LIPSMetric™ VD115

Vehicle Dimensioner

Datasheet

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Revision 1.0

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Contents

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1. Overview

LIPSMetric™ VD115 is a real-time vehicle dimensioning system for parking facilities, access control lanes, vehicle inspection, and logistics sites. The system combines LIPS 3D sensing, edge computing, and project-defined calibration to measure vehicle width, vehicle height, and chassis height as a vehicle passes through the measurement area.

LIPSMetric™ VD115 uses a Jetson Orin AGX IPC as the main processing platform and integrates two 3D cameras: LIPSedge™ AE450 for vehicle body width and height measurement, and LIPSedge™ AE430 for underbody or chassis height measurement.

Item		Description
Product		LIPSMetric™ VD115 Vehicle Dimensioner
Application		Vehicle profile measurement and access control support
Main processor		NVIDIA Jetson Orin AGX industrial IPC
Camera configuration	**LIPSedge™ AE450**	Measures the vehicle width/height
	LIPSedge™ AE430	Measures the chassis height
Main output		Width, height, chassis height, timestamp, status, image/depth/point-cloud records

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2. Features

Smart Parking
Real-time vehicle measurement for parking space allocation

Gate Access Control
Verify vehicle size to enable or restrict entry through gated systems

Large Vehicle Detection
Identify oversized vehicles for alerting, logging, or rerouting

- **3D Vehicle Sensing**: Captures vehicle body profile beyond 2D presence detection
- **Chassis Height Measurement**: Helps evaluate underbody clearance for parking or transfer systems
- **Edge Processing**: Reduces dependency on cloud processing and supports local decisions
- Real-time vehicle metrics measurement.
- Dual-camera architecture for vehicle body / underbody coverage.
- Edge AI processing on Jetson Orin AGX IPC for low-latency operation.
- Supports image capture, depth map, point cloud, result logging, and host integration.
- Supports CSV, JSON, database, REST API, or project-defined output flow.
- Suitable for parking towers, gate access control, inspection lane, and logistics workflows.
- Fixed installation with ROI, calibration, and validation records for repeatable deployment.
- Support for LIPSedge™ AE series camera

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3. Application Use Cases

- **Smart Parking**: Measures vehicle profile before entry to support parking allocation and safety checks
- **Gate Access Control**: Verifies vehicle size before allowing vehicle entry
- **Parking Tower Validation**: Checks vehicle dimensions and chassis clearance before automated handling
- **Inspection Lane**: Records measurement evidence for width, height, and underbody clearance
- **Logistics or fleet operation**: Logs vehicle profile data for routing, compliance, or asset management

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4. Specification

4.1 System

Item	Specification
Technology	LIPSMetric 3D vehicle dimensioning
Measurement Items	Vehicle width, vehicle height, chassis height
Measurement Source	LIPSedge™ AE450 for body profile; LIPSedge™ AE430 for underbody clearance
Main Processor	NVIDIA Jetson Orin AGX IPC
Operating System	Jetson Linux or project-approved Linux image
Camera Interface	Ethernet / GigE / PoE
External interface	Ethernet, file export, REST API, database
Working environment	Indoor or sheltered installation recommended unless protected enclosure is provided
Installation type	Fixed lane-side or project-defined mounting
Calibration	Site-specific ROI, ground reference, and camera alignment

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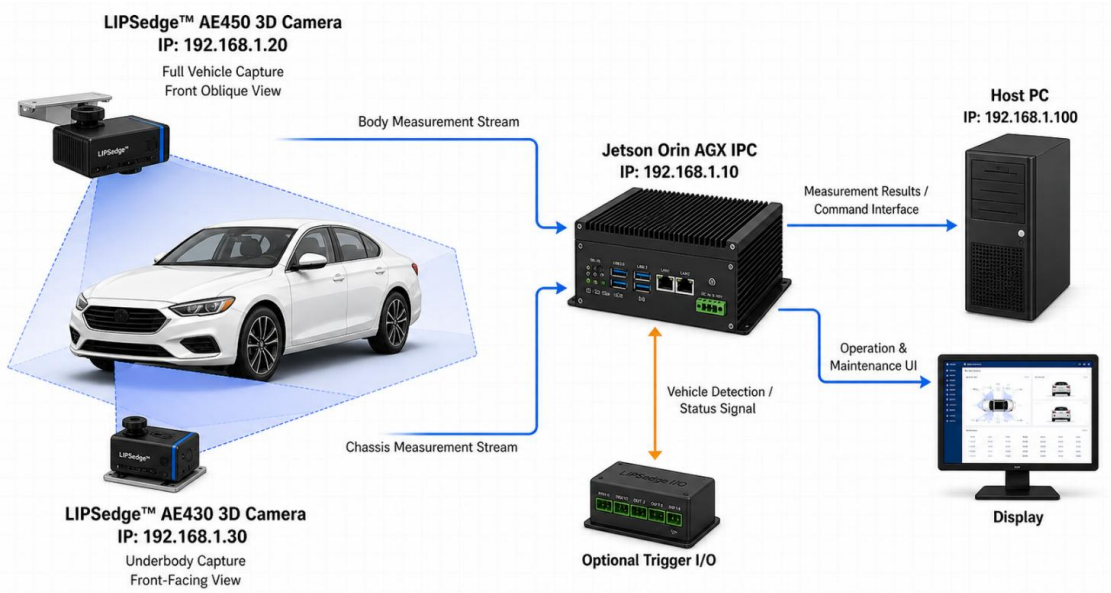
4.2 Measurement

- **Vehicle Width**: Calculated from the LIPSedge™ AE450 vehicle body profile
- **Vehicle Height**: Calculated from the LIPSedge™ AE450 ground-to-top body profile
- **Chassis Height**: Calculated from the LIPSedge™ AE430 underbody measurement region
- **Unit**: The measurement unit is mm.
- **Trigger Method**: Manual, software detection, external trigger, or project-defined method
- **Measurement Range**: Project-defined by camera placement, FoV, ROI, and vehicle class
- **Measurement accuracy**: 2% under proper installation

5. Hardware Details



[Accessories]

- **Camera Mounting Brackets**: For fixing the cameras in stable measurement positions
- **Network and Power Device**: For camera connection, power supply, and host communication

The system centers on the **Jetson Orin AGX IPC**, which acts as the main controller for AI processing, 3D processing, storage, and external communication.

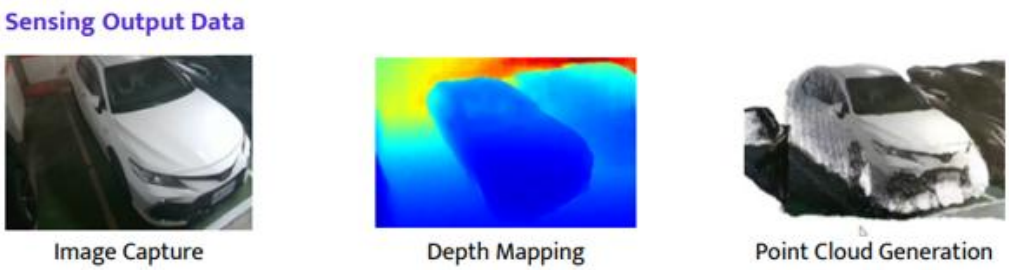
Two 3D cameras connect to the IPC through the camera network. The ` LIPSedge™ AE450 captures vehicle body data used for width and height measurement. It should be placed so the full vehicle body profile remains inside the configured field of view and region of interest. The LIPSedge™ AE430 captures underbody data used for chassis height measurement. It should be placed where the underbody measurement area is visible and protected from impact or water splash. For optimal performance, make sure the network and power are properly connected to provide camera connectivity and host communication.

The IPC is then connected to an external host that handles the uploaded measurement results or provides a host command interface. At the same time, the IPC is also connected to a display to supports local operation and maintenance UI. Optional trigger I/O can be connected for vehicle detection, status signals, or access-control integration.

An example network configuration assigns the IPC to `192.168.1.10`, the LIPSedge™ AE450 camera to `192.168.1.20`, the LIPSedge™ AE430 camera to `192.168.1.30`, and the external host to `192.168.1.100`. Actual IP addresses are site-specific and marked as TBD.

Overall, the graph shows how the LIPSMetric™ VD115 system utilizes the LIPSedge™ AE450 and AE430 cameras to capture body and chassis data, send it to the Jetson Orin AGX IPC for processing, and the IPC distributes results to external hosts, local displays, or integration interfaces.

As the LIPSMetric™ VD115 system captures vehicle data and sends it to the IPC for processing, it combines vehicle body sensing and underbody sensing to support measurement, review, and troubleshooting. Depending on the camera model, the 3D cameras can provide RGB or image capture for visual evidence, IR images for camera diagnostics and detection review, depth maps for measurement processing and site verification, and point-cloud data for 3D analysis, debugging, and validation.



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6. Working environment

Unstable site conditions can reduce measurement repeatability, affect camera visibility, and increase hardware maintenance risk. Make sure the installation environment matches the following guidelines to enable stable vehicle measurement through proper measurement area preparation, equipment placement, environmental control, cable routing, hardware protection, and service access.

- **Ground surface**: The installation site shall provide a flat and stable ground surface suitable for repeatable vehicle measurement.
- **Measurement lane**: The measurement lane must be clearly defined so vehicles pass through the configured measurement area consistently.
- **Camera visibility**: The camera's position should keep the required vehicle body and chassis measurement areas visible during operation.
- **Illumination**: Lighting conditions should avoid strong direct sunlight, unstable shadows, and severe reflections where possible.
- **Vibration**: all cameras and brackets must remain fixed to prevent measurement deviation.
- **Cable protection**: Cables shall be routed and protected against vehicle impact, operator contact, water exposure, and abnormal bending.
- **IPC ventilation**: The IPC shall be installed in a location with sufficient ventilation, airflow, and service access.
- **Operating temperature**: The operating temperature range shall be defined according to the IPC and camera models delivered.

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7. Deployment Requirements

The mechanical layout is configured according to the approved project design to ensure stable camera positioning, complete measurement coverage, and repeatable vehicle data capture. Camera placement shall follow the installation drawing, measurement range, target vehicle class, and validation plan. The items below define the hardware installation requirements for the system / camera configuration based on established LIPSMetric™ Vehicle Dimensioner deployment practices.

System deployment requirements	
Item	**Specification**
System mechanical drawing	Project-defined
Camera tilt angle	Project-defined by ROI, FoV, and vehicle lane geometry
Measurement distance	Project-defined by camera placement, FoV, and target vehicle class
Camera protection	Project-defined bracket, enclosure, or guard
Cable length	TBD
Maintenance clearance	Required around IPC, cameras, and network devices

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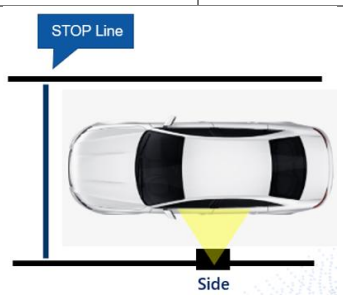
Camera deployment requirements		
Models	**Item**	**Specification**
LIPSedge™ AE450	Body measurement mounting	Ceiling mounted, wall mounted, or tripod mounted
	Reference installation height	4 m reference height from Sales Kit vehicle dimensioner configuration; final value project-defined
	Working distance	0.52 m - 6.0 m
	Camera dimension	145 x 102 x 43 mm
	Depth FoV	87 deg H x 58 deg V x 95 deg D
	Protection	IP67 ruggedized camera housing
	Power input	PoE or 12V 2A
	Output interface	RJ-45 with M12 lock
LIPSedge™ AE430	Chassis measurement mounting	Wall mounted or tripod mounted
	Chassis measurement height	Project-defined according to underbody measurement position and validation plan



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8. Software & Output Interface

The LIPSMetric™ VD115 software environment consists of four software items that support vehicle measurement, calibration, data storage, and host integration. Together, these items provide the functions required to capture vehicle data, process measurement areas, maintain calibration parameters, record operational information, and exchange results with external systems.

- **Measurement application**: Performs camera capture, ROI processing, measurement calculation, and result output
- **Calibration module**: Stores camera mapping, ground reference, ROI, and correction parameters
- **Logging module**: Stores system log, measurement record, captured data, and diagnostic files
- **Integration module**: Supports CSV, JSON, database, REST API, or project-defined host interface

8.1 Result fields

Each completed measurement generates a result record containing the measurement completion time, vehicle ID or transaction ID, vehicle width, vehicle height, chassis height, and result status. Width and height are measured by the LIPSedge™ AE450 camera, while chassis height is measured by the LIPSedge™ AE430 camera. The result status indicates whether the measurement is marked as Pass, Warning, or Fail.

Field	Description	Unit
timestamp	Measurement completion time	YYYY-MM-DD HH:mm:ss
vehicle_id	Vehicle ID or transaction ID	N/A
width	Vehicle width measured by LIPSedge™ AE450	mm
height	Vehicle height measured by LIPSedge™ AE450	mm
chassis height	Chassis height measured by LIPSedge™ AE430	mm
result status	Measurement status	Pass / Warning / Fail

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9. Validation Reference

LIPSMetrics™ VD115 shall be validated with reference vehicles or reference objects under the approved site configuration. Acceptance criteria shall be agreed before deployment.

Item	Reference Value	Measured Value	Difference	Result
Vehicle width	TBD	TBD	TBD	Pass / Fail
Vehicle height	TBD	TBD	TBD	Pass / Fail
Chassis height	TBD	TBD	TBD	Pass / Fail

Note: All specifications are subject to change without prior notice. Measurement performance depends on camera placement, vehicle class, lighting, calibration, ROI, lane behavior, and final acceptance criteria. Measurement accuracy is specified as 2% under approved installation, calibration, and validation conditions.

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