



2011



# Strata Proximity Systems

## Surface Display with Integral Silent Zone Transmitter

### Users Manual v1.0

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# 1 Overview

The Surface Display with Silent Zone Transmitter is part of a complete HazardAvert proximity warning system from Strata Proximity Systems which provides warnings to both individuals and to machinery to alert them that the individual has entered too close to an operating piece of equipment and is in a dangerous situation or that vehicles or machinery are getting close enough that a collision possibility exists. The Surface Display with Silent Zone Transmitter is mounted on a vehicle or piece of machinery and is connected to a central control unit.

## 1.1 Theory of Operation

The functions of the Surface Display with Silent Zone Transmitter are:

- To transmit a 73 kHz “Silent Zone” field around a small portion of the vehicle or piece of machinery in which the operator is allowed to safely work or enter as part of his normal activities.
- To provide a visual and audible indication to the operator as to the status of the HazardAvert system in relation to this particular vehicle or piece of machinery.

The Surface Display with Silent Zone Transmitter is connected to the HazardAvert Central Controller, which under the control of a microcontroller, generates a 73 kHz signal for creating a Silent Zone around the area of a machine where the Display and Operator are located. This 73 kHz signal is connected to the Surface Display with Silent Zone Transmitter along with other signals via a wire bundle connected to a bulkhead connector on the housing of the Surface Display. Inside the Surface Display with Silent Zone Transmitter housing is a wire / ferrite radiator element to which the 73 kHz signal is connected. The 73 kHz signal passing through this wire / ferrite radiator element generates a 73kHz “Silent Zone” electromagnetic field which encompasses only the small area of the vehicle or machine in which the operator can safely be during operation. The operator is required to wear a Personal Alarm Device (PAD) which is another component of the HazardAvert system which detects and responds to the presence of 73 kHz fields. As long as the operator is within this “Silent Zone” his PAD will know he is within a safe area. If the operator exits this Silent Zone safe area, his PAD will function to alert him and other machines or vehicles equipped with the HazardAvert system of his proximity to dangerous conditions due to his distance from machine or vehicle hazards. The Surface Display with Silent Zone Transmitter also indicates to the operator the status of the system via a series of LEDs. There is an LED which indicates that the system is powered, an LED that indicates if there is an individual or other machinery close enough to warrant a “Warning” condition and another LED that indicates if there is an individual or other machinery close enough to

warrant a “Danger” condition. The Surface Display also has a LED to indicate if there is a bus communication failure with the Central Controller. The Surface Display also has 4 LEDS which in the case of a Warning or Danger condition, indicate which Surface Proximity Modules (another component of the HazardAvert System) are detecting the Warning or Danger condition.

There is also a sounder on the Surface Display with Silent Zone Transmitter which creates audible alerts to the operator of a Warning or Danger condition.

The Surface Display with Silent Zone Transmitter also contains a Bluetooth Transceiver which is FCC approved as an integratable module for transferring logged data from the HazardAvert system to an external Personal Computer for analysis.

## 1.2 Frequency of Operation

The Silent Zone Transmitter will transmit on a frequency of 73 kHz.

## 1.3 Label Information

The Surface Display label is located on the face of the unit. A picture of the Strata label is below:



The Strata label defines the model and serial number of the Surface Proximity Module also MSHA and Commonwealth of Pennsylvania information.

### 1.3.1.1 MSHA Blasting Distance

MSHA has published Program Policy Letter P11-V-07 concerning Two Way Communications and Blasting Circuits.

SPS magnetic field generators produce a magnetic field that at 100 kHz or .1000 MHz does not achieve the Critical H Field until 1.42 m with a blasting cap having a pickup area of 10 sq. meters.

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SPS magnetic field generators are safe to 1.42 m from the blasting caps. SPS does recommend a minimum distance of 25' as a precaution.

### **1.3.1.2 Pennsylvania Blasting Distance**

At this date, Pennsylvania has not made a recommendation or statement concerning surface systems.

## **1.4 FCC Information**

The FCC ID for the Surface Display with Silent Zone is ZQ3-SPS-SDMOD. When configured by Strata for underground use, the device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received including interference that may cause undesired operation.

Any intentional or unintentional changes or modifications to the configuration of the Surface Display with Silent Zone not expressly approved by Strata Proximity Systems LLC could void the user's authority to operate the equipment.

*NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## **2 Operation**

### **2.1 Installation Information**

The Surface Display with Silent Zone is mounted on a vehicle or piece of machinery. Metal near the Surface Proximity Module may impact performance. After installing the Surface Display

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with Silent Zone on the machine, performance of the unit should be verified by calibration and test.

### **2.1.1 Interoperability Warning**

The Surface Display with Silent Zone may experience erratic responses when in *very close* proximity to some electronic devices. Electrical devices may transmit an electrical field and noise from these fields *may* cause interference with the Surface Proximity Module. A safe guideline is to keep the Surface Proximity Generator *at least 75 mm away* from any electrical devices included but not limited to methane monitor, radio, mobile phone, GPS, PDA, battery charger and laptop computers.

## **2.2 Charging**

The Surface Display with Silent Zone is directly powered from the controller board and requires no internal battery or charging.

## **2.3 Alerts**

The Surface Display also has 4 LEDS which in the case of a Warning or Danger condition, indicate which Surface Proximity Modules (another component of the HazardAvert System) are detecting the Warning or Danger condition.

There is also a sounder on the Surface Display with Silent Zone Transmitter which creates audible alerts to the operator of a Warning or Danger condition.

## **2.4 Maintenance**

The Surface Display Unit with Silent Zone should be regularly cleaned to reduce buildup of dust and dirt.

## **3 Warranty**

Initial system hardware components will be warranted to be free of defects for a period of one (1) year from in service date. Subsequent component purchases will be warranted one (1) year from receipt acknowledgement. Warranted replacement or repair is not applicable in cases of physical damage or abuse as determined at the time of return or inspection.

## 4 Revision History

### 4.1 Version 1.0 – October 19, 2011

Original release. No revision history