2022

WOR-0022 Technical Specifications

WORLD OF ROBOTS

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Reichel Robotik

02.05.2022

Table Of Contents

List Of Tables

1 Company

Reichel AG
Kremser Str. 5
93055 Regensburg
GERMANY

2 Business Unit

https://www.reichel-robotik.de

3 Brand

Modular Robotics Platforms

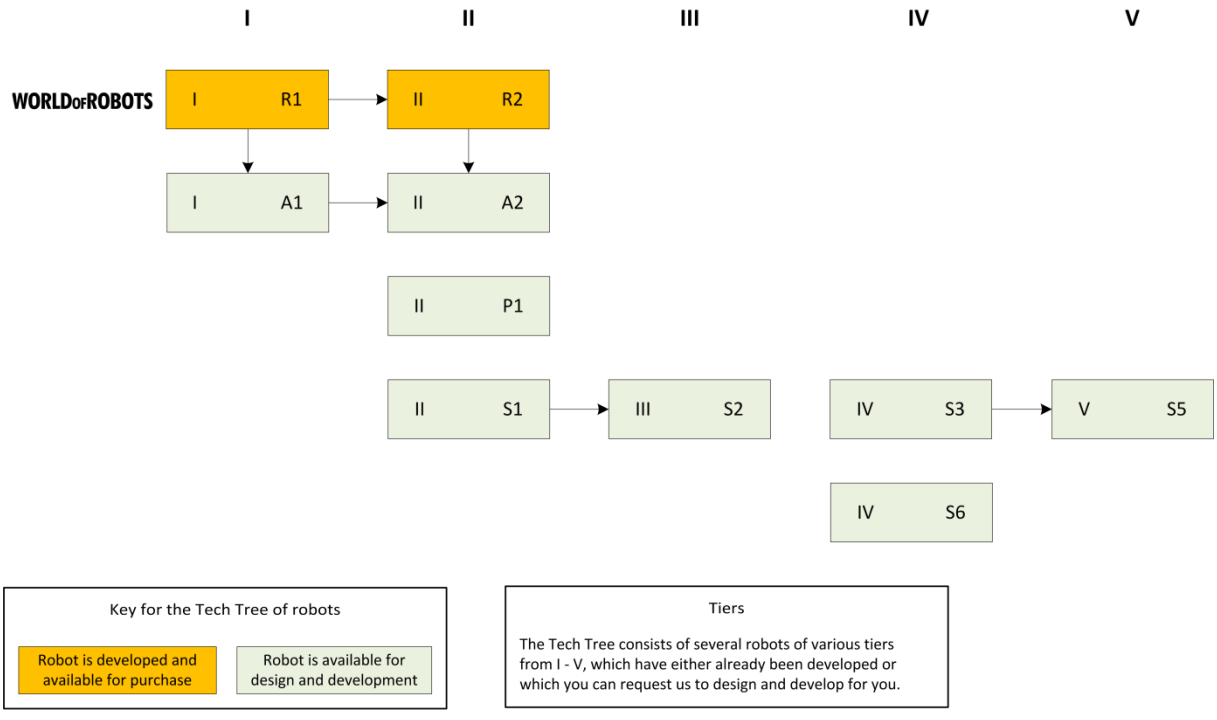
WORLD OF ROBOTS offers easy to use and extremely modular robotics platforms. Depending on robot modules various robot-types exist. WORLD OF ROBOTS is a brand created by Reichel AG.

https://en.reichel-versand.de/Robot-platforms.shtml

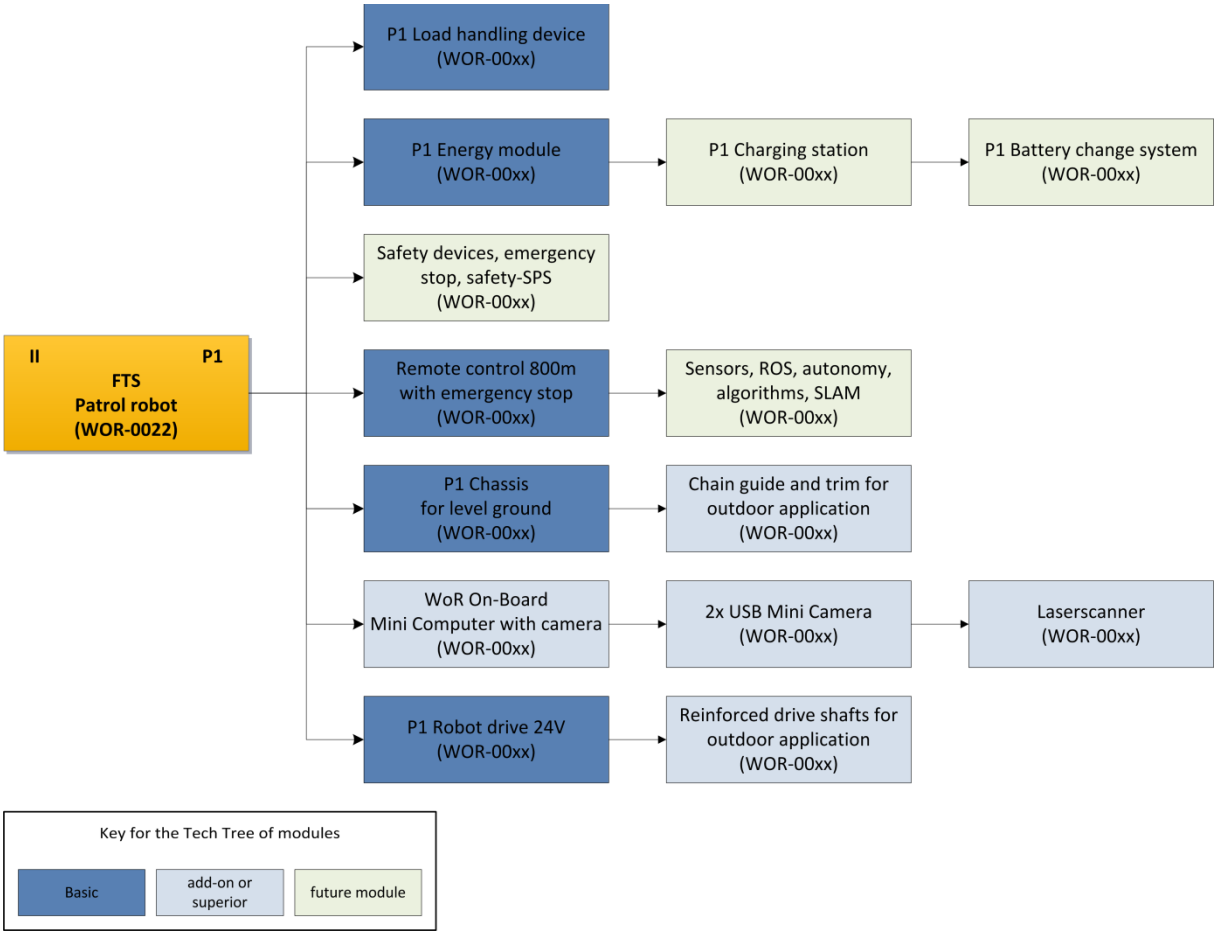
4 Tech Tree

4.1 Vehicle

The research tree is a hierarchical diagram of all possible sequences to investigate the vehicles and modules. For each brand, the available research tree can be viewed and it provides a good overview of the research possibilities.



4.2 Modules



Robot-type description

Base robot. A base vehicle has a basic configuration of modules.

Standard robot. A base vehicle can be expanded to a standard vehicle by advanced modules.

Elite robot. A vehicle, in which the best available modules are used, is given the elite status.

Premium robot. Premium robots need not to be explored, but also cannot be improved. Their modules are fixed.

5 Applications

5.1 AGVS

Automated guided vehicle systems (AGVS) are in-house, floor-supported materials handling systems comprising automatically controlled vehicles whose primary task is materials transport rather than the transport of passengers. They are used inside and outside of buildings and essentially consist of

- One or several automated guided vehicles
- A guidance control system
- Devices for position determination and localization
- Data transmission equipment
- Infrastructure and peripherals.

5.2 Defence robot, military robot, object protection robot

Potential applications after further R&D could be:

https://en.wikipedia.org/wiki/Military_robot

https://en.wikipedia.org/wiki/Goliath_tracked_mine

6 Development process

6.1 Technology Readiness Level (TRL)

The Technology Readiness Level (TRL) describes how far a technology has been developed. The EU defines the following TRL[1]:

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

The development of P1 targets TRL4.

[1] HORIZON 2020 – WORK PROGRAMME 2014-2015 General Annexes, G. Technology readiness levels (TRL)

6.2 Development project

As part of a development project the following could be achieved in the next 6 to 12 months: chassis in iteration 4, power electronics, remote control and power supply in iteration 2 and the load receiving means and the computer control via sensors in iteration 1.

7 Customers

Consequently, pilot customers are large corporations or research institutes with an own hardware development capacity such as research entities with capabilities in vehicle construction, mechatronics and/or hardware engineering.

8 P1 Platform Outdoor - Design and development project

8.1 Short description

The P1 is a modular build base robot made by WORLD OF ROBOTS. It's a patrol robot and belongs to the class of the automated guided vehicles for industry.

The carrier platform consists of the P1 chassis for level ground or in extension of a chain guide and trim for outdoor application. In the basic version, the vehicle has the P1 robot drive 24V; in an extension it has reinforced drive shafts for outdoor application.

8.2 Vehicle Characteristics

8.2.1 Base robot

Robot data	
Weight/Load Limit (kg)	45 kg / 60 kg
Engine power (W)	4x 144 W = 576 W nominal / 4x 660 W = 2,640 W max.
Speed limit (km/h)	4 km/h
Turn speed (degrees/s)	? degrees/s
View range (m)	-
Signal range (m)	800 m

Table 1: Robot data

Weight/Load limit (kg): The Weight is the total weight of the robot including all internals. The load limit is the maximum vehicle weight including payload. The weight determines the vehicle's manoeuvrability. Light robots are usually more agile in comparison to medium or heavy robots.

Engine power (W): Determines the vehicle's acceleration capacity.

Speed limit (km/h): Determines the vehicle's top speed.

Turn speed (degrees/sec): Determines the speed of the vehicle's rotation.

View range (m): Determines the view range of the sensors.

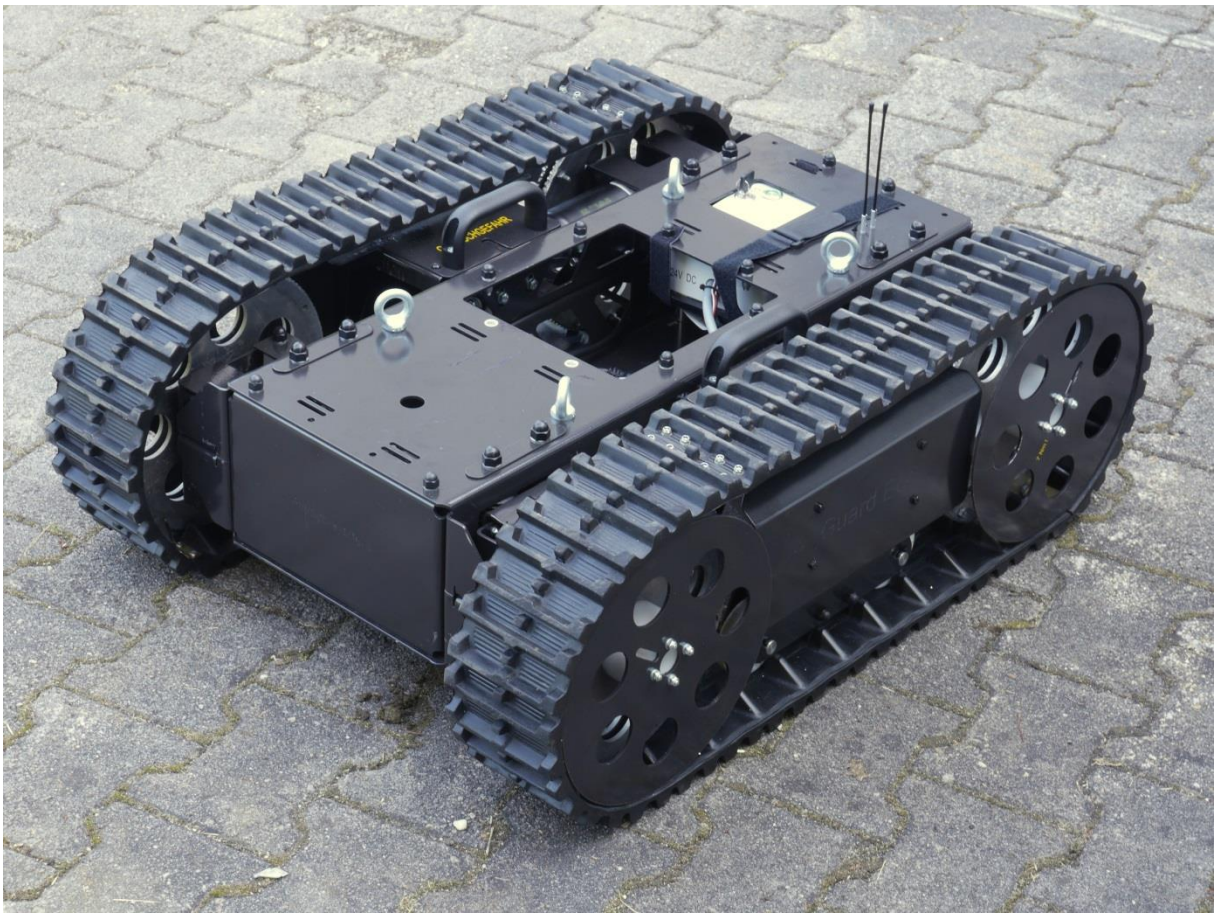
Signal range (m): Determines the signal range between vehicles or to the vehicle.

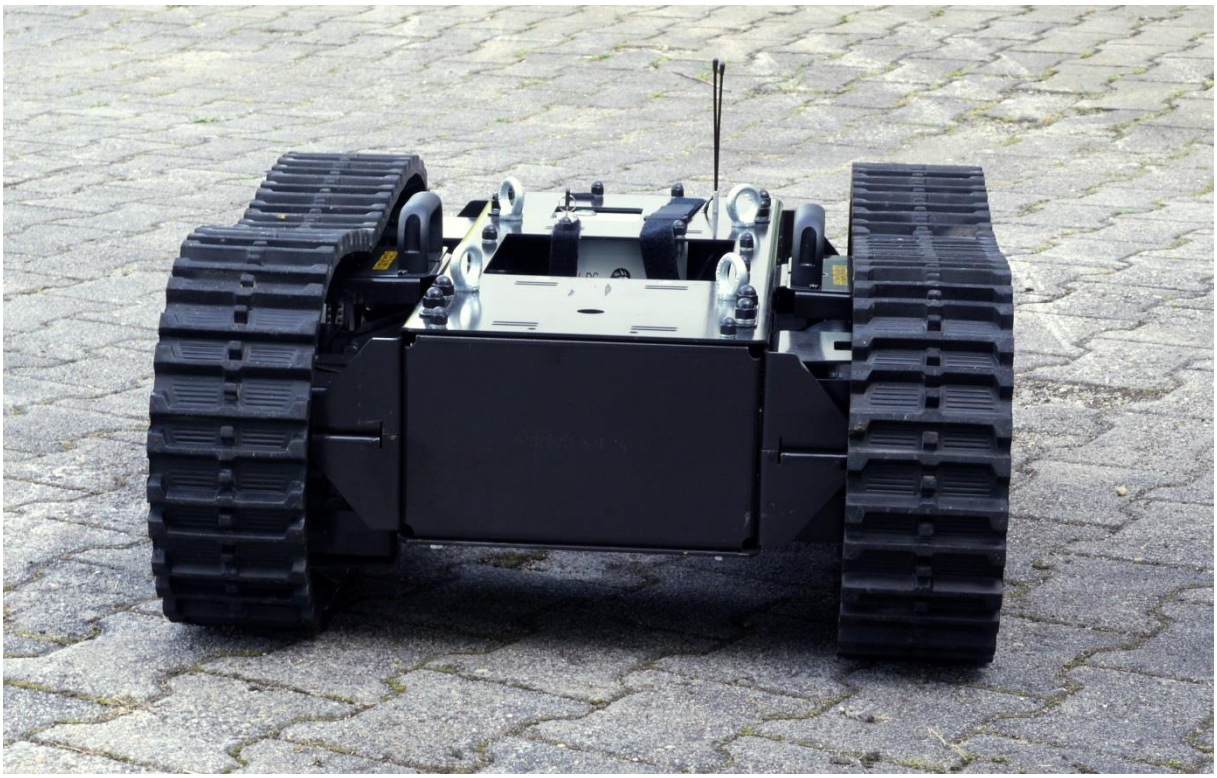
8.2.2 Continuous track concept

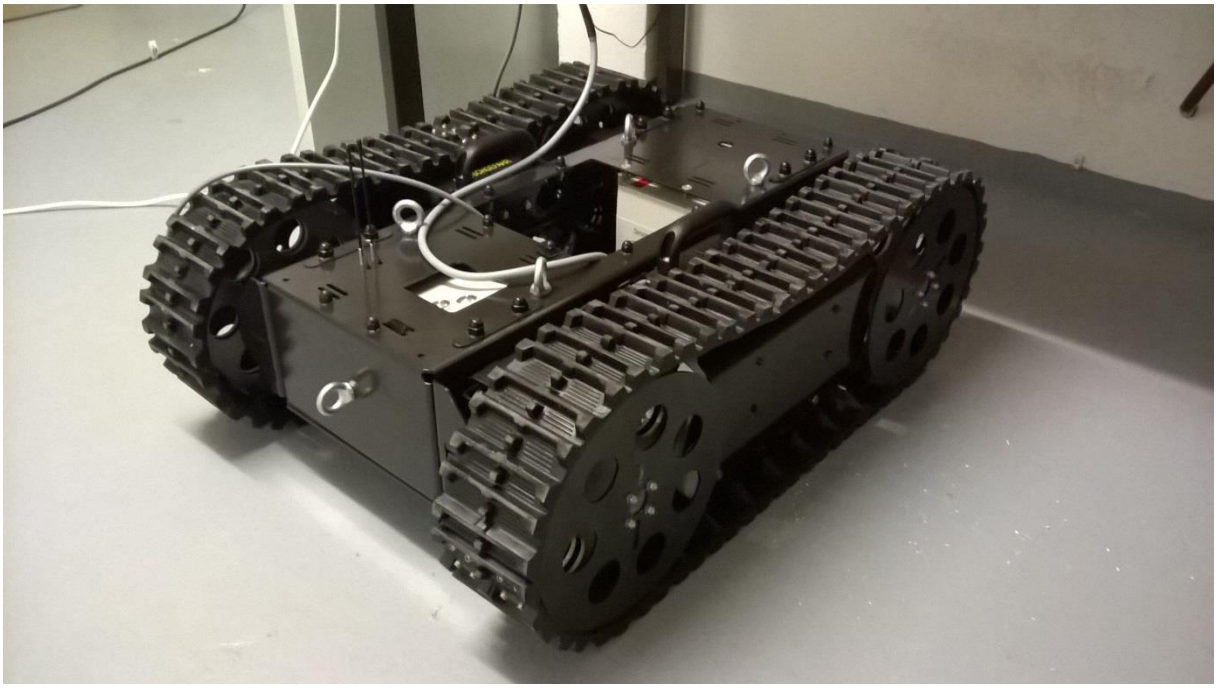
https://en.wikipedia.org/wiki/Continuous_track

8.3 Images

8.3.1 Photo







8.3.2 CAD

8.4 Video

http://youtu.be/6Gw56e9Dhw8

8.5 Product Information

Publishing date (date of last technical specification): 2015-07-23
Length: 850 mm
Width: 650 mm
Height: 300 mm
Weight: 45 kg
Shipping weight: 54 kg
Manufacturer: Reichel AG
Brand: WORLD OF ROBOTS
Article number: WOR-0022

8.6 Technical Description

8.6.1 Motor

4x DC motor 12 V, 12 A, 12 Nm, 40 r.p.m.

The DC motor was developed for industrial applications.

Permanent magnet technology. Transmission Ratio: 52:1. IP53