

InOrbit Helps Kärcher Advance the State of the Art in Autonomous Cleaning

Kärcher is the leading provider of cleaning technology worldwide. With high-pressure and ultra high-pressure cleaners, vacuum cleaners and steam cleaners, air purifiers, vacuum sweepers and scrubber driers, gantry car washes, cleaning agents, dry ice blasting machines, drinking water and wastewater treatment systems, water dispensers, as well as pumps and watering systems for home and garden, Kärcher offers a wide range of innovative solutions. This range includes perfectly matched products and accessories as well as consulting, service and various digital applications.

Innovation has played a key role in the company's growth and since its foundation in 1935 has become an important part of the corporate culture. About 90% of all products are five years old or less. More than 950 employees at the cleaning appliance manufacturer work in research and development. Kärcher currently holds 650 active patents.

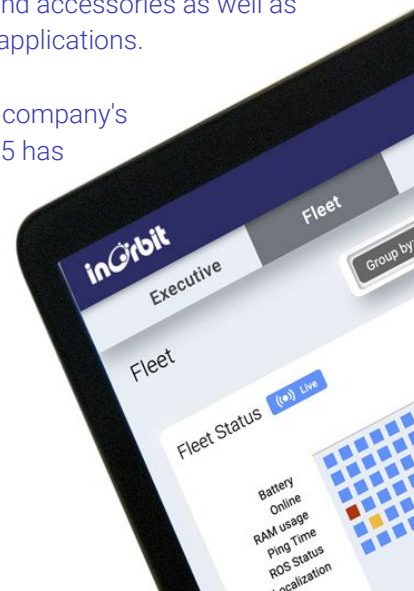
The company's goals are clear:
Innovation is what benefits people.

Kärcher has recently introduced best-in-class smart cleaning machines, from a self-driving vacuum to their flagship autonomous floor scrubber, the Kärcher Intelligent Robotic Applications KIRA B 50. This autonomous mobile robot can be used even in small spaces. It completes its cleaning tasks autonomously and, when necessary, returns to its docking station to recharge the lithium-ion batteries, empty the recovery tank and add fresh water.

KIRA B 50 can be deployed in different settings, including warehouses, education, supermarkets and high-tech manufacturing facilities. This allows Kärcher to respond to mounting demand for automation in light of widespread labor shortages and higher expectations around cleanliness. The machine and the cleaning crew now work together to take cleaning quality to new heights.

This drive for innovation led Kärcher to the InOrbit team. In looking at ways to further automate and provide additional robotics solutions to its product lines, Kärcher understood that it would need a robot operations platform to manage robots across their growing fleet. Kärcher picked InOrbit, the recognized leader in the emerging field of RobOps, short for robot operations.

The team's thought-leadership and industry experience was a key validation.



We are perfectionists, always rethinking systems and designs. We have the courage to break new ground and the conviction to do things instead of just talking about them.

<https://www.kaercher.com/>



“InOrbit is seen as the gold standard in the growing space of robotics operations software. They have a mature cloud platform and the ability to meet strict corporate standards from enterprises large and small. We have been very impressed with the InOrbit software and team..”

Florian Schoebinger, Manager Start-up Partnerships & Investments at Kärcher North America

InOrbit met and exceeded Kärcher's stringent requirements during its due diligence process, demonstrating technical details and providing information about how the platform works, including state of the art security and privacy policies, how operators can resolve incidents in the best way possible, and how InOrbit's product-centric approach positions the company to deliver continuous long-term value for Kärcher and its customers.

“New technologies like robotics and automation require that companies look at their business with a new lens. InOrbit has been an outstanding partner, sharing their perspective developed across many industries.

The adoption of InOrbit's robot operations platform to augment our own development provides a value-added offering from Kärcher that competitors can't match. Together we can pass along operational efficiency to keep robots doing what they do best, while the human workers around them are safer and more productive in their tasks.”



Marco Cardinale
Vice President Robotics at Kärcher

Working with leading roboticists at Kärcher, InOrbit got involved in the process early, guiding the development team on how to integrate a robotics operations platform from the beginning. This allowed the Kärcher product team to focus on their unique differentiators, such as the fully autonomous smart docking that enables KIRA B 50 to cover more ground unattended without adding to its bulk, allowing it to operate in tight, enclosed environments with many obstacles.



KIRA B 50 - INTELLIGENT CLEANING ROBOT

“ InOrbit’s engineering talent is top notch. Their expertise covers a broad set of areas that are all critical to creating an integrated solution, from core robotics software to scalable cloud infrastructure. Our collaboration has allowed us to accelerate our development and focus on the key functionality. ”

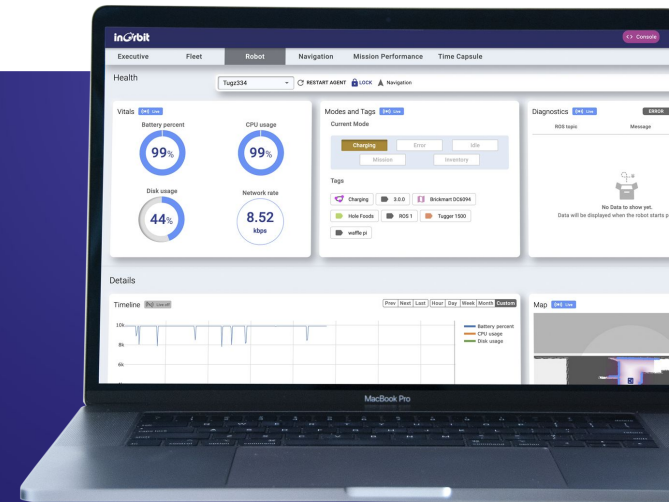
Felipe Garcia Lopez
Head of Robotic System and Software Engineering at Kärcher

Kärcher has taken particular advantage of some of InOrbit's unique tools and capabilities to meet their needs.

Data collection can be complex for any robot, especially in varied environments. The KIRA B 50 is managed with **Adaptive Diagnostics**, which provides dynamic sampling rates and variable data resolution to respond to changing conditions. Even if connectivity is less than ideal, **Data Backfill** ensures data integrity by storing data locally and reconstructing a robot's operating history upon reconnection, thus providing full visibility as the KIRA carries out cleaning tasks.

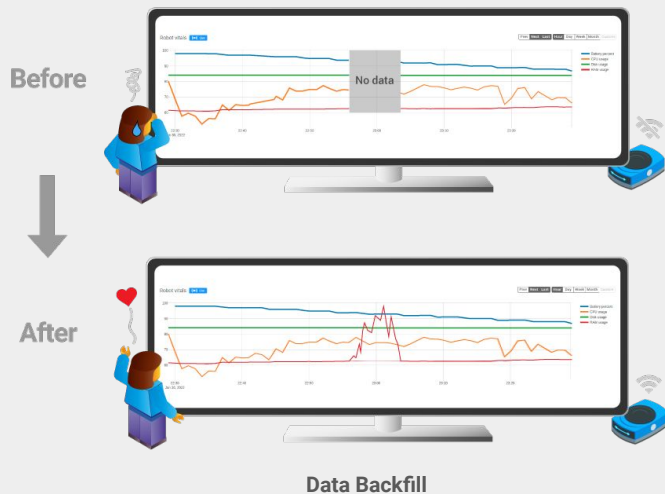


KIRA B 50 INTELLIGENT CLEANING ROBOT



Real-time, configurable analytics

Real-time, configurable analytics are proving invaluable in tracking the key performance indicators that matter most to the Kärcher team. InOrbit provides visibility into the success of each mission, which may combine multiple simpler tasks and take minutes or even hours to execute. Cleaning specific data, such as the water level in each unit, can also be tracked. Aggregated data makes it possible to fine-tune and optimize execution across multiple missions, robots or sites.



Data Backfill

Likewise, **Advanced Incident** detection uses multi-parameter programmatic rules, including many specific to KIRA and the cleaning space, to help Kärcher manage and respond to their most common autonomy exceptions in a timely manner, a key precept of RobOps. This ensures that any issues that may result in degraded performance or service interruption are identified, logged and in most cases resolved through remote interventions.

Even better than resolving incidents is preventing them from happening. Kärcher relies on **InOrbit Time Capsule™** to carry out **root cause analysis** by replaying and reviewing exactly what the data looked like over the course of a particular incident or mission. This became a key element of Kärcher's thorough testing to ensure the KIRA's launch readiness.

Companies increasingly expect higher levels of efficiency, visibility and automation. For instance, Building Service Contractors (BSC) have been a strong customer of Kärcher products for decades. These companies provide cleaning, facility maintenance, security and other related services to building owners and managers. As they deploy more robots across hundreds or thousands of sites under management, Kärcher and InOrbit can offer detailed performance analytics.

More generally, any large-scale operation, such as a manufacturer or third-party logistics (3PL) vendor with millions of square feet of warehouses, manufacturing plants and distribution centers, has growing needs around verifiable cleanliness, which have been exacerbated by the pandemic. They are also likely to deploy material handling robots, inventory management robots and potentially others for more specific tasks, such as trailer unloading. InOrbit enables the orchestration of all these robots, including Kärcher's product line, offering a single pane of glass to **maximize the potential of every robot**.

With several autonomous products in the market already and more in development, Kärcher is quickly becoming the leader in cleaning robots. Working together, Kärcher and InOrbit have augmented their respective capabilities, accelerating development to scale quickly and creating an exceptional solution for commercial cleaning customers looking to add robotics-driven cleaning solutions.

