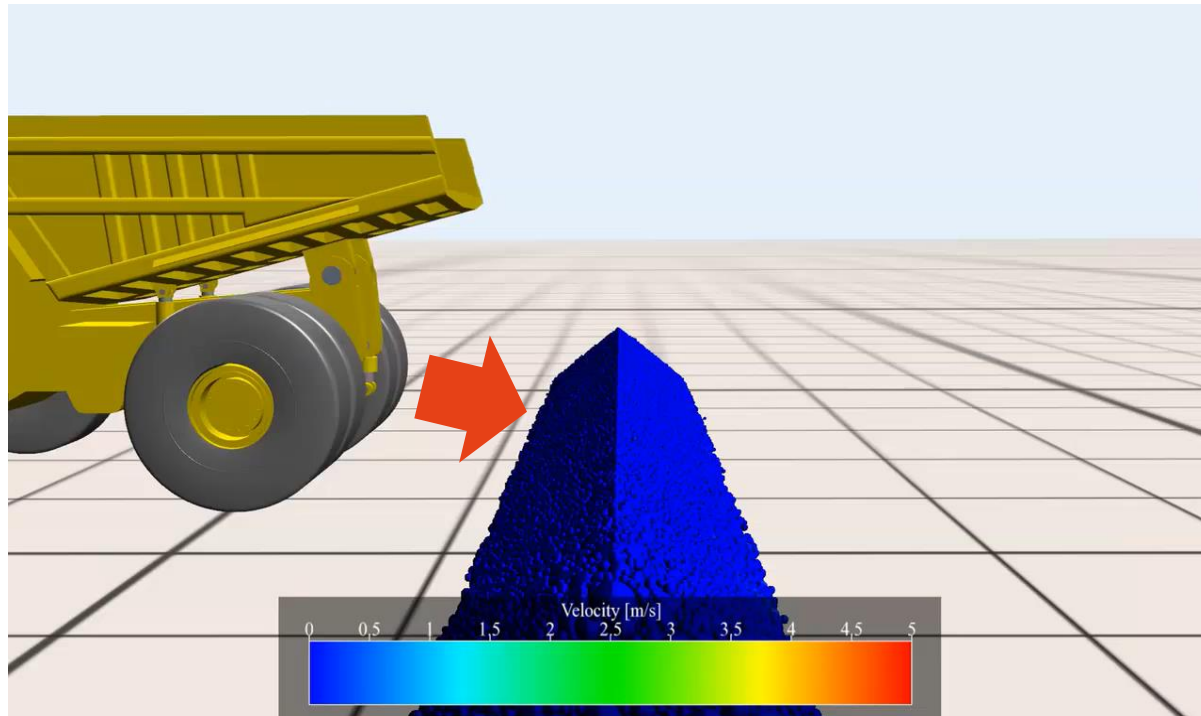


Distance
Ignore far objects that are not a danger, Warn for close objects

Warning Zone



EDGEYE is an additional feature built-in **SAFEYE** to assist during berm operations



EDGEYE has built-in VIDAR that can detect the distance to the berm to prevent accidental damage to the berm when the machine is reversing.

If there is a damaged/no berm, **EDGEYE** detects over the edge events.

Operators are then warned of this event.

FEATURES: EDGEYE – Void detection

Detection Area



EDGEYE can detect an over-the edge event



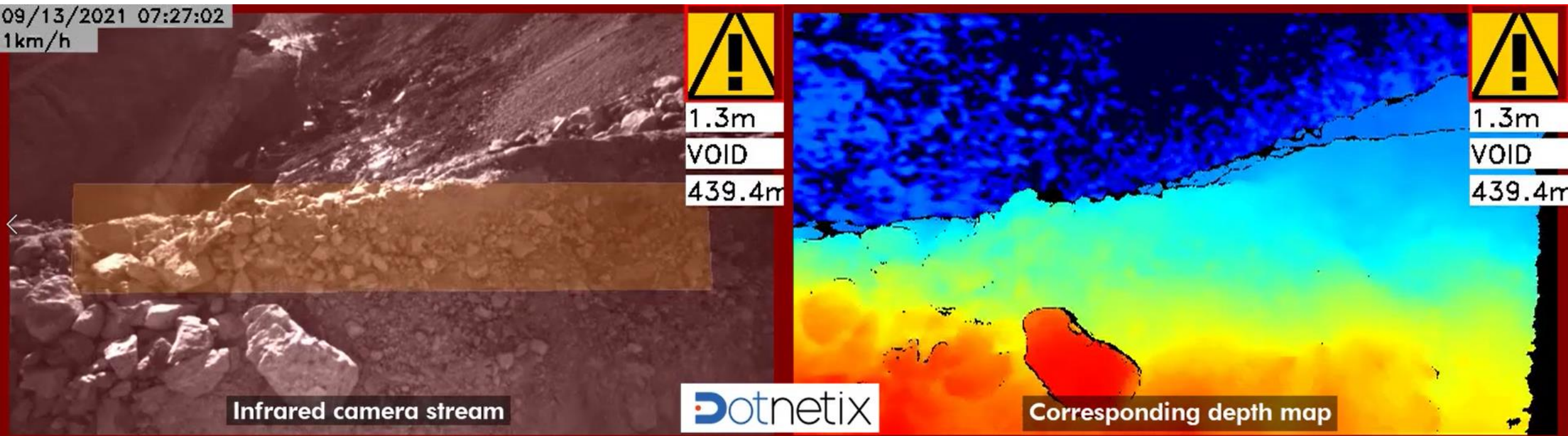
Video display
Audible and visual warning to operator



SAFEYE –
Detects over the edge events before the machine falls.

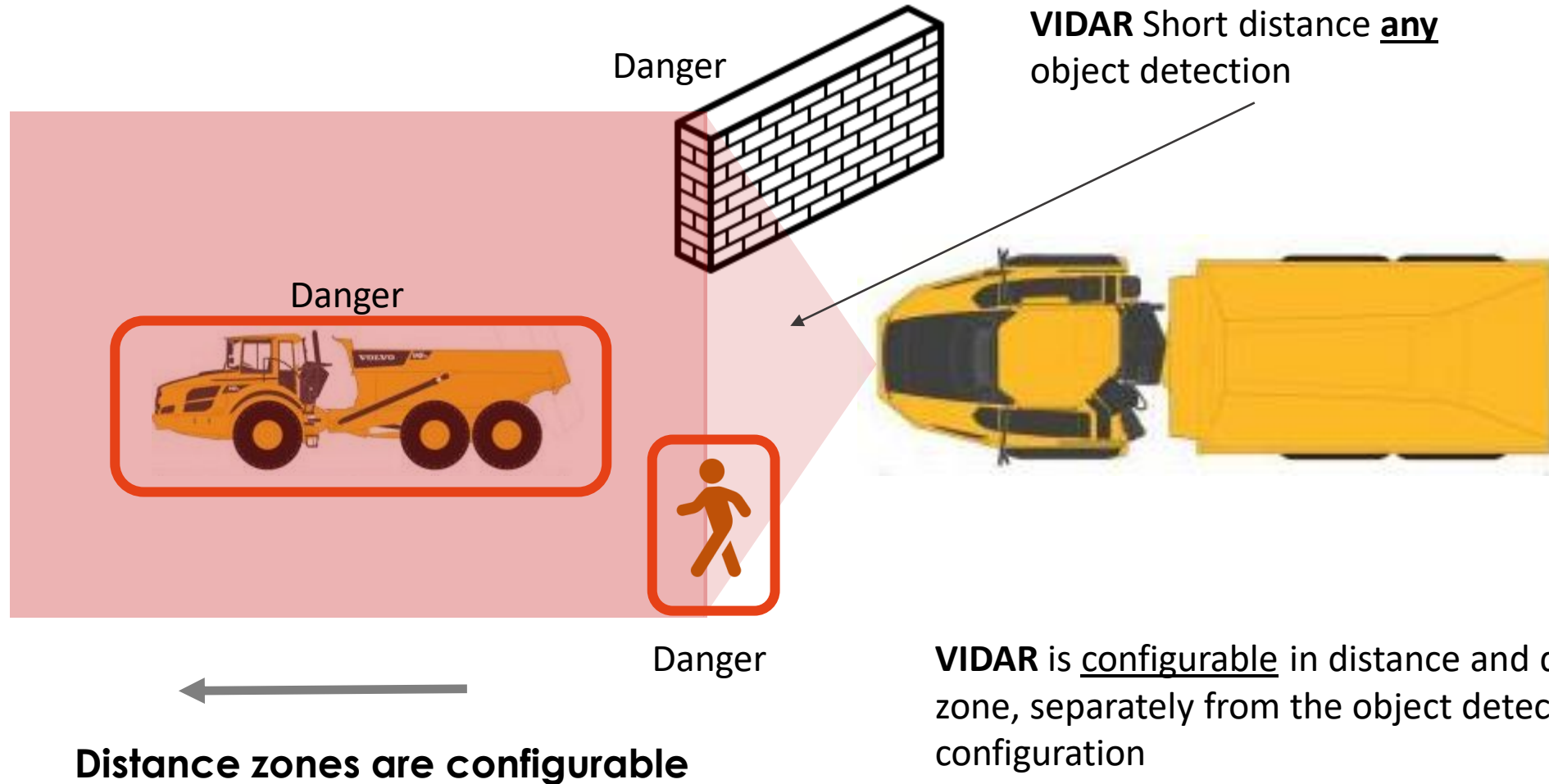
FEATURES: EDGEYE – Void detection

EDGEYE sees the world in 3D and can detect over the edge conditions.



FEATURES: Vidar – Short distance *Anything* detector

Wall, infrastructure, poles, containers etc.





PEDESTRIANS



MINING EQUIPMENT



CARS, LDVs



FRONT-END LOADER



EXCAVATORS



TRAIN



Other objects can be trained to be detected by SAFEYE

- Low False Alarm rate
- Does not cause false alarms on inclines and declines like traditional reflective technologies (Radar/LIDAR)
- Improves operator awareness
- Differentiates between pedestrians and machines for different warnings



Description	SAFEYE	Camera	LIDAR	RADAR	GPS/RF TAGS
Pedestrian Detection	Yes	No	No	No	No
Easy Installation	Yes	Yes	No	Yes	No
High Accuracy	Yes	No	Yes	Yes	No
False Alarm rate	Low	-	Medium	High	High
Video Logs	Yes	Yes	No	No	No
Incident Reporting	Yes	No	Yes	No	Yes
Cost	Low	Low	High	High	High
Recharge batteries	No	No	No	No	Yes
Maintenance	Low	Low	Low	Low	Very High



Instantly Locatable Sound

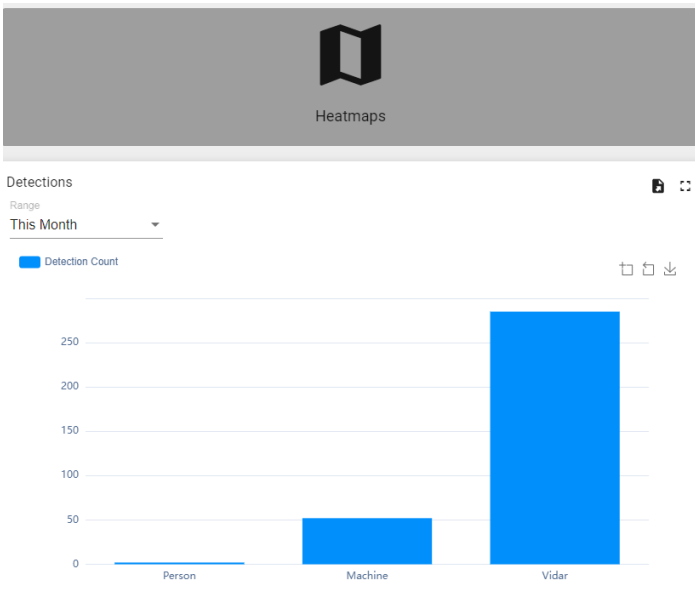
The multi-frequency speaker use a wide range of White Sound frequencies. This enables the listener to instantly locate where and what direction the sound is coming from. The broadband sound also gives workers wearing hearing protection devices (HPDs) and people with hearing difficulties a better chance of hearing the alarm.

The system combined with SafEye provide an easy way of warning pedestrians in the area that they are to close to the vehicle.

Works with the controller only.

Direct Pedestrian Alert

CLEARVIEW – Remote monitoring



Alarms

Realtime - last 30 days

Created time	Originator	Type	Severity	Status
2021-12-03 10:37:39	VAT69	Inactivity Alarm	Critical	Cleared Unacknowledged
2021-12-03 09:25:22	VAT69	Dirty Lens	Critical	Cleared Unacknowledged
2021-12-03 09:23:32	VAT69	Dirty Lens	Critical	Cleared Unacknowledged
2021-12-03 09:21:49	VAT69	Dirty Lens	Critical	Cleared Unacknowledged
2021-12-03 09:19:54	VAT69	Dirty Lens	Critical	Cleared Unacknowledged
2021-12-03 09:18:35	VAT69	Dirty Lens	Critical	Cleared Unacknowledged
2021-12-03 09:17:16	VAT69	Dirty Lens	Critical	Cleared Unacknowledged
2021-12-03 07:07:39	VAT69	Inactivity Alarm	Critical	Cleared Unacknowledged
2021-12-03 06:41:39	VAT69	Inactivity Alarm	Critical	Cleared Unacknowledged
2021-12-03 06:26:23	VAT69	Dirty Lens	Critical	Cleared Unacknowledged

- Online access via WiFi or Cellular
- Alarm terminal to manage critical alerts
- Interaction summary – Berm and Void



Front Camera	
camera_temperature	42.00
gps_status	OK
Web Address	camera0-XfwvKbX7z02B2GalF9E.dotnetix-clearview.com

Rear Camera	
camera_temperature	N-A
gps_status	N-A
Web Address	N-A

Left Camera	
camera_temperature	N-A
gps_status	N-A
Web Address	N-A

Right Camera	
camera_temperature	N-A
gps_status	N-A
Web Address	N-A

Single Camera	
camera_temperature	N-A
gps_status	N-A
Web Address	N-A

- GPS machine tracking and history
- EDGEYE camera parameters
- EDGEYE health

SAFEYE – Installations (Surface and Underground)



SAFEYE and NEXUS Integrated – Installations



Large Volume Production

Dotnetix has partnered with Etion Create which is a global supplier of complex technology products. The Etion group is recognised as a quality product supplier.

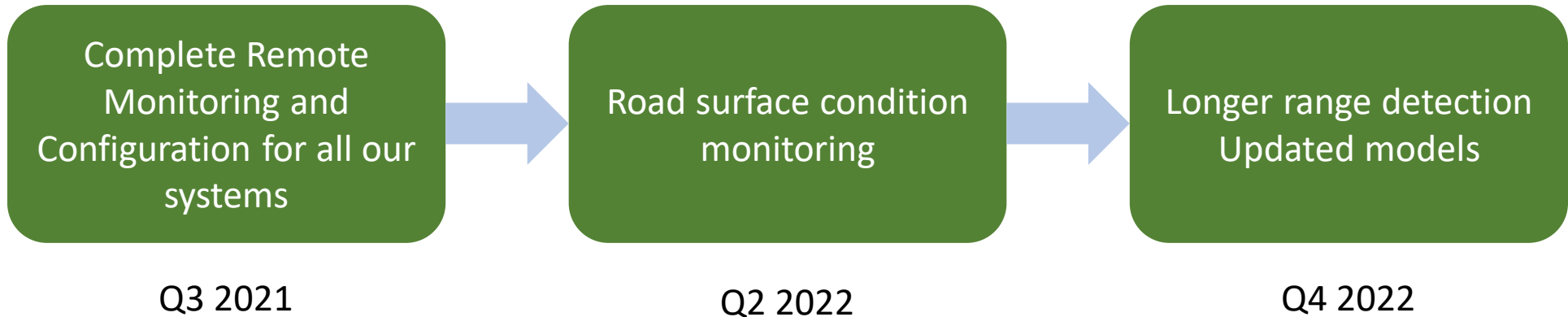
Etion has a production and testing facility of more than 200 people that assists Dotnetix with large volume production and can scale to any volume requirement



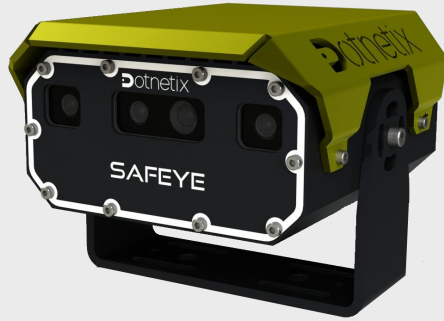
- Low false alarm rate
- Cost effective
- Reliable passive technology
- Improves operator awareness
- Easy to install



CUSTOMER DRIVEN REQUIREMENTS
“WE MAKE MACHINES SEE”



DotNetix
making machines see



SAFEYE

**INDUSTRIAL/MINING SAFETY
MACHINE VISION**