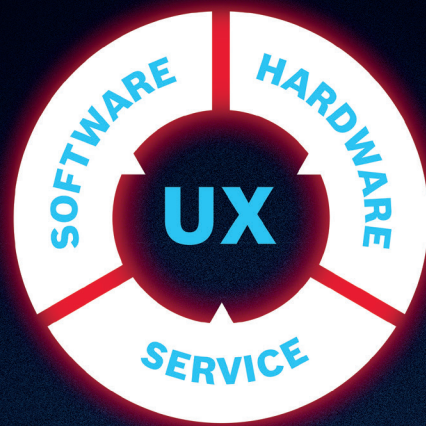


**Level Up Your Mobile Robots.**

**ROKIT – The Robotics Kit**

**by Bosch Rexroth**



# ROKIT – The Robotics Kit by Bosch Rexroth

## It's Time for Modular Systems in Mobile Robotics

With its robotics kit ROKIT, Bosch Rexroth unlocks new possibilities in the field of **mobile and service robotics**. The modular kit consisting of individual, coordinated and proven **software and hardware components** gives you the highest degree of freedom you need in the course of automating processes. The components – **ROKIT aXessor**, **ROKIT Locator**, **ROKIT Navigator** and **ROKIT Motor** – provide you with a graphical user interface and take care of positioning, navigation and motion execution for you. Supporting, product-specific **services** round off the user-focused portfolio.

## Why ROKIT?

Thanks to their **flexibility** and **easy applicability**, both the individual components and the entire robotics kit are compatible with **a wide range of vehicle types** and are ready for use in **a variety of applications**. And all this without any expert knowledge. Focus on the features that differentiate you from others – and let the **ROKIT components** take care of everything else.

Rexroth ROKIT is ready to use right away, without any additional effort, since the robotics kit outstrips current technology. The **innovative software and hardware components** ensure efficiency because they are **robust, powerful and modular** – qualities to which we attach great importance at Bosch Rexroth.

## Your Success Factors with Rexroth ROKIT

### FLEXIBLE

- ▶ Select components that suit your needs
- ▶ Continue to use your existing software and hardware solutions
- ▶ Integrate ROKIT into a wide variety of vehicle types and applications

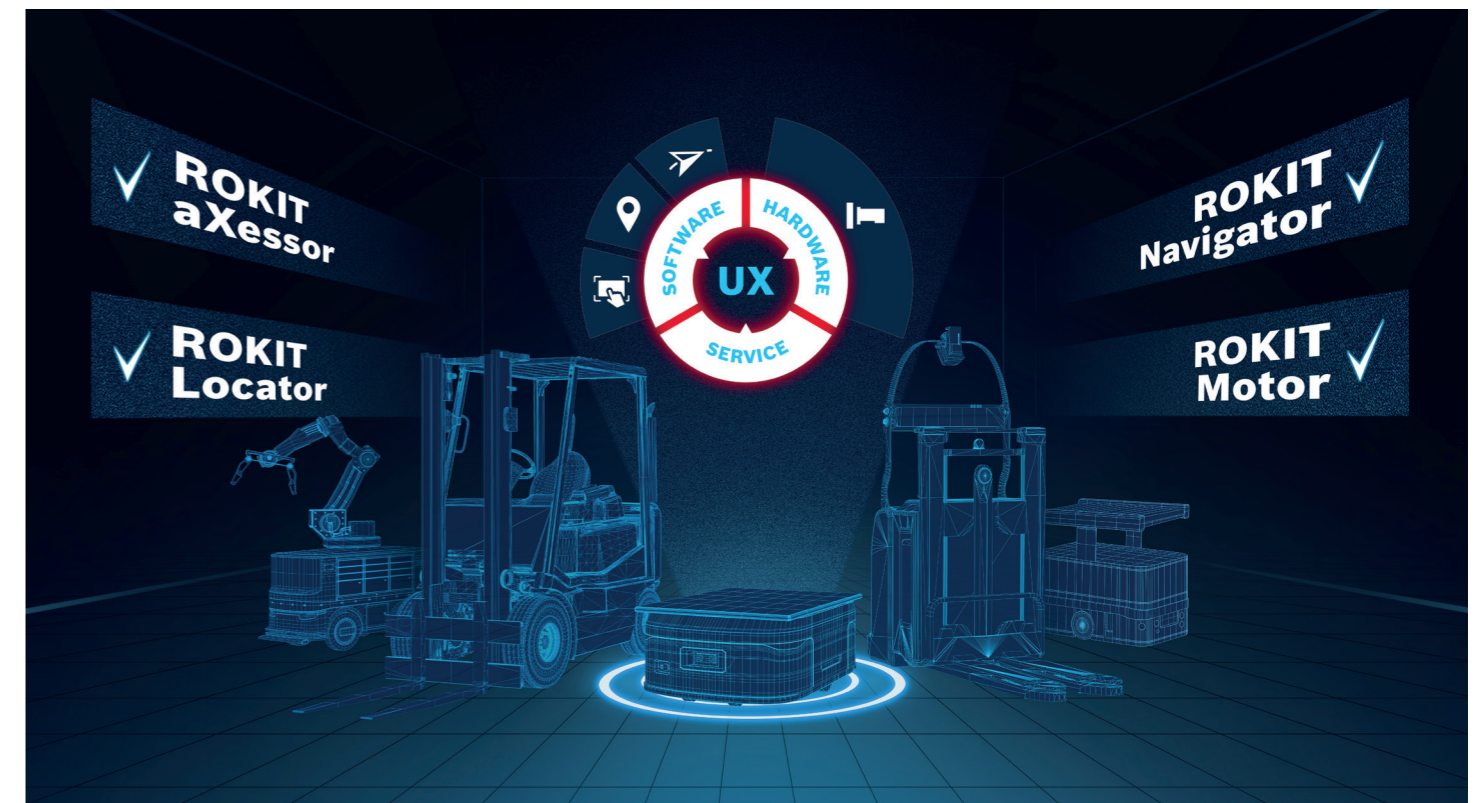
### EASY TO USE

- ▶ Less effort for integration, setup, production and maintenance thanks to easy applicability without expert knowledge
- ▶ Experience new standards in the industrial sector thanks to the user-friendly approach

### EFFICIENT AND ROBUST

- ▶ Save time and resources
- ▶ Deliver high-speed automation in intralogistics
- ▶ Focus on the features that differentiate you from others – let ROKIT take care of everything else
- ▶ Benefit from a resilient robotics kit with powerful algorithms, durable and proven components, industrial-grade software and supplementary services

## Step into the ROKIT Universe and Learn More about the Individual Components



- 04-05 Rexroth ROKIT aXessor**  
Intuitive **graphical user interface** for central access to all ROKIT components
- 06-07 Rexroth ROKIT Locator**  
**Laser localization software** to reliably determine the position and orientation of mobile robots
- 08-09 Rexroth ROKIT Navigator**  
Navigation software for the efficient **motion planning** of mobile robots
- 10-11 Rexroth ROKIT Motor**  
Highly integrated and ready-to-install **wheel drive module** for mobile robots



### Have we sparked your interest?

Discover the individual ROKIT components at [www.boschrexroth.com/rokit](http://www.boschrexroth.com/rokit) or contact us at [robotics@boschrexroth.de](mailto:robotics@boschrexroth.de).

## Rexroth ROKIT aXessor

### Your GUI for Powerful Software and Hardware



The ROKIT aXessor by Bosch Rexroth is an intuitive graphical user interface (GUI) enabling central access to all ROKIT components. The comprehensive technologies and high-performance software and hardware solutions can be controlled and linked with the clear and user-friendly interface of the ROKIT aXessor. No expert knowledge is required to use the ROKIT aXessor – which ramps up the efficiency of integration, setup and operation.

#### Optimal transparency of your ROKIT components

Visualize your entire fleet and stay in control of the system with the help of the ROKIT aXessor. The graphical user interface enables you to easily manage your fleet by pooling processes and work steps.

#### User-centered operation makes the difference

The ROKIT aXessor offers you a completely new kind of industrial user interface, because it was developed from the user's perspective. The modern gamification approach, combined with Bosch Rexroth's know-how and feedback from ROKIT aXessor users, guarantees you an easy introduction to all ROKIT products and their inspirational use.

#### STAY ON TOP OF THINGS

- ▶ Central access to ROKIT components
- ▶ Fleet administration and visualization
- ▶ Efficient commissioning and operation
- ▶ Targeted feedback via notifications
- ▶ Traceability and system overview

#### YOUR EASY CONTROL CONCEPT

- ▶ One control concept for all ROKIT components
- ▶ Clear, wizard-supported operation
- ▶ Compatible with various operating systems (Linux/Windows)
- ▶ Customizable (light/dark mode; multilingual)
- ▶ Gamification: intuitive, inspiring and interactive use
- ▶ User-friendly: no expert knowledge required

## ROKIT aXessor\* Features

\* depends on the selected ROKIT components

#### Quick start – Express mapping

The easiest and fastest way to record the environment and kick-start the localization.

#### Fleet manager

Allows easy and intuitive management and operation of the ROKIT Locator fleet.

#### Visual recording

Supports the commissioning of complex use cases through live mapping.

#### Reference alignment

Alignment of the ROKIT Locator map to an existing coordinate system.

#### Central map management

Allows an efficient handling of the maps of the entire ROKIT Locator fleet.

#### Live view

Visualization of the entire ROKIT Locator fleet.

#### Manual map alignment

Adjust the map with offsets and rotations.

#### Masking

Hides vehicle contours in sensor data.

#### Map expansion

Allows users to extend existing maps as well as to replace map zones.

#### Event center

Quick and organized access to all notifications and background processes of the ROKIT components.

#### Various login options

Enables the user to log in flexibly and situationally.

#### Security

Secure state-of-the-art communication with certificates.

#### Licensing

Deploys a new license to ROKIT components and provides an overview of all licensed devices and their status.

#### Support

Quick and easy support with automatically generated reports.



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## Rexroth ROKIT Locator

### Your Easy-to-Use Laser Localization Software



The ROKIT Locator by Bosch Rexroth is a software component that reliably determines the position and orientation of a wide range of vehicle types in a variety of changing environments. This is made possible by a high-performance algorithm that automatically detects and maps the natural environment using a laser sensor on the vehicle. Bosch Rexroth thus provides a key technology and resolves the challenge of localizing your mobile robots with maximum flexibility and usability.

#### Flexibility for all situations

Benefit from the effortless integration of the ROKIT Locator into a wide range of vehicle types as well as into numerous industries and application areas. Thanks to the modular approach, the software is hardware-independent.

#### Outstanding usability

Due to the fast and easy setup and reliable operation, you do not have to worry about locating your mobile robots. The flexible adaptation to changing environments also enables automatic map updates for your entire fleet.

#### ONE FOR ALL

- ▶ Suitable for a wide range of vehicle types, industries and application areas
- ▶ Available as software-only solution or as Rexroth ROKIT Locator.Box – ready to use on an extremely compact industrial computer
- ▶ Supports numerous brands and types of laser scanners and industrial computers
- ▶ Flexible laser positioning

#### INTUITIVE FOR YOU

- ▶ Express mapping
- ▶ No need for infrastructure adaptations or expert knowledge
- ▶ No maintenance of infrastructure required
- ▶ Automatic map updates

## ROKIT Locator Features

#### Express mapping – guided live mapping

Maps the environment with just a few clicks without the need for infrastructure adaptations or expert knowledge.

#### Masking

Hides vehicle contours in sensor data.

#### Manual map alignment

Adjust the map with offsets and rotations.

#### Reference alignment

Align the ROKIT Locator map to an existing coordinate system.

#### Initial localization

Automatic localization after a change of position.

#### Robust and reliable localization

Functions smoothly in dynamic industrial environments regardless of vibrations and ramps.

#### Wheel odometry fusion

The positioning includes information of laser scans and estimated movements of the vehicle based on the wheel rotations.

#### Map update

Automatically detects changes in the environment, continuously updates the ROKIT Locator map, and shares it with the entire ROKIT Locator fleet.

#### Map expansion

Allows users to extend existing ROKIT Locator maps and replace map zones.

#### Dual laser

Supports up to two lasers.



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## Rexroth ROKIT Navigator

### Your Advanced Motion Planning Software



The ROKIT Navigator by Bosch Rexroth is navigation software for the efficient motion planning of mobile robots, thus making it a natural extension of the ROKIT Locator. The modular and easy-to-integrate software reliably and transparently controls the movement of your goods from A to B. It also ensures smooth, elegant driving and responds to obstacles. Like the ROKIT Locator, the ROKIT Navigator is compatible with a wide range of mobile robots and offers interfaces for other components as standard.

#### Increase your productivity

Navigation made perfect: high-precision, deterministic, reliable. A straightforward targeted integration phase enables the motion planning software to simplify the parameterization effort for different types of vehicles.

#### Compatible with a wide range of software and hardware applications

Integrate the ROKIT Navigator into existing standards – with no need for adapters or additional interfaces. The component is compatible with VDA 5050 interface-enabled fleet management systems and takes into account your current on-premises safety requirements.

#### PLAN YOUR NEXT MOVE

- ▶ Reliable goods delivery and handling
- ▶ Obstacle avoidance and navigation in cramped spaces
- ▶ Transparent driving behavior
- ▶ Efficient algorithm

#### EASY TO INTEGRATE

- ▶ Fast and easy integration – no expert knowledge required
- ▶ Observance of general safety conditions
- ▶ Fast adaptation to different kinematics
- ▶ VDA 5050-compatible
- ▶ Open interfaces

## ROKIT Navigator Features

#### Obstacle avoidance

Takes into account objects in the driving tube and avoids them within the permitted avoidance area.

#### Compliance with external safety requirements

Smooth integration of safety control into vehicle motion planning.

#### Observance of acceleration restrictions

Motion planning takes into account compliance with the maximum longitudinal and lateral acceleration.

#### Consideration of vehicle and load contour

Prevents vehicle or load collision with obstacles.

#### VDA 5050-compatible

Support of the VDA 5050 specification between vehicle and fleet management.

#### Consideration of orientation restrictions

Enables, depending on the drive type, motion sequences independent of the vehicle orientation.

#### Zone observance

Compliance with specific conditions in defined areas (e.g. speed limit, exclusive driving area).

#### Navigation in confined spaces

Safe vehicle manoeuvring in limited spaces.

#### Support of different drive types

e.g. Ackermann, differential drives, omnidirectional drives.

#### Fast integration and commissioning

Tool-supported offline calibration of system parameters.

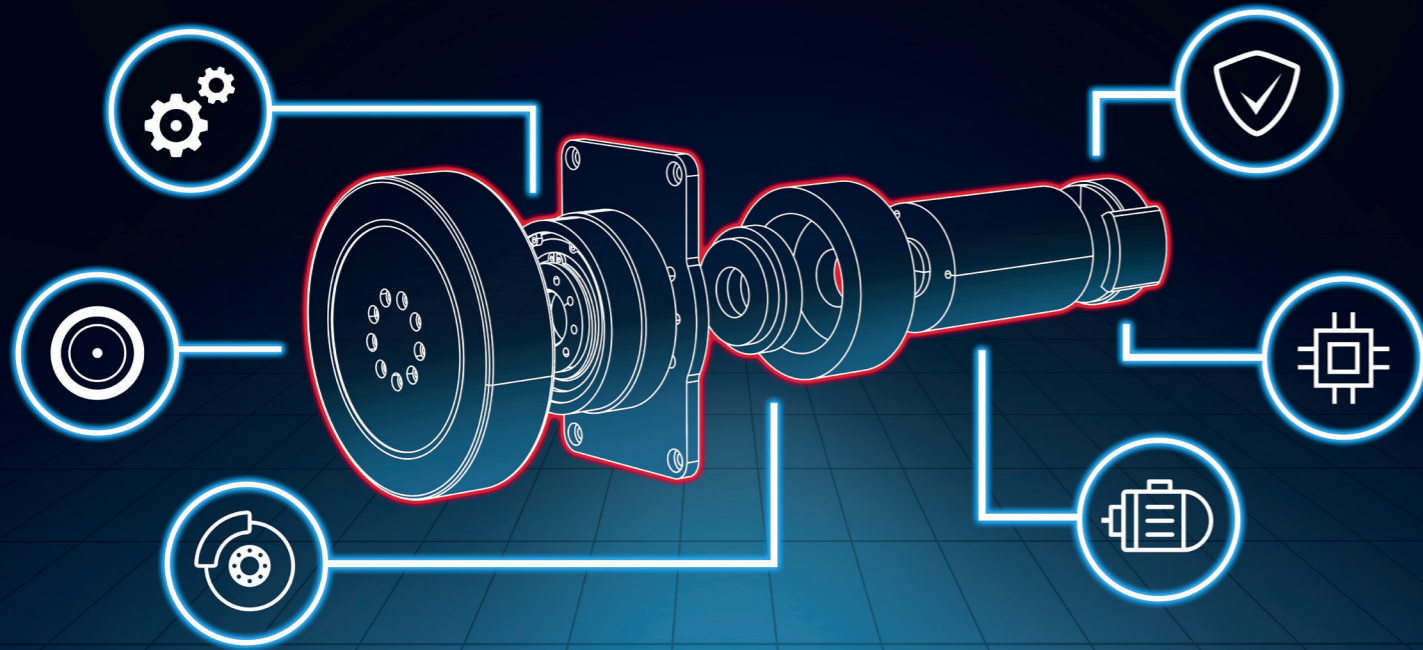


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# Rexroth ROKIT Motor

## Your 6-in-1 Wheel Drive Module



### REDUCE YOUR DEVELOPMENT EFFORT

- ▶ Reduces the workload of development, production and maintenance
- ▶ Small installation space
- ▶ Integrated functional safety
- ▶ Single-source solution
- ▶ Reduced complexity saves time

### FOR YOUR MOBILE ROBOTS

- ▶ High quality: Rexroth – Drive & Control proven
- ▶ Specially designed for mobile applications
- ▶ Easy applicability
- ▶ ROS2 driver supplied

The ROKIT Motor by Bosch Rexroth is a complete, highly integrated and ready-to-use wheel drive module for mobile robots, like differential-driven vehicles for payloads of up to one ton. The module, consisting of wheel, planetary gear box, safety and parking brake, motor, safety encoder and motion controller, significantly reduces the workload in procurement processes as well as in development, production and maintenance – thus ensuring efficient operation and a focus on the features that differentiate you from others.

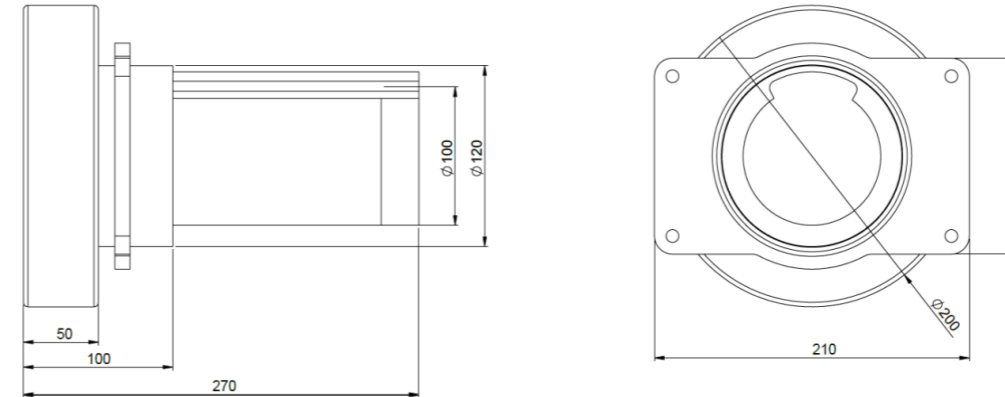
#### Highly integrated into your vehicle

The high-quality individual components are coordinated with each other and proven in many application areas. Integrated functional safety is ensured.

#### Specifically designed for mobile robots

The ROKIT Motor is tailored to the performance profile of AGVs and AMRs and comes with proven Bosch Rexroth quality and technology. All components offer optimum robustness for your mobile robots.

## ROKIT Motor Technical Data



| General                         | Specification                        |
|---------------------------------|--------------------------------------|
| IP protection class             | IP64                                 |
| Lifetime                        | 95,000 km                            |
| Safety standard                 | ISO 13849 PL d                       |
| Power supply voltage            | Nominal 48 VDC (range 18 ... 60 VDC) |
| Temperature range               | -20 to 70 °C                         |
| Vibration resistant             | According to DIN EN 60068            |
| Shock resistant                 | According to DIN EN 60068            |
| Wheel                           | Specification                        |
| Wheel diameter                  | 200 mm                               |
| Nominal drive speed             | 2 m/s                                |
| Nominal torque                  | 30 Nm                                |
| Peak torque                     | 100 Nm                               |
| Nominal power                   | 800 W                                |
| Peak power                      | 1,000 W                              |
| Material                        | Vulkollan 92 Shore A                 |
| Gear box                        | Specification                        |
| Type                            | Planetary                            |
| Safety and parking brake        | Specification                        |
| Wheel holding torque            | 100 Nm                               |
| Active at STO (safe torque off) | Yes                                  |
| Motor                           | Specification                        |
| Type                            | PMSM, brushless                      |
| Encoder                         | Specification                        |
| Integrated safety               | Yes                                  |
| Positioning accuracy wheel      | 50 arcmin                            |
| Motion controller               | Specification                        |
| Safe torque off                 | SIL3 and PLd                         |
| CANopen                         | DS301 with DS402 device profile      |
| ROS2 interface                  | Yes                                  |



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