





A frequent challenge at industrial work sites:

Presence of People around Mobile Machinery

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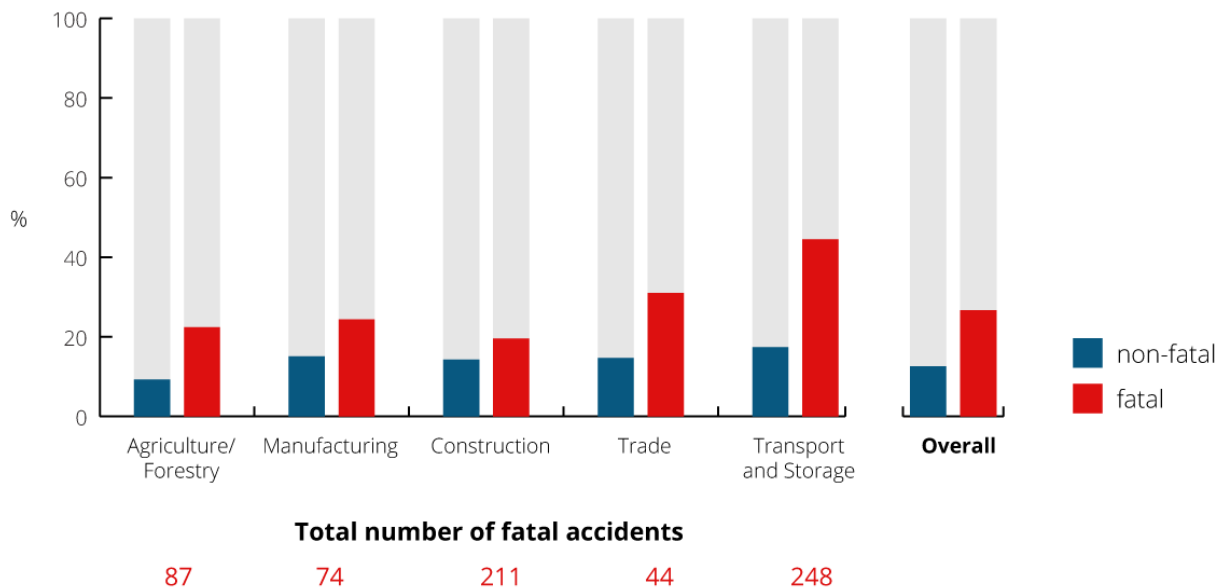
Frequent causes for accidents:

- **Blind Spots around Large Vehicles**
- **Humans Ignoring Safety Guidelines**

Accidents at Work in the European Union



Percentage of accidents as a consequence of workers being struck by equipment in motion



Summary

26.7 % of all fatal and
12.6 % of all non-fatal
accidents due to
workers being struck
by equipment in motion

Source: eurostat
Year: 2018

Frequent consequences of heavy vehicle accidents:

- **Injuries or Fatalities**
- **Production Shutdown**
- **Safety Investigations**

emitrace® Driver Assistance

What is emitrace®?

A camera-based assistance system for drivers of industrial machinery that detects persons with help of their reflective safety clothing

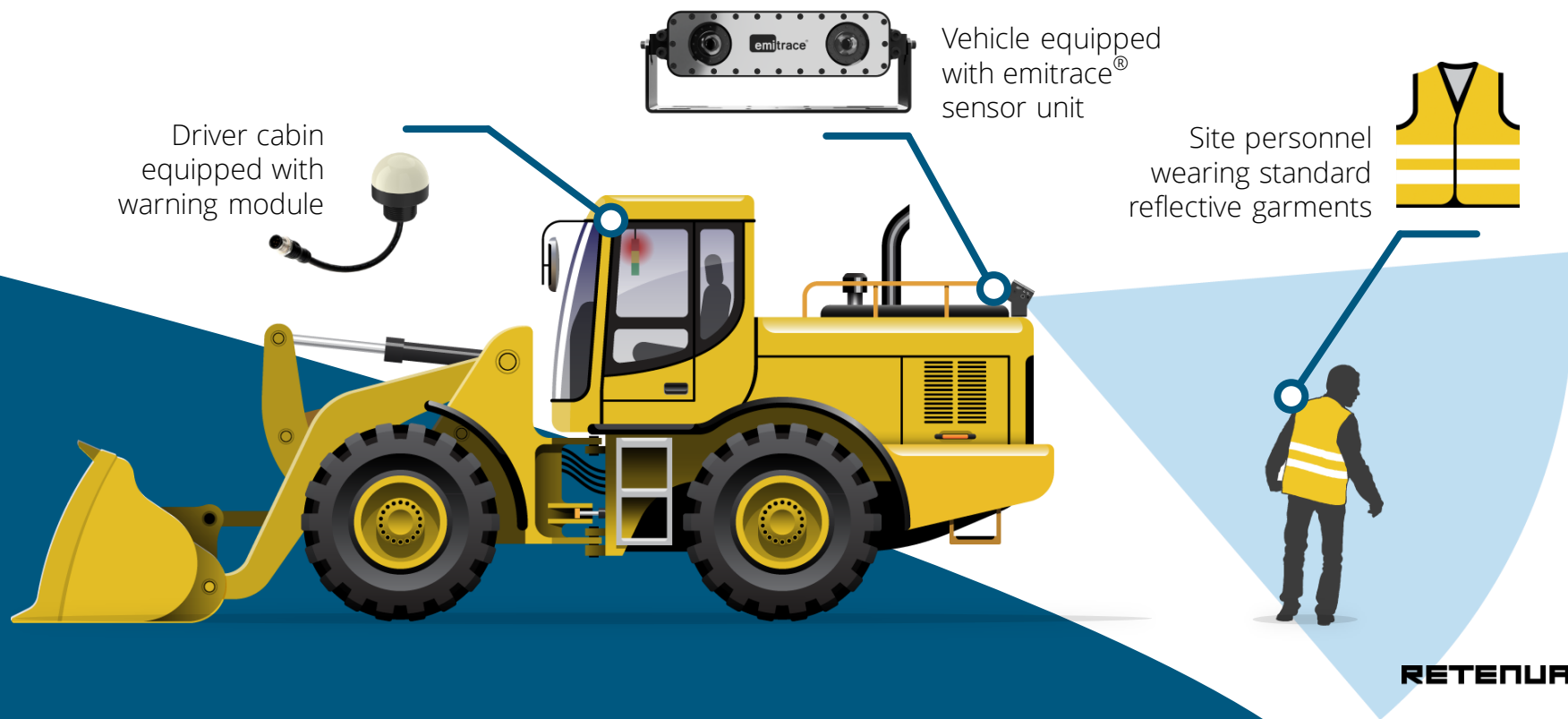


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emitrace® Driver Assistance

Working Principle



Working Principle



Color Camera Image

emitrace® IR Image



Detection Principle

1. Infrared Imaging
2. Ambient Light Suppression
3. Recognition of Reflective Patterns (AI)
4. Stereo Triangulation

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Working Principle



emitrace® Driver Assistance

Working Principle



No detection
Lamp showing green



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Working Principle



Person in medium risk zone detected
Lamp showing yellow



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Working Principle



Person in high risk zone detected
Lamp showing red



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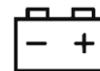
Sensor Unit



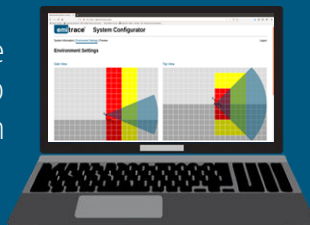
Signal Output for
Warning Module



Power Input (12-24V)
and Input State Signals



Network Interface
for System Setup
and Configuration



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User Interface

1

Standard Module

Turck K50 Pro

Compact unit with
RGB-diodes and
optional audio signal



2

Alternative Module

Werma K37

Classical stack light
with different status
and warning lights



3

Individual Solutions

Combinations of various
visible or audible warning
elements for vehicle integration



emitrace® Driver Assistance

System Components



+



+



Standard Kit

Sensor Unit

Power and Signal Cabling

Standard Warning Module

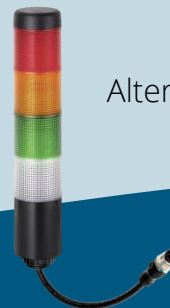
Accessories



+



Signal Splitter and Extra Cabling
for Vehicle Integration



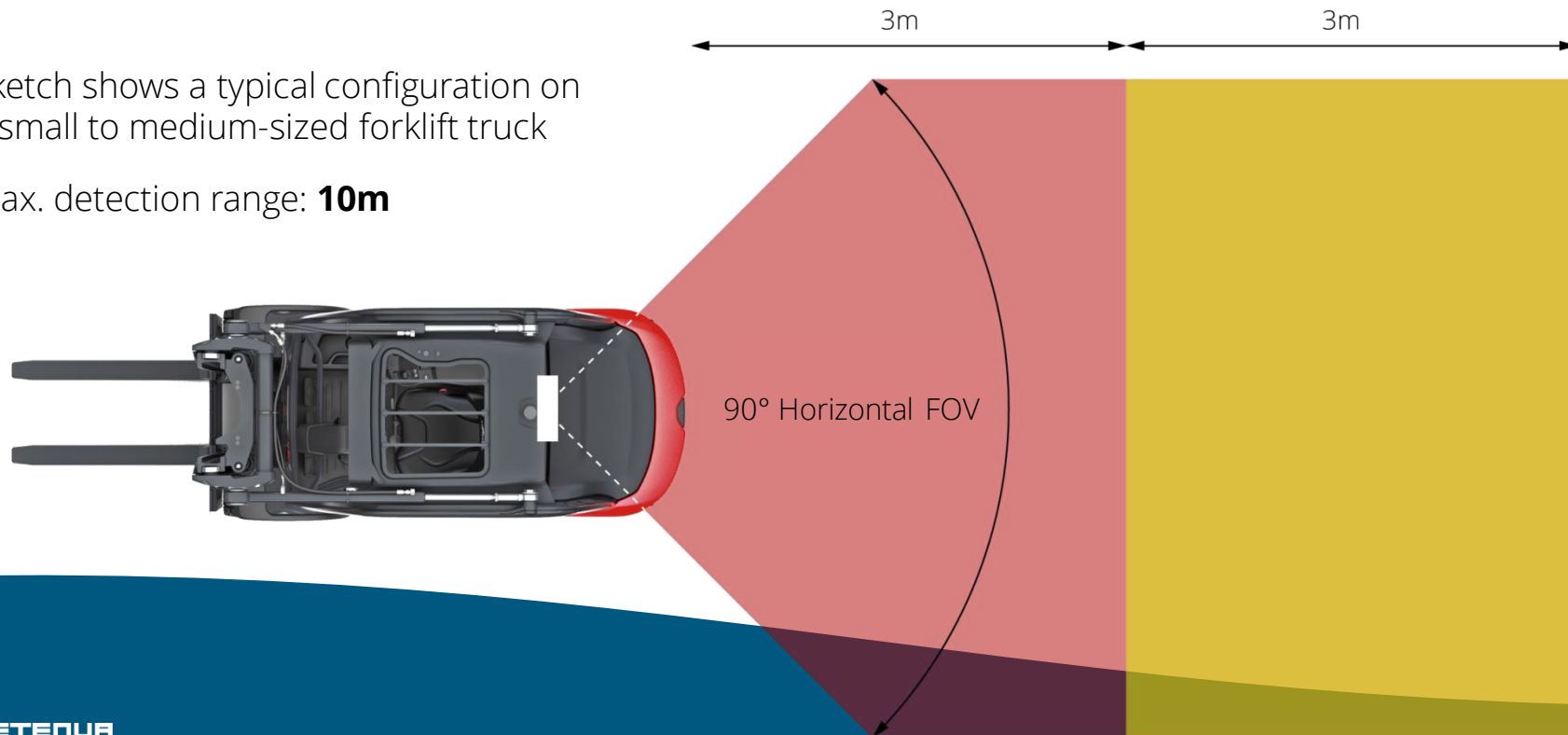
Alternative Warning Module

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Field of View

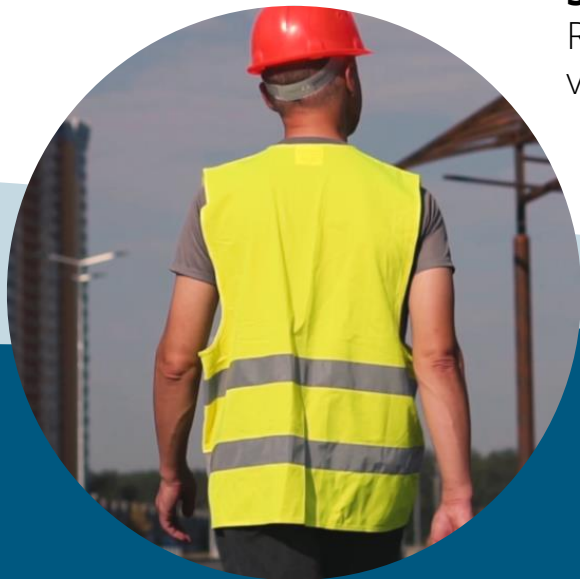
Sketch shows a typical configuration on a small to medium-sized forklift truck

Max. detection range: **10m**



emitrace® Driver Assistance

Advantages with emitrace®



Simplicity

Requires only standard high-visibility clothing on personnel



No electronic tags/sensors
required on personnel

Advantages with emitrace®



Compact Embedded Design

Direct sensing and computation in sensor unit means no additional onboard computers and shorter installation time

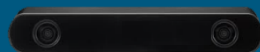


Sensing + Processing



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User Interface



Sensing



Processing



Display

Common
Camera
Systems

emitrace® Driver Assistance

Advantages with emitrace®



Flexibility

Suitable for indoor and outdoor, day- and nighttime, above- and underground operation



Compactness

Driver receives visible and/or audible warning signals on a compact module in driver cabin



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Example Installation

Vehicle: Side Loader (Bulmor)

Location: Uddeholm Steel Factory, Sweden



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Example Installation

Vehicle: Demo Forklift Truck (Linde)

Location: Linde Material Handling Sweden



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Example Installation

Vehicle: Forklift Truck (Svetruck)

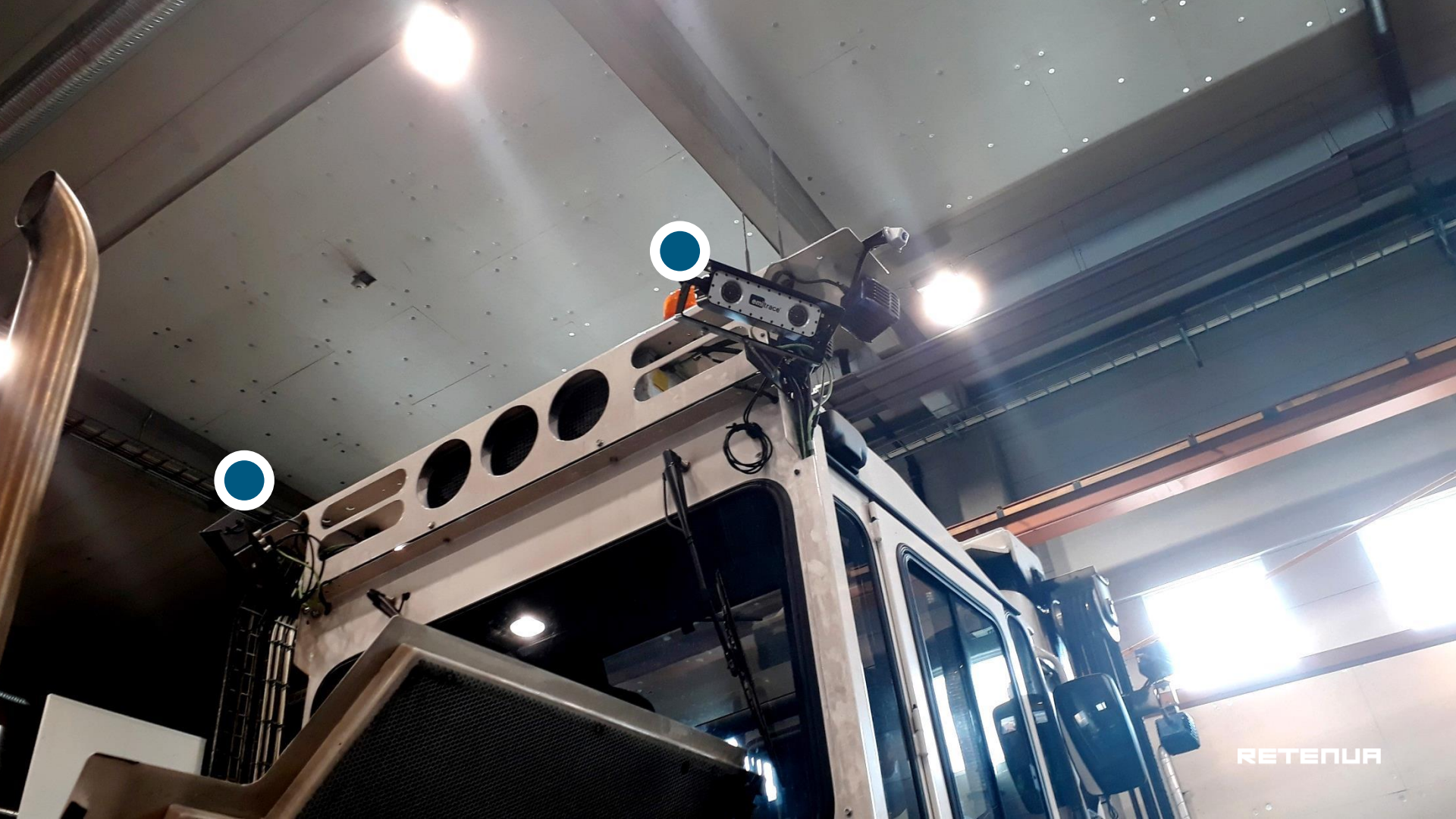
Location: Södra Forestry Group, Sweden



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RETELIJA



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Pilot Installation

Vehicle: Wheel Loader (Volvo)

Location: NCC Construction Company, Sweden



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Retenua AB

Intelligent Sensor Systems

Berglundavägen 12C
702 36 Örebro
Sweden

www.retenua.com
info@retenua.se

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