## TIAGo

**A versatile and scalable mobile manipulator with integrated perception and AI capabilities**

**FACT SHEET**

**PAL Robotics S.L.**

<table>
<thead>
<tr>
<th>Price</th>
<th>Starting at 48,000 €</th>
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<tbody>
<tr>
<td>Geographic availability</td>
<td>Europe, Asia, Japan, US, Latin America</td>
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### Hardware configuration
- 2x 20 Ah 36 V battery packs (8-10h autonomy)
- Charging at 100-240 VAC with external charger (40.8 V 8 A) connected to:
  - Manual plug on the robot
  - Dock Station (automatic charging)
- Expansion ports:
  - 2x USB
  - 2x GigE
  - 1x 12 V 5 A power supply
  - CAN Service port

### Sensors
- Laser rangefinder 5.6 / 10 / 25 m range
- 6 DoF IMU in the base
- Sensor currents at each arm and gripper joints
- ATI mini45 6-axis Force/Torque sensor on the wrist
- Endoscopic camera on gripper
- Orbbec Astra / Astra S / Astra Pro in head

### Low-level interface
- API language(s): ROS API (C++, Python)
- Interface frequency: 100 Hz
- Command level:
  - Position / Velocity / Torque
  - Joint space / Cartesian space
- Robot state: q, dq, effort (current consumption), temperature
- Model available at 100 Hz (computed by RBDL from URDF)
- Gripper commands: position, max current
- Gripper state: aperture, current consumption, temperature
- Gripper access frequency: 100 Hz
- Hardware connectivity:
  - Ethernet
  - Wi-Fi
- Protocol: TCP/IP
- Minimum requirements external computer:
  - Any computer ready to run Ubuntu 16.04 + ROS Kinetic
  - NVIDIA GPU recommended for graphical visualization purposes