

Features of LaserGuard intelligent detection system

- * 3D laser radar technology with real 3D coordinates for all detected events
- * 3D makes shape analyse and position related triggering of events possible
- * Totally independent of ambient light as it have its own laser source
- * Range up to 700 meter with high accuracy of 10-20 cm
- * Unique trigg and filter functions like speed , shape , motion pattern etc.

LaserGuard 3D sensing alarm system

LaserGuard is a unique security system for control of areas and surfaces against any type of intruder. The system use a 3D laser radar camera (Ladar) scanning the checked area and makes a dynamic 3D image of it. The 3D image contains full 3D information and positions of what exist in the area static.

The area is scanned all the time and new 3D maps are produced and these are checked to the master map for any type of 3D deviation. Deviations are found by a subtraction algorithm in 3D.

Deviations are analysed against set parameters and when deviations are detected to preset characteristics the alarm functions is alerted.

Alarm is normally creating an image from a special camera. We have PTZ cameras where we aim and zoom the camera to get best view of what we want to see.

LaserGuard is fully web compatible. All can be controlled by a web browser / Internet anywhere worldwide.

3D images can be created by Laserguard and we can make a complete 3D image of any area with good accuracy. This makes measurements possible like volume control of piles as well as position control of anything moving in the area.

Many of our products are protected by patents and patent applications

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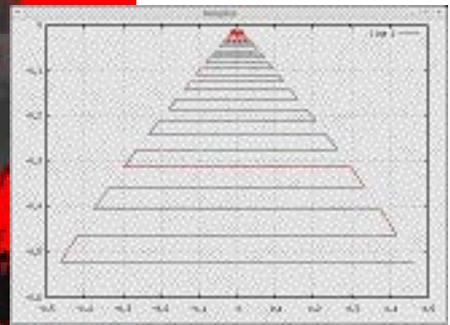


Ladar unit is based on a 2 axis laser scanner with a high speed and high accuracy distance meter.

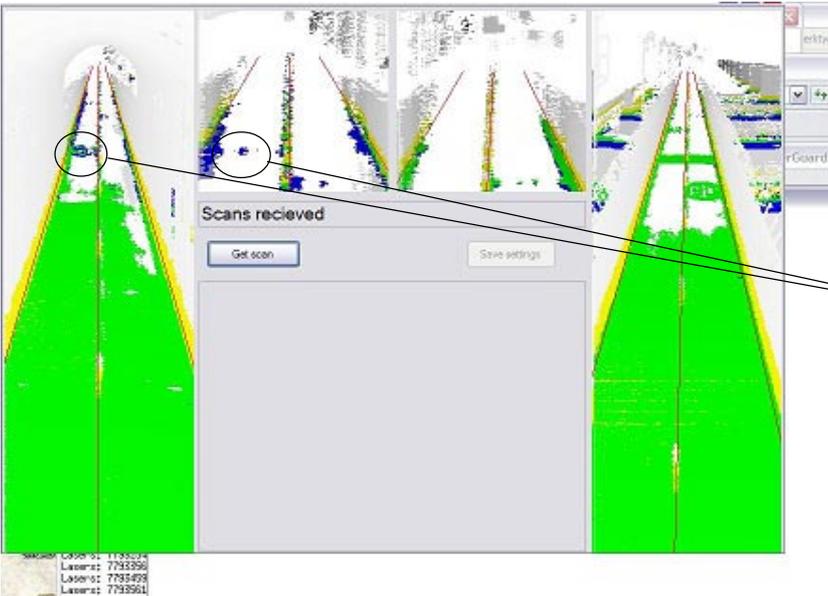
The scanner paints the area with a laserbeam making a full 3D image of the entire area. The speed and scanning pattern can be set by the computer in many ways.

Each Voxel (Volume pixel) is handled in a database. Special algorithms handle many thousand points as a surface / skin layer.

Master scan calibrates the scanner and deviations from this are detected and analysed. Depending on deviation the software decide what to do. All events are logged and stored in the database for future studies.



Left is a camera view of an area Range in image is 1-150 meter
 Centre image is same area in 3D. Dark is closer and white more far away. Red are disturbed images like lost signal or split signals from corners.
 Right image is a typical scanning pattern over a rectangular area.



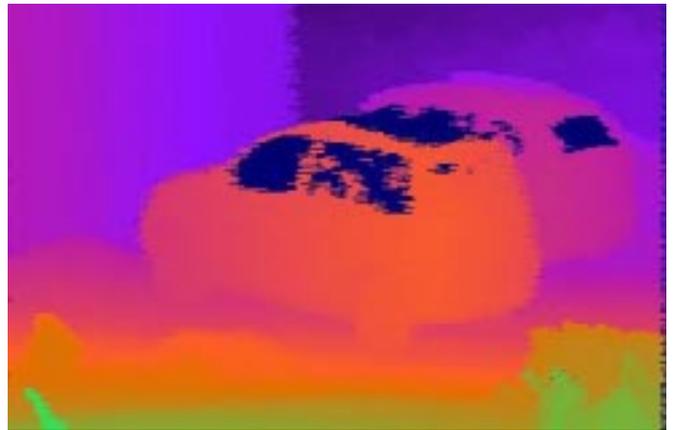
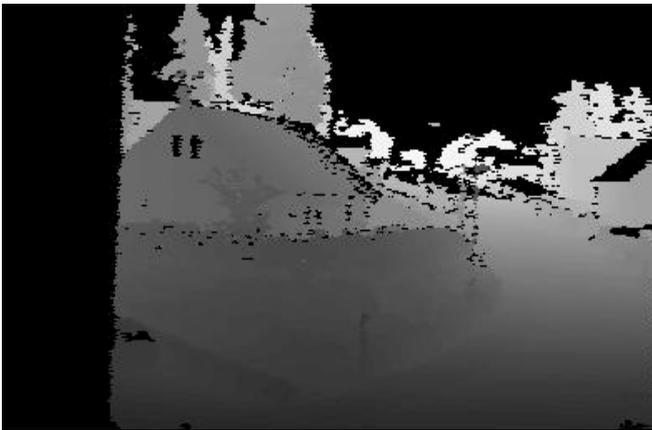
Left image is a scanned area of 6x600 meter. This is scanned by the Ladar system. Alarm area is between the 2 yellow lines. Green are hits on the asphalt surface. White area are no readings as the reflex was very weak. Each view have 300 meter length and 6 meter in width. Blue point clusters on surface was a car which is detected with very good margins. The system have a resolution in this application of about 30x30 cm over 6x300 meter in area.

In this application we use a motion trigger telling if a car is driving too slow.

Cycle speed is about 5 sec to alarm.

Trigg functions are very excellent as we always calculate 3D positions and 3D shapes of what we want to detect.. Ambient light, darkness and object colours are making no problems at all as we have our own active laser light. This makes the system hard to avoid as every person and intruder must have a volume. None is invisible in its own 3D shape.

As examples we can make cars invisible for the system when we want to see pedestrians only. We can say that if speed is high or low we make an alarm. We can say that everyone moving left right shall make alarm but none else. This is also done under almost any conditions and here LaserGuard have no equal.



3D images created by the LaserGuard system. Each pixel in the image have a depth coordinate. here depth is showed as a gray scale on left image and as a colour at right image. This type of information is easy to understand for the eye. Range of 3D images can be up to 400 meter (optional 1200 meter).

Typical Laserguard system



Right side
PTZ camera of best quality with auto tracker functions and slave operation by information from Ladar unit

Left side
Ladar unit with moveable Night and day camera



LAN / W-Lan connection

LAN / W-Lan connection

Red marker around detected anomaly

Operators screen dump

This is a typical view of a double Ladar system. Each unit cover 6x300 meter and have a resolution of about 50x50 cm for alarm generating objects / changes.

Left images show normal situation of area. Right images show the actual view with Ladar information overview on top the image. Red markings in the 2 images are cars which has stopped in the area for more than 5-10 seconds. Criteria here is that stopped cars shall give an alarm . Moving cars shall not give alarms and pedestrians are invisible for the alarm

Green markings are cars which move in the area. Top right is manual override of the external PTZ camera. It can also operate as a slave to the Ladar.

The square with red dots is a vertical top view of the area. Red dots ate non moving objects. Larger dots are larger in dimensions.

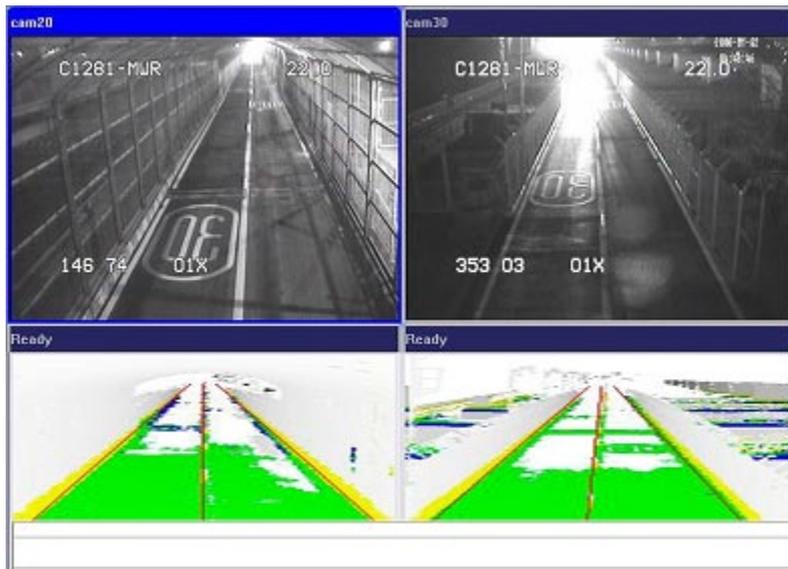


Camera units

The camera units can have its own software. This screen dump shows the ladar camera unit with activated motion analyze software. Red squares are points where there are changes in image over the preset threshold values.



Right image is not 100% sharp. Reasons are this is taken with the Nivis colour camera in moonshine at 3000 meters distance. Laserguard have really unique high end cameras to see where none else can see. Nivis colour is unique and adds far better visibility in dark twilight.



Screen dump of other version of system. Here we have 2 systems in parallel. Cameras look on a road strip of 520 meter in length. Images shows the area in night time. Under it we have camera displays of area. On right side we have blue indications of something and this is a car front. This will cause an alarm for operator if car is moving in a strange way. If car pass in normal ways there is no alarm. Pedestrians and not creating any alarm with these settings.

We can trig alarms on any type of motion pattern and 3D shape of detected objects. Cameras can zoom in what is detected automatically and object is marked on screen.