



The World's Leading Provider of LiDAR, 3D Camera and Perception Solutions



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About Us

Founded in 2018, LuminWave Technology is the world's leading provider of LiDAR, 3D Camera and perception solutions, specializing in development, manufacture and sales of LiDAR, 3D sensors products. Headquartered in Hangzhou (China), it has already set up several R&D Centers and Customer Service network in Xi'an (China), Los Angeles (USA). The founders of LuminWave are experts in MIT Photonics and seasoned engineers, boasting significant industry experience as well as proficiency in

FMCW, ToF technologies, and the capability to develop both 3D sensing hardware and software, along with perception algorithms. LuminWave Technology has developed a variety of high-performance FMCW LiDAR and industrial 3D cameras products and solutions, widely used in autonomous driving, smart logistics, robotics.



Corporate Culture



Mission

Make WISE LiDAR Possible
Worthwhile | Intelligent | Scalable | Economical



Vision

Committed to becoming a global leader in LiDAR technology and working with business partners to create a better future for humanity.



Values

Building Trust
Earning Respect
Chasing Excellence
Creating Values



5 Laboratories



5 Customer Service Center



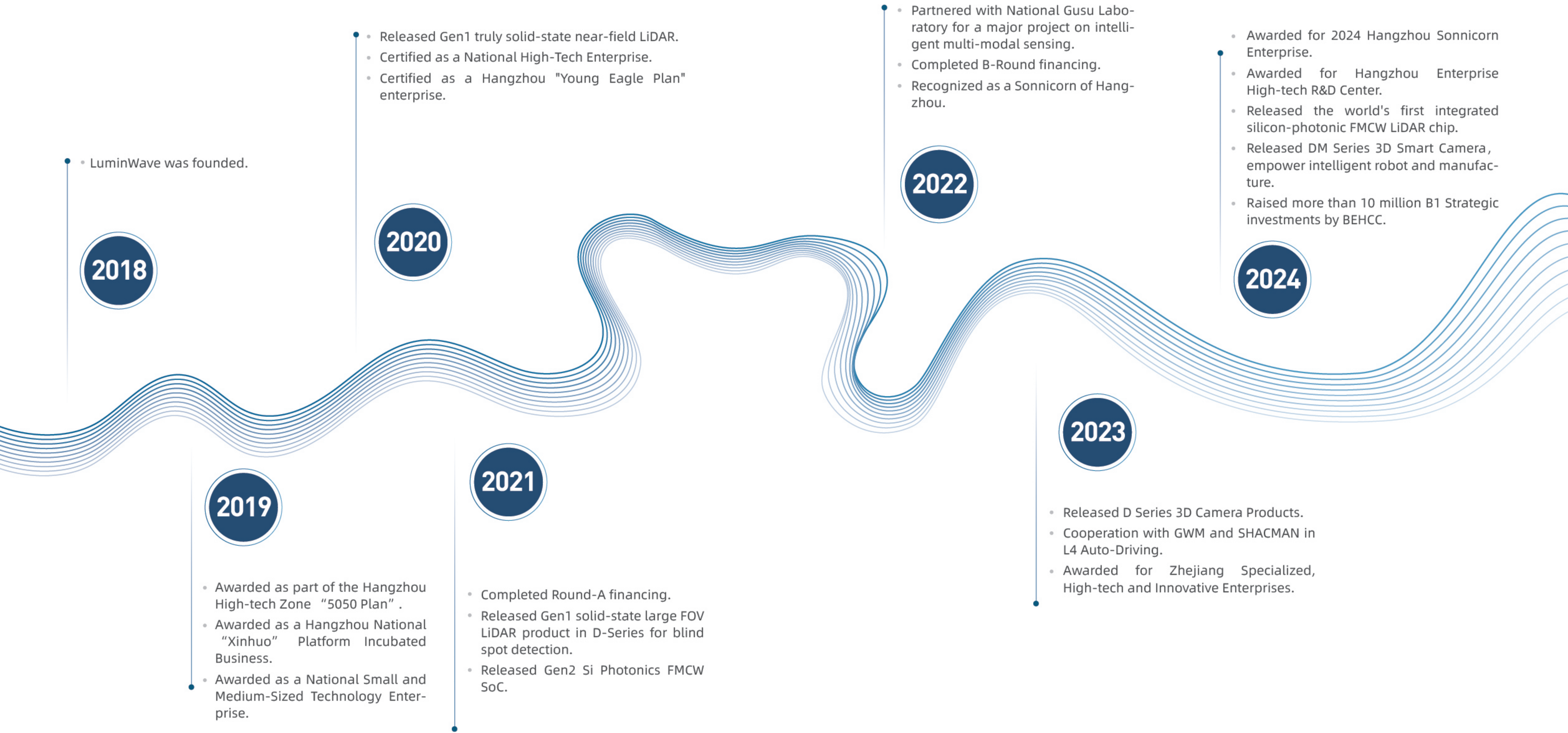
3 R&D Centers



>100 Patents



Our History



Honors



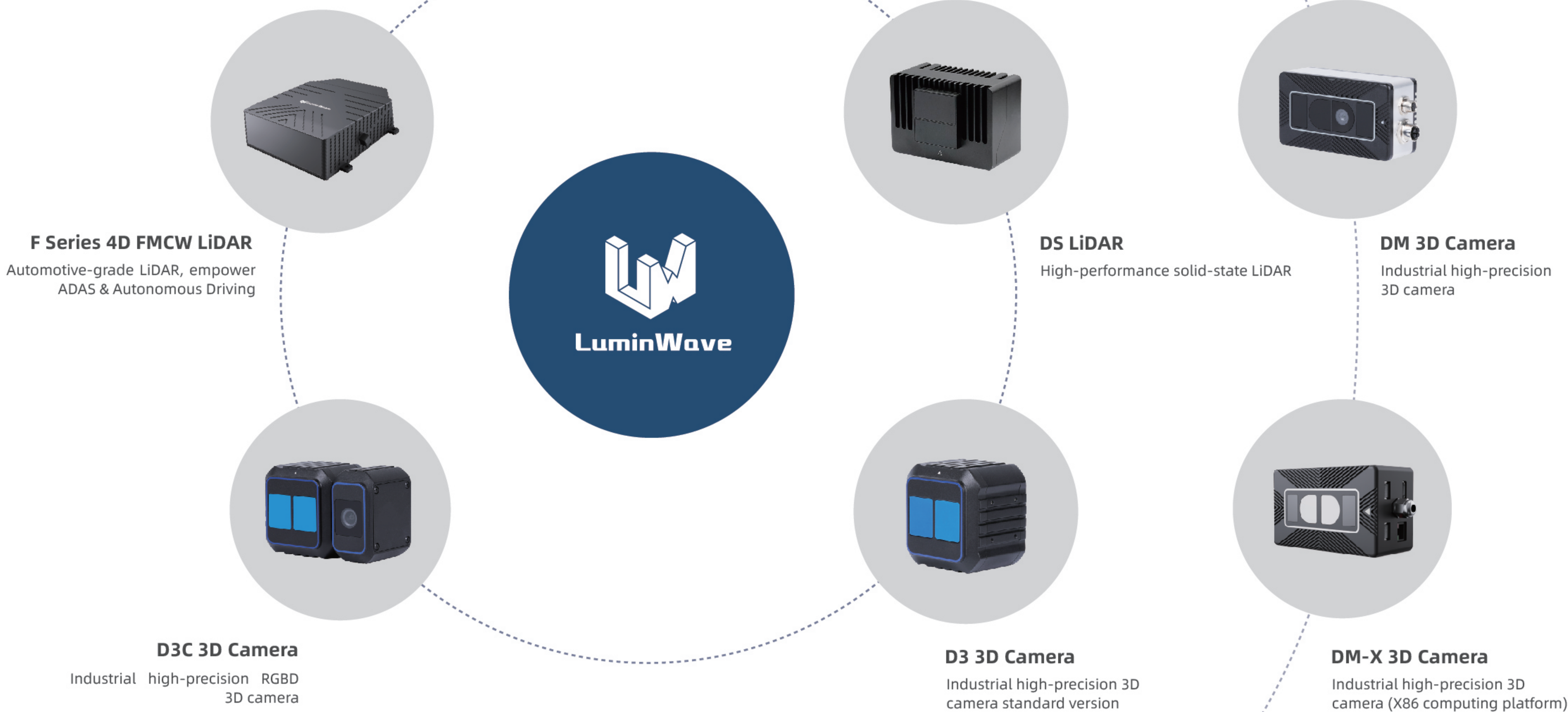
- National Small and Medium-Sized Technology Enterprise
- National High-Tech Enterprise
- Zhejiang Specialized, High-tech and Innovative Enterprises
- Innovative Small and Midsize Enterprise of Zhejiang Province
- Hangzhou Enterprise High-tech R&D Center
- Hangzhou "Young Eagle Plan" enterprise
- Hangzhou Sonnicorn Enterprise
- 2020 LiDAR Golden Globe Award by GaoGong Intelligent Vehicle Institute
- 2021 Technology Advancement Award by Zuosi Vehicle Research
- 2022 China Smart EV Sci-Tech Innovation Company TOP10
- 2022 China High Tech High Growth Company of the Year
- 2022 TOP 10 Lidar Supplier for Intelligent Automotive Smart Driving
- 2023 Company of Most Valuable to Invest in Intelligent Vehicle Industry
- 2024 AIIA Award for Automotive Intelligence Innovation Leadership
- 2024 TOP50 Emerging Enterprise in Intelligent Sensors
- 2025 Outstanding Supply Chain Enterprise in Intelligent Loading and Unloading Solutions

Partners



Our Products

Our diverse portfolio of technologies is tailored to tackle the core challenges in Autonomous Driving, Intelligent Logistics, Industrial Automation, and Embodied Intelligence.



Core Technology

01

Frequency modulation coherent detection achieves high sensitivity, improves signal-to-noise ratio by 10⁶ times, and achieves single photon detection capability.

Coherent detection enhances LiDAR's ranging ability and reduces the output power of the light source to the mw level.

Real time Doppler velocity measurement and anti-interference, with only 2 points to lock the target, effectively improving robustness.

Laser, silicon optical chip, and optical lens components are integrated into a single chip at the millimeter scale, effectively reducing product size and cost.

02

Integrated optical antenna and control unit.

Accurate beam control for multi-channel solid-state scanning.

Software defined ROI and flexible setting of scanning area.

03

Our solutions are driven by self-developed deep learning algorithms that enable advanced capabilities such as:

- Precise Logistics Depalletizing
- Accurate Filling-Port Positioning
- Reliable AGV Collision Avoidance
- Intelligent Safety Area Protection



04

3D integrated packaging technology to reduce product size.

Self-developed chip level beam scanning platform technology, suitable for various applications.

Dynamic ROI, flexible definition of scanning mode and resolution.

High reliability, suitable for large-scale production.

05

At the core of our technology is a high-precision FMCW lidar ranging algorithm.

It is coupled with advanced data processing for noise reduction and point cloud enhancement, and supports seamless OTA updates to ensure ongoing optimization.

F Series 4D FMCW LiDAR

Automotive-grade LiDAR, empower ADAS & Autonomous Driving



LiDAR on a Chip Integration



Velocity Detection



Anti-Interference



High SNR and Excellent Performance



Excellent Environments Performance



No High-Reflection Expansion



The F series products are FMCW 4D LiDAR based on silicon photonic integration technology. The product can provide four-dimension point cloud data, including distance and velocity, which can suppress ambient light and multi-LiDAR interference, improve the perception accuracy and robustness of autonomous driving and ADAS effectively.

Specifications

Product Number		F1
Optics	Sensor	Si Photonics FMCW PIC
	Light Wavelength	1550nm
	Number of Lines	128 (adjustable)
Performance	Working Distance	250m @10%
	MAX Working Distance	300m
	FoV (H×V)	120°× 25°
	120°× 25°	0.1°× 0.1°
	Distance Accuracy	5cm (1σ)
	Velocity Accuracy	0.2m/s
	Frame Rate	10Hz
Function	Output Data	Point Clouds, Velocity
	Time Synchronization	gPTP, PTP, NTP
Interface	Operating Voltage	9-32V (DC)
	Power Consumption	< 45w
	Data Transmission Interface	1000M Base T1 Ethernet
Physics	Ambient Light Resistance	≥100kLux
	Cross Talk Resistance	Support Multi-Product Operation
	Operating Temperature	-40°C ~ 85°C
	Storage Temperature	-40°C ~ 105°C
	Eye Safety	Class 1
	Protection	IP67、IP6K9K

Applications



Ghost Probe



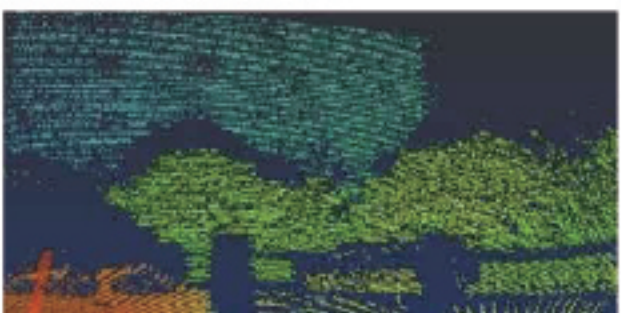
Dooring Accident



Dust/Mist Misjudgment



High Reflection Expansion



Ambient Light Interference



Static Small Objects Recognition



Self-Localization within Tunnels



Longer Detection Distance

DS LiDAR

High-performance solid-state LiDAR



Pure Solid-state



Long-range Detection



Built-in IMU



Anti-interference Ambient Light

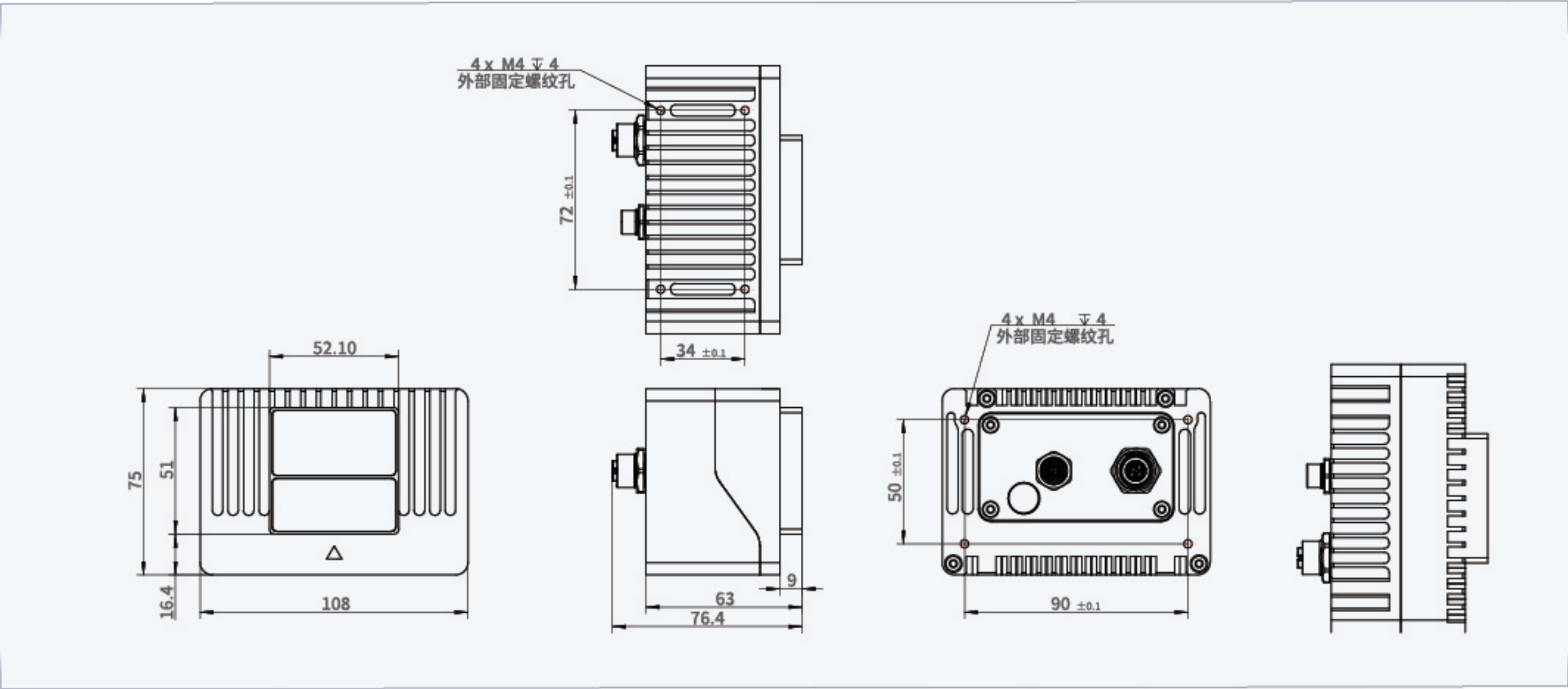


The DS product is a high-performance solid-state LiDAR. It has some properties: pure solid-state design, up to 50m long-range detection, high resolution. It can provide real-time 3D point cloud data for both indoor and outdoor scenarios, making it suitable for applications such as autonomous driving, blind zone detection, obstacle avoidance and positioning for vehicles and mobile robotics.

Specifications

Product Number	LWP-D445-I/B
Working Principle	dToF
Scanning Principle	SPAD
Laser Wavelength	905nm
Eye Safety Class	Class1
Working Distance	30m@10%
Ambient Light Resistance	100klux
Blind Zone	0.2m
Ranging Accuracy	±5cm
Horizontal Field of View	120°
Vertical Field of View	50°
Resolution	0.33° (H) ×0.33° (V)
Frame Rate	10Hz
Point Frequency (single-echo mode)	540,000 pts/s @ 10Hz
Data Transmission Interface	1000M Ethernet
Built-in IMU	LSM6DS3TR-C
Power Supply	DC 12V-24V
Operating Temperature	-20°C~55°C
Weight	700g
Main Dimensions (L×W×H)	108×76.4×75mm

Dimension Drawing



DM 3D Camera

Industrial high-precision 3D camera

HDR

High Dynamic Range (HDR) Mode

56FPS

High-Speed (56fps) Mode

Anti-interference Ambient Light

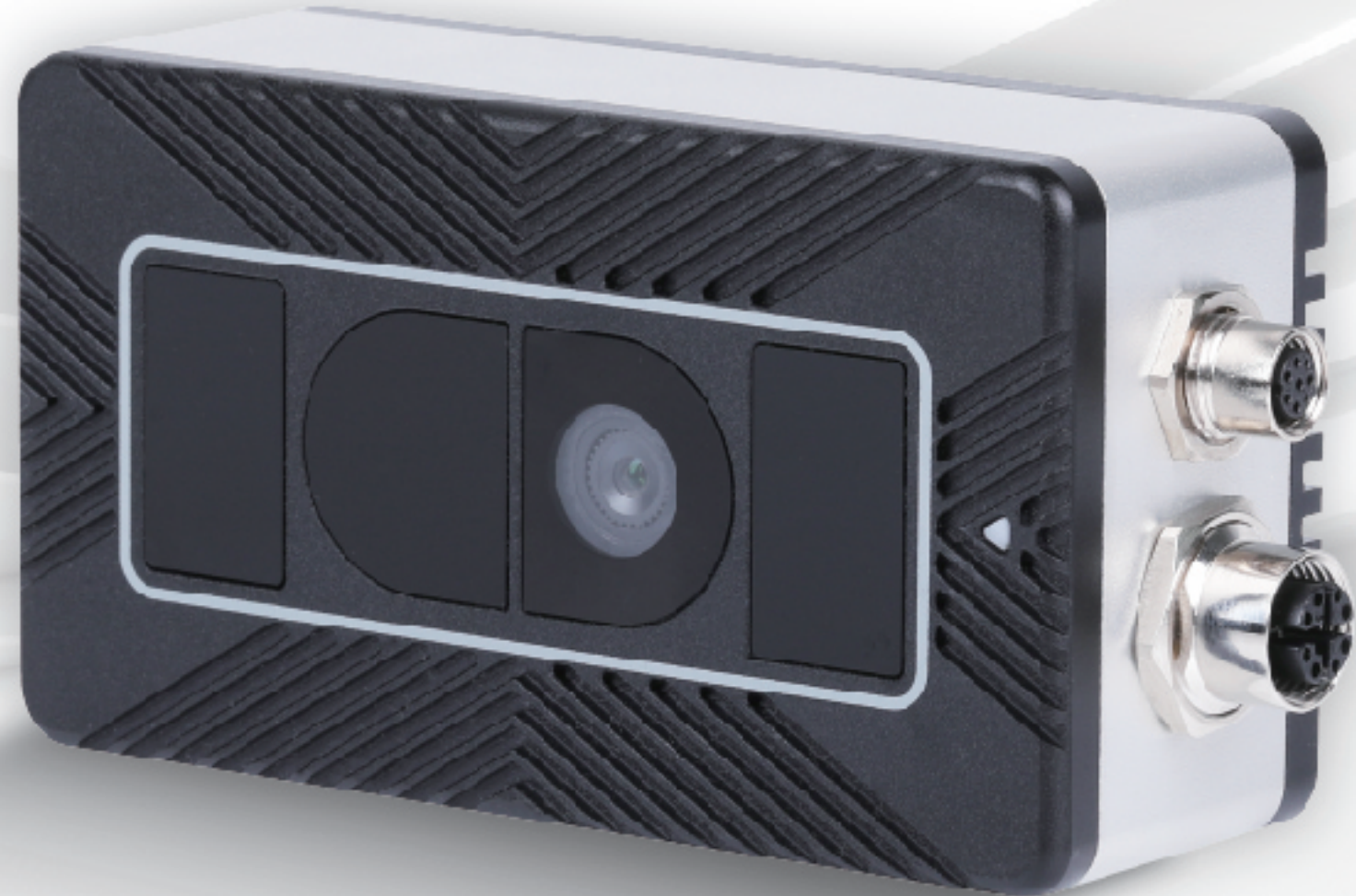
x/=

6TOPS NPU Computility

AI

Built-in Variety of Application Algorithms

Support Efficient Deployment



The DM camera is an industrial-grade RGBD smart camera. It has a high-performance iToF sensor based on SONY DepthSense™ technology platform, and powered by the RK3588 processor, which boasts a 6TOPS computing capability. It features high dynamic range and high frame rate modes. Additionally, it offers standardized tutorials for secondary development and a set of basic operator interfaces, enabling users to develop and deploy 3D vision AI application algorithms efficiently.

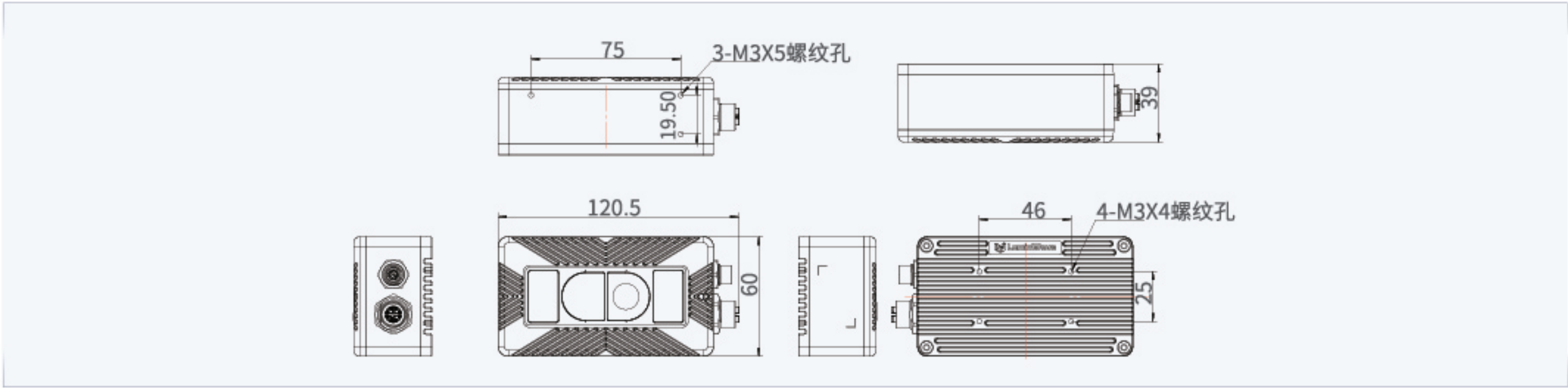
The product can be widely applied in scenarios such as Logistics Depalletizing, Collision Avoidance, Pallet Recognition, Safety Area Protection, Smart Construction Sites, Agricultural Harvesting, Smart Wheelchairs, Intelligent Security and People Flow Statistics.

Specifications

Product Number		LWP-D322-I LWP-D322-IS (Standard FoV)	LWP-D322C-I LWP-D322C-IS (RGBD)	LWP-D322W-I LWP-D322W-IS (Wide FoV)
Operating Principle		ToF (Time-of-Flight)		
Sensor		Sony IMX570		
Laser		940nm VCSEL*2		
*Working Distance		0.2m~10m		
Ranging Accuracy		±3mm+0.25%*depth		
ToF Field of View (H×V)		70°(±2)×50°(±2)		103°(±2)×81°(±2)
RGB Field of View (H×V)		/	71°(±2) ×58°(±2)	/
RGBD Field of View (H×V)		/	68°(±2) ×50°(±2)	/
ToF Resolution		640×480 dpi		
RGB Resolution		/	1600×1200 dpi	/
Frame Rate		Standard mode: Max 28fps; High speed mode: Max 56fps		
Human Eye Safety		Class 1		
Function	HDR Function	Normal HDR, High-precision HDR		
	Exposure Time	0-4000μs Exposure time adjustment		
	Filters	Support multiple filter settings including spatial, temporal, confidence, and fly point filters		
	Output Data Type	Depth, IR, PointCloud, IMU	Depth, IR, PointCloud, IMU, RGB (YUV)	Depth, IR, PointCloud, IMU
Interface	Power Supply	DC 12V-24V		
	Rated Power	15W		
	Network Interface	M12, 8-pin; X-coded; female		
	*Power and I/O Interface	M8, 8-pin; A-coded; female		
Physics	*Dimensions (L×W×H)	108mm×39mm×60mm		
	Weight	366g		
	*Operating Temperature	-30℃ ~ 65℃		
	Storage Temperature	-40℃ ~ 85℃		
	Protection Level	IP67		
Supported System		Above Windows10 / above Ubuntu 20.04 / Ros		

* Dimensions: Dimensions of the main body
* Operating Temperature: Extreme working temperatures may affect product performance. If you have such requirements, please consult our technical staff first.
* Power and I/O Interface: Ensure that the device's power supply voltage is within the range of 7-24.VDC. Voltage outside this range will affect the device's normal startup.
* Working Distance: The default range is 0.2~5m; for a 10m version, please contact our sales staff for customization.

Dimension Drawing



DM-X 3D Camera

Industrial high-precision 3D camera (X86 computing platform)



Support AI
Algorithm
Deployment
(X86)



Millimeter
Precision



Anti-inter-
ference
Ambient
Light



Sony Depth-
Sense®
Technology



SDK Supports
Multiple
Platforms



Multi-mode
Operation

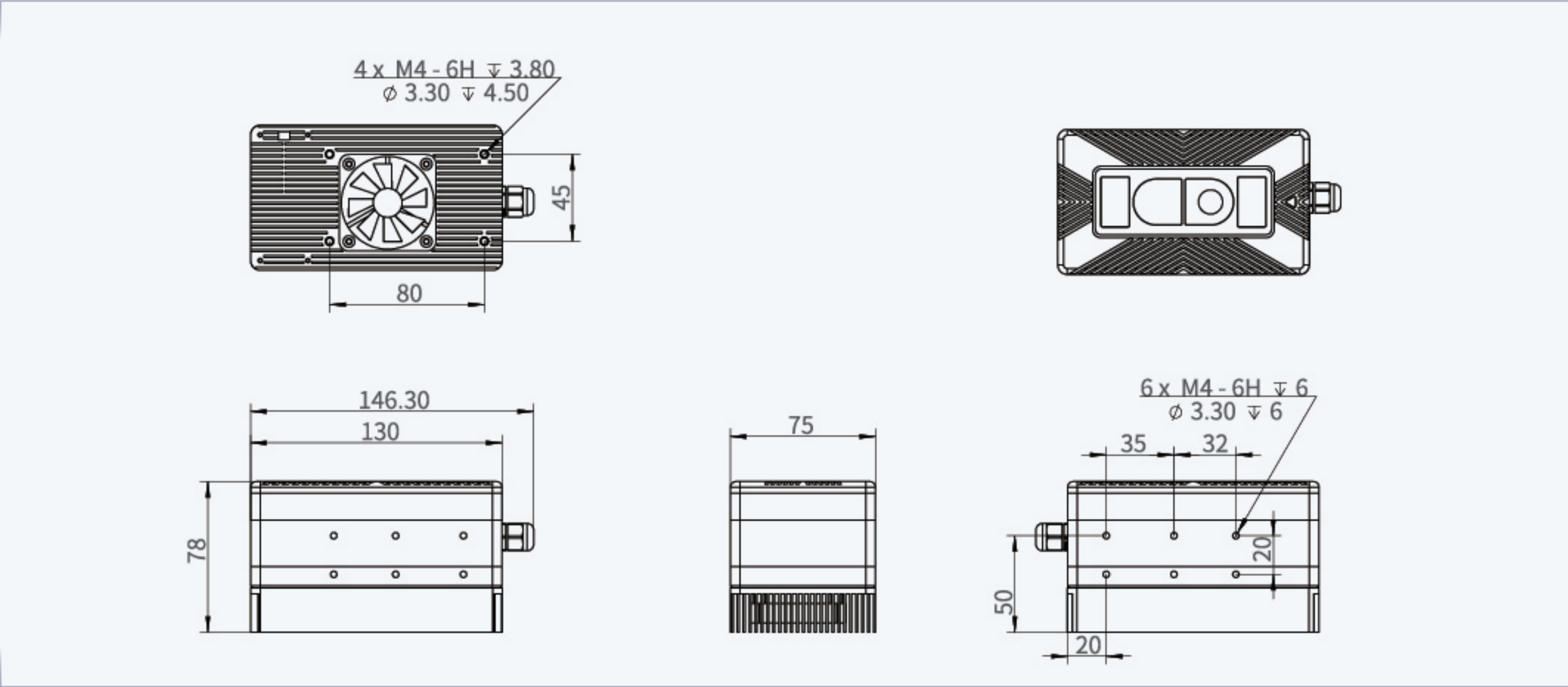


Based on Sony DepthSense® technology, DM-X is a high-performance 3D RGBD industrial camera, with millimeter precision, VGA Depth Resolution. Embedded unique algorithms in product, the product can provide IR, point cloud, depth and RGB information in real time. Equipped with high-performance Intel CPU, the product supports embedded algorithm deployment and can be widely used in long-distance non-contact measurement, crowd count, industrial automation, logistics, and robotics.

Specifications

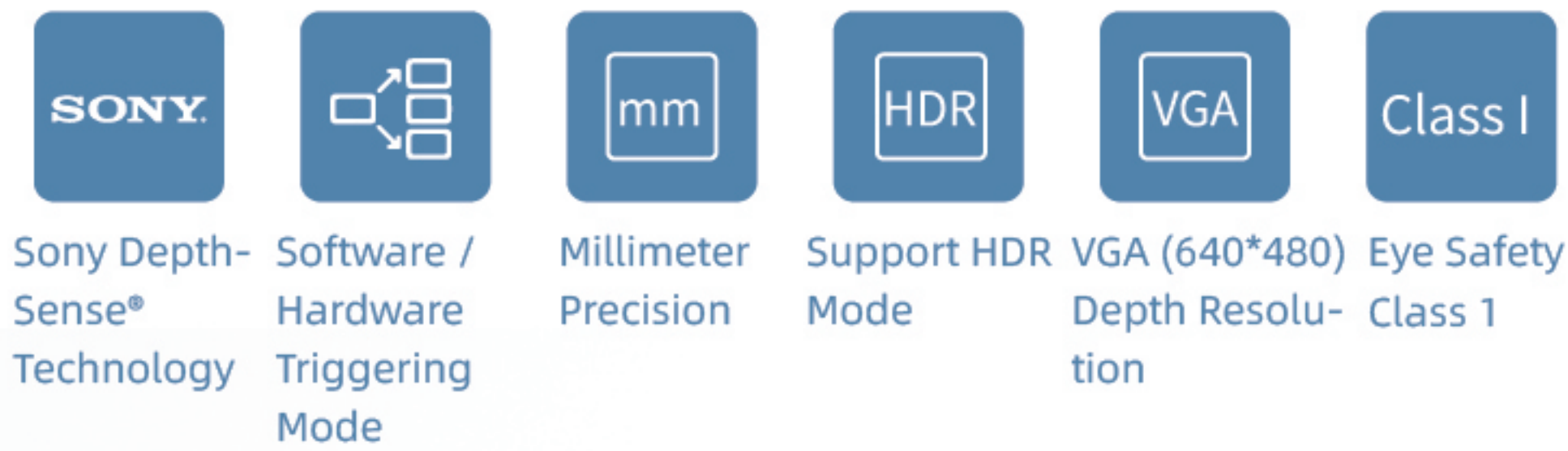
Product Number	LWP-D311C-I	LWP-D311C-I/F
Dimensions	130mm×55mm×75mm	130mm×78mm×75mm
Working Principle	ToF (Time-of-Flight)	
Laser	940nm VCSEL*2	
Working Distance	0.2m~5m	
Ranging Accuracy	< 1%	
Field of View (H×V)	70°×50°	
Resolution (ToF)	640×480dpi	
Resolution (RGB)	1600×1200 dpi	
Frame Rate	20fps	
Operating Temperature	-30℃ ~ 65℃	
Storage Temperature	-40℃ ~ 85℃	
Power Consumption	< 10w	
I/O Interface	1 input, 1 output, 1 I/O	
Data Interface	RJ45 *1, HDMI*1, built-in USB*1, External USB*2	
Power Supply	DC12V/24V	
CPU	N97 (2.0GHz)	
RAM	8G	
Disk	64G/128G	
Operating System	Default Win11 64 bit system	
Protection Level	IP42	
Eye Safety	Class1	

Dimension Drawing



D3 3D Camera

Industrial high-precision 3D camera standard version

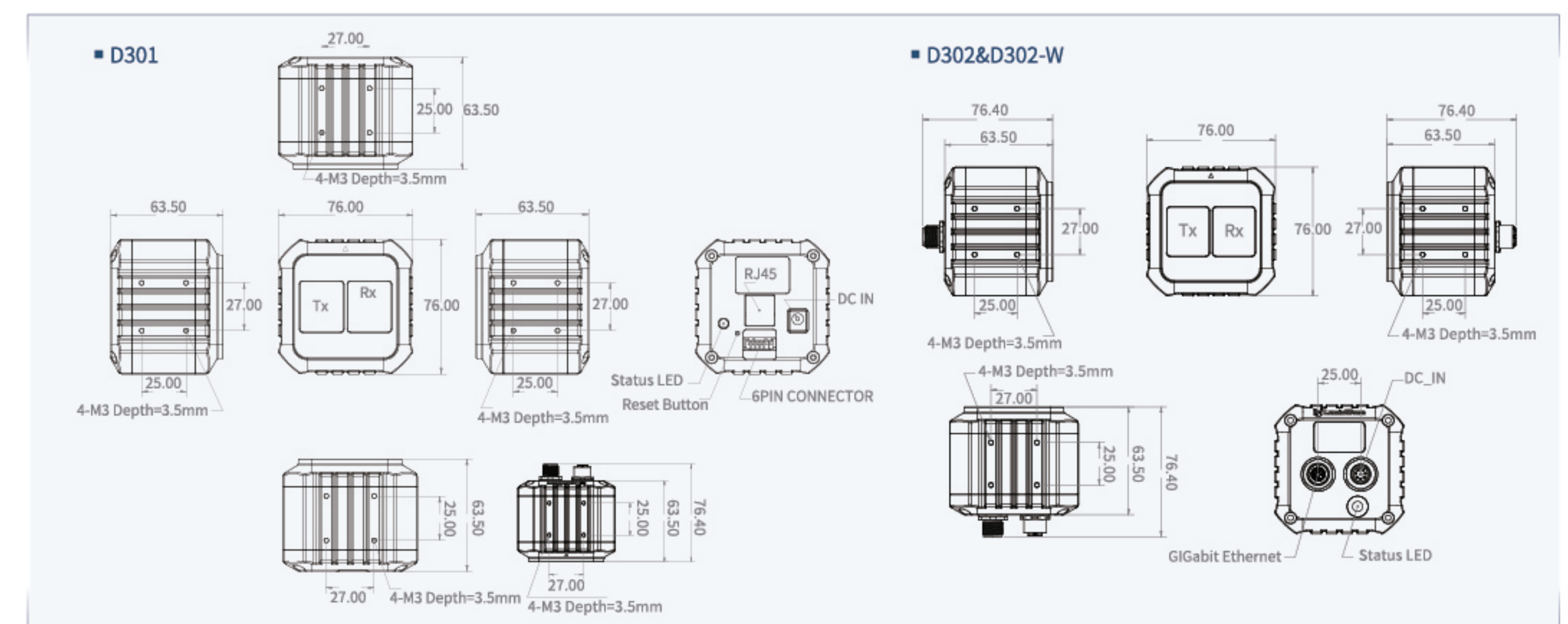


Embedded unique point cloud filtering and image processing algorithms in product, The product can provide IR, point cloud, and depth information in real time. It also has high reliable performance.

Specifications

Product Number		LWP-D301	LWP-D302	LWP-D302-W
Working Principle		ToF		
Sensor		Sony DepthSense® ToF IMX570		
Laser		940nm VCSEL*2		
Working Distance		0.4m~5m		
Ranging Accuracy		< 1% (@2m ≤5mm)		
ToF (H×V)		70°×50°		103°×81°
ToF Resolution		640×480 pixel		
Frame Rate		Max.30 fps		
Eye Safety		Class 1		
Function	HDR Function	Support		
	Exposure Time	Support		
	Various Filter Settings	Support		
	Output Data Format	RAW12 (depth map, IR map, point cloud)		
Interface	Power Supply	12~24V DC		
	Power Consumption	<10W		
	Network Interface	RJ45 1000M Ethernet	Aviation plug: 8 pin*M12 X-code	
	Power Interface	6.4mm DC	Aviation plug: 8 pin*M12 A-code	
Physics	Dimensions (L×W×H)	76mm×63.5mm×76mm		
	Weight	385g	411g	
	Operating Temperature	-20 ~ 50 °C		
	Storage Temperature	-30 ~70 °C		
	Protection Level	IP42	IP67	
Operating System		Windows 10 and above /Linux		

Dimension Drawing



D3C 3D Camera

Industrial high-precision RGBD 3D camera



Synchronize Depth and Color Information



Provide Rich Visual Information



Object Classification and Detection in Complex Scenarios

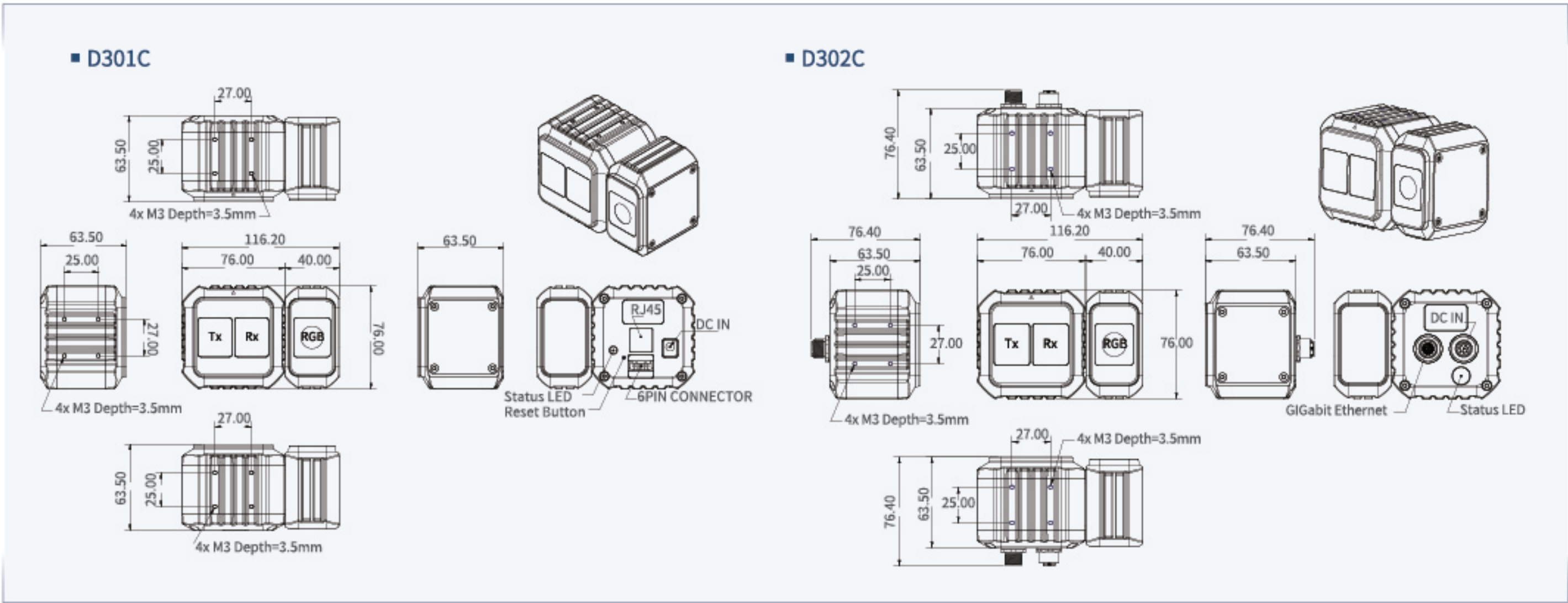


The product has millimeter accuracy, supports point cloud and RGB alignment, can reach to microsecond synchronous output of RGB images and ToF images, supports global-shutter image sensor technology. It can reach to high-precision edge segmentation, and captures the object's three-dimensional data accurately, which can meet the requirements for applications in complex environments.

Specifications

Product Number		LWP-D301C	LWP-D302C
Working Principle		ToF+RGBD	
Sensor		Sony DepthSense® ToF IMX570	
Laser		940nm VCSEL*2	
Working Distance		0.4m~5m	
Ranging Accuracy		< 1% (@ 2m≤5mm)	
ToF Field of View (H×V)		70°×50°	
RGB Field of View (H×V)		70°×50°	
ToF Resolution		640×480 pixels	
RGB Resolution		1600×1200 pixel (global exposure)	
Frame Rate		Max.30 fps	
Eye Safety		Class 1	
Function	HDR Function	Support	
	Exposure Time	Support	
	Various Filter Settings	Support	
	Output Data Format	RAW12 (depth map, IR map, point cloud) +RGB	
	RGB/ToF Time Synchronization	100us	
Inter-face	Power Supply	12~24V DC	
	Power Consumption	<10W	
	Network Interface	RJ45 1000M Ethernet	Aviation plug: 8 pin*M12 X-code
	Power Interface	6.4mm DC	Aviation plug: 8 pin*M12 A-code
Phys-ics	Dimensions (L×W×H)	116.2mm×63.5mm×76mm	
	Weight	680g	706g
	Operating Temperature	-20 ~ 50℃	
	Storage Temperature	-30 ~70℃	
	Protection Level	IP42	IP67
Operating System		Windows 10 and above /Linux	

Dimension Drawing



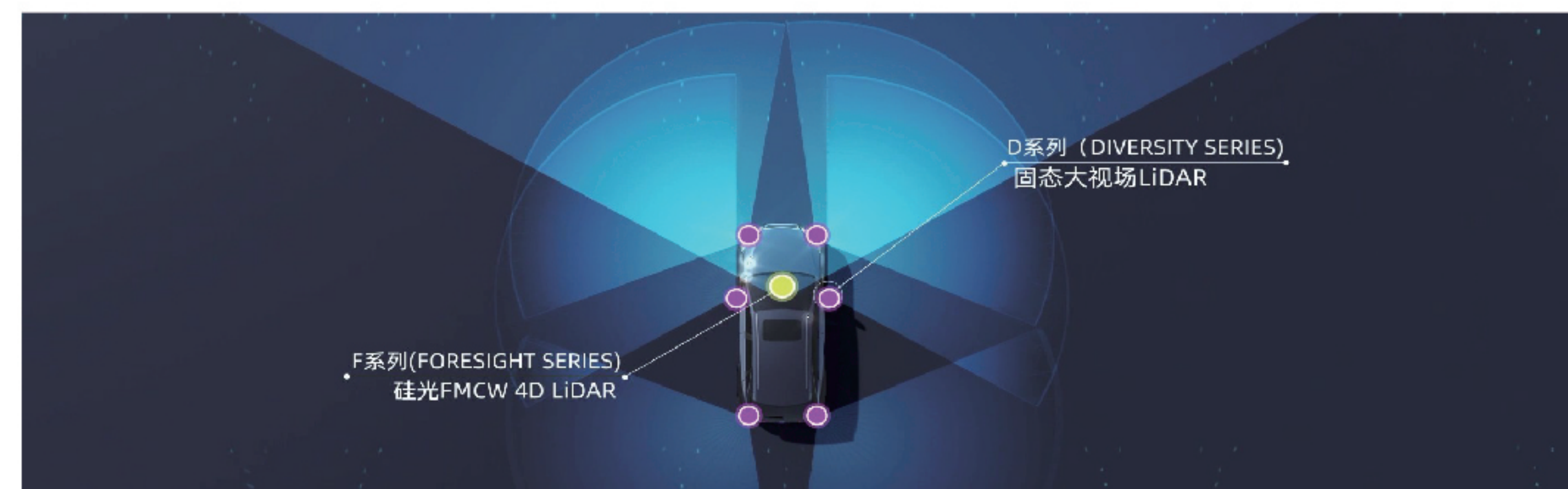
ADAS & Autonomous Driving

Navigating on Autopilot (NOA) in urban environments presents far greater challenges than highway driving. Luminwave's FMCW 4D LiDAR delivers cutting-edge, real-time multi-dimensional environmental perception with unmatched robustness. Compared to conventional 3D ToF LiDAR solution, our FMCW technology offers over 100 times greater immunity to ambient light interference and LiDAR crosstalk.

What truly differentiates FMCW LiDAR is its ability to capture instantaneous Doppler velocity within a single frame. This allows the system to quickly and accurately distinguish between moving and static objects—independent of lighting conditions. Such capability is critical in addressing safety-sensitive edge cases, such as sudden pedestrian crossings, car door openings, mud splashing, and other unpredictable scenarios that demand split-second perception.

With Luminwave's FMCW 4D LiDAR, you can build autonomous navigation systems capable of excelling in the most demanding urban settings—enabled by performance and reliability you can trust.

Composition



Core Advantages

- Immunity to ambient light interference and crosstalk
- Low cost, high reliability enabled by Si photonics technology
- Real-time Doppler velocity
- Long detection range

Applications



Passenger Vehicle



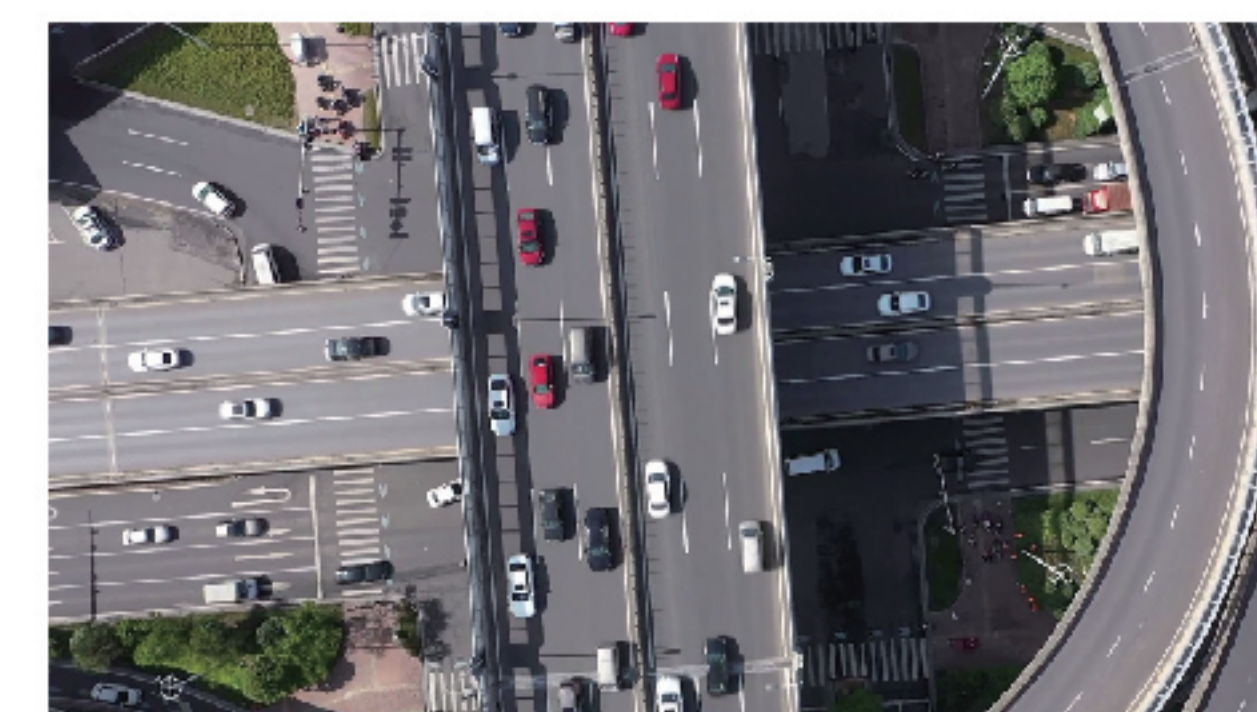
Commercial Vehicle



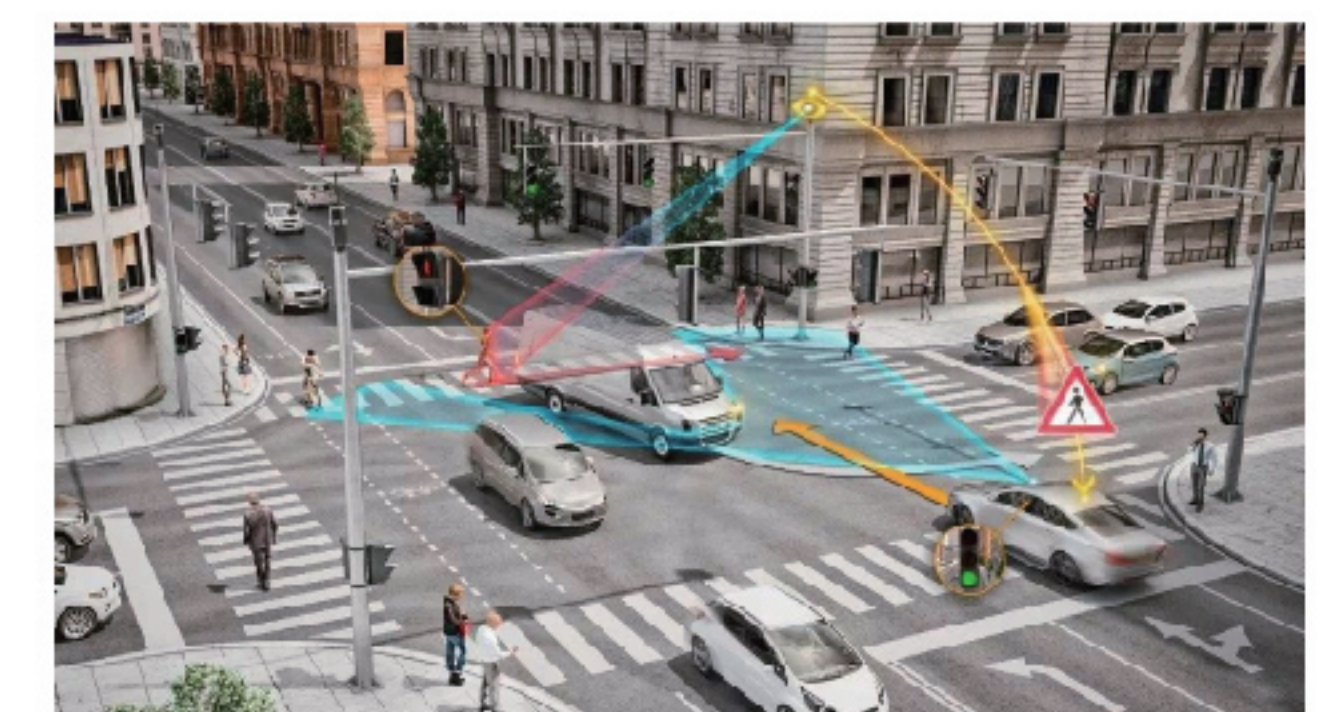
Autonomous Delivery Vehicle



Heavy-duty Truck



City NOA



V2X



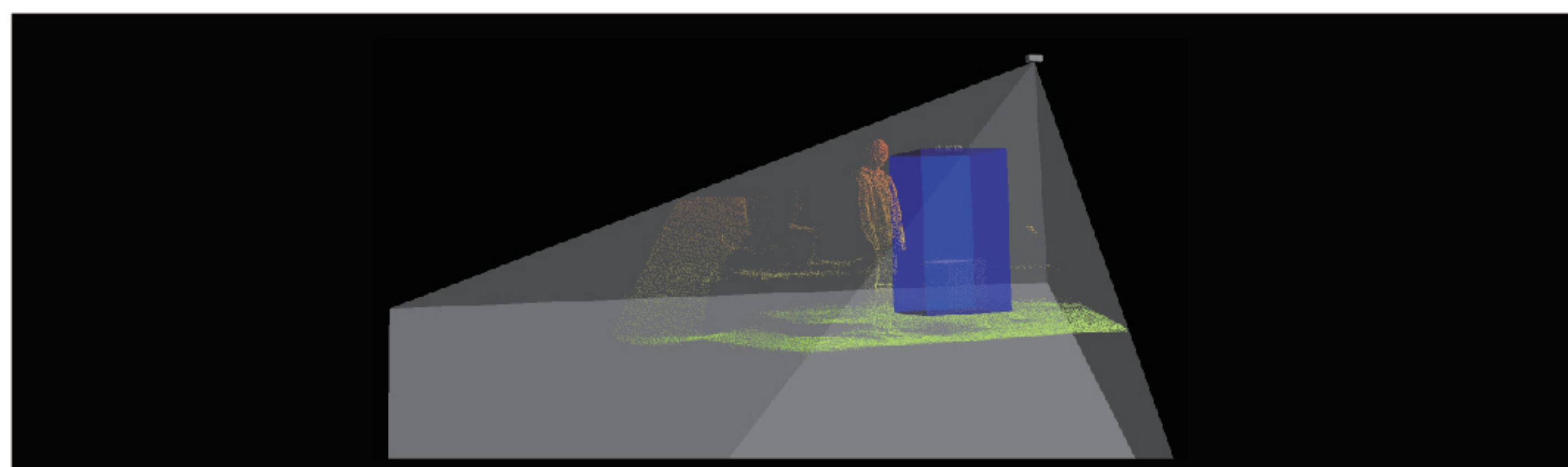
Safety Area Protection

Intelligence that Keeps Pace with Production

Traditional safety measures like physical barriers and emergency stops are no longer sufficient. They react too slowly and leave dangerous gaps, failing to protect against risks in today's dynamic human-robot collaboration environments.

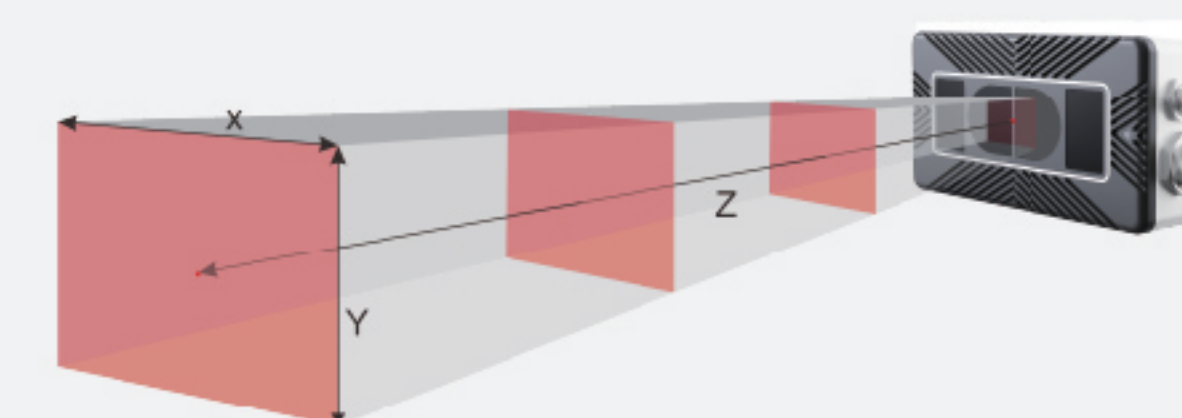
LuminWave transforms industrial safety with our D-series ToF camera-based 3D spatial protection solution VizoSentry™. It enables proactive, high-precision safety zones that safeguard personnel around equipment like injection molding machines and robotic arms without disrupting workflow. The system ensures instant response to intrusions, protecting your people while maximizing your productivity.

Point Cloud Examples



Core Specifications and Field of View Diagram

- Working Distance: 0.2-5m
- Human Eye Safety: Class 1
- Power Supply: DC 12V-24V
- Frame Rate: Max 28fps
- Wavelength: 940nm
- Rated Power: 15W
- Ambient Light Resistance: Support 100Klux
- Interface: IO (1 in 1 out) / CAN
- Field of View (H×V): 70°(±2)×50°(±2) / 103°(±2) ×81°(±2)
- Protection Level: IP67



Installation Height (m)	Standard FoV (70°×50°)		Wide FoV (103°×81°)	
	X (m)	Y (m)	X (m)	Y (m)
0.5	0.7	0.47	1.26	0.85
1	1.4	0.93	2.51	1.71
2	2.8	1.87	5.03	3.42
3	4.2	2.8	7.54	5.12
4	5.6	3.73	10.06	6.83
5	7	4.66	12.57	8.54

Key Features & Benefits

- Compact by Design**
Its small form factor saves space and streamlines installation for fast, flexible deployment.
- Safety in Three Dimensions**
Establish a fully customizable 3D protection zone, backed by rich visual data (IR, depth, point cloud).
- Intelligent Discrimination**
AI precisely identifies people versus objects, minimizing false stops and maintaining production flow.
- Unshaken by Light**
With 940nm active laser imaging, it performs reliably in pitch darkness or under intense 100Klux light.
- Flexible Risk Management**
Configure multiple protection levels to match varying hazards across different areas.

Applications



Robotic Arm Safety Zone Protection



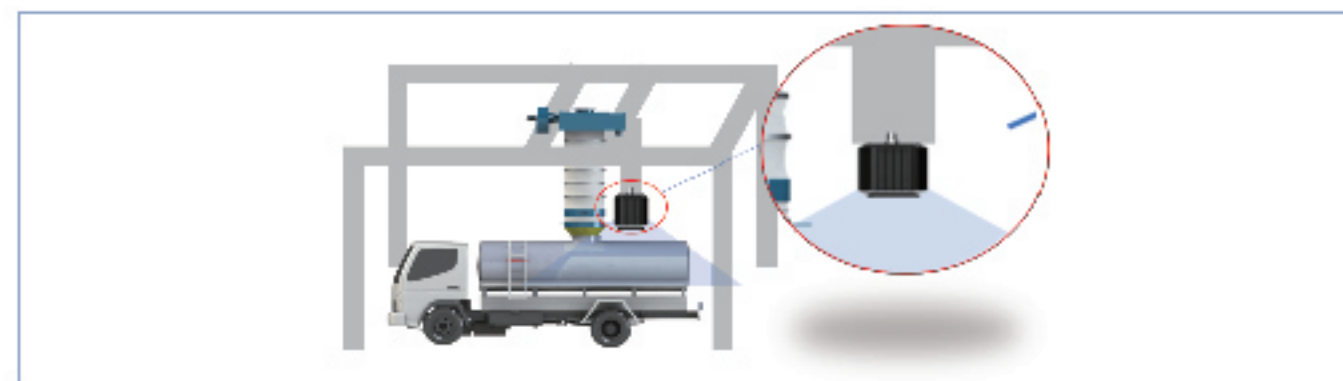
Injection Molding Machine Safety Zone Protection

Filling-Port Position

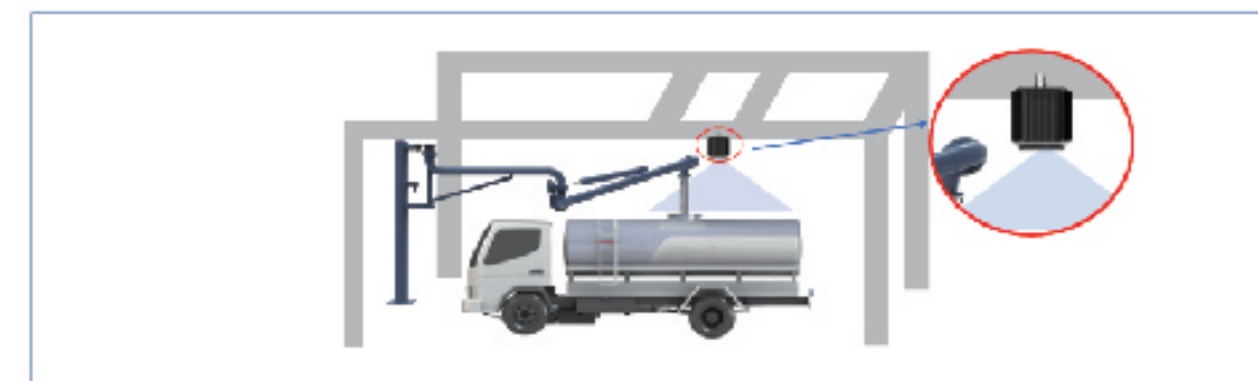
Automate with Precision and Safety

Tank truck loading operations are fraught with challenges—from health hazards like dust and toxic gases to rising labor costs and high staff turnover. While many seek automation for a solution, true success requires unparalleled precision and reliability.

LuminWave's ToF camera delivers exactly that. With millimeter-level accuracy and robust performance even in challenging conditions, it quickly identifies the filling-port's position and shape, guiding the discharge nozzle into perfect alignment. Suitable for both solid materials like coal and ore, as well as liquids like hydrochloric acid and petroleum, our technology enables fully automated, efficient, and safer loading operations.

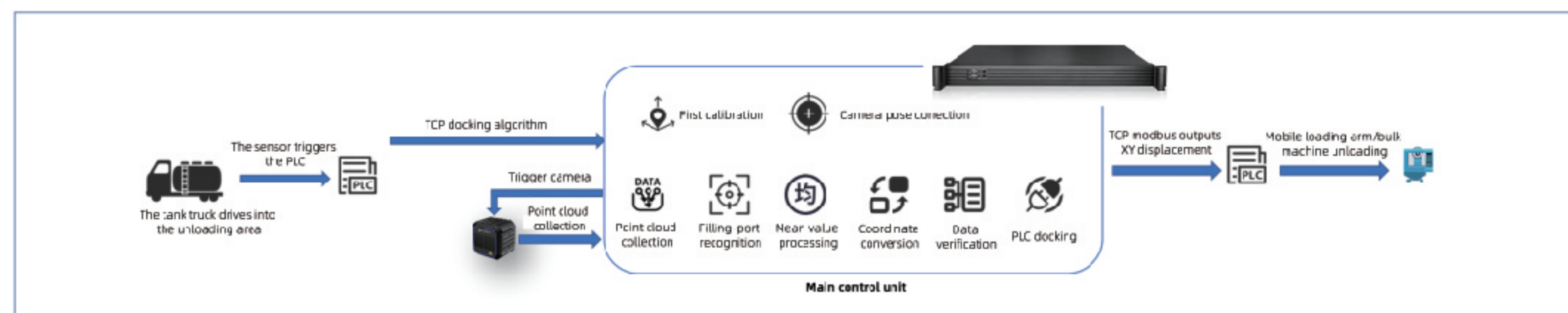


Suitable for solid materials like cement, coal and ore



Suitable for liquids like hydrochloric acid and petroleum

Process



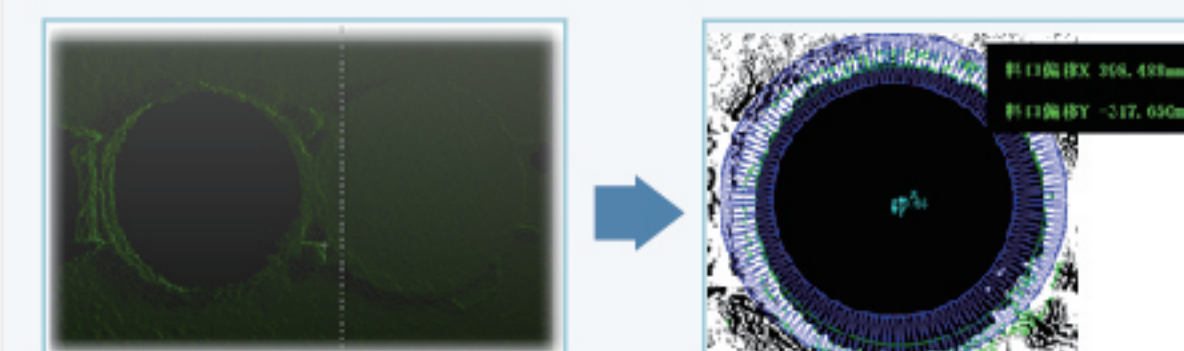
Core Advantages

- Millimeter Precision**
 Employs advanced algorithms to deliver high-precision recognition results.
- Instant Response**
 Immediately outputs tank mouth XYZ coordinates, drastically cutting positioning time.
- Universal PLC Integration**
 Compatible with major PLC protocols (Siemens, Mitsubishi, ModbusTCP, etc.) for simplified operation.
- Flexible Deployment**
 Supports single (vertical/inclined) or dual-camera setups to suit diverse scenario needs.
- Rugged IP67 Design**
 Built to resist dust and moisture, ensuring reliability in harsh environments.
- Optimized 3D Imaging**
 Features built-in HDR, noise reduction, and distortion correction for superior image clarity.
- Explosion-Proof Certification**
 Camera section is explosion-proof, backed by a complete test report.
- Robust Light Immunity**
 3D imaging remains stable and accurate in both no-light and strong-light conditions.

Cases

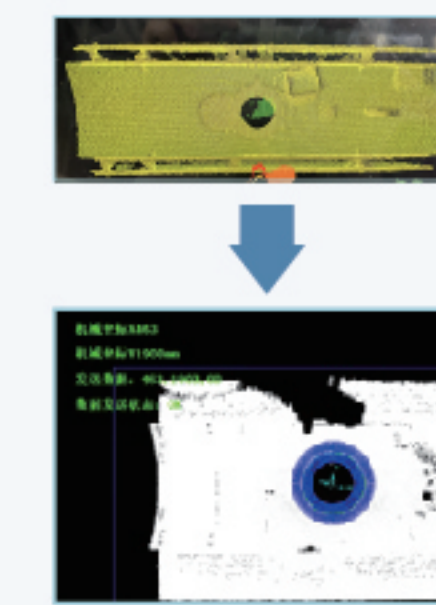
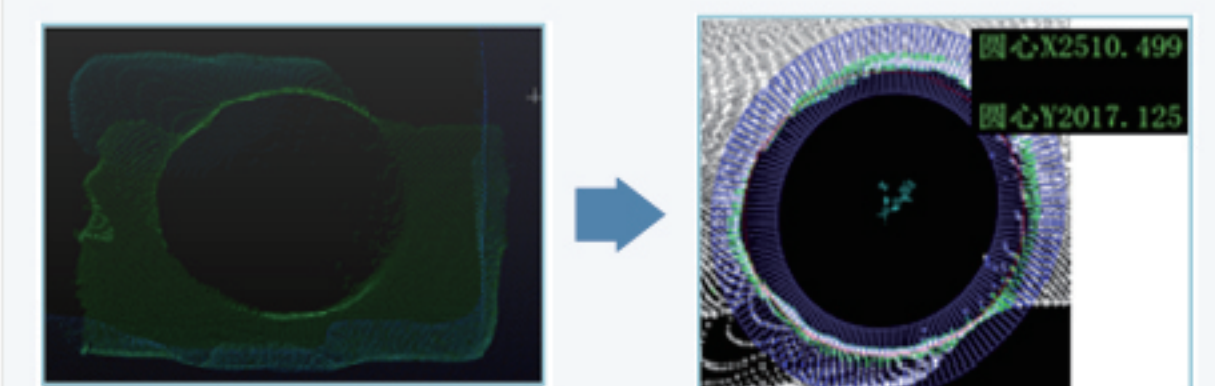
Case 1: Bulk loader- Cement Loading

- **Camera Type:** Non-explosion-proof camera
- **Orientation:** Vertical downward angle
- **Installation Height:** 1.4 meters above the tank mouth
- **Mounting Location:** attached to the bulk loader
- **Accuracy:** $\pm 10\text{mm}$
- **Response Time:** Outputs PLC XY coordinates within 1 second
- **Results:** Nearly 50 validation tests have consistently demonstrated successful material loading into the tank mouth.



Case 2: Bulk loader- Cement Loading

- **Camera Type:** Non-explosion-proof camera
- **Orientation:** 55° downward tilt
- **Installation Height:** 2 meters from the tank mouth
- **Mounting Location:** Mounted on a gantry frame
- **Accuracy:** $\pm 15\text{mm}$
- **Response Time:** Outputs PLC XY coordinates within 1 second
- **Results:** Nearly 50 validation tests have consistently demonstrated successful material loading into the tank mouth.



Case 3: Loading Arm-Caustic Soda Loading

- **Camera Type:** Non-explosion-proof camera
- **Orientation:** Vertical downward angle
- **Installation Height:** 2.7 meters above the tank mouth
- **Mounting Location:** attached to the loading arm
- **Accuracy:** $\pm 10\text{mm}$
- **Response Time:** Outputs PLC XY coordinates within 10 second
- **Results:** The project has been successfully accepted, with nearly 200 validation tests all confirming the material is being accurately loaded into the tank mouth.

Soft Pack Depalletizing

Unlock Efficiency with Intelligent 3D Vision

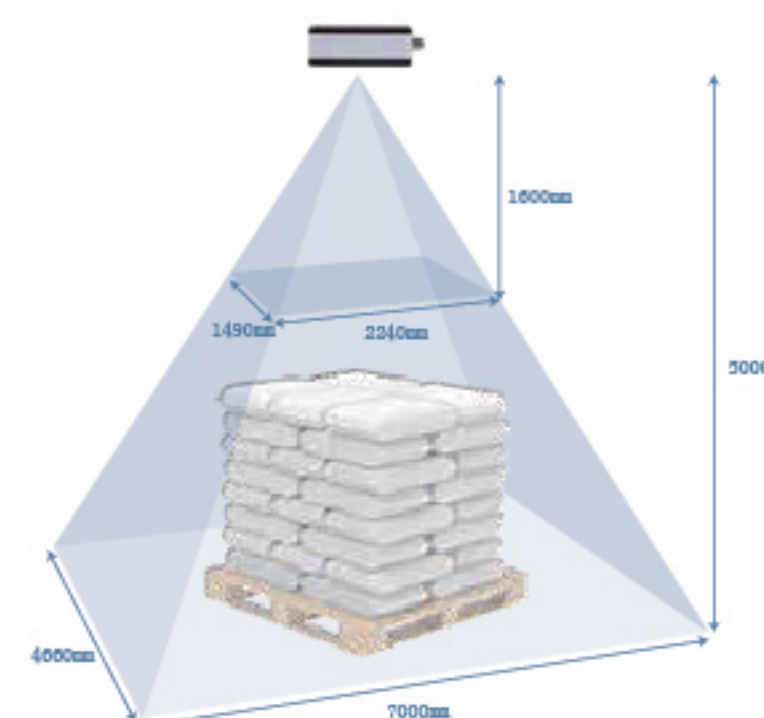
Manual depalletizing of heavy, toxic, or dusty soft packs poses significant safety risks and drives up labor costs. While traditional automation offers an alternative, it often lacks the flexibility and precision needed for diverse goods and complex scenarios.

LuminWave's 3D vision-based depalletizing technology is the intelligent solution. It accurately identifies and handles various soft packaging, from bags to jute sacks, even when dealing with deformities or wrinkles. Highly compatible with different pallet types, including oversized ones, our system boosts efficiency, slashes labor costs, and minimizes errors—delivering unmatched adaptability for your most demanding depalletizing tasks.

Core Specifications and Field of View Diagram

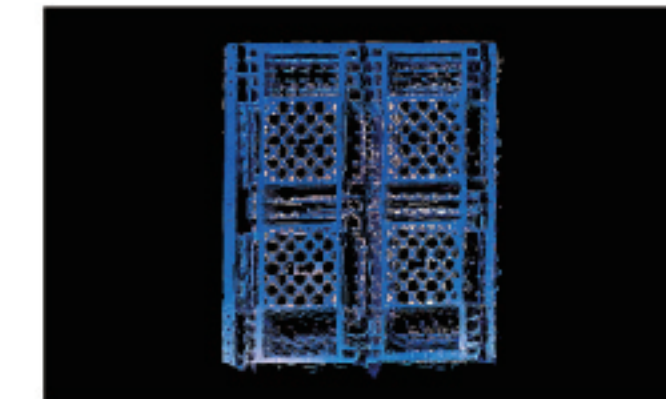


Near Field of View	2240mm*1490mm@1.6m
Far Field of View	7000mm*4660mm@5m
ToF Resolution	640*480dpi
RGB Resolution	1600*1200dpi
Range Accuracy	±3mm+0.25%*depth
Frame Rate	Max28fps

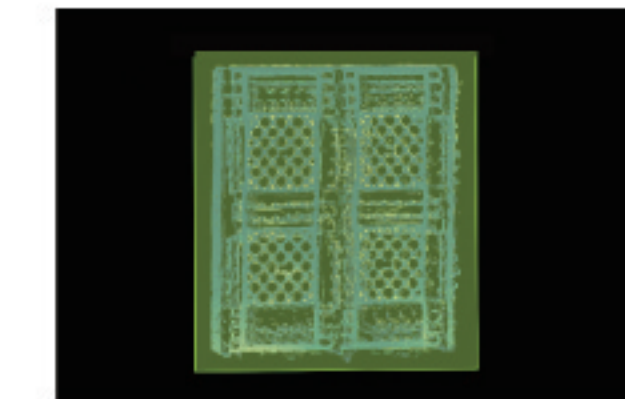


Point Cloud Examples

Empty Pallet



Point Cloud



Recognition Performance

Soft Pack



Point Cloud



Recognition Performance

Core Advantages

- Extended Range & Wide FoV**
 A 70°x50° field of view and 5m working distance effortlessly handle oversized pallets up to 2.3m in height.
- Seamless Integration**
 Compatible with major robot brands (4/6-axis, pedestal) and easily deployed in single or dual-workstation layouts.
- Superior Environmental Stability**
 Unaffected by ambient light or factory lighting for reliable performance in real-world conditions.
- Universal Pallet Compatibility**
 Works seamlessly with common pallet types, including 5-way, 6-way, and square-entry designs.
- Advanced AI Recognition**
 Identifies new materials without pre-registration, handling plain colors, complex patterns, and deformed soft packaging with empty pallet detection.

Cases

Challenges

This depalletizing project must overcome a unique set of stringent conditions. The core requirement is to handle non-standard oversized pallets (2m×2m×2.3m), a task for which conventional solutions are inadequate. This challenge is compounded by tight spatial constraints and exacerbated by significant ambient light interference from scattered sunlight, posing a direct threat to reliable vision recognition. Furthermore, all of this must be achieved under the client's high cost-effectiveness requirements, demanding an optimal balance between performance and budget.

Key Highlights & Achievements

- Oversized & Dual-Pallet Mastery:** Effortlessly manages large pallets (3.5m×2.2m×2.3m) and supports dual-pallet workflows with intelligent empty pallet identification.
- Compact, Cost-Saving Design:** A column robot integration slashes the system's footprint and cost, delivering exceptional value.
- Rapid 3-Day Deployment:** Achieved full system commissioning in just three days, minimizing operational disruption.
- Ambient Light Immunity:** Reliably performs under challenging conditions, including direct skylight interference.
- 99.9% Recognition Accuracy:** Ensures ultra-reliable operation with a recognition cycle of under 3 seconds for maximum throughput.



Project Site



Recognition Result

AGV Pallet Identification

Precision Guidance for Autonomous Handling

For AGVs in automated warehouses, reliably identifying and engaging pallets is a foundational task. LuminWave's solution empowers your AGVs with the perception needed for flawless execution.

Using a 3D ToF camera and advanced deep learning, our system doesn't just see a pallet—it understands it. It identifies the pallet's type, quantity, material, and dimensions. More importantly, it provides real-time guidance by calculating critical parameters like skew, offset, position, and orientation. This ensures every pickup and drop-off is precise, enabling seamless integration into your logistics workflow.

Two Paths to Precision Pallet Recognition

Choose the solution that best fits your infrastructure and budget, both engineered by LuminWave for reliable performance.



Option A: For Systems with a High-Performance IPC

Maximize your existing investment. Our IPC Solution pairs the D3 Camera with a powerful pallet recognition SDK, deploying it to your industrial PC to utilize its available computational resources. It outputs real-time pallet pose—enabling seamless integration and accurate guidance.



Option B: For Stand-Alone, Cost-Sensitive Applications

A compact, all-in-one answer. Our Embedded Solution features the DM Camera with a built-in RK3588 core board. This self-contained unit delivers 6 TOPS of AI processing power to run advanced recognition algorithms locally, eliminating the need for an external IPC and reducing total system cost.

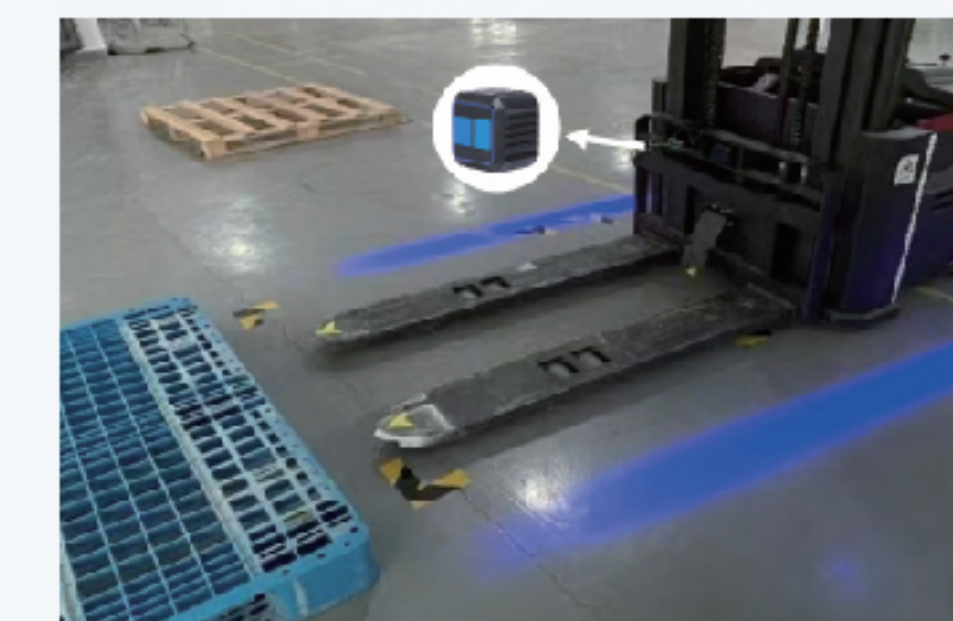
Core Advantages

- Precise Recognition**
Accurately identifies pallets across all colors, materials, and designs.
- Ambient Light Immunity**
Advanced filtering guarantees stable performance, even in semi-outdoor light.
- Scenario Agnostic**
Adapts seamlessly from single-pallet handling to complex multi-pallet stacks.
- Optimized 3D Imaging**
Integrated HDR and noise reduction deliver superior image clarity.
- Rugged Reliability**
IP67 rating ensures robust operation in the toughest industrial settings.
- Seamless Integration**
Comprehensive Windows/Linux SDKs for easy deployment.

Cases

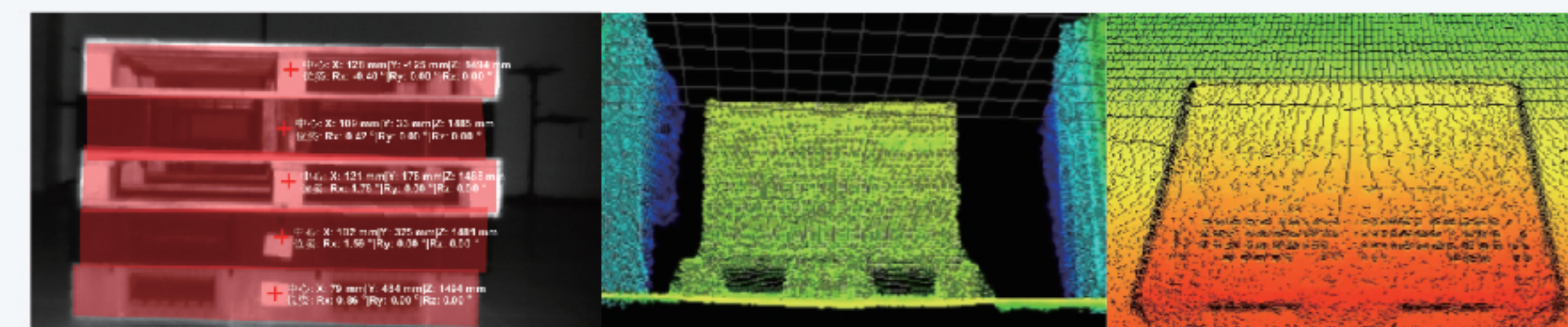
AGV Pallet Recognition: Enabling Uninterrupted Logistics in the Dark

LuminWave's pallet recognition solution has been deployed at a leading AGV manufacturer, overcoming the critical challenge of unreliable vision in low-light truck compartments to ensure seamless loading and unloading operations.



Key Achievements

- Reliable Dark Operation:** Achieves stable recognition of multiple pallets and outputs precise coordinates and poses, even in the pitch-black environment inside truck compartments.
- Exceptional Adaptability:** Leverages AI deep learning to accurately identify pallets across a wide range of colors and materials, fulfilling diverse client requirements.
- Dynamic Recognition:** With a high output rate of 10 frames per second, the system identifies pallets while the AGV is in motion, supporting continuous workflow.
- Extended Range:** Effective at vertical distances of up to 2.5 meters, offering flexibility in operational design.



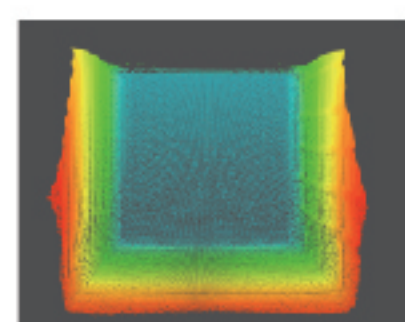


Intelligent Wagon Space Measuring

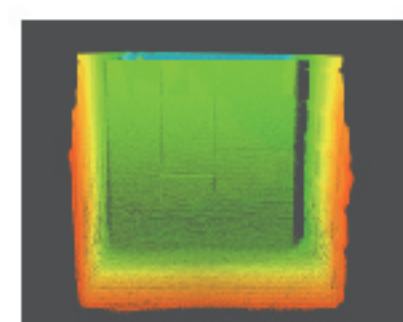
Load Smarter, Ship Safer

In logistics, unoptimized cargo space leads to inefficient loads, safety risks, and higher costs. Precise space management is no longer a luxury—it's a necessity for modern operations.

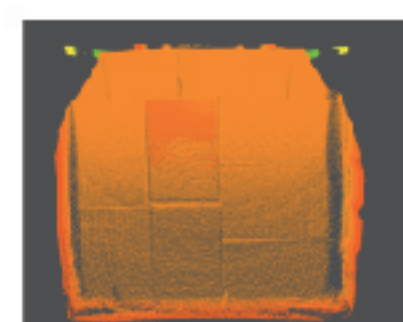
LuminWave's solution delivers this precision. Our system uses a 3D ToF camera and intelligent algorithms to perform a one-click scan of the wagon's interior, providing an immediate and accurate volume measurement. More importantly, it provides real-time visibility during loading, enabling data-driven decisions that maximize capacity, ensure load stability, and ultimately cut transportation expenses.



0% Loading Rate



43% Loading Rate



70% Loading Rate

Core Advantages

- One-Click Calibration**
 Automated setup for instant cargo space measurement.
- Multi-Wagon Adaptability**
 Compatible with various carriage types and cargo volumes.
- Multi-Scenario Flexibility**
 Supports software, hardware, and trigger modes for diverse applications.
- 3D Visualization**
 Real-time 3D monitoring of cargo stacking for transparent operations.
- Advanced Denoising**
 Integrated HDR, auto-exposure, and filtering for clear imaging.
- AI Volume Engine**
 Achieves $\leq 5\%$ volume error; ready for stand-alone use or integration.



Make WISE LiDAR Possible