



## ADVANCED MACHINE – MAN COLLISION DETECTION SYSTEM



**SSZ® ECHO GUARD**

# WHAT IS SSZ® ECHO GUARD?

SSZ® ECHO GUARD is a technologically advanced system designed to enhance safe driving under conditions in which limited visibility poses a challenge.

- monitors the area around the vehicle
- warns of personnel approaching the vehicle via a colour coded display
- warns of personnel in direct machine proximity through the use of optical and acoustic signals
- detects transmitter equipped personnel within 18 metres in warehouses and within 30 metres in open space

- manufacturing
- warehousing
- loading and unloading zones
- terminals

SSZ® ECHO GUARD is specifically well suited for all enterprises where logistic systems play a significant role in:

- internal transport
- loading, unloading and reloading of goods
- works carried out by various types of vehicles and machines assisted by pedestrian employees

## PURPOSE OF SSZ® ECHO GUARD

SSZ® ECHO GUARD was designed to guard personnel against accidental collision with various types of vehicles. SSZ® ECHO GUARD may be employed on vehicles and machines wherever there is a need for protection against sudden intrusion of pedestrian employees.

The product is particularly designed for enterprises that employ forklifts for internal transportation.

It can improve the safety of pedestrian employees working in the following working environments:

## BENEFITS OF USING SSZ® ECHO GUARD:

- provides employees with greater security in warehouses
- minimizes the risk of accidents and minimizes their costs
- increases security of pedestrian employees in zones of loading, unloading and transportation of goods
- deployable on various type of machinery and vehicles
- time stamped automated logging of events
- integrates with higher-level logistics systems

## SYSTEM COMPONENTS

### IMPLEMENTATION

- user-friendly configurable system elements
- CAN bus configuration possibility
- light and comfortable transmitter



"It is the employer's obligation to ensure the safety and health of workers in every aspect related to work(...) consult workers on introduction of new technologies; designate worker(s) to carry out activities related to the protection and prevention of occupational risks"

Directive 89/391/EEC - OSH "Framework Directive"

## THE ROLE OF SSZ® ECHO GUARD IN OCCUPATIONAL HEALTH AND SAFETY

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SSZ® ECHO GUARD significantly improves OHS in industrial plants by decreasing the number and severity of transportation related accidents.

## THE ROLE OF SSZ® ECHO GUARD IN OCCUPATIONAL HEALTH AND SAFETY

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SSZ® ECHO GUARD has been designed to enable easy and safe implementation on any type of vehicle.

## OUR SYSTEM IS A GREAT SOLUTION FOR THE FOLLOWING SECTORS:

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- internal transport
- ports and terminals
- warehousing, logistics and distribution
- quarries, centres for obtaining aggregates
- mines
- civil engineering and construction

## THE SYSTEM CAN BE USE IN VARIOUS VEHICLES:

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- forklifts
- excavators
- loaders
- container cranes
- cranes
- tipper trucks

**SSZ® ECHO GUARD DRAMATICALLY IMPROVES DRIVER SPATIAL AWARENESS BY OFFERING APPROPRIATE EARLY WARNING ALERTS OF POSSIBLE MACHINE-MAN COLLISIONS.**

## PERSONAL TRANSMITTER

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The device operates by constantly transmitting a long wave (100 kHz to 500 kHz) analogue radio signal. Analogue signals, contrary to more commonly used digital identification signalling systems, offer superior system coverage and better resistance to interference. The unit is battery powered and works only in transmission mode.

## DIRECTIONAL DETECTOR

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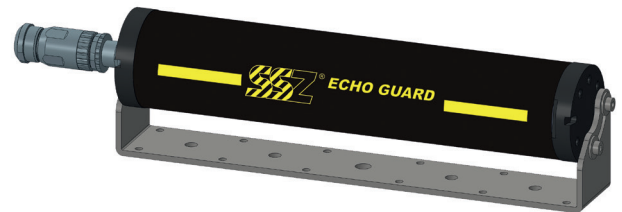
The function of the directional detector is to detect the signals emitted by the personal transmitter units. The received signal is amplified and then sent by antenna cable to the driver's display terminal. The use of ferrite antennas in the directional detectors allows for the identification of the direction from which the transmitted signal originated from. This unique capability distinguishes SSZ® ECHO GUARD from competing solutions operating on higher frequencies.



In any working environment associated with transport and storage of goods employing different types of vehicles and operating personnel in the immediate vicinity of such vehicles there is a potential risk of accidents. SSZ® ECHO GUARD helps to minimize the risk of collisions and reduce hazardous events and risky behaviours.



PERSONAL TRANSMITTER



DIRECTIONAL DETECTOR

## DISPLAY TERMINAL

The display terminal is the central unit of the system. It is mounted in the cockpit of the vehicle near the operator. The display terminal is mounted in such a manner as to insure safe operation of the unit and that it does not pose a distraction hazard to the driver. The terminal displays a representation of the area around the vehicle and shows the direction of an approaching person as well as the person's distance from the vehicle. This information is conveyed to the driver by depicting an intuitive three colour range icon on the display terminal. The acoustic and visual signallers are connected to the central unit in such a manner as to effectively alert the driver of a potential collision.

The central unit offers the capability of event logging to a mass storage device of up to 2 GB in capacity. The unit can be optionally equipped with a Wi-Fi module allowing wireless data transmission and centralized event logging.



DISPLAY TERMINAL



# PRINCIPLE OF OPERATION

SSZ® ECHO GUARD is optimised for wireless positioning of workers in noisy and difficult radio communication environments. Low frequency radio signals have better penetration and diffraction properties and as such they are able to bend around the human body as well as other obstacles. Depending on local conditions, the system offers information about the presence and direction of an approaching worker within the radius of several to several dozen metres from a detector equipped vehicle or machine.

Leveraging state of the art FPGA programmable logic solutions, SSZ® ECHO GUARD offers a revolutionary approach to the extraction of positional information contained within a radio beacon signal. Signal processing takes place within several hundred microseconds and the result is instantly available and visualized on the driver's cab display terminal in a non-distracting manner.

SSZ® ECHO GUARD has the ability to recognize radio interference and inform the driver of possible system performance degradation. The system evaluates the nature and level of radio interference in the environment and is able to dynamically adjust and adapt to quickly varying conditions.



## STEP I

The presence of the employee is recognized



## STEP II

The employee enters the hazardous area



## STEP III

Direct collision hazard

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