

January 20, 2021

## Pioneer Starts Mass Production of Medium Range Type of Solid-State 3D-LiDAR Using MEMS Mirror

— Expanding the lineup of 3D-LiDAR systems which is high-quality and made-in-Japan for applications in diverse scenes —

Pioneer Smart Sensing Innovations Corporation (“PSSI,” hereafter), a consolidated subsidiary of Pioneer Corporation (“Pioneer,” hereafter), has started mass production of the medium range type of Solid-State 3D-LiDAR “1st Model\*1” from mid-January 2021.

The “1st Model” combines the optical disc player and other laser-related technologies as well as other automotive product development and manufacturing knowhow such as car navigation, accumulated by Pioneer over many years with the optical lens technologies of Canon Inc. to realize high performance and compact size. The device consists of a solid-state type that uses a MEMS mirror\*2 and a coaxial optical system, enabling it to perform high-speed scanning and generate high-definition point cloud data while detecting obstacles in the scanning range with high accuracy.

This medium range type of 3D-LiDAR is capable of detecting objects up to 120 meters away\*3. Installed on fixed road equipment or similar equipment, it can be used as a monitoring or security device detecting obstacles, foreign objects, and intruders from distances longer than the short range type. As an automotive device, it utilizes to various needs, for example, when combined with already-released the short range type of “1st Model”, it’s able to detect objects around the vehicles.

Moreover, by combining with software for “noise removal” and/or “object detection, recognition, and tracking” that is developed together with the hardware (3D-LiDAR), it can be offered as a solution for “object detection, recognition, and tracking” and “3D data generation, and change-point detection.”

All production and quality control of the device will be conducted at Pioneer’s development and production center in Japan (Kawagoe Plant, Saitama Prefecture). We achieve high quality, stable product supply, and product support by complying the strict quality requirements for automotive products.

PSSI will contribute to the building of a society with greater safety and security by providing solutions that combine the device with software, while also expanding its lineup of 3D-LiDAR systems.



【3D-LiDAR “1st Model”(Medium Range)】

PSSI site URL: <http://autonomousdriving.pioneer/en/?ad=pr>

\* Click here for the 3D-LiDAR “1st Model” (Short Range) news (announced on December 10, 2020).

<https://global.pioneer/en/news/press/2020/pdf/1210-1.pdf>

**[Features of the medium range type of 3D-LiDAR “1st Model”]**

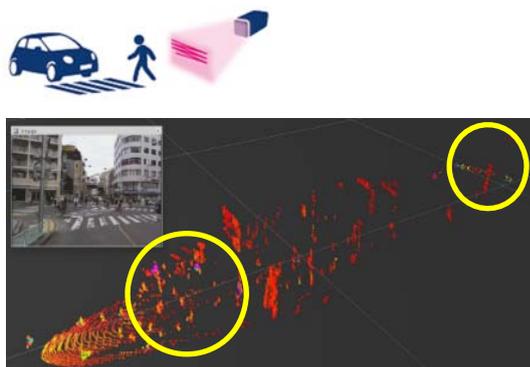
- 1) Approximately twice the detection distance can be achieved compared to the short range type\*3
- 2) Compact size with solid-state type using a MEMS mirror
- 3) Generates high-density, high-definition point cloud data through high-speed scanning
- 4) High-accuracy object detection and recognition, which is ensured when combined with Pioneer’s software
- 5) High-quality, made-in-Japan product

**[Example applications]**

■ As a security/ monitoring device

- Installed on the roadside to monitoring traffic conditions and support merging on express ways
- Detection of intruders in commercial facilities, etc.

Example 1: Monitoring a crosswalk



Example 2: Monitoring an expressway



left: Detection of people and people at intersections / right: Detection of distant buildings

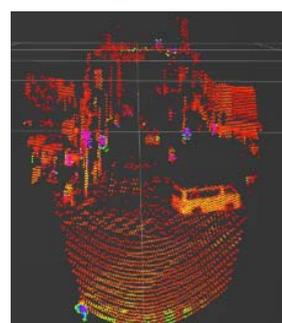
■ Automotive use (For autonomous driving/ ADAS)

- Detection of obstacles in front of / further away from the vehicles
- Detection of objects around the vehicles, which is possible when combined with the short range type (to avoid danger when turning right/left or moving straight ahead)

Example combination Point  
 Medium Range × 1  
 Short Range × 2



cloud data  
 Medium Range × 1



\*1: The name of the 3D-LiDAR, known as the “2020 Model” at the time of announcement on December 19, 2019, was changed to the “1st Model”.

\*2: MEMS: Micro Electro Mechanical Systems

\*3: Measurement distance differs according to the detection environment.

### 【Main feature of “1st Model”】

	Medium Range Type	Short Range Type (already-released)
Model number	SSL-M01	SSL-S01
Scanning Method	MEMS mirror -based raster scanning method	
Transmission Reception System	Coaxial optical system by single Laser and single APD	
Laser Wavelength	905 nm	
Field of View (H × V)	30° × 15°	60° × 30°
Resolution (H × V)	76 × 76	
Frame Rate	24 Hz	
Measurement Distance	Person : Up to 80 m Vehicle : Up to 120 m	Person : Up to 40 m Vehicle : Up to 70 m
Size (W × D × H)	129.5 × 205.2 × 88.6 mm	129.5 × 110.6 × 88.6 mm

※APD : avalanche photodiode

#### ■About Pioneer Smart Sensing Innovations Corporation

As a new company to take over the business activities which handles autonomous driving-related business in Pioneer, Pioneer Smart Sensing Innovations Corporation” is established in 2019. PSSI has been developing and producing low-cost, compact and high-performance 3D-LiDAR with raster scan type using MEMS mirror, and develops and provides high-precision software utilizing 3D-LiDAR sensors.



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