

# Mobile Robots LD Series

## Autonomous Mobile Robots (AMRs), self-mapping, self-navigating.

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





## Ordering Information

### Mobile Robots-LD Platform




Appearance	Product Type	Product Name	Maximum Load	Maximum Speed	Configuration & Attachment		Part Number
	OEM	LD-60	60 kg	1.8 m/s	Standard	-	37032-00000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37032-00002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 12944-000	37032-10004
		LD-90	90 kg	1.35 m/s	Standard	-	37042-00000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37042-00002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 12944-000	37042-10004
		LD-250	250 kg	1.2 m/s	Standard	-	37222-00000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37222-00002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 20458-002	37222-10004
	ESD OEM	LD-60	60 kg	1.8 m/s	Standard	-	37032-20000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37032-20002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 12944-000	37032-20004
		LD-90	90 kg	1.35 m/s	Standard	-	37042-20000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37042-20002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 12944-000	37042-20004
		LD-250	250 kg	1.2 m/s	Standard	-	37222-20000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37222-20002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 20458-002	37222-20004

## LD Series

Appearance	Product Type	Product Name	Maximum Load	Maximum Speed	Configuration & Attachment		Part Number
	Cart Transporter	LD-105CT	105 kg	1.35 m/s	Standard	Touchscreen :13605-000 Side laser :13456-000	37142-00010
					Docking station kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L	37142-00012
					Starter kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L Acuity localization :13700-000 Joystick :13558-000 Cart :75020-000	37142-01014
	Cart Transporter	LD-130CT	130 kg	0.9 m/s	Standard	Touchscreen :13605-000 Side laser :13456-000	37162-00010
					Docking station kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L	37162-00012
					Starter kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L Acuity localization :13700-000 Joystick :13558-000 Cart :75020-000	37162-01014

**Note:** For existing customer of mobile robots, please contact an OMRON representative prior to ordering additional mobile robots to ensure proper fleet management.  
Refer to page 18 for previous generation models.

### Fleet Operations Workspace Solutions


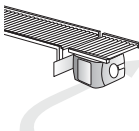




Appearance	Product Name	Configuration & Attachment	Part Number
	Primary Fleet Operations Workspace (FLOW) Core License, 1 Year	Entitlement for a 1 year renewable Primary FLOW Core license	20271-800
	Primary Fleet Operations Workspace (FLOW) Core License, 5 Year	Entitlement for a 5 year renewable Primary FLOW Core license	20271-806
	Secondary Fleet Operations Workspace (FLOW) Core License, 1 Year	Entitlement for a 1 year renewable Secondary FLOW Core License	20271-802
	Secondary Fleet Operations Workspace (FLOW) Core License, 5 Year	Entitlement for a 5 year renewable Secondary FLOW Core License	20271-807
	Primary Fleet Manager	EM2100 Appliance with Temporary 120 Day Fleet Operations Workspace License	20271-900
	Secondary Fleet Manager	EM2100 Appliance with Temporary 120 Day Fleet Operations Workspace License	20271-901
	Bundle. Fleet Simulator	Package includes: Entitlement for perpetual Fleet Simulator License and EM2100 appliance	20271-903
	License, Fleet Simulator	Entitlement for perpetual Fleet Simulator license for existing EM2100 devices	20271-804

\* 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.





\* 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.

\* After four consecutive 1 year renewals (for a total of 5 years) or after purchase of a 5 year license, all fleet management functions will continue to operate without requiring subsequent subscription renewals. Please note that an active subscription will still be required to have access to subsequent software releases, including bug fixes, feature upgrades and performance improvements.





## Options

Appearance	Product Name	Specification	Configuration & Attachment	Part Number
	High Accuracy Positioning System (HAPS) - LD-60/LD-90	Single sensor	Sensor × 1, mounting bracket × 1, power connector × 1, RS-232 connector × 1, 25 mm wide magnetic tape (south top side, 50 m roll)	13660-100
		Double sensor	Sensor × 2, mounting bracket × 2, power connector × 2, RS-232 connector × 2, 25 mm wide magnetic tape (south top side, 50 m roll)	13660-000
	High Accuracy Positioning System (HAPS) - LD-250	Single sensor	Sensor × 1, mounting bracket × 1, power connector × 1, RS-232 connector × 1, 25 mm wide magnetic tape (south top side, 50 m roll)	21374-100
		Double sensor	Sensor × 2, mounting bracket × 2, power connector × 2, RS-232 connector × 2, 25 mm wide magnetic tape (south top side, 50 m roll)	21374-000
		Magnetic tape	25 mm wide magnetic tape (south top side, 50 m roll)	14925-000
	Cell Alignment Positioning System (CAPS)	Software license	Software license activated on each AMR individually. Upload to the AMR via SetNetGo	20271-805
	Acuity Localization	-	Camera, mounting kit, cables, leveling kit	13700-000
	Touchscreen	-	Touchscreen with bracket, power supply with bracket, power cable from core to power supply (33 cm), power cable from power supply to touchscreen (183 cm), Ethernet cable between touchscreen and core (153 cm), gasket between touchscreen and AIV mounting surface, software package including touchscreen support	13605-000
	Side Laser	Bundle	Laser × 2, cable × 1	13456-000
		Kit	Laser × 2, Cable × 1, mounting kit × 2, metal cover × 2	13456-100
	Call/Door Box	WiFi	Call/door box, cable	13029-802

## Accessories

Appearance	Product Name	Specification	Configuration & Attachment	Part Number
	Battery	355 x 158 x 217 mm	For all LD models	20452-000
	Docking Station	-	Docking station, AC power cable	12477-000
		Extended Wall mount	Docking station, AC power cable, extended wall mount (for Cart Transporter)	12477-050
	Joystick	Cable length: 0.6 to 3 m	-	13558-000
	Breakout Cable	-	DB44HD breakout cable (D-SUB44 pin cable for digital I/O interface)	14165-000

## LD Series

Appearance	Product Name	Specification	Configuration & Attachment	Part Number
	Top Plate - LD-60, LD-90	Top cover for OEM type	-	12944-000
	Top Plate - LD-250	Top cover for OEM type	-	20458-002
	Cart*	-	-	75020-000
	Battery Power Cable	Cable length: 0.45 m	-	12676-000L

\* The cart only applies to LD-CT models.

## Specifications

### Mobile Robots-LD Platform LD-60, LD-90, ESD OEM, and Cart Transporter

Item		LD-60, LD-90, ESD OEM		Cart Transporter		Note
		37032-□□□□□	37042-□□□□□	37142-□□□□□	37162-□□□□□	
Materials		Polycarbonate				
Dimension (L × W × H)		699 × 500 × 383 mm		894 × 1074 × 1394 mm*		* Height includes WiFi antenna
Weight (with Battery)		62 kg		81 kg (Vehicle)/23 kg (Cart)		
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				Direct sunlight may cause safety laser false positive
	IP rating	IP20				
	Cleanroom rating	Fed Class 100, ISO Class 5		None		
Floor Conditions	Floor Requirements	Linoleum, epoxy, or concrete (no water, no oil, no dirt)				
	Minimum floor flatness	F <sub>F</sub> 25 (ACI 117 standard)*				* ACI 117 is the American Concrete Institute standard for concrete floors. F <sub>F</sub> is flatness, F <sub>L</sub> is the level. Higher F <sub>F</sub> numbers represent flatter floors. F <sub>F</sub> 25 is a fairly lenient specification.
	Traversable step	15 mm max.* <sup>1</sup>	10 mm max.* <sup>1</sup>	5 mm max.* <sup>2</sup>	5 mm max.* <sup>2</sup>	* <sup>1</sup> A speed of 250-300 mm/s and 250 mm/s, for the LD-60 and LD-90, is required for these steps. Faster or frequent driving over such steps or gaps will shorten the lifespan of the drivetrain components. Lower speeds may not traverse the step. Steps should have smooth, rounded profiles.
	Traversable gap	15 mm max.	15 mm max.	5 mm max.* <sup>2</sup>	5 mm max.* <sup>2</sup>	* <sup>2</sup> The Cart Transporter with a cart is capable of driving over a gap or step of 5 mm at a speed of 250 mm/s, but this should not be regarded as normal use. Regular driving over such gaps or steps will shorten the lifespan of the drivetrain components.
	Climb grade	Below 1: 12 (60 kg max.) Flat floor only (over 60 kg)		Flat floor only		
	Navigation	Routing	Autonomous routing by localizing with safety scanning laser based on environment mapping			
Environmental map making method		Scan by walking the mobile robot through the environment, and upload the scan data in the MobilePlanner				
Payload	Maximum Weight	60 kg	90 kg	105 kg*	130 kg*	* Excluding cart weight
Mobility	Maximum Speed	1800 mm/s	1350 mm/s	1350 mm/s	900 mm/s	
	Maximum Rotation Speed	180°/s	180°/s	100°/s		
	Stop Position Repeatability	Basic: ±100 mm position Standard Target: ±25 mm position, ± 2° rotation				*±10 mm position, ±0.5° rotation with option, (High Accuracy Positioning System) ±8 mm position, ±1° rotation with option, (Cell Alignment Positioning System)
Drive wheel	Materials	Non-marking nylon foam-filled rubber, non-conductive				
	Size	200 dia. × 50 mm nominal, 2 wheels				
Passive caster	Materials	Conductive thermoplastic rubber on polyolefin				
	Size	75 dia. × 41 mm nominal, 4 casters				
Power	Battery	22-30 VDC				
	Capacity	72 Ah Battery cell nominal capacity				
	Run Time	15 hours (continuous) approx.				With no payload condition
	Recharge Time	4 hours (5:1 ratio) approx.				
	Battery Life Cycles	2,000 recharge cycles (battery cell nominal)				
	Charging Method	Automatic / manual				
	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 22-30 VDC, 4 A switched × 2 22-30 VDC, 10 A switched* 22-30 VDC, 10 A safe, switched*				5, 12, 20, and 22-30 VDC power can be provided to external devices * 10 A switched and 10 A safe, switched share the 10 A of current
Standard	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-60, LD-90, ESD OEM		Cart Transporter		Note
		37032-□□□□□	37042-□□□□□	37142-□□□□□	37162-□□□□□	
Safety Features	Safety Scanning Laser	1 at front Class 1 PLd safety per ISO13849-1 15 m maximum range 240° field of view				
	Emergency Stop	1 at operator panel		1 at HMI post touchscreen, 1 at operator panel		
	Rear Sonar	2 at rear, 2 m range				Each pair includes one emitter and one receiver working together
	Front Bumper	1 at front of platform, 2 pairs of sensors				
	Low Front Laser	1 at front of platform Class 1 4 m maximum range 126° field of view				
	Side Laser	Option*		2 on horizontal tubes of HMI post Class 1 4 m maximum range 270° field of view		* 2 on sides of payload structure, user-mounted
	Indicators	Light disc in each side		Light disc in each side, beacon on HMI post		
	Speaker	3.5 in., 80 W max.				
Operator Interface	Screen / Touch Panel	3.5 in. TFT 320 × 240 pixels, color screen		7.0 in. TFT LCD touch panel, 18/24 bit RGB		
	Button	On button: green Off button: red Brake-release button: orange Keyswitch (disabled off button) *		On button: green Off button: red Brake-release button: orange Keyswitch (disabled off button) *, Latch button, unlatch button		* Key switch can be used to disable the off button to avoid accidental shutdown or tampering.
User Interface	Wireless	802.11 a/b/g/n/ac				
	Ethernet Port	1 x user LAN, 1 x maintenance LAN, Auto-MDIX				
	Serial	RS-232 × 2				
	Digital I/O	16 inputs, 16 outputs				
	Analog I/O	8 inputs (0 to 30 V), 4 outputs (0-20 V)				
	Audio	Digital audio out, audio in / audio out				
Cart Latching	Latching Method	Not available		Automatic		

**Mobile Robots-LD Platform**  
**LD-250, ESD OEM**

Item		LD-250, ESD OEM	Note
		37222-□000□	
Materials		Aluminum	
Dimension (L × W × H)		963 × 718 × 383 mm	* Height to top plate.
Weight		148kg (with battery), 129kg (without battery)	
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	Direct sunlight may cause safety laser false positive
	IP rating	IP20	
	Cleanroom rating	Fed Class 100, ISO Class 5	
Floor Conditions	Floor Requirements	Linoleum, epoxy, or concrete (no water, no oil, no dirt)	
	Minimum floor flatness	F <sub>F</sub> 25 (ACI 117 standard)*	* ACI 117 is the American Concrete Institute standard for concrete floors. F <sub>F</sub> is flatness, F <sub>L</sub> is the level. Higher F <sub>F</sub> numbers represent flatter floors. F <sub>F</sub> 25 is a fairly lenient specification.
	Traversable step	10 mm max.*	* For LD-250, the robot should traverse the 10mm step at 600 mm/s or slower for best performance of the laser and battery.
	Traversable gap	15 mm max.	
	Climb grade	Flat floor only (full payload)	
Navigation	Routing	Autonomous routing by localizing with safety scanning laser based on environment mapping	
	Environmental map making method	Scan by walking the mobile robot through the environment, and upload the scan data in the MobilePlanner	
Payload	Maximum Weight	250 kg	
Mobility	Maximum Speed	1200 mm/s	
	Maximum Rotation Speed	120°/s	
	Stop Position Repeatability	Basic: ±100 mm position Standard Target: ±25 mm position, ± 2° rotation	*±10 mm position, ±0.5° rotation with option, (High Accuracy Positioning System) ±8 mm position, ±1° rotation with option, (Cell Alignment Positioning System)
Drive wheel	Materials	Aluminum with polyurethane tread	
	Size	200 dia. × 50 mm nominal, 2 wheels	
Passive caster	Materials	Static dissipative	
	Size	127 dia. × 51 mm nominal, 4 casters	
Power	Battery	22-30 VDC	
	Capacity	72 Ah Battery cell nominal capacity	
	Run Time	13 hours (continuous) approx.	With no payload condition
	Recharge Time	4 hours (4:1 ratio) approx.	
	Battery Life Cycles	2,000 recharge cycles (battery cell nominal)	
	Charging Method	Automatic / manual	
	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 22-30 VDC, 4 A switched × 2 22-30 VDC, 10 A switched* 22-30 VDC, 10 A safe, switched*	5, 12, 20, and 22-30 VDC power can be provided to external devices * 10 A switched and 10 A safe, switched share the 10 A of current
Standard	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, ESD OEM	Note
		37222-□000□	
Safety Features	Safety Scanning Laser	1 at front Class 1 PLd safety per ISO13849-1 3 m maximum radius from laser for safety zones 40 m radius for general sensing 240° field of view	
	Emergency Stop	1 at operator panel, 1 on each side (3 total)	
	Rear Sensing	Time of flight (TOF) sensors	
	Low Front Laser	1 at front of platform Class 1 4 m maximum range 126° field of view	
	Side Laser	Option*	* 2 on sides of payload structure, user-mounted
	Indicators	Light disc in each side	
	Speaker	3.5 in., 80 W max.	
Operator Interface	Screen / Touch Panel	3.5 in. TFT 320 × 240 pixels, color screen	
	Button	On button: green Off button: red Brake-release button: orange Keyswitch (disabled off button)*	* Key switch can be used to disable the off button to avoid accidental shutdown or tampering.
User Interface	Wireless	802.11 a/b/g/n/ac	
	Ethernet Port	1 x user LAN, 1 x maintenance LAN, Auto-MDIX	
	Serial	RS-232 × 2	
	Digital I/O	16 inputs, 16 outputs	
	Analog I/O	8 inputs (0 to 30 V), 4 outputs (0-20 V)	
	Audio	Digital audio out, audio in / audio out	
Cart Latching	Latching Method	Not available	



**MobilePlanner Software**

Operating System	Windows 10 (32-bit/64-bit version)
CPU	1.5 GHz dual-core CPU recommended
Main Memory	1.5 GB min. (4 GB min. recommended)
Hard Disk	At least 200 MB of available space
Video Memory	256 MB min.
Display	XGA 1024 × 768, 16 million colors
Supported Languages	English, Japanese, German, French, Italian, Korean, Spanish, Simplified Chinese, Traditional Chinese

**EM2100 Appliance**

Part Numbers	20271-900 (Primary Fleet Manager) 20271-901 (Secondary Fleet Manager) 20271-903 (Bundle, Fleet Simulator)
Dimensions- W × D × H	430 × 495.3 × 43.7 mm
Weight	9.1 kg
Mounting method	1U rack mount in a standard 19-inch equipment rack
Power Supply	100-240 VAC (typical 100 W)
Power Consumption	200W max.
Operating Temperature	10 to 35 °C
Storage Temperature	-25 to 60 °C
Operating Humidity	8 to 90%, non-condensing
Storage Humidity	5 to 95%, non-condensing
Chassis protection class	IP20
CPU	Intel® Xeon® CPU
Main Memory	32 GB DDR3
Storage	60 GB SSD
Archive Storage	4 TB HDD
Communication port	10/100/1000 Ethernet × 4, USB × 4, VGA
Status Display	Multi-segment LCD

**High Accuracy Positioning System**

Part Number	13660-□00 (LD-60/90/105CT/130CT) 21374-□00 (LD-250)	
Sensor	Depth	30 mm
	Width	160 mm
	Rating	IP64
	Environment	-40 to 85 °C
	LEDs	Power, tape present, left marker, right marker
Magnetic Tape	Width	25 mm
	Orientation	South up
Markers (Magnetic Tape)	Width	25 mm
	Length	300 mm min. for 500 mm/s drive speed
	Orientation	North up
	Separation From Tape	15 - 30 mm
Connections	Front Sensor	RS232-1 (/dev/ttyUSB9) on the core
	Rear Sensor	RS232-2 (/dev/ttyUSB10) on the core
	Power, Both Sensors	Aux power using the included splitter cable

**Acuity Localization**

Part Number	13700-□00
Field of View	140°
Power Input	12 VDC (±10%) supplied from platform through power connector
Power Consumption	3.3 W maximum

**Cell Alignment Positioning System (CAPS)**

Part Number	20271-805
Type	Software license
Stop Position Accuracy	±8 mm position, ±1° rotation

**Touchscreen**

Part Number	13605-000
Touch Panel	PCAP touch sensor, black-bordered cover lens
TFT Display	TFT LCD panel, 18/24 bit RGB parallel interface, 7.0 in. WVGA - wide viewing angles, 5-touch
Backlight	Constant current LED supply
Power Input	5 VDC supplied through power connector
Power Consumption	6.5 W maximum

**Call/Door Box**

Part Number	13029-802
Dimensions- W × D × H	141.4 × 74.7 × 30 mm
Weight	190 g
Mounting method	Mount to the provided wall frame with four screws
Power Supply	12 VDC
Power Consumption	0.5 A, 6 W typical
WiFi	IEEE 802.11 a/b/g/n
Communication Port	Ethernet
I/O	Input × 2, output × 2 (30 VDC, 2 A max.)

**Battery**

Part Number	20452-000
Run Time (No Payload)	15 hours (continuous) approx. (LD-60/90) 13 hours (continuous) approx. (LD-250)
Weight	19 kg
Voltage	22-30 VDC
Capacity	72 Ah (battery cell nominal)
Recharge Time	4 hours approx.
Life Expectancy	2,000 times 80% DOD (battery cell nominal), 7 years, approx., 16 hrs/day, 5 days/wk 4 years, approx., 19/7 (full-time)

**Docking Station**

Part Number	12477-0□0
Current	8 A*1
Contacts	2
Power	100 to 240 VAC, 50 to 60 Hz
Power Consumption	800 W
Humidity	5 to 95 %, non-condensing
Temperature	5 to 40° C
Dimensions (W × D × H)	349 × 369 × 315 mm 495 × 495.5 × 317 mm (with floor plate)
Weight	8.2 kg
Mounting	Wall bracket, directly to floor, or on floor with floor plate
Indicators	Power on: blue Charging: yellow
Connector	For out-of-platform battery charging

\*1 Thermal fuse in AC power switch (10 A time-lag fuse at switch for legacy dock)

**Joystick**

Part Number	13558-000
Weight	0.55 kg
IP Rating	IP56

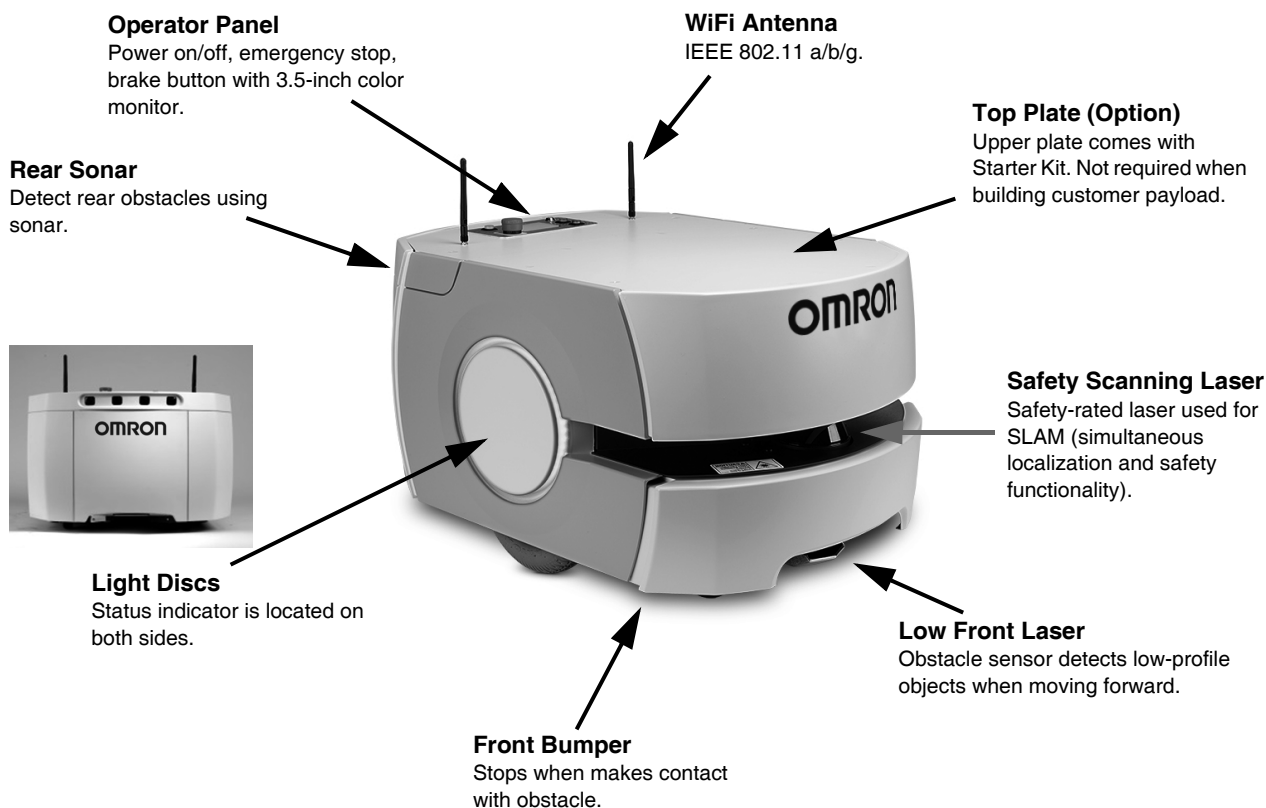
**Cart**

Part Number	75020-000
Dimensions (L × W × H)	592 × 846 × 480 mm
Weight	23 kg
Rating	ESP-rated
Passive Casters	2 front, 2 rear, spring-loaded
Caster Diameter	100 mm nominal
Caster Brakes	At 2 rear casters

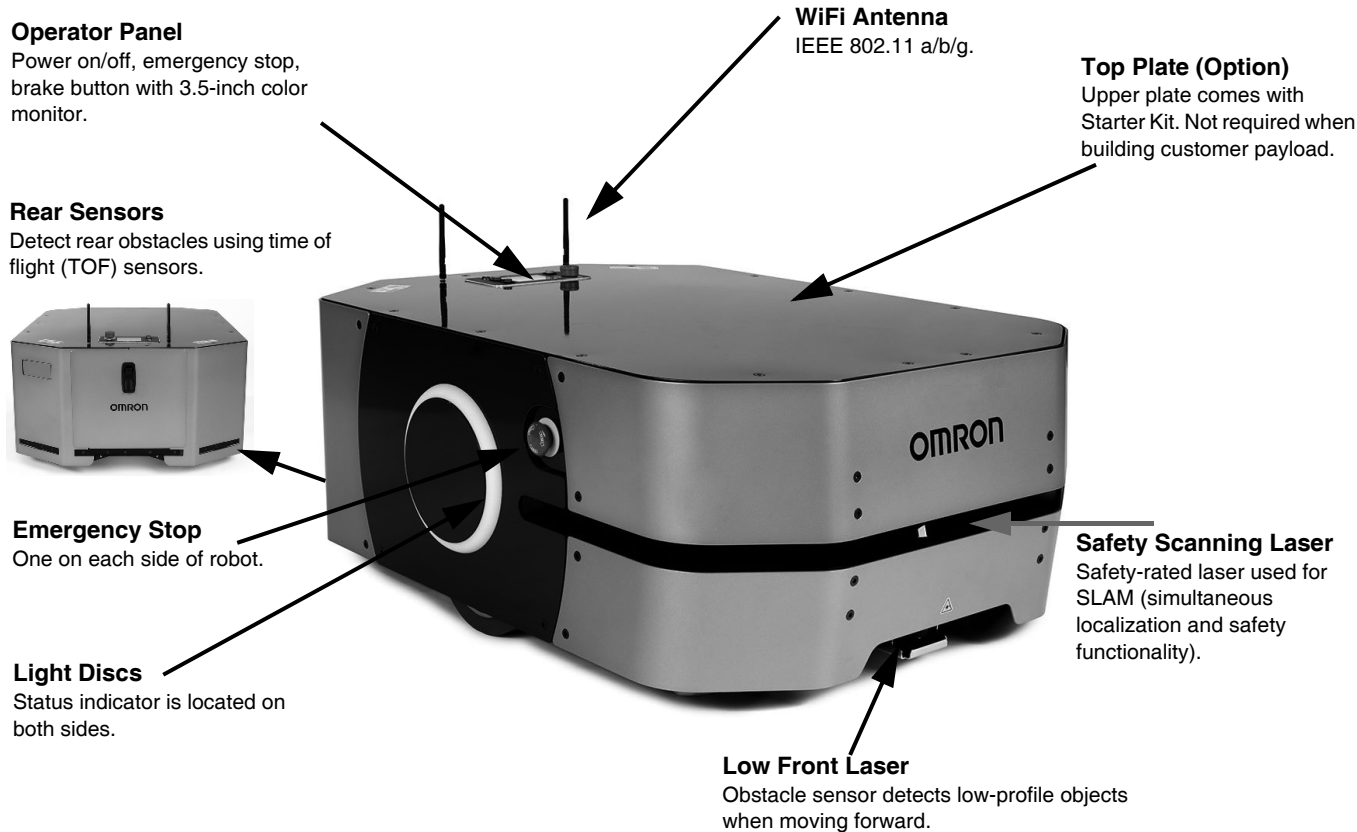
## LD Series

### Components and Functions

#### LD-60, LD-90, ESD OEM



#### LD-250, ESD OEM



## Components and Functions

### Cart Transporter

#### Operator Panel

- 7 in. color touchscreen (status, goal input)
- WiFi antenna × 2
- Emergency stop
- Power on/off
- Brake button
- Latch/unlatch buttons for cart
- Beacon
- Acuity localization (optional)



#### OEM

OEM with cart latching plate.

#### Rear Laser

Rear obstacle detection laser.

#### Side Laser

Vertical obstacle detection laser.

#### Cart

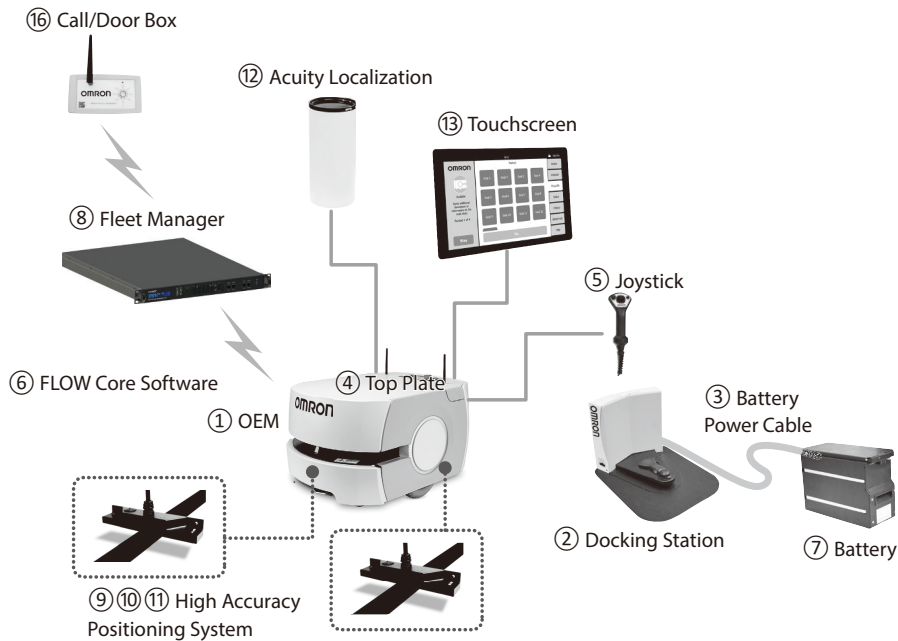
Automatically latch/unlatch cart with manual break. Latching/unlatching can be controlled by software.



# LD Series

## System Configuration

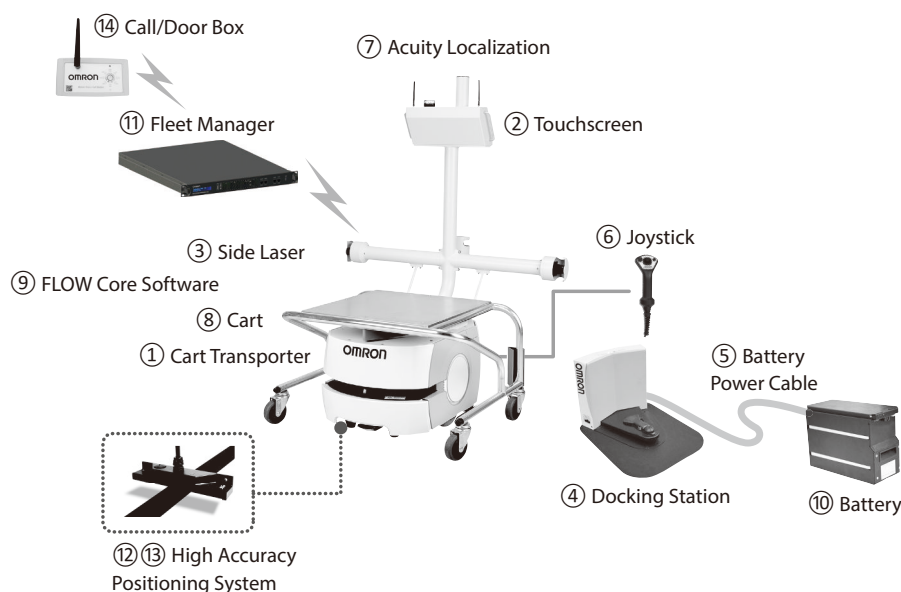
### OEM



	Product Name	Part Number	Description	Notes
①	OEM	37□□2-00000	A mobile robot OEM running OMRON's FLOW Core Software.	Included in docking station kit and starter kit
②	Docking Station	12477-000	A docking station to charge the battery installed in the mobile robot.	
③	Battery Power Cable	12676-000L	A cable to connect a battery and docking station to charge the battery outside of the mobile robot.	
④	Top Plate	12944-000 20458-002	A upper plate of the mobile robot OEM. It is not necessary for building customer payload.	Included in starter kit
⑤	Joystick	13558-000	Used for manually controlling the mobile robot.	
⑥	FLOW Core Software	Embedded	OMRON'S mobile solution operating software supporting navigation, safety, fleet management and advanced features.	
⑦	Battery	20452-000	A battery that is installed in the mobile robot.	-
⑧	Fleet Manager	20271-900	EM2100 appliance with FLOW Core software configured for mobile robot fleet management.	-
⑨	High Accuracy Positioning System (Single sensor)	13660-100 21374-100	A combination of sensor and magnetic tape to achieve accurate alignment during forward driving motion, when the sensor is attached to mobile robot and magnetic tape is on the floor.	-
⑩	High Accuracy Positioning System (Double sensor)	13660-000 21374-000	A combination of two sensors and magnetic tape to achieve accurate alignment during forward and backward driving motions, when the sensors are attached to mobile robot and magnetic tape is on the floor.	-
⑪	Magnetic Tape	14925-000	Magnetic tape for the High Accuracy Positioning System. The tape is applied to signal the mobile robot where to stop.	-
⑫	Acuity Localization	13700-000	Used where process layout or obstacle location changes often. Installed on a payload structure attached to the mobile robot.	-
⑬	Touchscreen	13605-000	Allows operators to check the status of the mobile robot, enter goals, and pause the mobile robot. Installed on a payload structure attached to the mobile robot.	-
⑭	Side Laser Bundle	13456-000	Used to detect obstacles that are at heights the safety scanning laser of the mobile robot cannot detect. Installed on a payload structure attached to the mobile robot.	-
⑮	Side Laser Kit	13456-100	Includes the above mentioned side laser, mounting kit, and metal enclosures.	-
⑯	Call/Door Box	13029-802	Used to issue a request for a mobile robot to go to the goal or to open a closed door, usually installed at location of use.	-
⑰	Breakout Cable	14165-000	A D-SUB44 pin cable for digital I/O interface of the mobile robot.	-

## System Configuration

### Cart Transporter



	Product Name	Part Number	Description	Notes
①	Cart Transporter	371□2-00000	A mobile robot cart transporter running OMRON's FLOW Core Software. The battery is not included.	Included in docking station kit and starter kit
②	Touchscreen	13605-000	Allows operators to check the status of the mobile robot, enter goals, and pause the mobile robot. Installed on a payload structure attached to the mobile robot.	
③	Side Laser	13456-000	Used to detect obstacles that are at heights the safety scanning laser of the mobile robot cannot detect. Installed on a payload structure attached to the mobile robot.	
④	Docking Station	12477-000	A docking station to charge the battery installed in the mobile robot.	
⑤	Battery Power Cable	12676-000L	A cable to connect a battery and docking station to charge the battery outside of the mobile robot.	
⑥	Joystick	13558-000	Used for manually controlling the mobile robot.	Included in starter kit
⑦	Acuity Localization	13700-000	Used where process layout or obstacle location changes often. Installed on a payload structure attached to the mobile robot.	
⑧	Cart	75020-000	A cart designed to work seamlessly with the mobile robot cart transporter.	
⑨	FLOW Core Software	Embedded	OMRON's mobile solution operating software supporting navigation, safety, fleet management and advanced features.	-
⑩	Battery	18578-000	A battery that is installed in the mobile robot.	-
⑪	Fleet Manager	20271-900	EM2100 appliance with FLOW Core software configured for mobile robot fleet management.	-
⑫	High Accuracy Positioning System (Single Sensor)	13660-100	A sensor and magnetic tape to achieve accurate alignment when the mobile robot follows driving forward. The sensors are attached to the mobile robot.	-
⑬	Magnetic Tape	14925-000	Magnetic tape for the High Accuracy Positioning System. The tape is applied to signal the mobile robot where to stop.	-
⑭	Call/Door Box	13029-802	Used to issue a request for a mobile robot to go to the goal or to open a closed door. Installed at the goal or door.	-
⑮	Breakout Cable	14165-000	A D-SUB44 pin cable for digital I/O interface of the mobile robot.	-

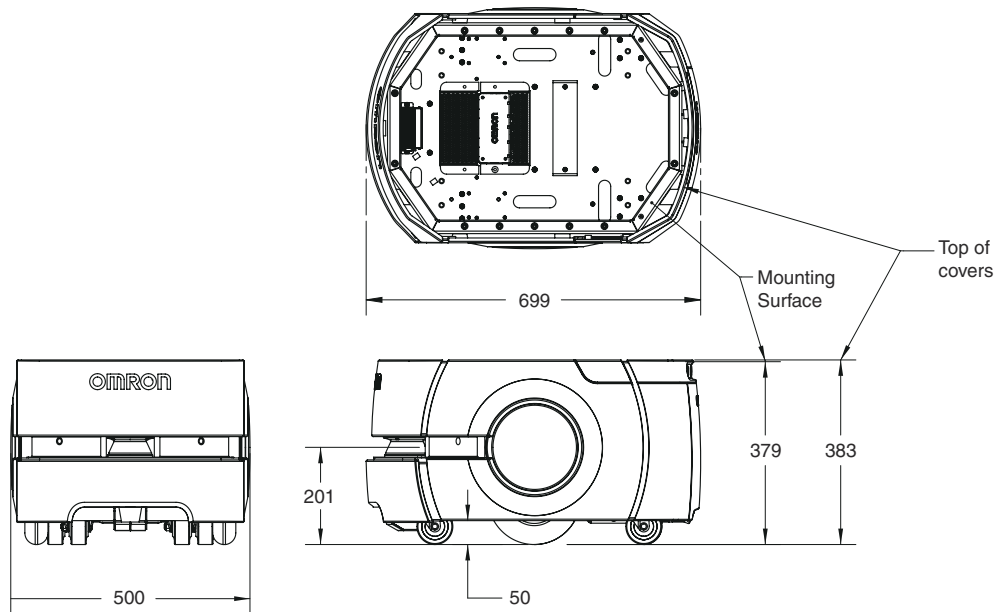
## LD Series

### Dimensions

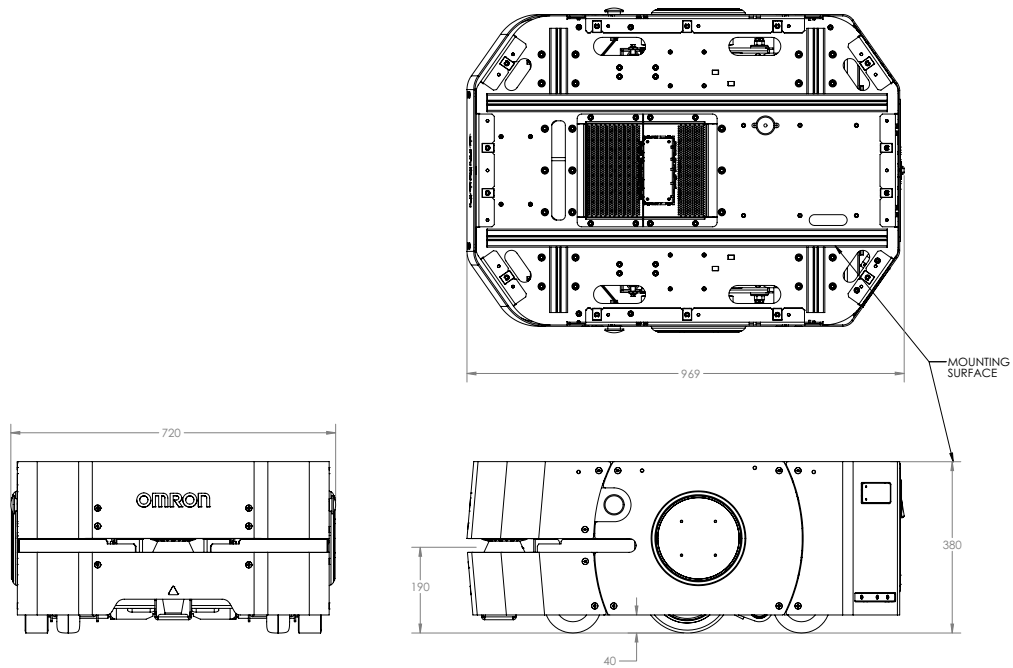
CAD data can be downloaded from Omron Adept Technologies Inc. website.  
<http://www.adept.com/Robots-CAD-File>

(Unit: mm)

#### Mobile Robots-LD Platform LD-60, LD-90, ESD OEM



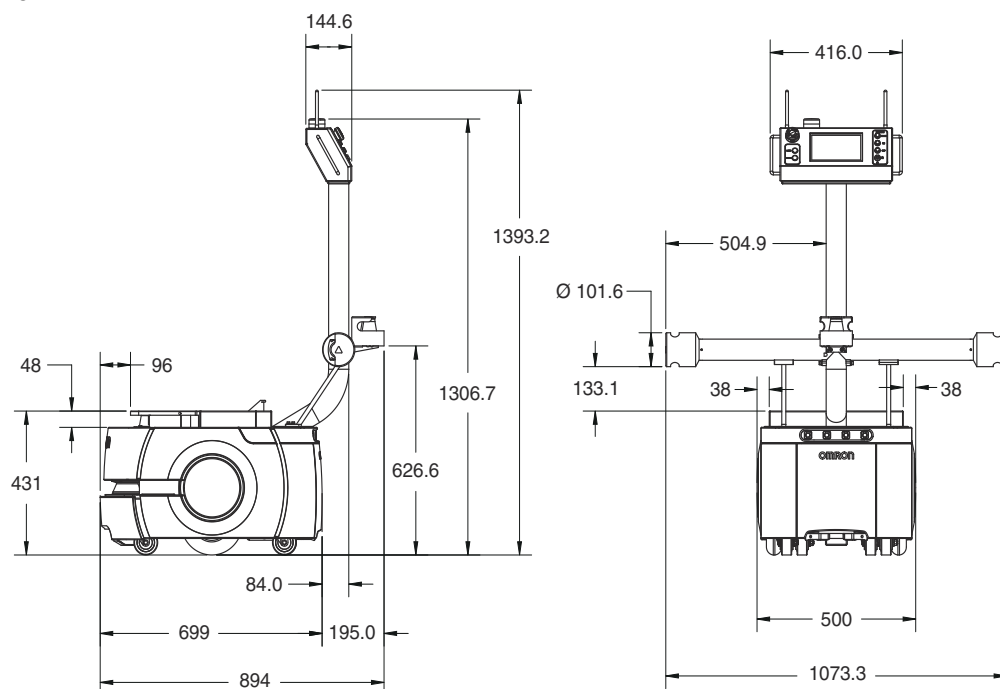
#### LD-250, ESD OEM



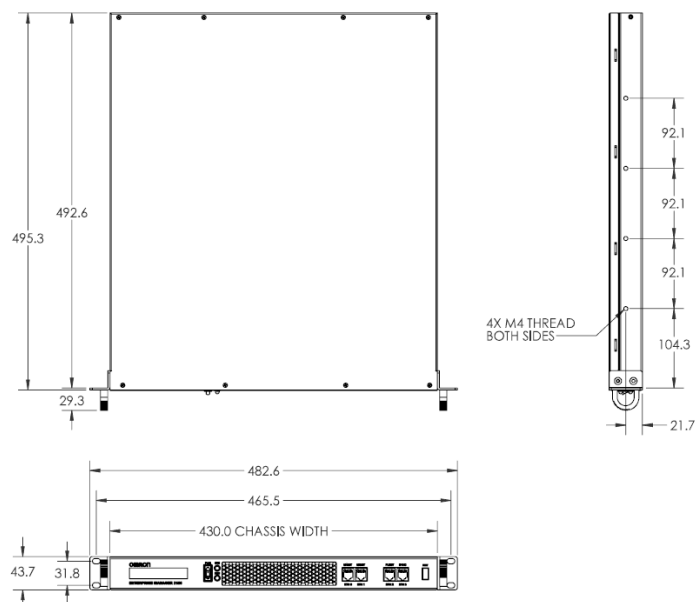
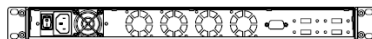
## Dimensions

(Unit: mm)

## Cart Transporter



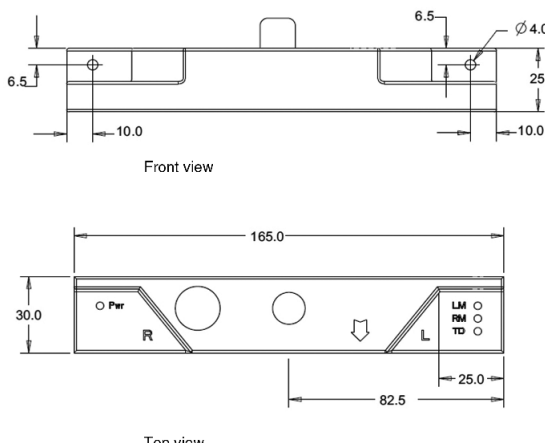
## Fleet Manager EM2100 Appliance



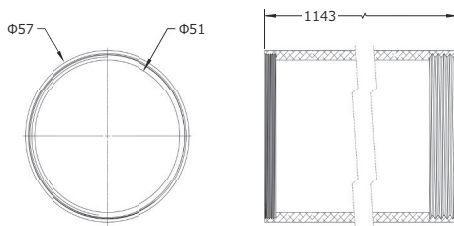
## Dimensions

(Unit: mm)

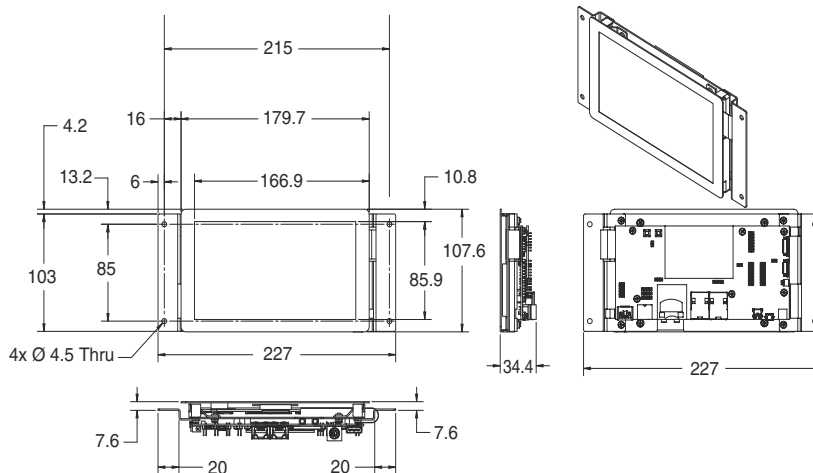
## High Accuracy Positioning System



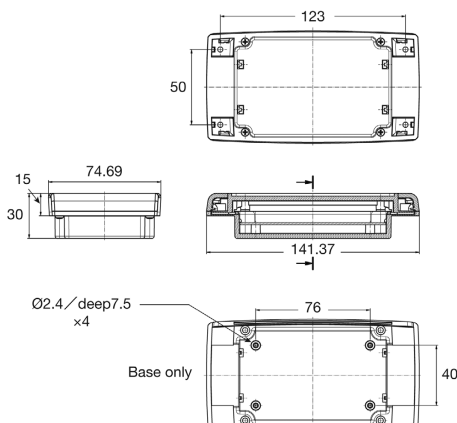
## Acuity Localization



## Touchscreen



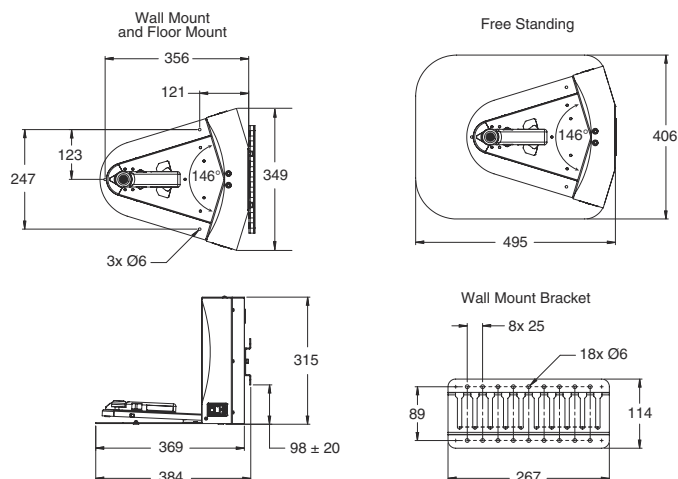
## Call/Door Box



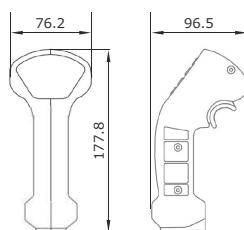


## Dimensions

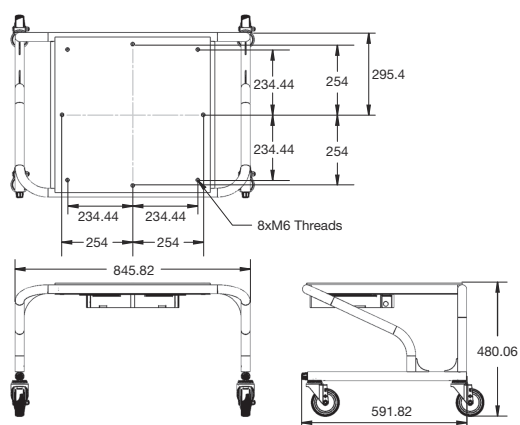
## Docking Station



## Joystick



## Cart



## LD Series



### Related Manuals

Manual No.	English Title
I611	Mobile Robots LD Platform User Guide
I612	Mobile Robots LD Cart Transporter User Guide
I613	Mobile Robots LD Platform Peripherals Guide
I614	Mobile Robots Software Suite User Guide
I615	Enterprise Manager User Guide
I616	Mobile Robot LD Safety Guide
I617	Advanced Robotics Command Language Reference Guide
I618	Advanced Robotics Command Language Enterprise Manager Integration Guide
I634	EM2100 Installation Guide
I635	Fleet Operations Workspace Core User Guide
I636	Fleet Operations Workspace Core Migration Guide
I637	Fleet Operation Workspace Core Integration Toolkit User Guide
I641	Fleet Simulator User's Guide
I642	LD-250 Platform User Guide

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## Ordering Information for Previous Generation Models (Planned Obsolescence in Future)

### Mobile Robots-LD Platform

Appearance	Product Type	Product Name	Maximum Load	Maximum Speed	Configuration & Attachment		Part Number
	OEM*	LD-60	60 kg	1.8 m/s	Standard	-	37031-00000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37031-00002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 12944-000	37031-10004
		LD-90	90 kg	1.35 m/s	Standard	-	37041-00000
					Docking station kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L	37041-00002
					Starter kit	Docking station : 12477-000 Battery power cable (0.45 m) : 12676-000L Joystick : 13558-000 Top plate : 12944-000	37041-10004
	Cart Transporter	LD-105CT	105 kg	1.35 m/s	Standard	Touchscreen :13605-000 Side laser :13456-000	37141-00010
					Docking station kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L	37141-00012
					Starter kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L Acuity localization :13700-000 Joystick :13558-000 Cart :75020-000	37141-01014
		LD-130CT	130 kg	0.9 m/s	Standard	Touchscreen :13605-000 Side laser :13456-000	37161-00010
					Docking station kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L	37161-00012
					Starter kit	Touchscreen :13605-000 Side laser :13456-000 Docking station :12477-050 Battery power cable (0.45 m) :12676-000L Acuity localization :13700-000 Joystick :13558-000 Cart :75020-000	37161-01014

\* Also available in ESD versions (built in accordance with the IEC 61340-5-1 standard).

### Legacy Fleet Management Solutions

Appearance	Product Name	Configuration & Attachment	Part Number
	MobilePlanner	Installer (USB)* License Dongle MSS 4.X compatible	13495-200

\* The latest version of MobilePlanner can be downloaded from the OMRON Robotics and Safety Technologies Inc. website.

[illegible]

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**CSM\_7\_1**

Cat. No. I828-E-09

0221(0117)

# Mobile Robots HD Series


## Autonomous Mobile Robots (AMRs) that self-navigate to transport heavy payloads

- Natural feature navigation:  
Automatically plans efficient routes and prevents collisions
- Fleet management:  
Operates in coordination with a fleet of up to 100 mobile robots
- Easy deployment:  
Installs quickly, without facility modifications






## Ordering Information

### Mobile Robots-HD Platform

Appearance	Product Name	Maximum Load	Maximum Speed	Configuration and Attachment		Part Number
	HD-1500	1500 kg	1800 mm/s	Mobile Robot, HD-1500, No Battery		37480-00000
				Mobile Robot, HD-1500, No Battery Single HAPS (Factory installed)	:37480-00000 :68925-010	37480-00100
				Mobile Robot, HD-1500, No Battery Double HAPS (Factory installed)	:37480-00000 :68925-020	37480-00200
				Mobile Robot, HD-1500, No Battery Side Lasers (Factory installed)	:37480-00000 :68945-010	37480-00010
				Mobile Robot, HD-1500, No Battery Single HAPS (Factory installed) Side Lasers (Factory installed)	:37480-00000 :68925-010 :68945-000	37480-00110
				Mobile Robot, HD-1500, No Battery Double HAPS (Factory installed) Side Lasers (Factory installed)	:37480-00000 :68925-020 :68945-000	37480-00210
				Starter Kit, Mobile Robot, HD-1500, No Battery Docking Station Pendant Top Plate (Factory installed)	:37480-00000 :68910-010 :68940-000L :68950-000	37480-10004
				Starter Kit, Mobile Robot, HD-1500, No Battery Docking Station Single HAPS (Factory installed) Pendant Top Plate (Factory installed)	:37480-00000 :68910-010 :68925-010 :68940-000L :68950-000	37480-10104
				Starter Kit, Mobile Robot, HD-1500, No Battery Docking Station Double HAPS (Factory installed) Pendant Top Plate (Factory installed)	:37480-00000 :68910-010 :68925-020 :68940-000L :68950-000	37480-10204
				Starter Kit, Mobile Robot, HD-1500, No Battery Docking Station Single HAPS (Factory installed) Pendant Top Plate (Factory installed) Side Lasers (Factory installed)	:37480-00000 :68910-010 :68925-010 :68940-000L :68950-000 :68945-000	37480-10114
				Starter Kit, Mobile Robot, HD-1500, No Battery Docking Station Double HAPS (Factory installed) Pendant Top Plate (Factory installed) Side Lasers (Factory installed)	:37480-00000 :68910-010 :68925-020 :68940-000L :68950-000 :68945-000	37480-10214
				Bundle, Mobile Robot, HD-1500, No Battery Docking Station	:37480-00000 :68910-010	37480-00002
				Battery for HD-1500		68330-000


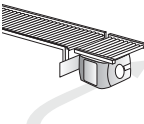
**Note:** To ensure proper fleet management, please contact an OMRON representative before ordering mobile robots to add to an existing fleet.

## Fleet Operations Workspace Solutions

Appearance	Product Name	Configuration & Attachment	Part Number
	Primary Fleet Operations Workspace (FLOW) Core License, 1 Year	Entitlement for a 1 year renewable Primary FLOW Core license per AMR	20271-800
	Primary Fleet Operations Workspace (FLOW) Core License, 5 Year	Entitlement for a 5 year renewable Primary FLOW Core license per AMR	20271-806
	Secondary Fleet Operations Workspace (FLOW) Core License, 1 Year	Entitlement for a 1 year renewable Secondary FLOW Core License per fleet	20271-802
	Secondary Fleet Operations Workspace (FLOW) Core License, 5 Year	Entitlement for a 5 year renewable Secondary FLOW Core License per fleet	20271-807
	Primary Fleet Manager	EM2100 Appliance with Temporary 120 Day Fleet Operations Workspace License	20271-900
	Secondary Fleet Manager	EM2100 Appliance with Temporary 120 Day Fleet Operations Workspace License	20271-901
	Bundle. Fleet Simulator	Package includes: Entitlement for perpetual Fleet Simulator License and EM2100 appliance	20271-903
	License, Fleet Simulator	Entitlement for perpetual Fleet Simulator license for existing EM2100 devices	20271-804







- \* 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.
- \* 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.
- \* After four consecutive 1 year renewals (for a total of 5 years) or after purchase of a 5 year license, all fleet management functions will continue to operate without requiring subsequent subscription renewals. Please note that an active subscription will still be required to have access to subsequent software releases, including bug fixes, feature upgrades and performance improvements.

## Options

Appearance	Product Name	Specification	Configuration & Attachment	Part Number
	High Accuracy Positioning System (HAPS)	Kit, Single sensor	Sensor × 1, mounting bracket × 1, power connector × 1, RS-232 connector × 1, 25 mm wide magnetic tape (south top side, 50 m roll)	68925-010
		Kit, Double sensor	Sensor × 2, mounting bracket × 2, power connector × 1, RS-232 connector × 2, 25 mm wide magnetic tape (south top side, 50 m roll)	68925-020
		Heavy Duty Magnetic tape	25 mm wide magnetic tape (south top side, 50 m roll)	14925-000
	Cell Alignment Positioning System (CAPS)	Software license	Software license activated on each AMR individually.	20271-805



## Accessories

Appearance	Product Name	Specification	Configuration & Attachment	Part Number
	Battery	For HD-1500 models	HD-1500 battery	68330-000
	Docking Station (Part number: 68910-010)	Both wall or floor mount	Power Supply	68310-000
			Charging Target	68910-000
	Pendant	Cable length: 0.6 to 3 m	Includes a 3-position enabling switch	68940-000L
	Top Plate	Top cover for HD-1500	Kit includes mounting hardware and a cover for the User Access Panel	68950-000
	Side Lasers	270 degree field of view, 8 m detection range.	Side lasers may be mounted in the standard location on the AMR, or moved to a custom location. The kit comes with brackets that may be used if the lasers are not mounted in the standard location.	68945-010

# HD Series

## Specifications

### Mobile Robots-HD Platform

Item		HD-1500	Note
Materials		Structural components are made from low carbon steel and cast aluminum, nonstructural parts are aluminum	
Dimension (L × W × H)		1696 x 1195 x 370 mm	
Weight (with Battery)		585 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	Direct sunlight may cause safety laser false positive
	IP rating	IP20	
Floor Conditions	Floor Requirements	concrete, eproxy floor (no water, no oil, no dirt)	
	Minimum floor flatness	F <sub>F</sub> 25 (ACI 117 standard)*	* ACI 117 is the American Concrete Institute standard for concrete floors.
	Traversable step	10 mm max.	Maximum speed of 500 mm/sec forward and 400 mm/sec backwards
	Traversable gap	15 mm max.	
	Climb grade	level floor only.	max. 3% incline
Navigation	Routing	Autonomous routing by localizing with safety scanning laser based on environment mapping	
	Environmental map making method	Scan by walking the mobile robot through the environment, and upload the scan data in the MobilePlanner	
Payload	Maximum Weight	1500 kg	
Mobility	Maximum Speed	1800 mm/s	
	Maximum Rotation Speed	60°/s	
	Stop Position Repeatability	± 50 mm position*	*±10 mm position, ±0.5° rotation with option, (High Accuracy Positioning System) ±8 mm position, ±1° rotation with option, (Cell Alignment Positioning System)
Drive wheels	Materials	Non-marking, static dissipative Polyurethane on steel rim.	
	Size	250 mm diameter x 80mm 2 wheels	
Passive casters	Materials	Non-marking Polyurethane on cast iron 200 mm diameter x 50mm, 4 casters, 2 wheels each (8 wheels total)	
Power	Voltage	42VDC - 57VDC (52.8 V Nominal)	
	Capacity	70 Ah Battery cell nominal capacity	
	Run Time	12.5 hours (unloaded), 9 hours (full load)	
	Recharge Time	23.33 minutes (20 - 80%) or 39 minutes (0 - 100%)	
	Battery Life Cycles	9000 recharge cycles (battery cell nominal)	
	Charging Method	Automatic / manual	
Standard	Harmonized Standard	EN ISO 12100, EN ISO 13849-1, EN 60204-1	
	Relevant Standard	EN 60204-1, ISO 10218, UL1564, UL2271, UL1740	
	Wireless	IEEE 802.11 a/b/g/n/ac	
Safety Features	Safety Scanning Lasers	(2) one at front right corner and one at back left corner for 360 degree of safety zones. Each laser has a 270 deg. field of view.	175 mm above floor 360°, 30 m range, Class 1, eye-safe PLd Safety per ISO 13849-1
	Emergency Stops	one at Operator Panel screen, four others on the side panels (2 on each side)	
	Low Lasers	(2) one at front -right and one at back-left. 180 degree field of view	
	Side Lasers	Optional	* 2 on sides of payload structure, factory mounted, user-adjustable
	Indicators	Light disks on each side, light strips on the front and back.	
	Speakers	(2) 3.5 in. speakers, (2) piezo buzzers	
Operator Panel	Display	7 in. diagonal LCD	
	Controls	Key switch*, pendant connector, and maintenance port, on, off, and brake-release buttons.	* Key switch can be used to disable the off button to avoid accidental shutdown or tampering
User Interface	Wireless	IEEE 802.11 a/b/g/n/ac	
	Ethernet Port	1 x maintenance LAN, 1 x user LAN, 2 x internal LAN	
	Digital I/O	8 inputs and outputs	
	Analog I/O	4 inputs and outputs	
	Audio	Digital audio out	

## Components and Functions

### MobilePlanner Software

Operating System	Windows 10 (32-bit/64-bit version)
CPU	1.5 GHz dual-core CPU recommended
Main Memory	1.5 GB min. (4 GB min. recommended)
Hard Disk	At least 200 MB of available space
Video Memory	256 MB min.
Display	XGA 1024 × 768, 16 million colors minimum
Supported Languages	English, German, Japanese, French, Italian, Korean, Spanish, Simplified Chinese and Traditional Chinese.

### EM2100 Appliance

Part Numbers	20271-900 (Primary Fleet Manager) 20271-901 (Secondary Fleet Manager) 20271-903 (Bundle, Fleet Simulator)
Dimensions- W × D × H	430 × 495.3 × 43.7 mm
Weight	9.1 kg
Mounting method	1U rack mount in a standard 19-inch equipment rack
Power Supply	100-240 VAC (typical 100 W)
Power Consumption	200W max.
Operating Temperature	10 to 35 °C
Storage Temperature	-25 to 60 °C
Operating Humidity	8 to 90%, non-condensing
Storage Humidity	5 to 95%, non-condensing
Chassis protection class	IP20
Main Memory	32 GB DDR3
Storage	60 GB SSD
Archive Storage	4 TB HDD
Communication port	10/100/1000 Ethernet × 4, USB × 4, VGA
Status Display	Multi-segment LCD

### High Accuracy Positioning System

Part Number	62925-010 and 62925-020	
Sensor	Depth	30 mm
	Width	165 mm
	Rating	IP64
	Environment	-40 to 85 °C
	LEDs	Power, tape present, left marker, right marker
Magnetic Tape	Width	25 mm
	Orientation	South up
Markers (Magnetic Tape)	Width	25 mm
	Length	300 mm min. for 500 mm/s drive speed
	Orientation	North up
	Separation From Tape	15 - 30 mm
Connections	Front Sensor	RS232-1
	Rear Sensor	RS232-2
	Power, Both Sensors	Aux power using the included splitter cable

### Cell Alignment Positioning System (CAPS)

Part Number	20271-805
Stop Position Accuracy	±8 mm position, ±1° rotation
Type	Software license

### Battery

Part Number	68330-000
Run Time (No Payload)	12.5 hours
Weight	68kg
Voltage	44 - 57VDC (52.8V Nominal)
Capacity	70Ah
Recharge Time	23.33 minutes (20 - 80%) or 39 minutes (0 - 100%)
Life Expectancy	9000 charge cycle 80% BOL capacity

### Docking Station

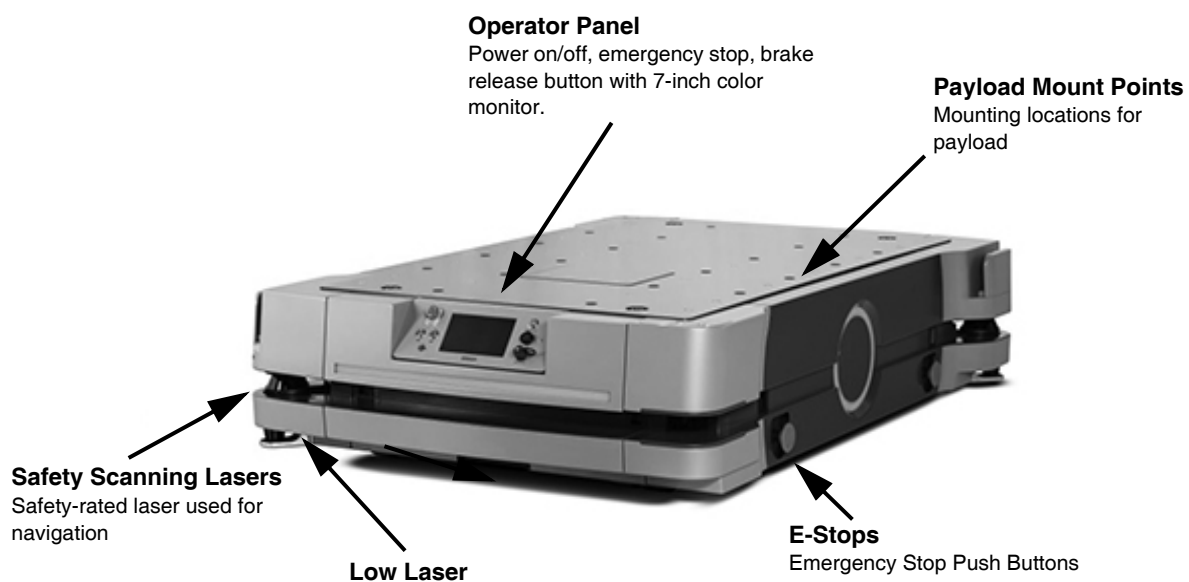
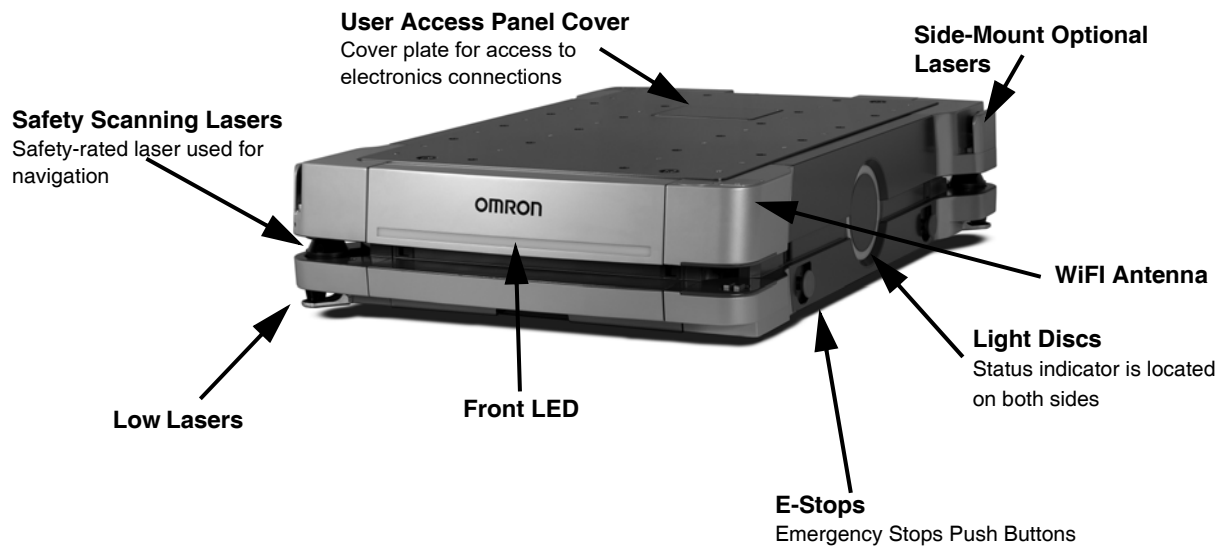
Part Number	68310-000 (power supply); 68910-000 (target)
Current	Input current: 23 A Output current: 120 A
Contacts	2
Power	200 - 240 VAC (Delta/Wye) 380 - 415 VAC (Wye only)
Power Consumption	7.3 kW
Humidity	5 to 95 %, non-condensing
Temperature	5 to 40° C
Dimensions (W × L × H)	Power supply: 610 x 333 x 1112 mm Charging target: 1256 x 503 x 297 mm
Weight	Power supply: 105 kg Charging target: 39 kg
Mounting	directly to floor and wall
Indicators	Power on: Blue Charging: Yellow Error: Red Operating: Green

### Pendant

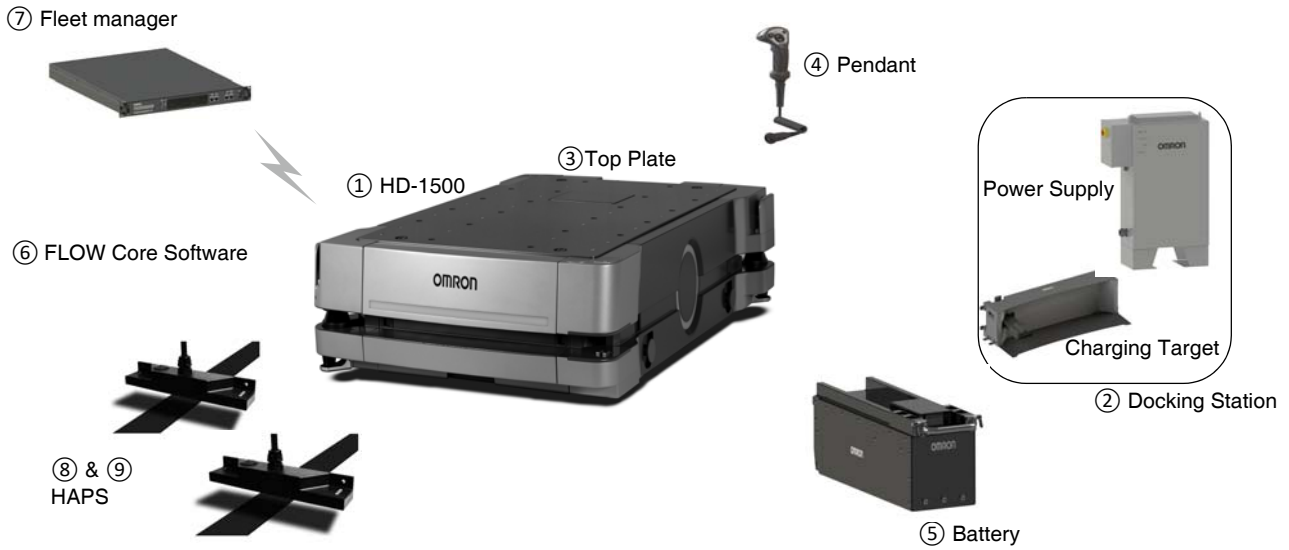
Part Number	68940-000L
Weight	0.55 kg
IP Rating	IP56

## HD Series

### HD-1500



# Accessories



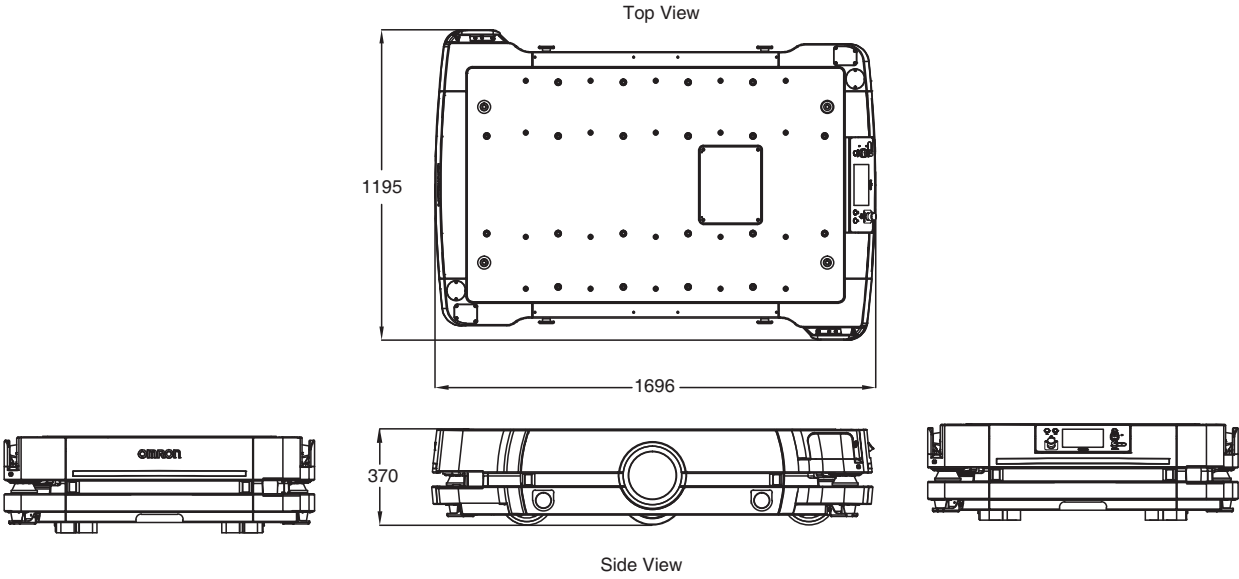
	Product Name	Part Number	Description	Notes
①	HD-1500	37480-00000	A mobile robot OEM running OMRON's FLOW Core Software. The battery is not included.	
②	Docking Station	68910-010	A docking station to charge the battery: Power supply: 68310-000 Charging target: 68910-000	Included in starter kit
③	Top Plate, HD-1500	68950-000	A upper plate of the mobile robot. It is not necessary for building customer payload.	
④	Pendant, HD-1500	68940-000L	Used for manually controlling the mobile robot.	
⑤	Battery, HD-1500	68330-000	A battery that is installed in the mobile robot.	-
⑥	FLOW Core Software	Embedded	OMRON'S mobile solution operating software supporting navigation, safety, fleet management and advanced features.	-
⑦	Fleet Manager	20271-900	EM2100 appliance with FLOW Core software configured for mobile robot fleet management.	-
⑧	High Accuracy Positioning System (Single sensor)	68925-010	A combination of sensor and magnetic tape to achieve accurate alignment during forward driving motion, when the sensor is attached to mobile robot and magnetic tape is on the floor.	Factory Installed (Not field installed)
⑨	High Accuracy Positioning System (Double sensor)	68925-020	A combination of two sensors and magnetic tape to achieve accurate alignment during forward and backward driving motions, when the sensors are attached to mobile robot and magnetic tape is on the floor.	Factory Installed (Not field installed)
⑩	Magnetic Tape	14925-000	Heavy duty magnetic tape for the High Accuracy Positioning System. The tape is applied to signal the mobile robot where to stop.	-
⑪	Side Laser Kit	68945-010	Includes side laser, mounting kit, and metal enclosures.	-

HD Series

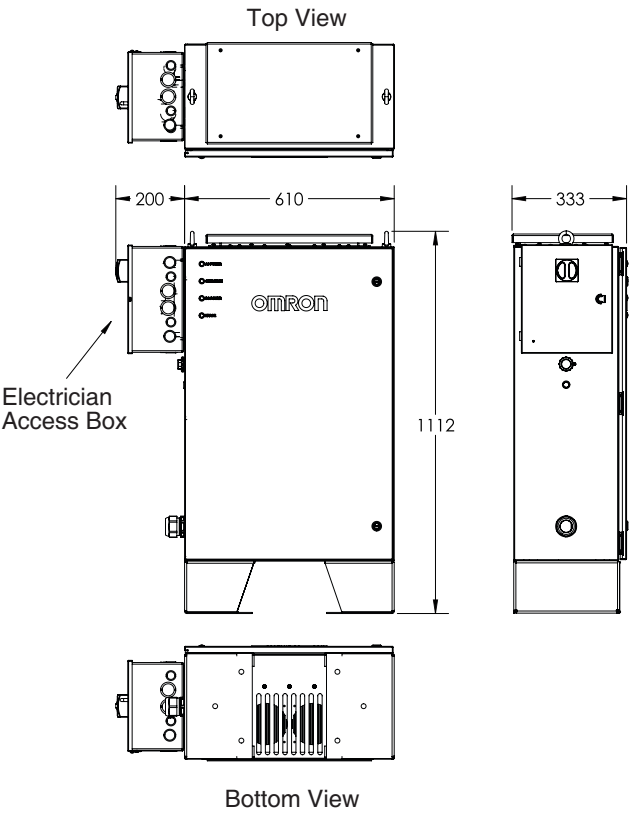
Dimensions

(Unit: mm)

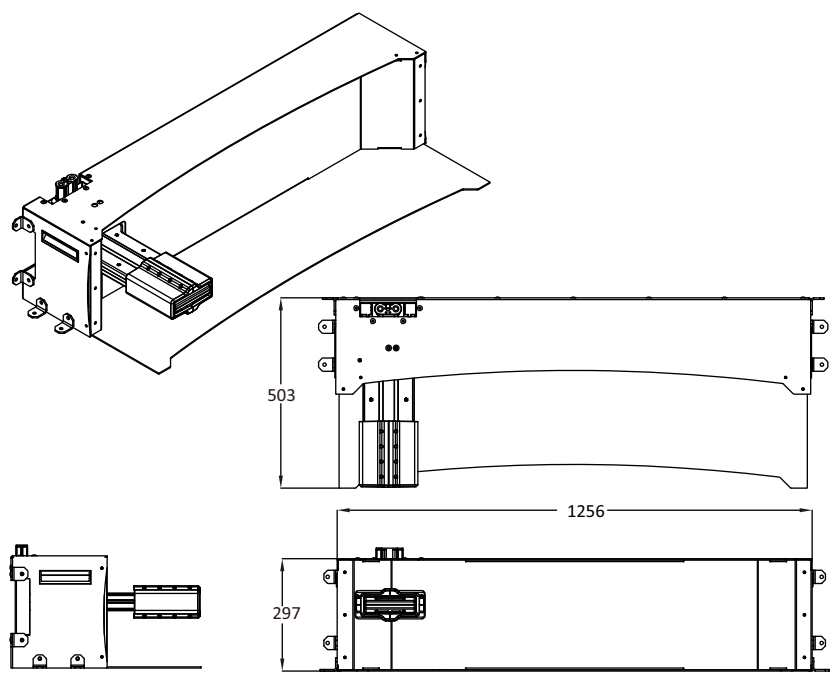
HD-1500 Mobile Robot



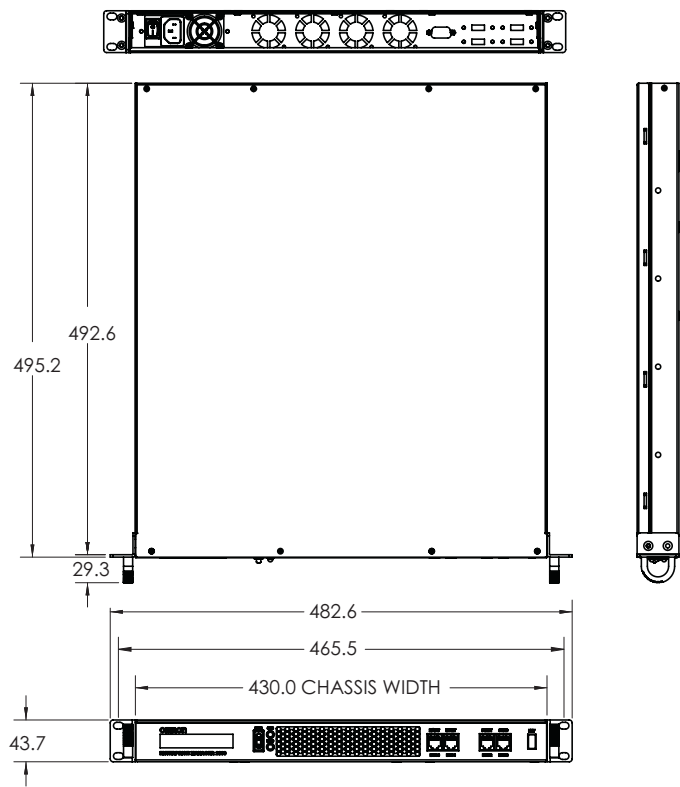
Power Supply Box



Docking Target

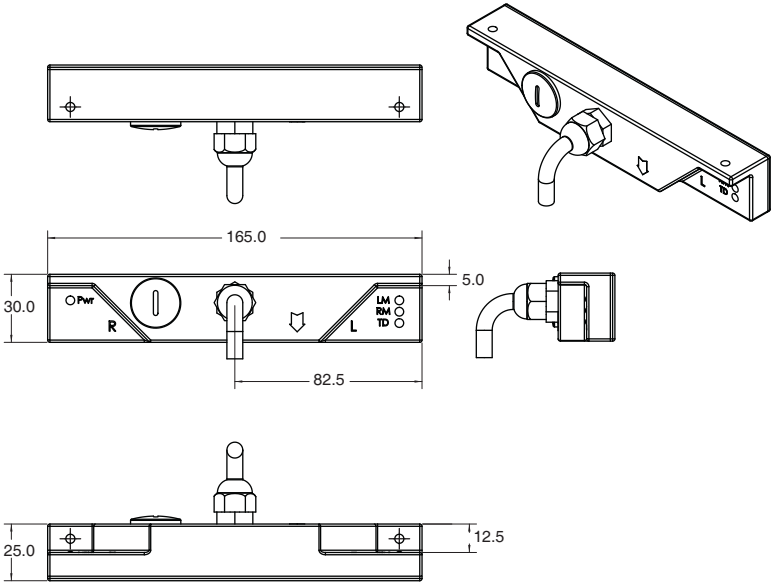


Fleet Manager EM2100 Appliance

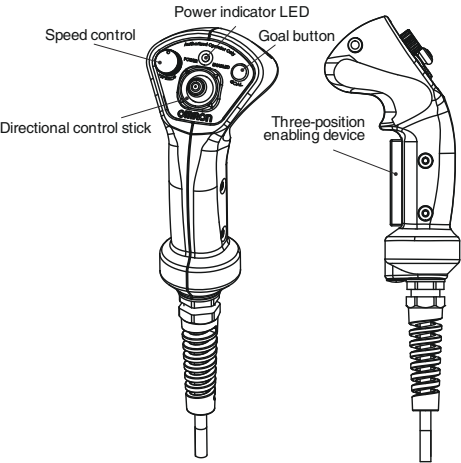


# HD Series

## High Accuracy Positioning System



## Pendant



# Related Manuals

Manual No.	English Title
I614	Mobile Robots Software Suite User Manual
I615	Enterprise Manager User Manual
I617	Advanced Robotics Command Language Reference Manual
I618	Advanced Robotics Command Language Enterprise Manager Integration Manual
I634	EM2100 Installation Manual
I635	Fleet Operations Workspace Core User Manual
I636	Fleet Operations Workspace Core Migration Manual
I637	Fleet Operation Workspace Core Integration Toolkit User Manual
I641	Fleet Simulator User's Manual
I645-E	HD-1500 User's Manual

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