



MobED OCDS Hardware Document

2025. 09. 10

Next-Generation Technology Division

OCDS Overview



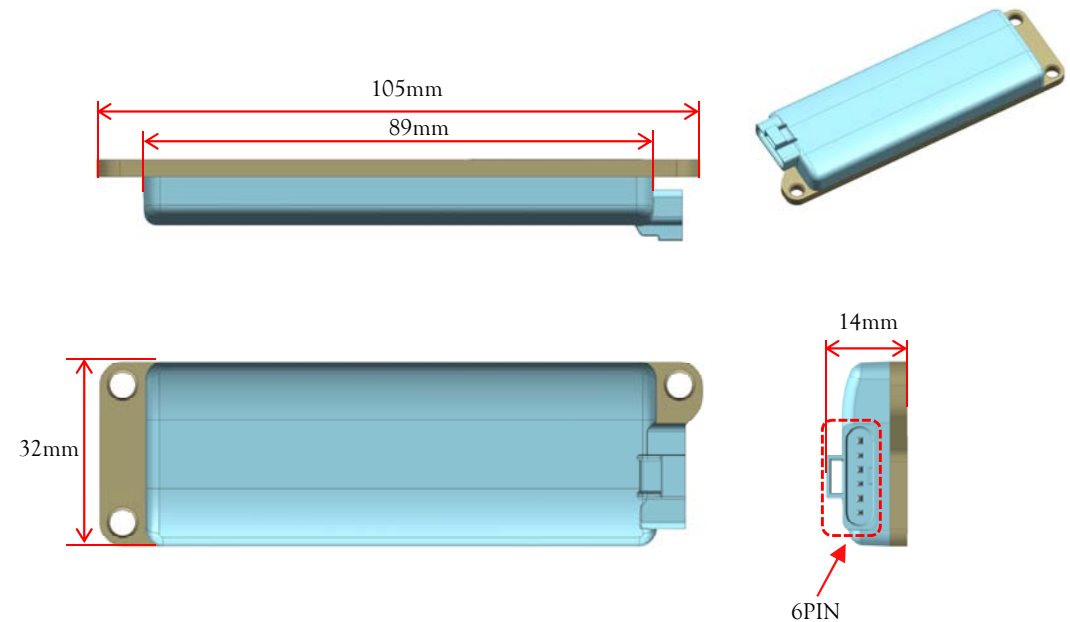
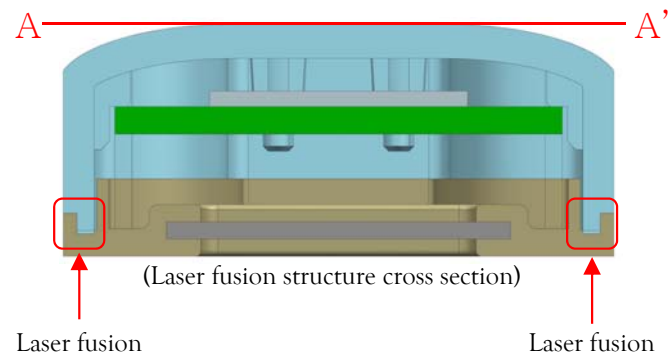
- Sensors for detecting obstacles and cliffs in the front, rear, left, and right sides of MobED
 - OCDS : Obstacles and Cliff Detection Sensor
- Detects surrounding obstacles and cliffs and transmits detection information to the robot embedded controller.
 - One side configuration with two sensors each responsible for obstacle/cliff detection
 - Set one of the sensors as the master to transmit the final detection information

OCDS Specifications

No	Detailed	note
System Configuration	- Front Side : (ODS) 1EA + (CDS) 1EA - Rear Side : (ODS) 1EA + (CDS) 1EA - Left Side : (ODS) 1EA + (CDS) 1EA - Right Side : (ODS) 1EA + (CDS) 1EA	- Total : 8 EA
Mounting location	- Obstacle detection : 40mm from floor surface - Cliff detection : 80mm from floor surface	
FOV	- Horizontal (140°, -70° ~ +70°) - Vertical (140°, -70° ~ +70°)	
Range Resolution	- 0.044m (Korea, Europe, North America, etc.) - 0.088m (china)	- Requirement: 0.1m or less
Range Accuracy	- 0.011m	
Detection range	- Front obstacle distance (ODS): Min. 0.1m ~ Max. 1.0m - Cliff detection distance (CDS): Min. 0.1m ~ Max. 1.0m - Cliff detection step height : Min. 0.1m 이상	
Object information transmission time	- ODS : Within 40ms - CDS : Within 40ms	
Data Rate	- 1332 byte per 40ms - 260kbps	- RS-485 spec : 1Mbps

OCDS Mechanical Structure and Exploded View

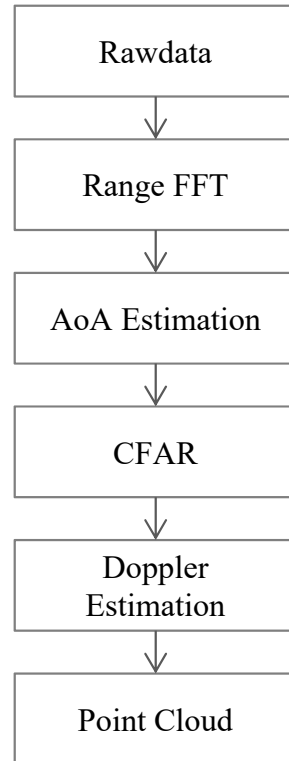
- SIZE : 105 × 32 × 14 mm
- Radome and housing laser fusion bonding



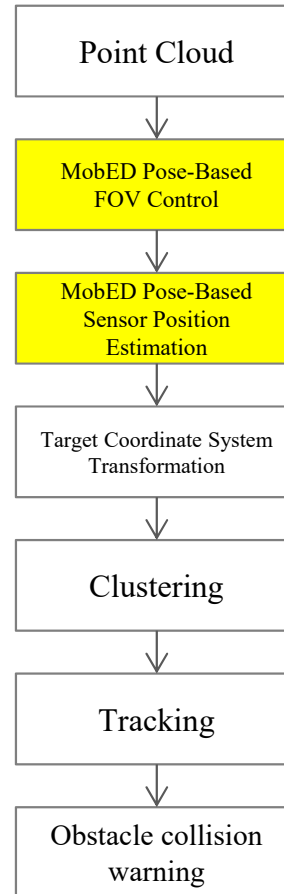
Exploded view of the device		P/NAME	MATERIAL	
Exploded view of the device showing components 1 through 6.	1	RADOME ASSY	PBT+ASA+PET-GF30-006 TYPE A-3	
	2	PCB ASS'Y	FR-4	
	3	THERMAL PAD	SILICON	
	4	MEMBRANE	ePTFE	
	5	HOUSING ASSY	PBT-GF30-006 TYPE A-2 & A5754	
	6	LABEL	PP Series	

OCDS Algorithm Process

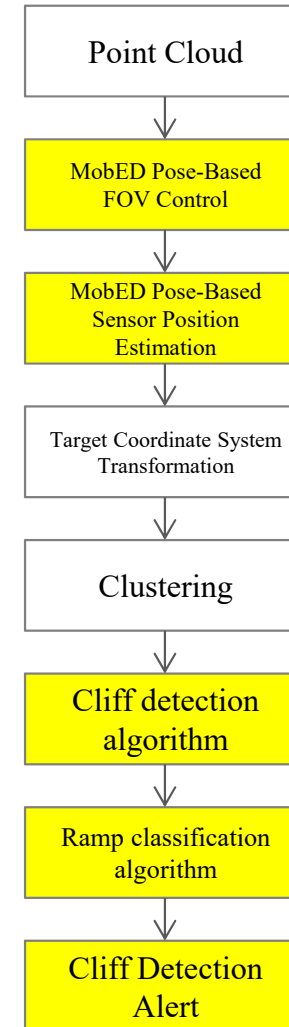
< Radar signal processing >



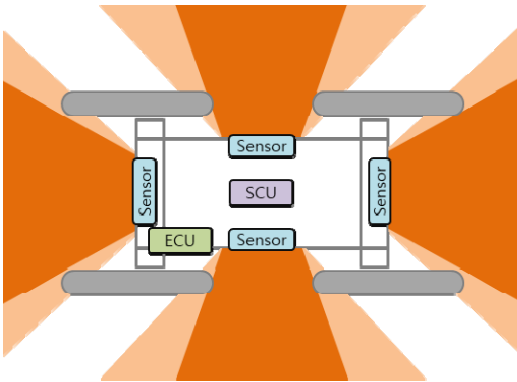
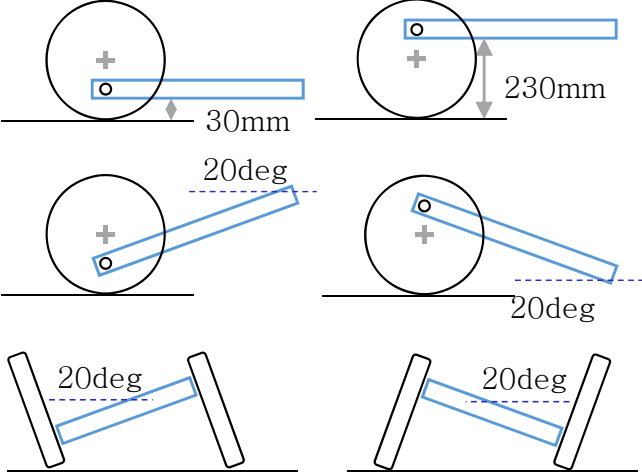
< Obstacle detection >



<Cliff detection>



OCDS Algorithm Description of contents

item	detail
Real-time reflection of robot's detailed information	✓ Obstacle/cliff/slope detection reflecting the robot's posture information - 'Eccentric Wheel'-based structure where each wheel operates independently - Real-time control of the robot wheel angle that changes up to 20 degrees in the roll/pitch direction - Real-time control of the robot body height that changes up to 230/20mm - Calculate the occlusion area using the posture information and transmit detection information within the valid area   Sensor detection specifications  Mobile detailed information reflection valid detection range 

OCDS Algorithm Description of contents

item	detail
Cliff detection	✓ World's first cliff detection with radar - Radar has lower resolution and fewer point clouds than lidar sensors, making it relatively disadvantageous for cliff detection (high frequency of false detection) - To overcome these shortcomings, the stability of cliff detection has been improved by introducing a mapping algorithm - Mapping algorithm: Predicts cliff points by estimating the speed and displacement of MobED [Cliff Detection view] [Cliff detection results]
Ramp classification	✓ World's first ramp detection with radar - When entering a ramp, the introduction of the Mapping algorithm improves the stability of uphill/downhill slope detection. - When positioned on a ramp, the MobED detailed information is reflected to improve the stability of detection to determine whether the end of the ramp is flat or a cliff. [Ramp detection view]

Compliance information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device should be installed and operated with minimum 20 cm between the radiator and your body.