

Pioneer Manipulator



The **Pioneer Manipulator** is an integrated mobile manipulation robot based on Adept MobileRobots' Pioneer LX research AIV (Autonomous Intelligent Vehicle). Designed to last for years of continuous service and equipped with our proprietary mapping and autonomous navigation software, the Pioneer LX provides an excellent building block for a mobile manipulation platform. Using laser and sonar sensors the Pioneer Manipulator will map and navigate with unrivaled sophistication.

We've integrated our LX base with a pair of manipulation arms from Kinova that are also aimed at research applications. These manipulators are mounted to a custom designed torso with two different mounting points to allow for a higher or lower overall reach depending on your needs. At the top of the torso the Kinect for Windows V2 RGB-D Sensor is mounted on a pan/tilt stage allowing for continuous coverage of the workspace while the arms are mounted in either configuration. The manipulators are light, compact, and

power efficient making them the perfect fit for integration into a mobile base. With plug and play functionality and a free SDK to get your projects moving right away, these arms are also a perfect fit for your research application needs.

The Pioneer Manipulator is a rugged, reliable, sophisticated robot that is purpose built for the research community and its needs. Designed to be extensively capable "out of the box" in a broad array of applications, the Pioneer Manipulator is sure to immediately enhance your new or existing program.

Product Features and Benefits

Reliable – The Pioneer Manipulator's mobile base is designed for continuous duty and comes with a docking station that the robot will navigate to autonomously when charging is needed. Typical run time between charging is 6-1/2 hours with all components in use. The robot can also traverse things like power cords, elevator gaps, and ramp transitions that can be troublesome to other mobile robots.

Customizable – The Pioneer Manipulator is fully designed and fabricated by Adept

MobileRobots. If your application has a specific requirement that the standard configuration will not meet simply inquire with the sales team. Adept MobileRobots has a wide variety of supported and tested accessories that can be integrated with the robotic platform for custom needs.

Full suite of Adept MobileRobots' mapping and navigation software – All Adept MobileRobots platforms include our Pioneer SDK, a complete set of programs and libraries that accelerate the develop-

Pioneer Manipulator includes

- Vision: Kinect for Windows V2 Pan/Tilt Stage
- Manipulation: Two Kinova Jaco2 Research Manipulators
- Torso: Two different options for manipulator mounting points
- Autonomous Navigation and Mapping Software
- SICK S300 Laser Scanner
- Joystick (used for Mapping, Re-location)
- Front and Rear Sonar, Forward Bumper Panel
- Wireless Ethernet Communication
- Color LED Status Indicator Rings
- Docking station for Autonomous or Manual Charging
- Speakers and Voice Synthesis Software
- Pioneer Software Development Kit

Optional Accessory Packages

- Digital Pan / Tilt / Zoom Camera
- Bumblebee Stereo Camera
- Configured Wireless Access Point
- Configured Laptop

ment of robotics applications. The Pioneer SDK includes C++ libraries and partial interfaces for ROS, Python, Java, and MATLAB. The Pioneer Manipulator also comes with our laser mapping and navigation software, ARNL, which will allow you to begin mapping and autonomous navigation as soon as your robot is powered up. All our software is backed by our product support team.

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SPECIFICATIONS

Processors

Integrated On-Board Computer (Mobile Base)

- Intel D252 64-bit Dual Core 1.8 GHz Atom
- Integrated Graphics Processing Unit
- 2GB DDR3-1066 RAM
- Available with Windows or Linux OS
- 802.11 a/b/g Wireless
- Gigabit Ethernet (2x)
- 16 In / 16 Out Digital I/O

Second Embedded Computer (Accessory and Additional Processing)

- Inquire for specifications

Physical Specifications

Weight	80 kg (176 lbs)
Payload	35 kg (77 lbs)

Power

Battery	24VDC LiFePO4
Capacity	60Ah
Run Time	6.5 hours (Continuous)
Recharge Time	3.5 hours (5:1 ratio)
Battery Life	7 years (16 hrs/day, 5 days/wk)
Charging Station	Automatic or Manual
Auxiliary Power	5, 12 VDC

Inputs / Outputs

USB 2.0	6
USB 3.0	2
Serial	2
VGA	1

Mobility Overview

Maximum Speed	1.8 m/sec
Tire Composition	Non-Marking Rubber
Steering	Differential
Wheels	2 Drive Wheels 4 Casters
Swing Radius	323 mm (13.5 in)
Turning Radius	0
Traversable Gap	15 mm (0.6 in)
Traversable Sill	15 mm (0.6 in)

Manipulator Overview

Payload	2.5 kg (5.5 lbs) mid-range 1.5 kg (3.3 lbs) full extension
Reach	90 cm (35.4 in)
Back Drivability	When shutdown
Gear Type	Harmonic Drive
Gear Ratio	1:136 (Large Actuators 1 and 3) 1:160 (Large Actuator 2) 1:110 (Small Actuators 4, 5, and 6)
Maximum Linear Arm Speed	20 cm/s (8 in/s)



More Information:

See our website www.mobilerobots.com for a full range of supported accessories or contact our sales department to discuss your application.

**adept
mobilerobots®**

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