

# Autonomous Mobile Robots

# LD Series

Designed to automate material transport tasks in factories and indoor facilities.

- Natural-feature navigation:  
Automatically plans efficient routes and prevents collisions
- Fleet management:  
Supervises and coordinates the entire fleet of up to 100 vehicles
- Easy deployment:  
Short installation time, no facility modifications



## Ordering Information

Product Name	Maximum Load	Docking Station Kit *1	Top Plate	Pendant (Joystick)	Part Number
LD-60	60 kg		No		37032-00000
		Yes		No	37032-00002
			Yes		37032-10004
LD-60 ESD *2			No		37032-20000
		Yes		No	37032-20002
			Yes		37032-20004
LD-90	90 kg		No		37042-00000
		Yes		No	37042-00002
			Yes		37042-10004
LD-90x *3			No		37062-00000
		Yes		No	37062-00002
			Yes		37062-10004
LD-90 ESD *2			No		37042-20000
		Yes		No	37042-20002
			Yes		37042-20004
LD-90x ESD *2*3			No		37062-20000
		Yes		No	37062-20002
			Yes		37062-20004
LD-250	250 kg		No		37222-00000
		Yes		No	37222-00002
			Yes		37222-10004
LD-250 ESD *2			No		37222-20000
		Yes		No	37222-20002
			Yes		37222-20004

\*1. Includes Battery Power Cable.











\*2. For use in electrostatic-sensitive environments, compliant to the IEC 61340-5-1 standard.




\*3. For use in cart transporter applications.

**Note:** 1. To ensure proper fleet management, please contact an OMRON representative before ordering AMRs to add to an existing fleet.  
2. Batteries are sold separately. Refer to *Accessories and Optional Items* on page 2 for more information.

## LD Series

### Accessories and Optional Items

	Item	Details	Part Number
	EM2100 Appliance	Appliance that runs any Fleet Operations Workspace Solutions software. 120 day factory trial license included. Refer to Fleet Operations Workspace (FLOW) Licenses below for more information.	20271-900 (Primary Fleet Manager) 20271-901 (Secondary Fleet Manager) 20271-903 (Bundle with Fleet Simulator License)
	Mobile I/O Box	Used with a Fleet Manager to summon an AMR to a goal or control connected devices with I/O	23419-802
	Mobile I/O Box Power Supply	Recommended for purchase with the Mobile I/O Box	23419-812
	High Accuracy Positioning System (HAPS) Single sensor	AMR Alignment using magnetic floor tape. Includes single HAPS sensor kit, one mounting bracket, cabling, hardware, and magnetic tape (254 mm wide, 49 m long)	LD-60/90: 13660-100 LD-250: 21374-100
	High Accuracy Positioning System (HAPS) Double sensor	AMR Alignment using magnetic floor tape. Includes double HAPS sensor kit, two mounting brackets, cabling, hardware, and magnetic tape (254 mm wide, 49 m long)	LD-60/90: 13660-000 LD-250: 21374-000
	RS232 Splitter Cable	Connects both sensors to the single AMR Core RS232 port	24010-000F
	Magnetic tape	25 mm wide magnetic tape (South top side, 49 m roll)	14925-000
	Acuity Localization	Camera, mounting kit, cables, leveling kit	13700-000
	Side Laser Bundle	Includes two Lasers and cable	13456-000
	Side Laser Kit	Includes two lasers, two mounting kits, two metal covers, and cable	13456-100
	Battery	Removable and rechargeable power source for the AMR.	20452-000
	Docking Station	Used to autonomously charge the battery inside an AMR or to charge an AMR battery outside of the AMR with a supplied cable	12477-000
	Pendant (Joystick)	Handheld device for manually driving an AMR and map creation, 3 m cable length	13558-000
	Breakout Cable	D-Sub44 pin cable for digital I/O interface	14165-000

	Item	Details	Part Number
	Top Plate - LD-60, LD-90, LD-90x	Provides additional protection for the AMR.	12944-000
	Top Plate - LD-250	Provides additional protection for the AMR.	20458-002
	Top Plate - LD-250 ESD		20458-202
	Battery Power Cable	Cable length: 0.45 m	12676-000L

## Fleet Operations Workspace (FLOW) Licenses

Product Name	Configuration	Part Number
Primary Fleet Operations Workspace (FLOW) Core License, 1 Year *1	Entitlement for a 1 year renewable Primary FLOW Core license, runtime and development, per AMR connection	20271-800
Primary Fleet Operations Workspace (FLOW) Core License, 5 Year *2	Entitlement for a 5 year renewable Primary FLOW Core license, runtime and development, per AMR connection	20271-806
Secondary Fleet Operations Workspace (FLOW) Core License, 1 Year *1	Entitlement for a 1 year renewable Secondary FLOW Core license per fleet, redundant runtime	20271-802
Secondary Fleet Operations Workspace (FLOW) Core License, 5 Year *2	Entitlement for a 5 year renewable Secondary FLOW Core license per fleet, redundant runtime	20271-807
License, Fleet Simulator	Entitlement for perpetual Fleet Simulator license for use with existing Fleet Manager appliance, simulation runtime and development	20271-804
License, Fleet Operations Workspace iQ	Entitlement for a 1 year renewable FLOW iQ license	20271-701
	Entitlement for a 5 year renewable FLOW iQ license	20271-705
Cell Alignment Positioning System (CAPS) License	AMR Alignment using software-defined target. Entitlement for a perpetual CAPS license	20271-805

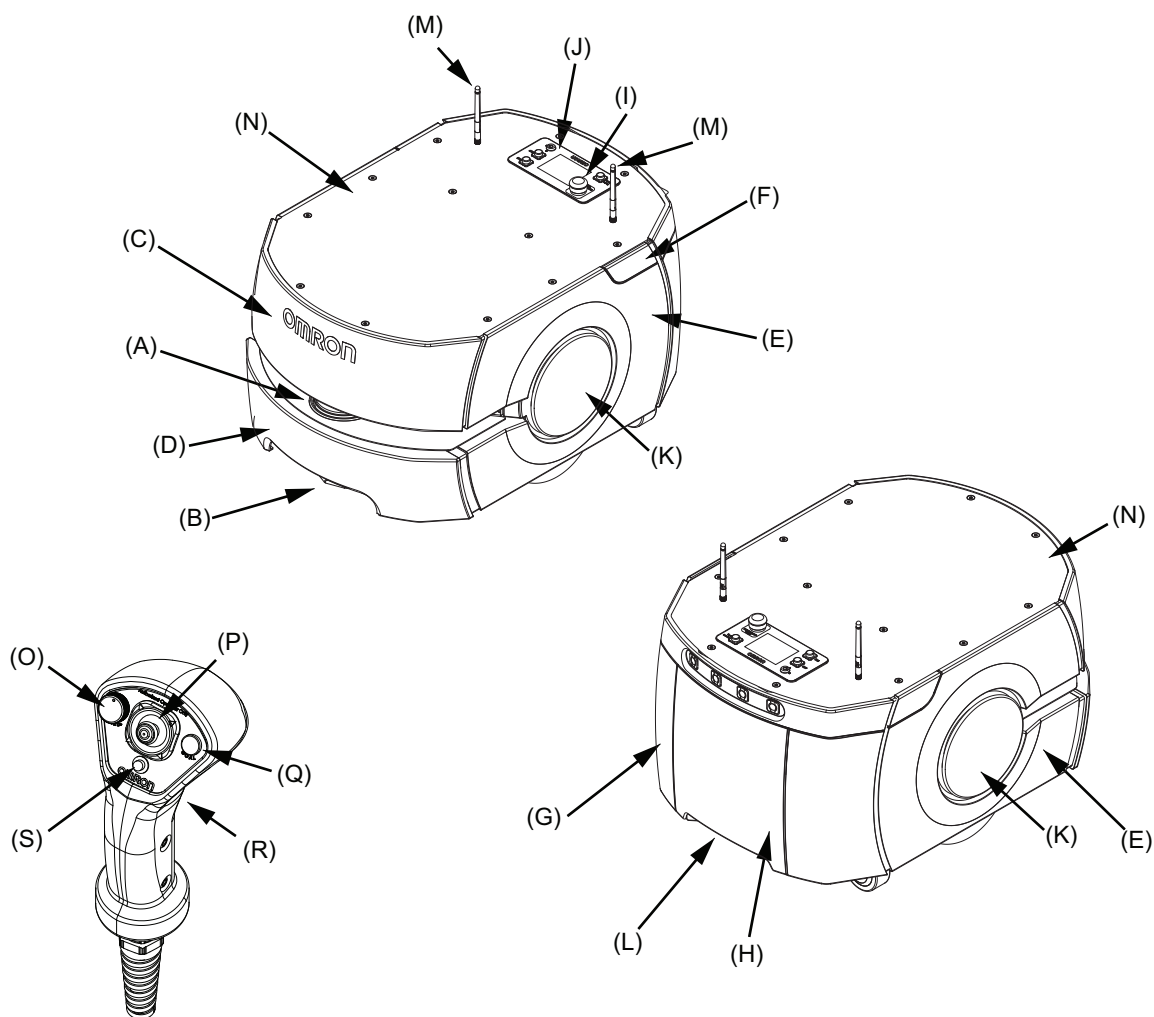
**Note:** To obtain the latest version of the Fleet Operations Workspace (FLOW) Core software, contact your local OMRON representative. Please note that an active subscription is required for access to software upgrades.

- \*1. Expiration of a 1 year subscription license without renewal will result in cessation of the fleet management functions of the OMRON AMR solution until the license is renewed.
- \*2. After five consecutively licensed years (either one 5 year license or five 1 year licenses), all fleet management functions will continue to operate without requiring subsequent subscription renewals. An active subscription will still be required to access subsequent software releases, including bug fixes, feature upgrades, and performance improvements.

# LD Series

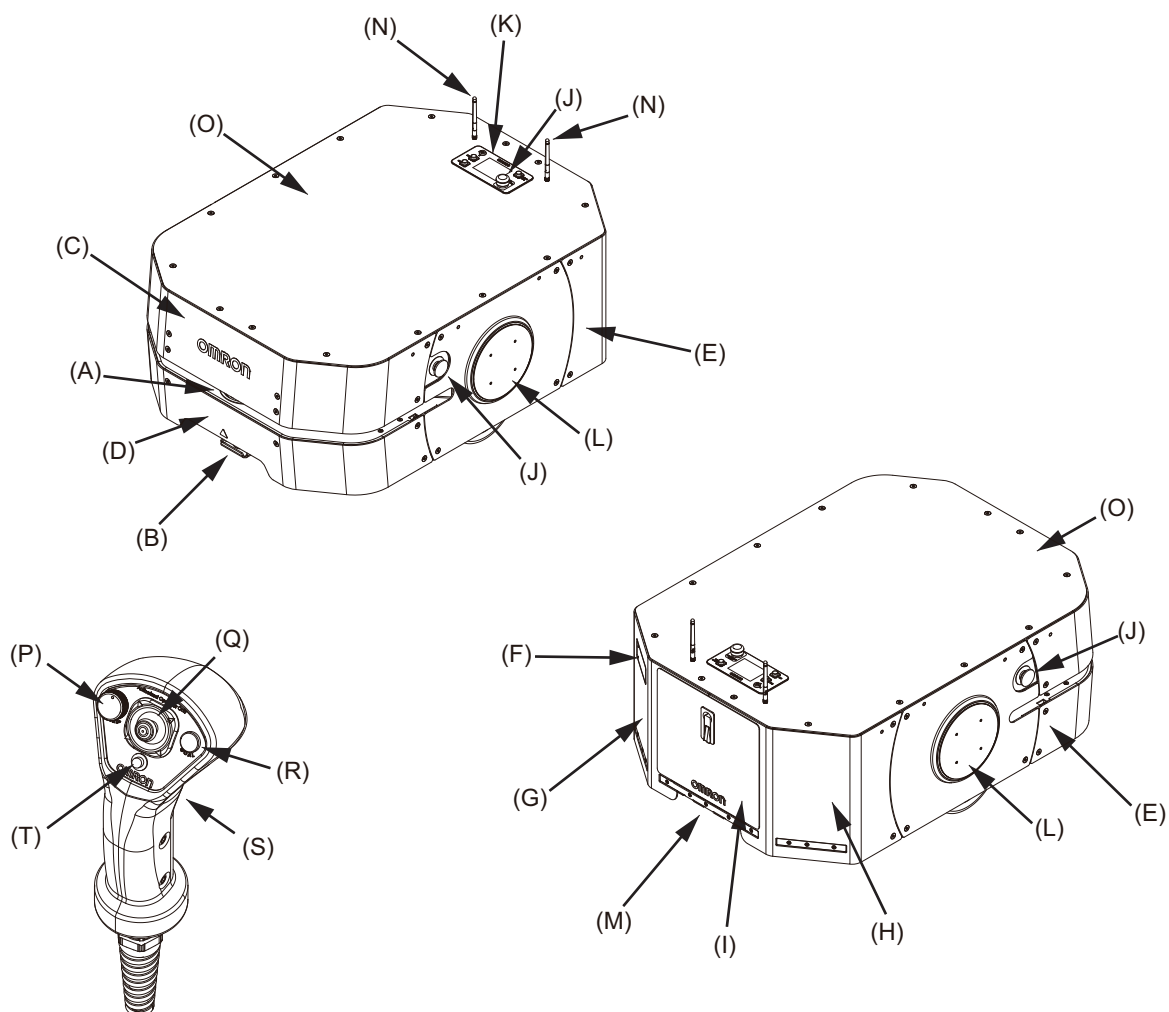
## Features and Components

LD-60, LD-90, LD-90x, LD-60 ESD, LD-90 ESD, and LD-90x ESD



Item	Description	Item	Description
A	Safety Laser Scanner	K	Light Disk
B	Low Laser	L	Charging Contacts
C	Upper Front Skin	M	Wireless Antennas
D	Bumper Skin	N	Payload Mounting Surface (Top Plate shown)
E	Side Skin	O	Speed Control
F	Access Panel	P	Directional Control Stick
G	Rear Skin	Q	Goal Button
H	Battery Door Skin	R	Trigger
I	E-STOP button	S	Indicator Light
J	Operator Panel		

LD-250, LD-250 ESD



Item	Description	Item	Description
A	Safety Laser Scanner	K	Operator Panel
B	Low Laser	L	Light Disk
C	Upper Front Skin	M	Charging Contacts
D	Bumper Skin	N	Wireless Antennas
E	Side Skin	O	Payload Mounting Surface (Top Plate shown)
F	Access Panel	P	Speed Control
G	Left Rear Skin	Q	Directional Control Stick
H	Right Rear Skin	R	Goal Button
I	Battery Door Skin	S	Trigger
J	E-STOP button	T	Indicator Light

# LD Series

## Specifications

### LD-60, LD-90, LD-90x, LD-60 ESD, LD-90 ESD, and LD-90x ESD

Item		LD-60	LD-90	LD-90x
<b>Weight (with Battery)</b>		62 kg		
<b>Environment</b>	<b>Ambient temperature</b>	5 to 40°C		
	<b>Ambient humidity</b>	5 to 95% (non-condensing)		
	<b>Operating Environment</b>	Indoor usage only, no excessive dust, no corrosive gas or liquid. Floor must be free of water, oil, dirt, and debris. Direct sunlight may cause safety laser false positives.		
	<b>Ingress Protection Class</b>	IP20		
	<b>Cleanroom rating</b>	ISO 5 / Class 100		
<b>Floor Conditions</b>	<b>Minimum floor flatness</b>	F <sub>F</sub> 25 (ACI 117 standard)		
	<b>Traversable step</b>	15 mm max. <sup>*1</sup>	10 mm max. <sup>*1</sup>	
	<b>Traversable gap</b>	15 mm max. <sup>*2</sup>		
	<b>Maximum Slope</b>	Up to 60 kg: 4.8° / 8.3% incline Over 60 kg: Level floor only		
	<b>Minimum floor compressive strength</b>	5 Mpa		
<b>Navigation</b>	<b>Routing</b>	Autonomous routing by localizing with safety scanning laser based on environment mapping		
	<b>Environmental map making method</b>	Scan by walking the AMR through the environment, and upload the scan data to the MobilePlanner software		
	<b>Low Front Laser</b>	One Class 1 laser at front of AMR with a 126° field of view		
	<b>Side Laser (optional)</b>	Two Class 1 lasers with a 270° field of view on the sides of payload structure, user-mounted		
<b>Visual Indicators</b>		Light discs are located on the sides of the AMR. Additional indicators can be added.		
<b>Payload</b>	<b>Maximum Weight</b>	60 kg	90 kg	
	<b>Run time (no payload)</b>	15 h approx.		20 h approx.
<b>Mobility</b>	<b>Run Time (full payload)</b>	12 h approx.		15 h approx.
	<b>Maximum Speed</b>	1800 mm/s	1350 mm/s	900 mm/s
	<b>Maximum Rotation Speed</b>	180 °/s		
	<b>Stop Position Repeatability (single AMR)</b>	<ul style="list-style-type: none"> <li>To a position: ±65 mm</li> <li>To standard target: ±25 mm, ±2°</li> <li>With CAPS: ±8 mm, ±0.5°</li> <li>With HAPS: ±8 mm, ±0.4°</li> </ul>		
	<b>Stop Position Repeatability (Fleet)</b>	<ul style="list-style-type: none"> <li>To a position: ±85 mm</li> <li>To standard target: ±35 mm, ±2°</li> <li>With CAPS: ±12 mm, ±0.5°</li> <li>With HAPS: ±10 mm, ±0.5°</li> </ul>		
	<b>Drive wheels</b>	<b>Materials</b>	Solid aluminum with non-marking, non-conductive, foam-filled rubber tread	
<b>Passive casters</b>	<b>Materials</b>	Conductive thermoplastic rubber on polyolefin		
<b>Auxiliary Power</b>		5 VDC±5%, 1 A switched Aux power 12 VDC±5%, 1 A switched Aux power 20 VDC±5%, 1 A switched Aux power 22 to 30 VDC, 4 A switched 22 to 30 VDC, 10 A switched 22 to 30 VDC, 10 A safe, switched 10 A switched and 10 A safe switched are from the same source and pass through the same 10 A fuse, so the sum of their current must be less than 10 A.		
<b>Standard</b>	<b>Harmonized Standard</b>	EN ISO 12100 / EN ISO 13849-1 / EN 60204-1		
	<b>Relevant Standard</b>	EN 1525 / ANSI B56.5		
	<b>Wireless</b>	IEEE 802.11 a/b/g/n/ac		
<b>Safety Features</b>	<b>Safety Scanning Laser</b>	One at front of AMR Class 1 PLd safety per ISO13849-1 240° field of view		
	<b>E-STOP Buttons</b>	One on Operator Panel, additional E-STOP buttons can be added to the payload structure		
	<b>Rear Sonar</b>	Two at rear of AMR, 2 m range. Each pair includes one emitter and one receiver working together.		
	<b>Front Bumper</b>	Two pairs of sensors at the front of the AMR		
	<b>Audible Indicators</b>	Two speakers are included. Additional buzzers can be added.		
<b>Operator Interface</b>	<b>Display</b>	8.89 cm diagonal TFT, 320 x 240 pixels, color screen		
	<b>Button</b>	ON button, OFF button, Brake-release button, and keyed mode selection		

Item		LD-60	LD-90	LD-90x
User Interface	Wireless	802.11 a/b/g/n/ac		
	Ethernet Port	Two user LAN, One maintenance LAN, Auto-MDIX		
	Serial	One RS-232		
	Digital I/O	16 inputs, 16 outputs		
	Audio	Digital audio in / out		

\*1. A speed of 250 mm/s is recommended for traversing steps, and routine driving over steps should be avoided. Lower speeds may not traverse the step. Faster or frequent driving over steps will shorten the lifespan of the drivetrain components. All steps should have smooth, rounded profiles.

\*2. AMR maximum speed is recommended for traversing gaps, and routine driving over gaps should be avoided. Lower speeds may not traverse the gap. Faster or frequent driving over gaps will shorten the lifespan of the drivetrain components.

### LD-250, LD-250 ESD Specifications

Item		LD-250
Weight (with battery)		148 kg
Environment	Ambient temperature	5 to 40°C
	Ambient humidity	5 to 95% (non-condensing)
	Operating Environment	Indoor usage only, no excessive dust, no corrosive gas or liquid. Floor must be free of water, oil, dirt, and debris. Direct sunlight may cause safety laser false positives.
	Ingress Protection Class	IP20
	Cleanroom rating	ISO 5 / Class 100
Floor Conditions	Minimum floor flatness	F <sub>r</sub> 25 (ACI 117 standard)
	Traversable step	10 mm max. *1
	Traversable gap	15 mm max. *2
	Maximum Slope	Max. 1.7° / 3% incline
	Minimum floor compressive strength	5 Mpa
Navigation	Routing	Autonomous routing by localizing with safety scanning laser based on environment mapping
	Environmental map making method	Scan by manually driving the AMR through the environment, and upload the scan data to the MobilePlanner for map creation.
	Low Front Laser	One Class 1 laser at front of AMR with a 126° field of view
	Side Laser (optional)	Two Class 1 lasers with a 270° field of view on the sides of payload structure, user-mounted
Visual Indicators		Light discs are located on the sides of the AMR. Additional indicators can be added.
Payload	Maximum Weight	250 kg
Mobility	Run time (no payload)	13 h approx.
	Run Time (full payload)	10 h approx.
	Maximum Speed	1200 mm/s
	Maximum Rotation Speed	120 °/s
	Stop Position Repeatability (single AMR)	<ul style="list-style-type: none"> <li>To a position: ±75 mm</li> <li>To standard target: ±25 mm, ±2°</li> <li>With CAPS: ±8 mm, ±0.5°</li> <li>With HAPS: ±8 mm, ±0.4°</li> </ul>
	Stop Position Repeatability (Fleet)	<ul style="list-style-type: none"> <li>To a position: ±100 mm</li> <li>To standard target: ±35 mm, ±2°</li> <li>With CAPS: ±14 mm, ±0.6°</li> <li>With HAPS: ±10 mm, ±0.6°</li> </ul>
Drive wheel	Materials	Aluminum with polyurethane tread
Passive caster	Materials	Elastomer (Polyurethane)
Auxiliary Power		5 VDC±5%, 1 A switched Aux power 12 VDC±5%, 1 A switched Aux power 20 VDC±5%, 1 A switched Aux power 22 to 30 VDC, 4 A switched × 2 22 to 30 VDC, 10 A switched 22 to 30 VDC, 10 A safe, switched 10 A switched and 10 A safe switched are drawn from the same source, and pass through the same 10 A fuse, so the sum of their current must be less than 10 A.
Standards	Harmonized Standard	EN ISO 12100 / EN ISO 13849-1 / EN 60204-1/
	Relevant Standard	EN 1525 / ANSI B56.5
	Wireless	802.11 a/b/g/n/ac

## LD Series

Item		LD-250
Safety Features	Safety Scanning Laser	One at front of AMR Class 1 PLd safety per ISO13849-1 240° field of view
	E-STOP Buttons	One at Operator Panel, one on each side. Additional E-STOP buttons can be added to the payload structure
	Rear Sensing	Time of flight (TOF) sensors
	Audible Indicators	Two speakers are included. Additional buzzers can be added
Operator Interface	Display	3.5 inch TFT, 320 × 240 pixels, color screen
	Button	ON button, OFF button, Brake-release button, and keyed mode selection
User Interface	Wireless	802.11 a/b/g/n/ac
	Ethernet Port	Two user LAN, One maintenance LAN, Auto-MDIX
	Serial	One RS-232
	Digital I/O	16 inputs, 16 outputs
	Audio	Digital audio in / out

\*1. A speed of 600 mm/s is recommended for traversing steps, and routine driving over steps should be avoided. Lower speeds may not traverse the step. Faster or frequent driving over steps and gaps will shorten the lifespan of the drivetrain components. All steps should have smooth, rounded profiles.

\*2. AMR maximum speed is recommended for traversing gaps, and routine driving over gaps should be avoided. Lower speeds may not traverse the gap. Faster or frequent driving over gaps will shorten the lifespan of the drivetrain components.



**EM2100 Appliance**

<b>Weight</b>	9.1 kg
<b>Mounting method</b>	1U rack mount in a standard 19-inch equipment rack
<b>Power Supply</b>	100 to 240 VAC (typical 100 W)
<b>Power Consumption</b>	200 W max.
<b>Operating Temperature</b>	10 to 35°C
<b>Storage Temperature</b>	-25 to 60°C
<b>Operating Humidity</b>	8 to 90%, non-condensing
<b>Storage Humidity</b>	5 to 95%, non-condensing
<b>Chassis Ingress Protection Class</b>	IP20
<b>CPU</b>	Intel® Xeon® CPU
<b>Main Memory</b>	32 GB DDR3
<b>Storage</b>	60 GB SSD
<b>Archive Storage</b>	4 TB HDD
<b>Communication ports</b>	Four 10/100/1000 Ethernet Four USB One VGA
<b>Status Display</b>	Multi-segment LCD

**High Accuracy Positioning System (HAPS)**

<b>Sensor</b>	<b>Depth</b>	30 mm
	<b>Width</b>	160 mm
	<b>Ingress Protection Class</b>	IP64
	<b>Environment</b>	-40 to 85°C
	<b>LEDs</b>	Power, tape present, left marker, right marker
<b>Magnetic Tape</b>	<b>Width</b>	25 mm
	<b>Orientation</b>	South up
<b>Markers (Magnetic Tape)</b>	<b>Width</b>	25 mm
	<b>Length</b>	300 mm min. for 500 mm/s drive speed
	<b>Orientation</b>	North up
	<b>Separation From Tape</b>	15 to 30 mm
<b>Connections</b>	<b>Front Sensor</b>	RS232-1 (/dev/ttyUSB9) on the core
	<b>Rear Sensor</b>	RS232-2 (/dev/ttyUSB10) on the core
	<b>Power, Both Sensors</b>	Aux power using the included splitter cable
<b>Stop Position Repeatability, LD-60, LD-90</b>	<b>Single AMR</b>	±8 mm position, 0.4° rotation
	<b>Fleet</b>	±10 mm position, 0.5° rotation
<b>Stop Position Repeatability, LD-250</b>	<b>Single AMR</b>	±8 mm position, 0.4° rotation
	<b>Fleet</b>	±10 mm position, 0.6° rotation

**Cell Alignment Positioning System (CAPS)**

<b>Stop Position Repeatability, LD-60, LD-90, LD-90x</b>	<b>Single AMR</b>	±8 mm position, 0.5° rotation
	<b>Fleet</b>	±12 mm position, 0.5° rotation
<b>Stop Position Repeatability, LD-250</b>	<b>Single AMR</b>	±8 mm position, 0.5° rotation
	<b>Fleet</b>	±14 mm position, 0.6° rotation
<b>Type</b>	Software license	

**Battery**

<b>Type</b>	Lithium Ion
<b>Weight</b>	19 kg
<b>Voltage</b>	22 to 30 VDC
<b>Capacity</b>	72 Ah (battery cell nominal)
<b>Recharge Time</b>	2 hrs. 10 min. for 20% to 80% charge
<b>Ingress Protection Class</b>	IP20
<b>Life Expectancy</b>	2,000 times 80% DOD (battery cell nominal), 7 years, approx., 16 h/day, 5 days/week 4 years, approx., 19/7 (full-time)
<b>Charging Method</b>	Automatic or manual

**Docking Station**

<b>Current</b>	8 A *
<b>Power</b>	100 to 240 VAC, 50 to 60 Hz
<b>Power Consumption</b>	800 W
<b>Humidity</b>	5 to 95%, non-condensing
<b>Temperature</b>	5 to 40° C
<b>Dimensions (W × D × H)</b>	349 × 369 × 315 mm
	495 × 495.5 × 317 mm (with floor plate)
<b>Weight</b>	8.2 kg
<b>Mounting</b>	Wall bracket, directly to floor, or on floor with floor plate
<b>Indicators</b>	Power on: blue Charging: yellow
<b>Connector</b>	For out-of-AMR battery charging

\* Circuit breaker built into AC power switch

**Joystick (Pendant)**

<b>Weight</b>	0.55 kg
<b>IP Rating</b>	IP56

**Acuity Localization**

<b>Field of View</b>	140°
<b>Power Input</b>	12 VDC (±10%) supplied from AMR through power connector
<b>Power Consumption</b>	3.3 W maximum

**MobilePlanner Software**

<b>CPU</b>	1.5 GHz dual-core CPU recommended
<b>Main Memory</b>	1.5 GB min. (4 GB min. recommended)
<b>Hard Disk</b>	At least 200 MB of available space
<b>Video Memory</b>	256 MB min.
<b>Display</b>	XGA 1024 × 768, 16 million colors
<b>Supported Languages</b>	English, Japanese, German, French, Italian, Korean, Spanish, Polish, Simplified Chinese, Traditional Chinese

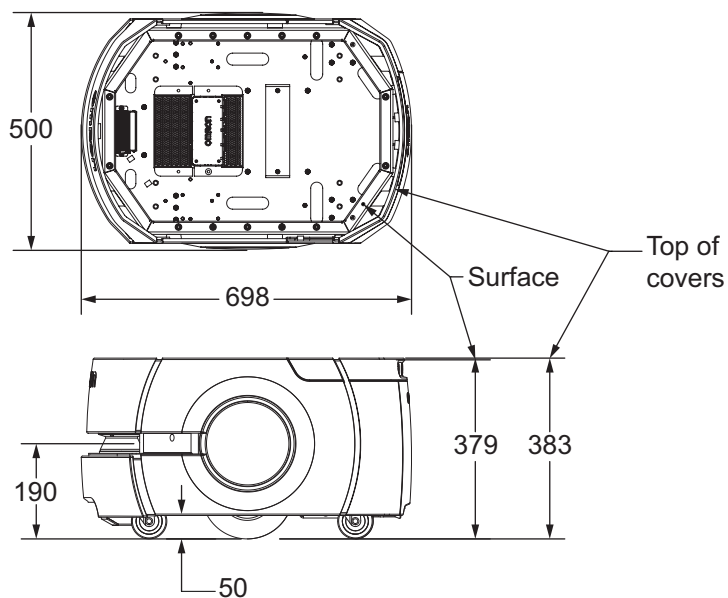
# LD Series

## Dimensions

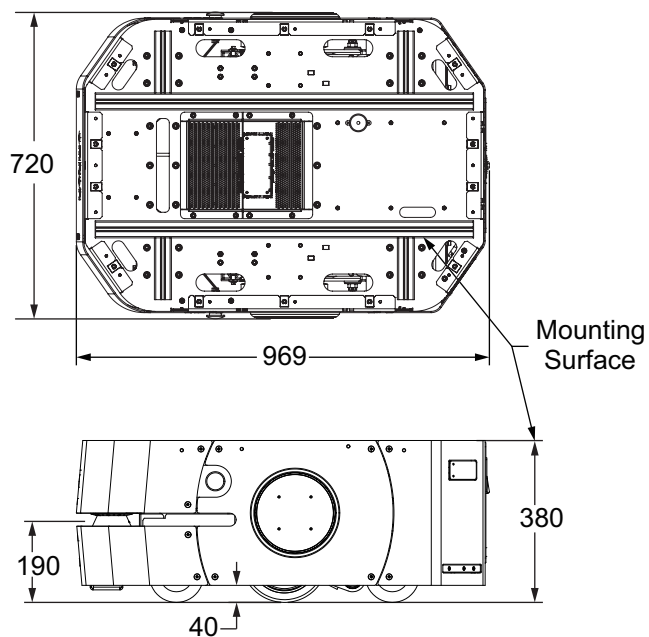
CAD data can be downloaded from [https://robotics.omron.com/browse-documents/dir\\_id=10](https://robotics.omron.com/browse-documents/dir_id=10):  
<http://www.adept.com/Robots-CAD-File>

(Unit: mm)

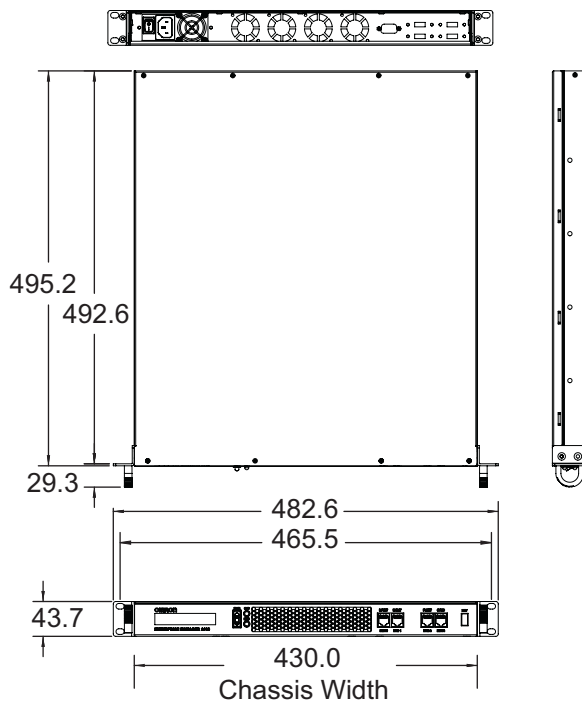
### LD-60, LD-90, LD-90x, LD-60 ESD, LD-90 ESD and LD-90x ESD



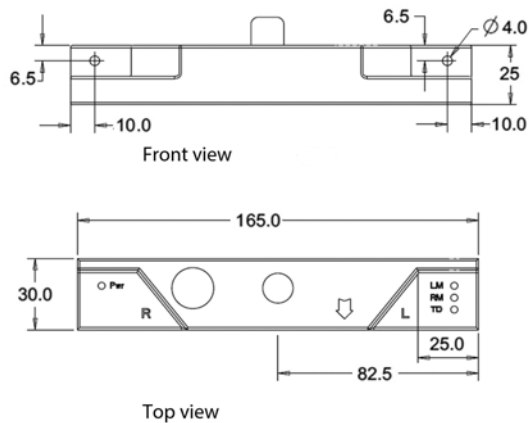
### LD-250, LD-250 ESD



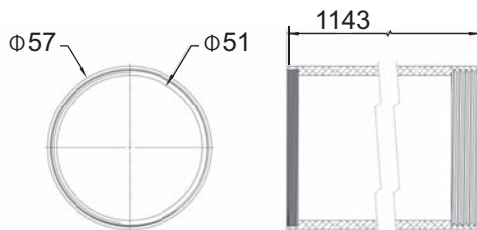
EM2100 Appliance



High Accuracy Positioning System (HAPS)

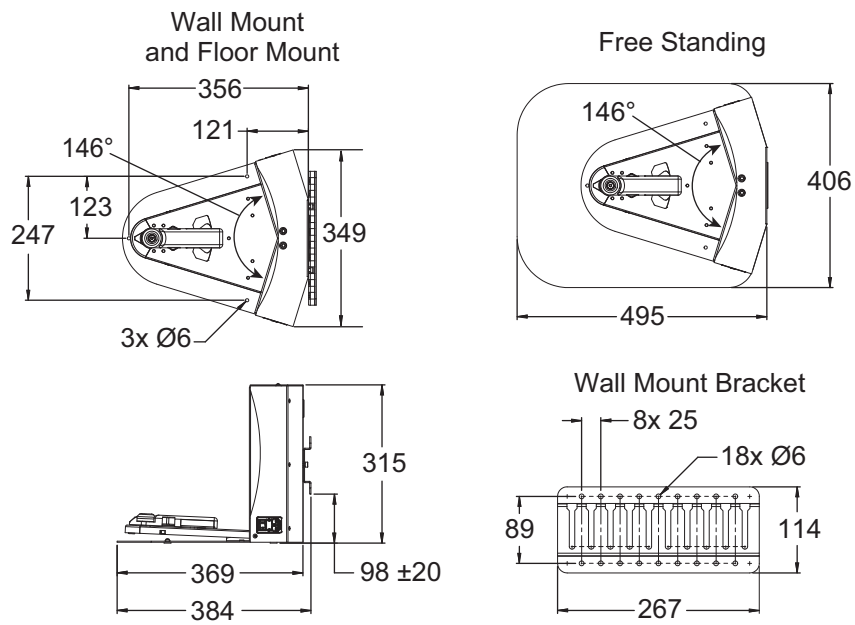


Acuity Localization

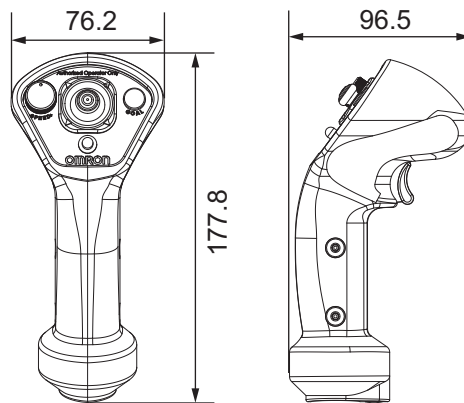


# LD Series

## Docking Station



## Joystick (Pendant)



## Related Manuals

Catalog Number	Manual Title
I611	LD-60/90 Platform User's Manual
I613	LD Platform Peripherals User's Guide
I614	Mobile Robot Software Suite User's Guide
I615	Enterprise Manager User Guide (this covers the EM1100, not the EM2100)
I616	Mobile Robot LD Safety Guide
I617	Advanced Robotics Command Language Reference Guide
I618	Advanced Robotics Command Language Fleet Manager - Mobile Robots Integration Guide
I634	EM2100 Installation Guide
I635	Fleet Operations Workspace Core User's Manual
I636	Fleet Operations Workspace Core Migration Guide
I637	Fleet Operations Workspace Core Integration Toolkit User Guide
I665	Fleet Operations Workspace iQ User's Manual
I649	Fleet Simulator User's Manual
I642	LD-250 Platform User's Manual
I677	Mobile I/O Box User's Manual
I680	LD-Series Integration Guide

- Intel, Xeon and Intel Xeon are trademarks of Intel Corporation in the U.S. and/or other countries.
- Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.
- The product photographs and figures that are used in this catalog may vary somewhat from the actual products.
- Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.



# Terms and Conditions Agreement

## **Read and understand this catalog.**

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

## **Warranties.**

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

## **Limitation on Liability; Etc.**

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

## **Suitability of Use.**

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

## **Programmable Products.**

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

## **Performance Data.**

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

## **Change in Specifications.**

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

## **Errors and Omissions.**

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

**Note: Do not use this document to operate the Unit.**

**OMRON Corporation Industrial Automation Company**

**Kyoto, JAPAN**

**Contact : [www.ia.omron.com](http://www.ia.omron.com)**

**Regional Headquarters**

**OMRON EUROPE B.V.**

Wegalaan 67-69, 2132 JD Hoofddorp  
The Netherlands  
Tel: (31) 2356-81-300 Fax: (31) 2356-81-388

**OMRON ASIA PACIFIC PTE. LTD.**  
438B Alexandra Road, #08-01/02 Alexandra  
Technopark, Singapore 119968  
Tel: (65) 6835-3011 Fax: (65) 6835-3011

**OMRON ELECTRONICS LLC**

2895 Greenspoint Parkway, Suite 200  
Hoffman Estates, IL 60169 U.S.A.  
Tel: (1) 847-843-7900 Fax: (1) 847-843-7787

**OMRON ROBOTICS AND SAFETY TECHNOLOGIES, INC.**  
4225 Hacienda Drive, Pleasanton, CA 94588 U.S.A.  
Tel: (1) 925-245-3400 Fax: (1) 925-960-0590

**OMRON (CHINA) CO., LTD.**

Room 2211, Bank of China Tower, 200 Yin Cheng Zhong Road,  
PuDong New Area, Shanghai, 200120, China  
Tel: (86) 21-6023-0333 Fax: (86) 21-5037-2388

**Authorized Distributor:**

©OMRON Corporation 2017-2023 All Rights Reserved.  
In the interest of product improvement,  
specifications are subject to change without notice.

**CSM\_11\_1**

**Cat. No. I828-E-13** 1023 (0117)

**11970-520L**