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BodyGuard™ Proximity Warning System

BodyGuard is an industrial quality proximity detection and warning system. The system has been designed to help improve workplace safety by effectively lowering the risk of collision between people and moving objects. BodyGuard has been built durable and robust to offer ongoing, reliable performance for almost any environment.

The BodyGuard proximity warning system has an audible and visual alarm that is activated to alert the personnel in the event of a potential collision.

In addition to the on-board Audible and visual proximity warning, the system has two digital outputs that can be used to control the movement of a vehicle or provide an auxiliary external proximity warning alert. The dual output signals can be used to indicate a “pre-warning” proximity to another object and the second output can stop the vehicle or control an additional external proximity warning in event of high possibility of collision.

Ideal for

- Vehicle to vehicle proximity detection
- Vehicle to fixed location/ pedestrian region or work area
- Personnel to vehicle proximity detection
- Personnel to Moving Machinery/Equipment proximity detection
- Machine to Machine proximity detection

Typical Applications

- Warehouses and picking areas
- Forklift operations
- Open-Cut mining operations (Haul Road trucks and Utility vehicles)
- Shipping/Cargo handling areas
- Cranes and general construction sites (Gantry cranes, Ground-Operated cranes etc)
- Truck loading bays

Features

- Effective collision avoidance function between personnel and moving objects
- IP67 ingress protection for harsh industrial environments
- Clear Visual and Audible proximity warning
- C-Tick approval for use in Australia
- Robust construction is made to last and withstand the elements
- User-definable, multiple detection zones
- Switched outputs to enable control of vehicle or external proximity alert
- Non-Volatile Event History log keeps Time/Date stamped record of all detections
- Easily configured using a laptop computer or PDA

How the system works

The system operates by creating an invisible “shield of protection” (detection zone) around any object that is fitted with a BodyGuard proximity warning device. The range of this invisible detection zone is programmable from a couple of metres to over metres. Whenever any object fitted with a BodyGuard proximity warning device enters the detection zone of another object that is also fitted with a BodyGuard proximity warning device, an audible/visual alarm will be activated to alert personnel.

Each detected object has a specific “Object Type” and Unique “ID”. All proximity detections are recorded in a permanent History Log that contains the Time and Date of the event, the Type of Object detected, ID of the object and relative distance. Other events, such as object leaving the detection zone and Reset button being pressed, are also recorded.

The History Log contains details of all proximity events that have occurred and can later be downloaded using a PDA device or Laptop computer. This proximity detection information is useful for risk reduction analysis and planning improvements to safety process in the workplace.

BodyGuard Devices

The BodyGuard system comprises three main devices.

1. **Vehicle Sensor Unit** – The Vehicle Sensor Unit can be fitted to a vehicle or moving machinery. The Vehicle Sensor Unit can detect the presence of other BodyGuard devices when they enter the proximity protection zone and activate an on-board audible/visual proximity warning and/or be used to control the motion or speed of the vehicle using the two digital outputs. The Vehicle Sensor Unit is also detected by other Sensor Units.
2. **Fixed Sensor Unit** – The Fixed Sensor Unit operates in a similar manner as the Vehicle unit but instead of providing an audible/visual proximity warning, the unit switches relay contacts that are used to control external sirens or flashing strobes. The Fixed Sensor Unit can detect the presence of other BodyGuard devices when they enter the proximity protection zone. The Sensor Unit is also detected by other Sensor Units. This unit is typically located in a pedestrian or worker area to provide warning to the personnel in event of close proximity or possibility of collision with moving vehicles or machinery.
3. **Personal TAG Unit** – The Personal TAG Unit is a small battery powered device that is typically worn by personnel (fitted to a hard-hat or worn in a pocket of a safety vest). The Personal TAG device is detected by Sensor Units but itself is not capable of proximity detection.

BodyGuard GROUPS

The BodyGuard system provides a flexible method for grouping certain types of vehicles together. The system can be set up to only activate on a certain group or combination of groups of objects.

The GROUP ID is not to be confused with the Device TYPE. The TYPE of device relates to the hardware (Fixed Unit, Vehicle Unit, TAG unit etc), whereas the GROUP refers to a logical grouping that the user can establish to determine how a system responds.

Personal TAG Units are configured at the factory to have a fixed Unique ID number and Group ID (Type 7, “TAG” group). This cannot be changed by the user. The Sensor Units however are not assigned a specific ID number or GROUP ID. These can be configured by the user. Each Sensor device can be programmed with an ID number from 1 to 65535 and can be assigned as a GROUP between 0 and 6. This effectively enables objects to be assigned as one of the 7 groups available. The configuration software that is supplied with BodyGuard systems allows the user to assign a descriptive text for each GROUP. (For Example: GROUP 0 may be called “TRUCK”, and GROUP 1 may be called “FORKLIFT” etc).

The benefit of this ability to group objects is that the BodyGuard units can also be configured to activate an alarm for a particular GROUP or combination of several GROUPS. This means that say a unit assigned to “TRUCK” group may ignore other objects that are assigned in the TRUCK GROUP but activate an alarm for detection of a TAG GROUP.

Proximity Detection Range
The proximity detection zone can be calibrated (programmed) between every object within the system, or a proximity detection range can be set for each TYPE (group) rather than every individual device.

Each unit can have two Detection ranges programmed. This enables a “pre-warning” zone to be established at a further distance and an “immanent danger” alert for close proximity. The Audible/Visual warning will activate only when the proximity of the other object is detected in the closest detection zone.

Outputs
In addition to the audible/visual warning system, the Sensor Units have twp Digital output signals. When an object is detected within the furthermost proximity detection zone then the first digital output is activated. When the object is detected in the nearest detection zone then the second digital output is activated. These signals can be useful for applying control of the vehicle or machinery or providing an external alarm indication using a large strobe light or siren. (Particularly when the unit is being used for fixed detection within an area).

Reset Button
Each Sensor Unit has a Reset Button. The Reset button can be configured to silence the Buzzer (In the case where a driver may be required to talk to personnel near the vehicle). The Reset button can also be used as an Acknowledgement by the operator that the alert has been noticed. (This event is then saved as a time/date stamped event in the history log).

Proximity Level Indication
The front panel of the Sensor Unit has 10 bright LEDs that are set up as a 5-level LED display that indicates relative proximity of any objects detected. When an object is detected within the closest proximity detection zone then all 10 LEDs will flash at once to alert the operator and the buzzer will sound.

Technical Data

BodyGuard Vehicle Sensor Unit		
Electrical	Power Supply12/24V DC Idle Current 30mA TX Current: 60mA Outputs 50V max 500mA Sink	
Mechanical	Dimensions 140mm x 110mm x 60mm Power Connector IP68 Metal Gland Programming Connector IP68 Circular 4 Pole Weight 800g	
Environmental	IP67 ingress rating Water/Dust proof -20 to +70 Degrees C Indoor/Outdoor use 3mm thick metal enclosure C-Tick Approval for use in Australia	
Radio	Frequency 433.92 MHz Output 25mW max. Range 5-100m No license fee required	

BodyGuard Fixed Sensor Unit		
Electrical	Power Supply12/24V DC Idle Current 30mA TX Current: 60mA Outputs 50V max 500mA Sink	
Mechanical	Dimensions 140mm x 110mm x 60mm Power Connector IP68 Metal Gland Programming Connector IP68 Circular 4 Pole Weight 800g	
Environmental	IP67 ingress rating Water/Dust proof -20 to +70 Degrees C Indoor/Outdoor use 3mm thick metal enclosure C-Tick Approval for use in Australia	
Radio	Frequency 433.92 MHz Output 25mW max. Range 5-100m No license fee required	

Personal TAG Unit		
Electrical	Built-in rechargeable batteries. 2.4V DC nom. Battery life > 7 days	
Mechanical	Dimensions 52mm x 79mm x 18mm Antenna 55mm Weight 95g	
Environmental	IP67 ingress rating Water/Dust proof -20 to +70 Degrees C Indoor/Outdoor use 3mm thick metal enclosure C-Tick Approval for use in Australia	
Radio	433.92 MHz 25mW max. Power Range 5-30m No license fee required	

Personal TAG Battery Charger		
Electrical	Power Supply 5V DC Current Limit 400mA Charge Status LED Full charge in 3 hours	
Mechanical	Dimensions 65mm x 60mm x 45mm Weight 120g Ganged for multi-way use TAG sits in cradle	
Environmental	Indoor use only -20 to +60 Degrees C	