Laser Radar
Capturing objects' profile, location and movement in real time.
Instantly capturing profile, location and movement. The 3DLR detects objects in real time to enhance safety regardless of bad environmental conditions and poor lighting.

### 3DLR’s Applications

#### Level-Crossing Obstacle Detection System

- Installed at over 2,000 level crossings to date
- Obtained Safety Integrity Level 4 in Europe.

- One 3D Laser Radar (3DLR) unit can cover the whole detection area of a level crossing (A general size of the level crossing. The possible detection area is 60 horizontal, 30 vertical and up to 30m ahead.)
- The 3DLR is contributing to the prevention of accidents at level crossings by detecting obstacles (vehicles etc.), when they are trapped inside a closed crossing.
- The 3DLR’s installation and after-care maintenance is carried out with ease as it is not placed within the track clearance.

### 3DLR’s Features and Performance

#### Features

- Accurately captures the form, position and movement of an object in real time.
- Informs the object’s location with high precision by directly measuring the distance from object to 3DLR head.
- IHI’s 3DLR is set apart from simple image sensors by its ability to provide consistent and reliable detection and tracking of objects regardless of bad weather conditions and poor lighting.
- The 3DLR has no adverse effect on electronic devices as its laser uses light instead of radio waves.

#### Illustration of the 3DLR’s moving obstacle detection method.

- Laser scanning
  - Laser light emitted within measuring range. The distance to each point is calculated.
  - 1st scan
  - 2nd scan
  - Nth scan

- All scan data
  - Receive reflected laser light from detected objects.

- Calculate objects’ locations.
  - Output locations and sizes of detected objects.

#### Performance

- Highly precise measurement performance even over long distances.
  - The 3DLR uses pulsed laser light to capture objects. It employs the TOF (Time of flight) method which calculates the time taken for the laser light to return to its point of emittance once reflected off of a detected object.

- Sensing performance
  - Detection time is 0.1 sec (min) to 3. sec (max) for a frame with angles of 90° horizontally and 60° vertically.

- Unique moving-object detection algorithm.
  - The 3DLR’s unique moving-object detection algorithm enables precise detection and tracking of objects such as pedestrians and vehicles on the road.

- Consistently logical detection even in snowfall
  - Based on its unique noise elimination method the 3DLR performs reliable object detection and tracking regardless of bad environmental conditions such as snow and rail fall.

#### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range</td>
<td>5~30m</td>
</tr>
<tr>
<td>Angle of Field of measurement</td>
<td>Horizontal: max 60° Vertical: max 30°</td>
</tr>
<tr>
<td>Detection time</td>
<td>0.5 sec</td>
</tr>
<tr>
<td>Safety standard for laser</td>
<td>IEC60825-1 Class1 JIS C 6802 Class1</td>
</tr>
<tr>
<td>Remarks</td>
<td>Max measurement range in spite of 200m (horizontal aspect)</td>
</tr>
</tbody>
</table>

#### Key Points

- Accurately captures the form, position and movement of an object in real time.
- Informs the object’s location with high precision by directly measuring the distance from object to 3DLR head.
- IHI’s 3DLR is set apart from simple image sensors by its ability to provide consistent and reliable detection and tracking of objects regardless of bad weather conditions and poor lighting.
- The 3DLR has no adverse effect on electronic devices as its laser uses light instead of radio waves.
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