Pioneer 3-DX

Pioneer 3-DX is a small lightweight two-wheel two-motor differential drive robot ideal for indoor laboratory or classroom use. The robot comes complete with front SONAR, one battery, wheel encoders, a microcontroller with ARCOS firmware, and the Pioneer SDK advanced mobile robotics software development package.

Pioneer research robots are the world's most popular intelligent mobile robots for education and research. Their versatility, reliability and durability have made them the preferred platform for advanced intelligent robotics. Pioneers are pre-assembled, customizable, upgradeable, and rugged enough to last through years of laboratory and classroom use.

Product Features and Benefits

• **Easy to Use** - Comes assembled and integrated with its accessory packages.

• **Reliable** - Construction is durable and rugged. Easily handles the small gaps, minor bumping, jarring, or other obstacles that hinder other robotic platforms. Some Pioneer robots have been in service for over 15 years.

• **Pioneer Software Development Kit** - All Adept MobileRobots platforms include Pioneer SDK, a complete set of robotics applications and libraries that accelerate the development of robotics projects. Pioneer SDK is backed by our product support team.

• **Customizable** - Easily accessorize by choosing from dozens of supported and tested accessories that integrate with the robotic platform. Additional help is available for future upgrades or added accessories.

• **Reference Platform** - Pioneer robots are a standard in intelligent mobile platforms. Search your preferred robotics journal or conference listings to find many examples of Pioneer platforms in research applications.

• **Technical Support** - Pioneer software and hardware comes fully documented with additional help available through our product support team.

Specifications

Construction
- Body: 1.6 mm aluminum (powder-coated)
- Tires: Foam-filled rubber

Operation
- Robot Weight: 9 kg
- Operating Payload: 17 kg

Differential Drive Movement
- Turn Radius: 0 cm
- Swing Radius: 26.7 cm
- Max. Forward/Backward Speed: 1.2 m/s
- Rotation Speed: 300°/s
- Max. Traversable Step: 2.5 cm
- Max. Traversable Gap: 5 cm
- Max. Traversable Grade: 25%
- Traversable Terrain: Indoor, wheelchair accessible

Power
- Run Time: 8-10 hours w/3 batteries (with no accessories)
- Charge Time: 12 hours (standard) or 2.4 hrs (optional high-capacity charger)
- Available Power Supplies:
  - 5 V @ 1.5 A switched
  - 12 V @ 2.5 A switched

Batteries
- Supports up to 3 at a time
- Voltage: 12 V
- Capacity: 7.2 Ah (each)
- Chemistry: lead acid
- Hot-swappable Batteries: Yes

Available Recharge Options:
- Direct plug-in
- Docking station
- Powercube (3-battery charging bay)

* Batteries are accessible through hinged latched access panel for hot-swapping (continuous operation)

Microcontroller I/O
- System Serial
- 32 digital inputs
- 8 digital outputs
- 7 analog inputs
- 3 serial expansion ports

*Some ports may not be available if certain accessories are included with the robot

User Control Panel
- MIDI programmable piezo buzzer
- Main power indicator
- Battery charge indicator
- 2 AUX power switches
- System reset
- Motor enable pushbutton

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Dimensions (mm)

455
237
210
381
62
195
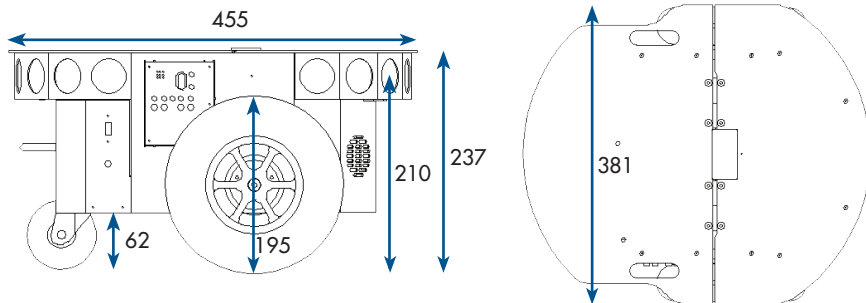
Core Software - included with all research platforms

ARIA provides a framework for controlling and receiving data from all MobileRobots platforms, as well as most accessories. Includes open source infrastructures and utilities useful for writing robot control software, support for network sockets, and an extensible framework for client-server network programming.

MobileSim open-source simulator which includes all MobileRobots platforms and many accessories.

MobileEyes graphical user interface client for remote operation and monitoring of the robot.

Mapper 3-Basic tool for creating and editing map files for use with ARIA, MobileSim, and navigation software.

SONARNL provides sonar-based approximate localization and navigation.

Accessory Support Software - bundled with purchase of robotic accessory

ARNL enables robust, laser-based autonomous localization and navigation.

Robotic Arm Support Pioneer arms are packaged with integrated software support.

Speech Recognition and Synthesis Library: Easy-to-use C++ development library for speech recognition based on the open source Sphinx2 system. Speech synthesis (text-to-speech) based on Cepstral synthesizer.

ACTS Color Tracking System: Software application which reads images from a camera and tracks the positions and sizes of multiple color regions. Information can be incorporated into your own software via ARIA.

Optional Industrial Grade Internally Mounted Computers

Mamba EBX-37 (Dual Core 2.26 GHz - 2-8 GB RAM)
6 X USB2.0 Ports
2 X PC/104+ Slots
4 X RS-232 Serial Ports
2 X 10/100/1000 Ethernet Ports
Onboard Audio & Video
Solid State Drive
Optional Wireless Ethernet

Optional Accessories:

- Laser-range finders
- Mono- and stereo-vision cameras
- Rear SONAR
- Wireless serial to Ethernet for remote operation
- Robotic arms and grippers
- Gyroscope
- Segmented bumper arrays
- Speakers and microphones
- Joystick
- Many more...

Include our integrated & supported accessories with your Pioneer 3-DX.

Here are some popular configurations to choose from:

Mapping & Vision

Gripping & Manipulation

Audio & Speech

More Information:

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

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