



Laser 3D Radar

**Capturing objects' profile, location
and movement in real time.**



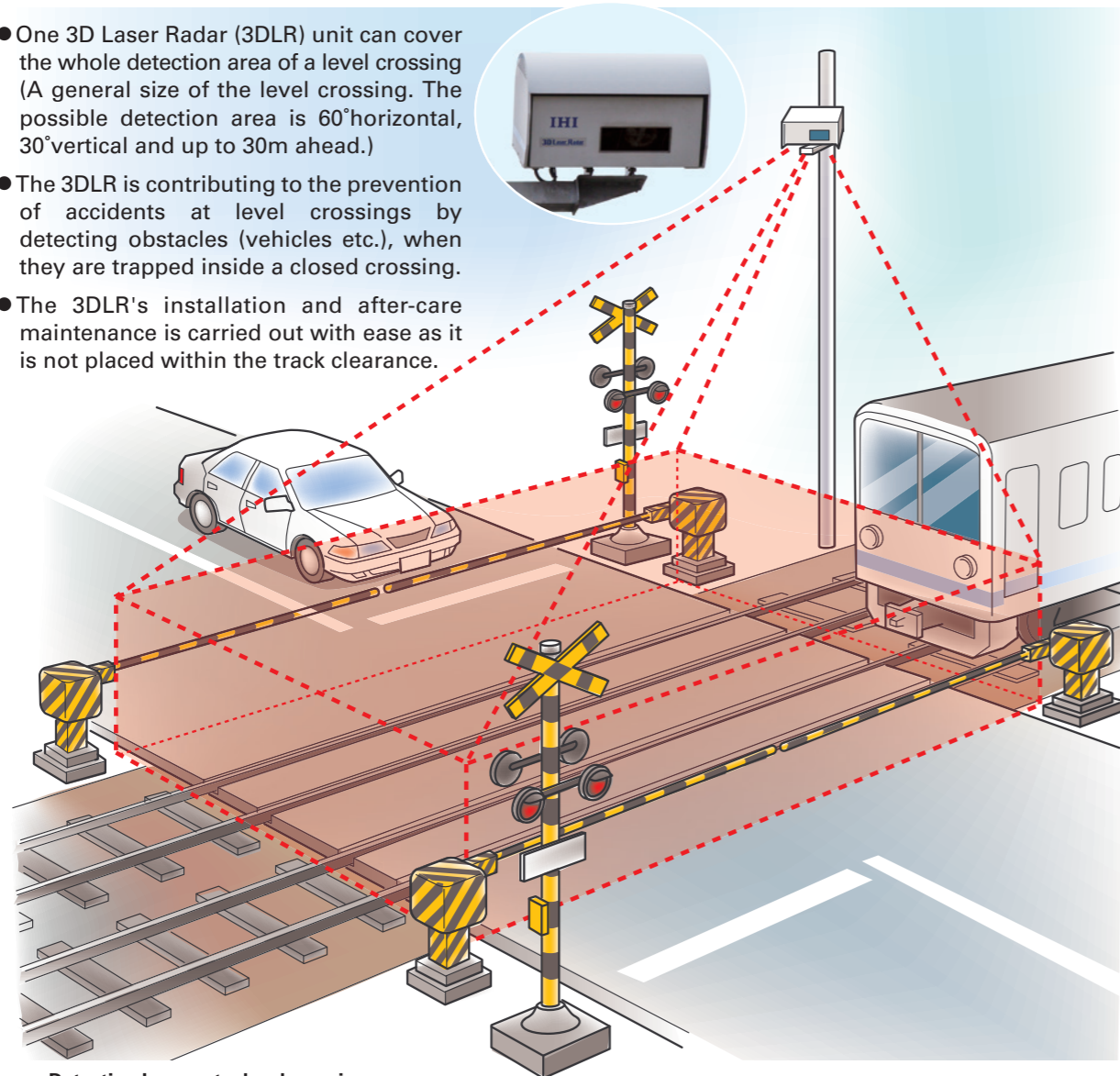
Instantly capturing profile, location and movement. The 3DLR detects objects in real time to enhance safety regardless of bad environmental conditions and poor lighting.

3D Laser Radar (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.



Detection Image at a level crossing



Detected Image with 3DLR



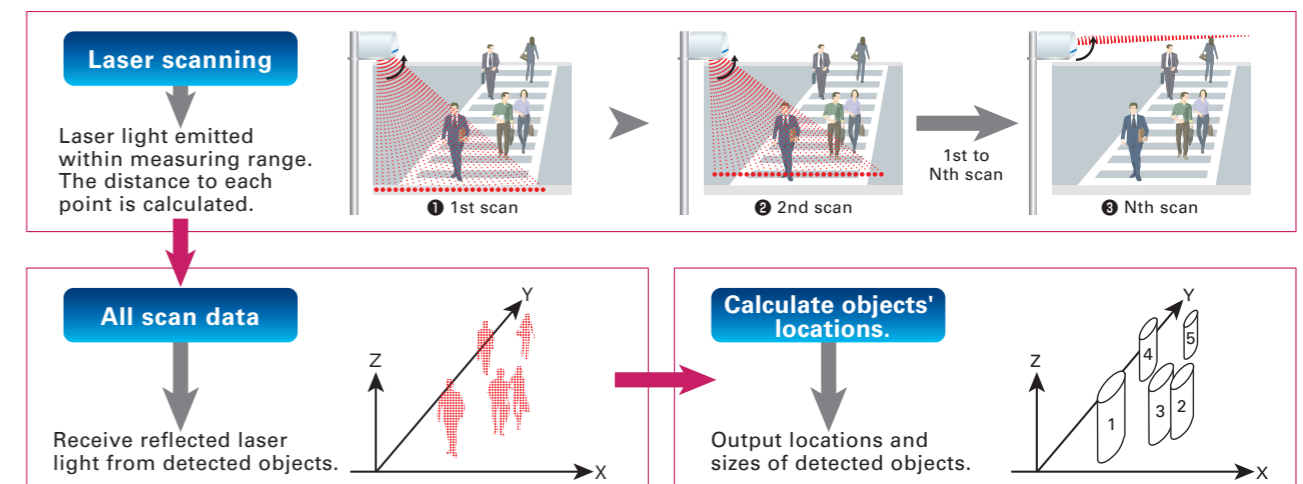
Camera Image of Road
(Detected results are displayed in red frames in camera images)

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.

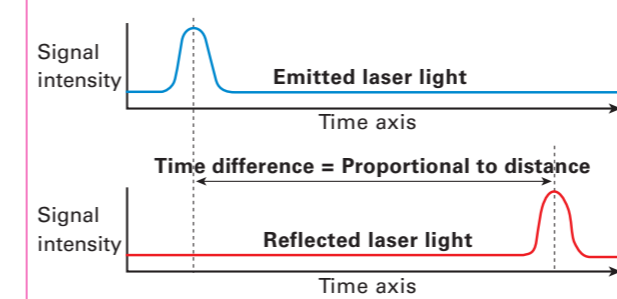


Performance

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.

TOF measurement



Two-axis scanning mechanism

By scanning the laser light along the horizontal and vertical axis of the detection area a 3D detection result is possible.

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.

	Level-crossing usage (standard)
Measurement range	5~30m
Angles of field of measurement	Horizontal max 60° Vertical max 30°
Detection time	0.5 sec
Safety standard for laser	IEC60825-1 Class1 JIS C 6802 Class1
Remarks	Max measurement range in upto 200m (conditions apply)

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