# 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

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Product Type</th>
<th>Product Name</th>
<th>Maximum Load</th>
<th>Maximum Speed</th>
<th>Configuration &amp; Attachment</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEM</td>
<td>LD-60</td>
<td>60 kg</td>
<td>1.8 m/s</td>
<td></td>
<td>Docking station kit</td>
<td>37032-00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Docking station</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Battery power cable (0.45 m)</td>
<td></td>
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<td></td>
<td>Top plate</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Starter kit</td>
<td>37032-00002</td>
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<tr>
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<td></td>
<td>Docking station</td>
<td></td>
</tr>
<tr>
<td>ESID OEM</td>
<td>LD-90</td>
<td>90 kg</td>
<td>1.35 m/s</td>
<td></td>
<td>Docking station kit</td>
<td>37042-00000</td>
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<td></td>
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<td>Battery power cable (0.45 m)</td>
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<td></td>
<td>Top plate</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Starter kit</td>
<td>37042-00002</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Docking station</td>
<td></td>
</tr>
<tr>
<td>Cart Transporter</td>
<td>LD-105CT</td>
<td>105 kg</td>
<td>1.35 m/s</td>
<td></td>
<td>Docking station kit</td>
<td>37142-00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Docking station</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Battery power cable (0.45 m)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Top plate</td>
<td></td>
</tr>
</tbody>
</table>

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- **Docking station kit:**
  Docking station
- **Battery power cable (0.45 m):**
  Battery power cable (0.45 m)
- **Joystick:**
  Joystick
- **Top plate:**
  Top plate
- **Starter kit:**
  Docking station
  Battery power cable (0.45 m)
  Joystick
  Top plate
- **Touchscreen:**
  Touchscreen
  Side laser
- **Docking station:**
  Docking station
  Battery power cable (0.45 m)
  Acuity localization
  Joystick
  Cart

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**Part Numbers:**

- 37032-00000
- 37032-00002
- 37042-00000
- 37042-00002
- 37222-00000
- 37222-00002
- 37222-10004
- 37222-100004
- 37032-00004
- 37032-20000
- 37032-20002
- 37032-20004
- 37042-20000
- 37042-20002
- 37042-20004
- 37142-00010
- 37142-00012
- 37142-01014
For existing customer of mobile robots, please contact an OMRON representative prior to ordering additional mobile robots to ensure proper fleet management.

Note: Refer to page #14 for previous generation models.

Fleet Operations Workspace Solutions

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Product Name</th>
<th>Configuration &amp; Attachment</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Fleet Operations Workspace (FLOW) Core License, 1 Year</td>
<td>Entitlement for a 1 year renewable Primary FLOW Core license</td>
<td>20271-800</td>
<td></td>
</tr>
<tr>
<td>Primary Fleet Operations Workspace (FLOW) Core License, 5 Year</td>
<td>Entitlement for a 5 year renewable Primary FLOW Core license</td>
<td>20271-806</td>
<td></td>
</tr>
<tr>
<td>Secondary Fleet Operations Workspace (FLOW) Core License, 1 Year</td>
<td>Entitlement for a 1 year renewable Secondary FLOW Core License</td>
<td>20271-802</td>
<td></td>
</tr>
<tr>
<td>Secondary Fleet Operations Workspace (FLOW) Core License, 5 Year</td>
<td>Entitlement for a 5 year renewable Secondary FLOW Core License</td>
<td>20271-807</td>
<td></td>
</tr>
<tr>
<td>Primary Fleet Manager</td>
<td>EM2100 Appliance with Temporary 120 Day Fleet Operations Workspace License</td>
<td>20271-900</td>
<td></td>
</tr>
<tr>
<td>Secondary Fleet Manager</td>
<td>EM2100 Appliance with Temporary 120 Day Fleet Operations Workspace License</td>
<td>20271-901</td>
<td></td>
</tr>
</tbody>
</table>

* To obtain the latest version of the Fleet Operations Workspace (FLOW) Core software, contact your local OMRON representative.

* 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, all fleet management functions will continue to operate without requiring subsequent subscription renewals.

Options

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Product Name</th>
<th>Specification</th>
<th>Configuration &amp; Attachment</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Accuracy Positioning System (HAPS) - LD-60/ LD-90</td>
<td>Single sensor</td>
<td>Sensor ( \times 1 ), mounting bracket ( \times 1 ), power connector ( \times 1 ), RS-232 connector ( \times 1 ), 25 mm wide magnetic tape (south top side, 50 m roll)</td>
<td>13660-100</td>
<td></td>
</tr>
<tr>
<td>High Accuracy Positioning System (HAPS) - LD-250</td>
<td>Single sensor</td>
<td>Sensor ( \times 1 ), mounting bracket ( \times 1 ), power connector ( \times 1 ), RS-232 connector ( \times 1 ), 25 mm wide magnetic tape (south top side, 50 m roll)</td>
<td>21374-100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Double sensor</td>
<td>Sensor ( \times 2 ), mounting bracket ( \times 2 ), power connector ( \times 1 ), RS-232 connector ( \times 2 ), 25 mm wide magnetic tape (south top side, 50 m roll)</td>
<td>13660-000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Double sensor</td>
<td>Sensor ( \times 2 ), mounting bracket ( \times 2 ), power connector ( \times 1 ), RS-232 connector ( \times 2 ), 25 mm wide magnetic tape (south top side, 50 m roll)</td>
<td>21374-000</td>
<td></td>
</tr>
<tr>
<td>Cell Alignment Positioning System (CAPS)</td>
<td>Software license</td>
<td>Software license activated on each AMR individually. Upload to the AMR via SetNetGo</td>
<td>20271-805</td>
<td></td>
</tr>
<tr>
<td>Acuity Localization</td>
<td>-</td>
<td>Camera, mounting kit, cables, leveling kit</td>
<td>13700-000</td>
<td></td>
</tr>
</tbody>
</table>
### Accessories

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Product Name</th>
<th>Specification</th>
<th>Configuration &amp; Attachment</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Touchscreen</td>
<td>-</td>
<td>Touchscreen with bracket,</td>
<td>13605-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>power supply with bracket,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>power cable from core to</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>power supply (33 cm), power</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cable from power supply to</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>touchscreen (183 cm),</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Ethernet cable between</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>touchscreen and core (153 cm),</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>gasket between touchscreen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>and AIV mounting surface,</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>software package including</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>touchscreen support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Side Laser</td>
<td>Bundle</td>
<td>Laser × 2, cable × 1</td>
<td>13456-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kit</td>
<td>Laser × 2, Cable × 1,</td>
<td>13456-100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>mounting kit × 2, metal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cover × 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Call/Door Box</td>
<td>WiFi Wired</td>
<td>Call/door box, cable</td>
<td>13029-802</td>
</tr>
<tr>
<td>Battery - LD-60, LD-90</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>18578-000</td>
</tr>
<tr>
<td>Battery - LD-250</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20452-000</td>
</tr>
<tr>
<td>Docking Station</td>
<td>-</td>
<td>Extended Wall mount</td>
<td>Docking station, AC power cable</td>
<td>12477-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Docking station, AC power</td>
<td>12477-050</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cable, extended wall mount</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(for Cart Transporter)</td>
<td></td>
</tr>
<tr>
<td>Joystick</td>
<td>Cable length: 0.6 to 3 m</td>
<td>-</td>
<td>-</td>
<td>13558-000</td>
</tr>
<tr>
<td>Breakout Cable</td>
<td>-</td>
<td>DB44HD breakout cable (D-SUB44 pin cable for digital I/O interface)</td>
<td>-</td>
<td>14165-000</td>
</tr>
<tr>
<td>Top Plate - LD-60, LD-90</td>
<td>Top cover for OEM type</td>
<td>-</td>
<td>-</td>
<td>12944-000</td>
</tr>
<tr>
<td>Top Plate - LD-250</td>
<td>Top cover for OEM type</td>
<td>-</td>
<td>-</td>
<td>20458-002</td>
</tr>
<tr>
<td>Cart*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>75020-000</td>
</tr>
<tr>
<td>Battery Power Cable</td>
<td>Cable length: 0.45 m</td>
<td>-</td>
<td>-</td>
<td>12676-000L</td>
</tr>
</tbody>
</table>

* The cart only applies to LD-CT models.
# LD Series Specifications

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

<table>
<thead>
<tr>
<th>Item</th>
<th>LD-60, LD-90, ESD OEM</th>
<th>LD-60, LD-90, ESD OEM</th>
<th>LD-60, LD-90, ESD OEM</th>
<th>LD-60, LD-90, ESD OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
</tr>
<tr>
<td>Dimension (L × W × H)</td>
<td>699 × 500 × 383 mm</td>
<td>894 × 1074 × 1394 mm**</td>
<td>* Height includes WiFi antenna</td>
<td></td>
</tr>
<tr>
<td>Weight (with Battery)</td>
<td>62 kg</td>
<td>81 kg (Vehicle)/23 kg (Cart)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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
- Minimum floor flatness: Fr25 (ACI 117 standard)*
- Traversable step: 15 mm max.*
- 10 mm max.*1
- 5 mm max.*2
- 5 mm max.*2
- Traversable gap: 15 mm max.
- 15 mm max.
- 5 mm max.*2
- 5 mm max.*2
- 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*1
- 130 kg*1
- Excluding cart weight
- Maximum Speed: 1800 mm/s
- 1350 mm/s
- 1350 mm/s
- 900 mm/s
- Maximum Rotation Speed: 180°/s
- 180°/s
- 100°/s

### Mobility
- Stop Position Accuracy: ≤ 100 mm position*, ± 2° rotation
- ±10 mm position, ±5° rotation with option, (High Accuracy Positioning System)
- ±25 mm position, ±3° 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

### Battery
- 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 *x 2
- 22-30 VDC, 10 A switched, switched*2
- 22-30 VDC, 10 A safe, switched*3

### Standard
- Harmonized Standard: EN ISO 12100 / EN ISO 13849-1 / EN 60204-1
- Relevant Standard: EN 1525 / ANSI B56.5
- Wireless: IEEE 802.11 a/b/g
<table>
<thead>
<tr>
<th>Safety Features</th>
<th></th>
</tr>
</thead>
</table>
| **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 |
| **Indicators** | Light disc in each side  
Light disc in each side, beacon on HMI post |
| **Speaker** | 3.5 in., 80 W max. |

<table>
<thead>
<tr>
<th>Operator Interface</th>
<th></th>
</tr>
</thead>
</table>
| **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) * |
| **Wireless** | IEEE 802.11 a/b/g |
| **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 |

<table>
<thead>
<tr>
<th>User Interface</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wireless</strong></td>
<td>IEEE 802.11 a/b/g</td>
</tr>
<tr>
<td><strong>Ethernet Port</strong></td>
<td>1 x user LAN, 1 x maintenance LAN, Auto-MDIX</td>
</tr>
<tr>
<td><strong>Serial</strong></td>
<td>RS-232 × 2</td>
</tr>
<tr>
<td><strong>Digital I/O</strong></td>
<td>16 inputs, 16 outputs</td>
</tr>
<tr>
<td><strong>Analog I/O</strong></td>
<td>8 inputs (0 to 30 V), 4 outputs (0-20 V)</td>
</tr>
<tr>
<td><strong>Audio</strong></td>
<td>Digital audio out, audio in / audio out</td>
</tr>
</tbody>
</table>
| **Cart Latching** | Latching Method  
Not available  
Automatic |

**Mobile Robots-LD Platform**

**LD-250 OEM**

<table>
<thead>
<tr>
<th>Item</th>
<th>LD-250 OEM</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td><strong>Dimension (L × W × H)</strong></td>
<td>963 × 718 × 383 mm</td>
<td>* Height to top plate.</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>148kg (with battery), 129kg (without battery)</td>
<td></td>
</tr>
</tbody>
</table>

**Environment**

<table>
<thead>
<tr>
<th>Environment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>5 to 40 °C</td>
</tr>
<tr>
<td><strong>Ambient humidity</strong></td>
<td>5 to 95 % (non-condensing)</td>
</tr>
</tbody>
</table>
| **Operating Environment** | Indoor usage only, no excessive dust, no corrosive gas  
Direct sunlight may cause safety laser false positive |
| **IP rating** | IP20 |
| **Cleanroom rating** | None |
| **Floor Requirements** | Linoleum, epoxy, or concrete (no water, no oil, no dirt) |
| **Minimum floor flatness** | Fr-25 (ACI 117 standard)* |
| **Traversable step** | 10 mm max.* |
| **Traversable gap** | 15 mm max. |
| **Climb grade** | Flat floor only (full payload) |

**Floor Conditions**

**Navigation**

<table>
<thead>
<tr>
<th>Navigation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routing</strong></td>
<td>Autonomous routing by localizing with safety scanning laser based on environment mapping</td>
</tr>
<tr>
<td><strong>Environmental map making method</strong></td>
<td>Scan by walking the mobile robot through the environment, and upload the scan data in the MobilePlanner</td>
</tr>
</tbody>
</table>
### LD Series

<table>
<thead>
<tr>
<th>Payload</th>
<th>Maximum Weight</th>
<th>250 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>Maximum Speed</td>
<td>1.2 mm/s</td>
</tr>
<tr>
<td></td>
<td>Maximum Rotation Speed</td>
<td>120°/s</td>
</tr>
<tr>
<td></td>
<td>Stop Position Accuracy</td>
<td>± 100 mm position*, ± 2° rotation</td>
</tr>
<tr>
<td>Drive wheel</td>
<td>Materials</td>
<td>Aluminum with polyurethane tread</td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>200 dia. × 50 mm nominal, 2 wheels</td>
</tr>
<tr>
<td>Passive caster</td>
<td>Materials</td>
<td>Conductive solid polyurethane</td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>127 dia. × 51 mm nominal, 4 casters</td>
</tr>
<tr>
<td>Battery</td>
<td>Capacity</td>
<td>72 Ah Battery cell nominal capacity</td>
</tr>
<tr>
<td></td>
<td>Run Time</td>
<td>13 hours (continuous) approx.</td>
</tr>
<tr>
<td></td>
<td>Recharge Time</td>
<td>4 hours (5:1 ratio) approx.</td>
</tr>
<tr>
<td>Power</td>
<td>Battery Life Cycles</td>
<td>2,000 recharge cycles (battery cell nominal)</td>
</tr>
<tr>
<td></td>
<td>Charging Method</td>
<td>Automatic / manual</td>
</tr>
<tr>
<td></td>
<td>Auxiliary Power</td>
<td>5 VDC±5%, 1 A switched Aux power</td>
</tr>
<tr>
<td></td>
<td>12 VDC±5%, 1 A switched Aux power</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 VDC±5%, 1 A switched Aux power</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22-30 VDC, 4 A switched × 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22-30 VDC, 10 A switched*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22-30 VDC, 10 A safe, switched*</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>Harmonized Standard</td>
<td>EN ISO 12100 / EN ISO 13849-1 / EN 60204-1</td>
</tr>
<tr>
<td></td>
<td>Relevant Standard</td>
<td>EN 1525 / ANSI B56.5</td>
</tr>
<tr>
<td></td>
<td>Wireless</td>
<td>IEEE 802.11 a/b/g</td>
</tr>
<tr>
<td>Safety Features</td>
<td>Safety Scanning Laser</td>
<td>1 at front</td>
</tr>
<tr>
<td></td>
<td>Class 1</td>
<td>PLdt safety per ISO13849-1</td>
</tr>
<tr>
<td></td>
<td>3 m maximum radius from laser for safety zones</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 m radius for general sensing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>240° field of view</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emergency Stop</td>
<td>1 at operator panel, 1 on each side (3 total)</td>
</tr>
<tr>
<td></td>
<td>Rear Sensing</td>
<td>Time of flight (TOF) sensors</td>
</tr>
<tr>
<td></td>
<td>Low Front Laser</td>
<td>1 at front of platform</td>
</tr>
<tr>
<td></td>
<td>Class 1</td>
<td>4 m maximum range</td>
</tr>
<tr>
<td></td>
<td>126° field of view</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Side Laser</td>
<td>Option*</td>
</tr>
<tr>
<td></td>
<td>Indicators</td>
<td>Light disc in each side</td>
</tr>
<tr>
<td></td>
<td>Speaker</td>
<td>3.5 in., 80 W max.</td>
</tr>
<tr>
<td>Operator Interface</td>
<td>Screen / Touch Panel</td>
<td>3.5 in. TFT 320 × 240 pixels, color screen</td>
</tr>
<tr>
<td></td>
<td>Button</td>
<td>On button: green</td>
</tr>
<tr>
<td></td>
<td>Off button: red</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brake-release button: orange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Key switch (disabled off button)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>User Interface</td>
<td>Wireless</td>
</tr>
<tr>
<td></td>
<td>Ethernet Port</td>
<td>1 x user LAN, 1 x maintenance LAN, Auto-MDIX</td>
</tr>
<tr>
<td></td>
<td>Serial</td>
<td>RS-232 × 2</td>
</tr>
<tr>
<td></td>
<td>Digital I/O</td>
<td>16 inputs, 16 outputs</td>
</tr>
<tr>
<td></td>
<td>Analog I/O</td>
<td>8 inputs (0 to 30 V), 4 outputs (0-20 V)</td>
</tr>
<tr>
<td></td>
<td>Audio</td>
<td>Digital audio out, audio in / audio out</td>
</tr>
<tr>
<td>Cart Latching</td>
<td>Latching Method</td>
<td>Not available</td>
</tr>
</tbody>
</table>
### 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**: Japanese, English, German

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

### High Accuracy Positioning System
- **Part Number**: 13660-000 (LD-60/90CT/130CT), 21374-000 (LD-250)

### Touchscreen
- **Part Number**: 13605-000
- **TFT 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**: 18578-000 (LD-60/90/105CT/130CT), 20452-000 (LD-250)
- **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**: 12477-00 (LD-60/90CT/130CT)
- **Current**: 8 A*2
- **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 (with floor plate) or 495 × 495.5 × 317 mm (w/o 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
  *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

Operator Panel
Power on/off, emergency stop, brake button with 3.5-inch color monitor.

Rear Sonar
Detect rear obstacles using sonar.

Light Discs
Status indicator is located on both sides.

Front Bumper
Stops when makes contact with obstacle.

Low Front Laser
Obstacle sensor detects low-profile objects when moving forward.

Safety Scanning Laser
Safety-rated laser used for SLAM (simultaneous localization and safety functionality).

WiFi Antenna
IEEE 802.11 a/b/g.

Top Plate (Option)
Upper plate comes with Starter Kit. Not required when building customer payload.

LD-250 OEM

Operator Panel
Power on/off, emergency stop, brake button with 3.5-inch color monitor.

Rear Sensors
Detect rear obstacles using time of flight (TOF) sensors.

Emergency Stop
One on each side of robot.

Light Discs
Status indicator is located on both sides.

Low Front Laser
Obstacle sensor detects low-profile objects when moving forward.

Safety Scanning Laser
Safety-rated laser used for SLAM (simultaneous localization and safety functionality).
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)

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.

OEM
OEM with cart latching plate.
# LD Series

## System Configuration

**OEM**

![Diagram of mobile robot components]

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Part Number</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEM</td>
<td>37:2-00000</td>
<td>A mobile robot OEM running OMRON's FLOW Core Software. The battery is not included.</td>
<td>Included in docking station kit and starter kit</td>
</tr>
<tr>
<td>Docking Station</td>
<td>12477-000</td>
<td>A docking station to charge the battery installed in the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>Battery Power Cable</td>
<td>12676-000L</td>
<td>A cable to connect a battery and docking station to charge the battery outside of the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>Top Plate</td>
<td>12044-000 / 20458-002</td>
<td>A upper plate of the mobile robot OEM. It is not necessary for building customer payload.</td>
<td>Included in starter kit</td>
</tr>
<tr>
<td>Joystick</td>
<td>13558-000</td>
<td>Used for manually controlling the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>FLOW Core Software</td>
<td>Embedded</td>
<td>OMRON'S mobile solution operating software supporting navigation, safety, fleet management and advanced features.</td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>18578-000 / 20452-000</td>
<td>A battery that is installed in the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>Fleet Manager</td>
<td>20271-900</td>
<td>EM2100 appliance with FLOW Core software configured for mobile robot fleet management.</td>
<td></td>
</tr>
<tr>
<td>High Accuracy Positioning System (Single sensor)</td>
<td>13660-100 / 21374-100</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>High Accuracy Positioning System (Double sensor)</td>
<td>13660-000 / 21374-000</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Magnetic Tape</td>
<td>14925-000</td>
<td>Magnetic tape for the High Accuracy Positioning System. The tape is applied to signal the mobile robot where to stop.</td>
<td></td>
</tr>
<tr>
<td>Acuity Localization</td>
<td>13700-000</td>
<td>Used where process layout or obstacle location changes often. Installed on a payload structure attached to the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>Touchscreen</td>
<td>13605-000</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Side Laser Bundle</td>
<td>13456-000</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Side Laser Kit</td>
<td>13456-100</td>
<td>Includes the above mentioned side laser, mounting kit, and metal enclosures.</td>
<td></td>
</tr>
<tr>
<td>Call/Door Box</td>
<td>13029-802</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Breakout Cable</td>
<td>14165-000</td>
<td>A D-SUB44 pin cable for digital I/O interface of the mobile robot.</td>
<td></td>
</tr>
</tbody>
</table>
## System Configuration

### Cart Transporter

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Part Number</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cart Transporter</td>
<td>371-2-00000</td>
<td>A mobile robot cart transporter running OMRON's FLOW Core Software. The battery is not included.</td>
<td></td>
</tr>
<tr>
<td>Touchscreen</td>
<td>13605-000</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Side Laser</td>
<td>13456-000</td>
<td>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.</td>
<td>Included in docking station kit and starter kit</td>
</tr>
<tr>
<td>Docking Station</td>
<td>12477-000</td>
<td>A docking station to charge the battery installed in the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>Battery Power Cable</td>
<td>12676-000L</td>
<td>A cable to connect a battery and docking station to charge the battery outside of the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>Joystick</td>
<td>13558-000</td>
<td>Used for manually controlling the mobile robot.</td>
<td></td>
</tr>
<tr>
<td>Acuity Localization</td>
<td>13700-000</td>
<td>Used where process layout or obstacle location changes often. Installed on a payload structure attached to the mobile robot.</td>
<td>Included in starter kit</td>
</tr>
<tr>
<td>Cart</td>
<td>75020-000</td>
<td>A cart designed to work seamlessly with the mobile robot cart transporter.</td>
<td></td>
</tr>
<tr>
<td>FLOW Core Software</td>
<td>Embedded</td>
<td>OMRON’s mobile solution operating software supporting navigation, safety, fleet management and advanced features.</td>
<td>-</td>
</tr>
<tr>
<td>Battery</td>
<td>18578-000</td>
<td>A battery that is installed in the mobile robot.</td>
<td>-</td>
</tr>
<tr>
<td>Fleet Manager</td>
<td>20271-900</td>
<td>EM2100 appliance with FLOW Core software configured for mobile robot fleet management.</td>
<td>-</td>
</tr>
<tr>
<td>High Accuracy Positioning System</td>
<td>13660-100</td>
<td>A sensor and magnetic tape to achieve accurate alignment when the mobile robot follows driving forward. The sensors are attached to the mobile robot.</td>
<td>-</td>
</tr>
<tr>
<td>Magnetic Tape</td>
<td>14925-000</td>
<td>Magnetic tape for the High Accuracy Positioning System. The tape is applied to signal the mobile robot where to stop.</td>
<td>-</td>
</tr>
<tr>
<td>Call/Door Box</td>
<td>13029-802</td>
<td>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.</td>
<td>-</td>
</tr>
<tr>
<td>Breakout Cable</td>
<td>14165-000</td>
<td>A D-SUB44 pin cable for digital I/O interface of the mobile robot.</td>
<td>-</td>
</tr>
</tbody>
</table>
LD Series
Dimensions

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

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

(Unit: mm)

LD-250 OEM
Dimensions

Cart Transporter

Fleet Manager EM2100 Appliance
LD Series
Dimensions
(Unit: mm)
High Accuracy Positioning System

Acuity Localization

Touchscreen

Call/Door Box
Dimensions

Docking Station

Wall Mount and Floor Mount

Free Standing

Wall Mount Bracket

Joystick

Cart

Dimensions

Docking Station

Wall Mount and Floor Mount

Free Standing

Wall Mount Bracket

Joystick

Cart

Dimensions
# LD Series

## Related Manuals

<table>
<thead>
<tr>
<th>Manual No.</th>
<th>English Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>I611</td>
<td>Mobile Robots LD Platform User Guide</td>
</tr>
<tr>
<td>I612</td>
<td>Mobile Robots LD Cart Transporter User Guide</td>
</tr>
<tr>
<td>I613</td>
<td>Mobile Robots LD Platform Peripherals Guide</td>
</tr>
<tr>
<td>I614</td>
<td>Mobile Robots Software Suite User Guide</td>
</tr>
<tr>
<td>I615</td>
<td>Enterprise Manager User Guide</td>
</tr>
<tr>
<td>I616</td>
<td>Mobile Robot LD Safety Guide</td>
</tr>
<tr>
<td>I617</td>
<td>Advanced Robotics Command Language Reference Guide</td>
</tr>
<tr>
<td>I618</td>
<td>Advanced Robotics Command Language Enterprise Manager Integration Guide</td>
</tr>
<tr>
<td>I634</td>
<td>EM2100 Installation Guide</td>
</tr>
<tr>
<td>I635</td>
<td>Fleet Operations Workspace Core User Guide</td>
</tr>
<tr>
<td>I636</td>
<td>Fleet Operations Workspace Core Migration Guide</td>
</tr>
<tr>
<td>I637</td>
<td>Fleet Operation Workspace Core Integration Toolkit User Guide</td>
</tr>
<tr>
<td>I642</td>
<td>LD-250 Platform User Guide</td>
</tr>
</tbody>
</table>

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

Mobile Robots-LD Platform

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Product Type</th>
<th>Product Name</th>
<th>Maximum Load</th>
<th>Maximum Speed</th>
<th>Configuration &amp; Attachment</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OEM</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD-60</td>
<td>OEM</td>
<td>60 kg</td>
<td>1.8 m/s</td>
<td></td>
<td>Standard</td>
<td>37031-00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Docking station</td>
<td>12477-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Battery power cable (0.45 m)</td>
<td>12676-0000L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Starter kit</td>
<td>12477-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Battery power cable (0.45 m)</td>
<td>12676-0000L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Joystick</td>
<td>13558-000</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td>Top plate</td>
<td>12944-000</td>
</tr>
<tr>
<td>LD-90</td>
<td>OEM</td>
<td>90 kg</td>
<td>1.35 m/s</td>
<td></td>
<td>Standard</td>
<td>37041-00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Docking station</td>
<td>12477-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Battery power cable (0.45 m)</td>
<td>12676-0000L</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>Starter kit</td>
<td>12477-000</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Battery power cable (0.45 m)</td>
<td>12676-0000L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Joystick</td>
<td>13558-000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Top plate</td>
<td>12944-000</td>
</tr>
<tr>
<td>LD-105CT</td>
<td>Cart</td>
<td>105 kg</td>
<td>1.35 m/s</td>
<td></td>
<td>Standard</td>
<td>37141-00010</td>
</tr>
<tr>
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* Also available in ESD versions (built in accordance with the IEC 61340-5-1 standard).

Legacy Fleet Management Solutions

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* The latest version of MobilePlanner can be downloaded from the OMRON Robotics and Safety Technologies Inc. website. https://robotics.omron.com
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