<table>
<thead>
<tr>
<th>Items</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing Distance</td>
<td>0.7~10m</td>
</tr>
<tr>
<td>FOV</td>
<td>H60° x V80°</td>
</tr>
<tr>
<td>Pixel Resolution</td>
<td>640 x 480pixel (7 fps), 320 x 240pixel (30fps)</td>
</tr>
<tr>
<td>Lighting</td>
<td>Infrared IR LD</td>
</tr>
<tr>
<td>Size</td>
<td>150x148x44mm (Excluding projecting part)</td>
</tr>
<tr>
<td>Weight</td>
<td>500g (Excluding cable)</td>
</tr>
<tr>
<td>Interface</td>
<td>Ethernet 100BASE-TX, PoE+</td>
</tr>
<tr>
<td>Illumination Condition</td>
<td>Under 10,000 lux (Indoor @daytime)</td>
</tr>
<tr>
<td>Temperature Condition</td>
<td>0~45℃</td>
</tr>
<tr>
<td>Humidity Condition</td>
<td>0~95% (Non-condensing)</td>
</tr>
<tr>
<td>Laser Class</td>
<td>Class 1</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>15W</td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
</tr>
<tr>
<td>IP Standard</td>
<td>IP66</td>
</tr>
</tbody>
</table>

![3D LiDAR TOF](image-url)
PRODUCTS

3D LiDAR (TOF) Sensor from Hitachi-LG Data Storage, Inc.

Next Generation Technology

3D LiDAR (TOF) Motion Sensor Series

Object distance measurement with high accuracy in real time
Easy to install with Ethernet (POE +) connection
Multiple use cases can be accommodated with the SDK

HLS-LFOM5
(Ceiling & Wall Installation type)

Ceiling installation
Wall-mounted installation

HLS-LFOM3
(Dustproof / waterproof support - IP66 compliant)

HLS-LFOM1
(For Indoor Use)
Features

Privacy Proof
The 3D TOF Sensor can detect humans and objects without identifying individuals. It can be installed in private spaces such as a restroom.

Accurate behavior data
The 3D TOF sensor captures behavior data with higher accuracy and reliability even if people cross or pass each other. The acquired data can be useful for the marketing and other extensive use-cases.

For Marketing Use

◆ Intelligent Interior Behavior Analysis

? Challenges and Needs:
- Visualize customer’s behavior and customer service data.
- Optimize the product line-up and layout
- Analyze marketing promotions and effectiveness

! Benefits:
- Analyze customer’s behavior more effectively
- Increase sales
- Improve loss prevention

Installation Space: All areas in the store

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(For Indoor Use)

※Visualize worker movements at the factory.

The traffic path is continuous from store entry to exit
Application Examples

- Monitor restricted area access
- Detect suspicious behavior and decrease shrinkage losses
- Tailgating prevention
- Monitor suspicious behavior in restrooms

Digital Signage

- Precisely count the people traffic in front of digital signage
- Quantify the effectiveness of advertising by measuring the walking speed of passerby
◆ **Volume Sizing**

Increase work efficiency by automating dimensional measurement

![Volume Sizing Diagram]

The size is detected automatically

◆ **Elevator Monitoring**

- Occupancy Rate Detection
- Fall Detection
- Security Monitoring
SDK Features

- Standard support of human detection
- API enabling easy use of 3D data
- Ready with sample applications for a variety of use cases
- Supports multiple operating systems

Major Functions

- Multiple sensor management
- Distance data capturing
- Lens distortion correction and 3D point cloud conversion
- Capture/Emulation
- Human detection
- Background subtraction

Sample System Configuration

Development Environment

<table>
<thead>
<tr>
<th>OS</th>
<th>Windows 7/8/8.1/10 (x86/x64)</th>
<th>Ubuntu 14.04 LTS/16.04 LTS (x64)</th>
<th>Debian 8.0 (x64)</th>
<th>CentOS 7.0 (x64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Visual Studio 2013/2015 gcc, g++ (-2td=gnu++11 option required) make,cmake,pkg-config</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programming Language</td>
<td>VC++/C++</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Operating Environment

<table>
<thead>
<tr>
<th>OS</th>
<th>Windows 7/8/8.1/10 (x86/x64)</th>
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<th>CentOS 7.0 (x64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware requirements (Single sensor in use)</td>
<td>Processor 1.6GHz or higher</td>
<td>Over 4GB memory</td>
<td>NIC port (one or more) (100BASE-TX/1000BASE-T)</td>
<td></td>
</tr>
</tbody>
</table>
◆ Human Detection/Human Counting

Data received from the sensor(s) can be used for traffic flow analysis and human counting. Precise measurement enables height and hand reach position data collection.

◆ Multi-Sensor Coordination Kit

Precise angle and position adjustment becomes possible when using multiple sensors together by using the calibration tool and the dedicated jig, taking approximately 5 min. per sensor.

◆ Traffic Flow Analysis with Multi-Sensor Data Stitching

Data from multiple sensors covering a vast area can be stitched to track traffic path. Output data of ID, coordinate, height, hand position and more will be made per frame, enabling use in traffic path analysis and heat map.

◆ Skeleton Detection

3D coordinates of upper human body parts can be collected for such use as performance analysis, athlete’s motion check and rehabilitation.

◆ Touch Detection

With its ability to detect 3D space, the sensor placed above the flat or curved screen can detect touching hands as well as hands near the screen.

◆ Volume Sizing

Sensor placed above the detection space can instantly measure the width, length and height of an object. The sensor can also be installed at an angle, giving flexibility in installation.

※ Many other sample applications are available.
※ Sample applications are not included in the SDK package. Please contact us if you are interested.
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- FOV: H60° x V80°
- Pixel Resolution: 640 x 480 pixels (7 fps), 320 x 240 pixels (30 fps)
- Lighting: Infrared IR LD
- Size: 150 x 148 x 44 mm (excluding projecting part)
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