VolksBot® RT configurations

RT3 RT4 RT6

Robot Specifications

<table>
<thead>
<tr>
<th>Dimension (L x W x H)</th>
<th>RT3</th>
<th>RT4</th>
<th>RT6</th>
</tr>
</thead>
<tbody>
<tr>
<td>590 x 540 x 340 mm</td>
<td>520 x 520 x 260 mm</td>
<td>670 x 510 x 220 mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wheels (Tubed tyres)</th>
<th>RT3</th>
<th>RT4</th>
<th>RT6</th>
</tr>
</thead>
<tbody>
<tr>
<td>260 x 85 mm</td>
<td>260 x 85 mm</td>
<td>210 x 50 mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight*</th>
<th>RT3</th>
<th>RT4</th>
<th>RT6</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 kg</td>
<td>14,5 kg</td>
<td>17,5 kg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. Speed</th>
<th>RT3</th>
<th>RT4</th>
<th>RT6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4 m/s</td>
<td>1,4 m/s</td>
<td>1,1 m/s</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. Payload</th>
<th>RT3</th>
<th>RT4</th>
<th>RT6</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 kg</td>
<td>40 kg</td>
<td>40 kg</td>
<td></td>
</tr>
</tbody>
</table>

* Excluding battery

Included in delivery

Robot kit
- Including premounted and wired RT3, RT4 or RT6, user manual, universal notebook mount

Motors
- Two Maxon DC Motors, 150 W, shaft encoder, planetary gear: ratio 74:1

Battery
- Two lead gel accumulators: 12 V, 7200 mAh, 2,5 kg
  - One battery charger, 24 V

Motor Controller VMC
- 3-channel motorcontroller, 12–24 V DC, 6 A continuous current per channel, supports DC motors up to 150W, 3 separate encoder inputs. Binary communication through RS232 port, configurable PID controller for each channel, configurable current limitation, permanent storage of up to 4 configuration sets

Software ICONNECT™ educational licence

Power Panel
- 2-channel redundant emergency stop (category 0-Stop), deep discharge protection, reverse voltage protection, status indication, max. continuous battery discharge 20 A

Customized solutions

By use of VolksBot components, Fraunhofer IAIS also develops customized solutions for mobile robotic applications. Please do not hesitate to contact us.

Please consult the VolksBot® Website www.volksbot.de for further information.

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**The VolksBot® Concept**

VolksBot® is a modular mobile robot construction kit, designed to fit the needs in research and education as well as in application oriented rapid prototyping. The component-based approach offers a plug-in architecture in electronic hardware, software and mechanics. It provides open interfaces to reusable hardware and software modules. Combined with an effective and robust design, a wide range of domain-specific robots can be created with little effort. Initially the VolksBot® concept was successfully applied in indoor applications. Now we extended the kit to also fit the demands of rough terrain. With VolksBot® RT real-life applications can quickly be put into practice at a reasonable price.

**Scalable Aluminum Chassis**

Depending on the desired dimensions and type of robot, the robots chassis can be created using light-weight aluminum machine construction beams. Simple and rigid connections between beams and additional components can be established using pluggable nuts and screws. The beams are industry standard, providing the high rigidity needed for robust robots. This approach provides maximum flexibility in the robots mechanical configuration with minimum machining effort.

**UDU (Universal Drive Unit)**

The UDU is a mechanical component for connecting an arbitrary number of wheels to one common motor. It consists of two bearing blocks, a steel shaft and two chain sprockets. The transmission between two UDUs is established via chain-drive. Since these drive units can be fixed anywhere along the chassis, it is possible to customize the wheel distances easily. Five different types of tubed tyres, ranging from 18cm to 40cm, are available for the UDU. Maxon 150W DC motors, including shaft-encoders and planetary-gears, are connected to the UDU's via claw couplings.

**Sensor Systems: IAISVision & 3DLS**

A catadioptric vision system IAISVision including a Firewire CCD camera and a hyperbolic mirror allows a 360° field of view. A color vision library for ICONNECT™ is free to download at [www.volksbot.de](http://www.volksbot.de) for non commercial use.

A 3D Laser Scanner allows quick, precise and cost-effective three-dimensional scanning of scenes and objects. The fields of application include map generation, surveying of rooms and spaces, building surveillance, tunnel or mine shaft inspection and many more. More information about 3DLS is available at [www.3d-scanner.net](http://www.3d-scanner.net)

The IAISVision system, its mirror as well as the 3DLS are available as separate components.

**Software**

Also in software, modularity is ensured, using the professional ICONNECT™ framework by Micro-Epsilon Messtechnik. The software is based on the signal flow principle and real-time capable under Windows®. On the website [www.volksbot.de](http://www.volksbot.de), Fraunhofer IAIS offers a “C++ Software Library” for mobile robots operating under Linux or Windows®.

ICONNECT™ is provided with the VolksBot® RT kit for non-commercial use. More information about ICONNECT™ is available at [www.iconnect.micro-epsilon.de](http://www.iconnect.micro-epsilon.de)

**Power Panel**

The new VolksBot® Power Panel combines various safety features regarding power management and robot operation. It includes an emergency stop function, protection against deep battery discharge, usage of automotive circuit breakers against over current and for reverse voltage protection. The front panel includes a main-power switch, charger plugs and status LEDs for convenient robot operation.

**VMC (VolksBot Motor Controller)**

The new VMC is a specially designed motor controller for mobile robotic applications. It offers PID velocity control for three DC motors with up to 150 W each. The controller features odometric data analysis, support of standardized interfaces, permanent storage of parameter sets and an API for convenient operation under Windows and Linux. The VMC is also available as separate component.

**The VolksBot® for rough terrain**

The ever growing family of the VolksBot® standard construction kits has now been extended to include the VolksBot®-XT (eXtreme Terrain). This new model is equipped with adaptive wheel suspension systems so that it can operate even in extremely rough terrain. It uses sensors that enable it to automatically recognize stair landings and to follow the stairway all on its own.

**The MarBot for use under water and in tidal flats**

The MarBot underwater robot was developed on the basis of the VolksBot® in co-operation with the Alfred Wegener Institute for Polar and Marine Research (AWI). The wheel-driven platform is able to use its sensors to perform sediment analyses on the sea floor on its own or to autonomously map large tidal flat surfaces.

[www.volksbot.de](http://www.volksbot.de)