

POLARX

Industrial Waterless Sweeping Robot

POLARX

Star50

Top 10 Core Technologies

Human-robot collaboration, industrial error-proofing and rapid service—built for real factories.



Technology & Product Competitiveness

SAFE • SIMPLE • STABLE • SUSTAINABLE

Automation where it works best—not automation at any cost

Star50 is built around a complete industrial operating model

01

Automation delivers scale

Large-area, high-frequency cleaning
Consistent execution of planned routes

02

People handle complexity

Workstations, dynamic areas and tight corners
Precise manual touch-up when needed

03

The system reconnects the workflow

Automatic relocalisation after manual use
Resume the original cleaning task

33 cm

Ultra-low profile

≈1000 m² /h

Real-world cleaning rate

30 L

Industrial dustbin

HybridSense™: one robot, two ways to clean

1 — AUTONOMOUS COVERAGE

Star50 handles the open areas.

Structured routes • Edge cleaning • No operator needed



Public areas: automated

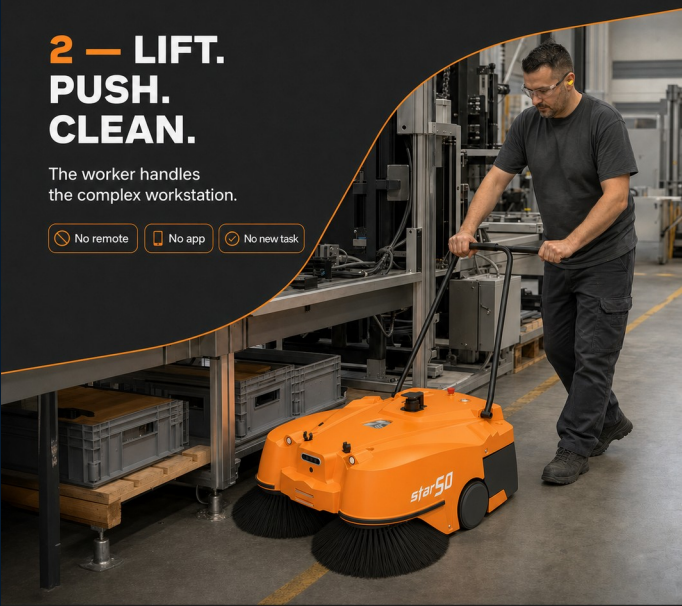
2 — LIFT. PUSH. CLEAN.

The worker handles the complex workstation.

No remote

No app

No new task



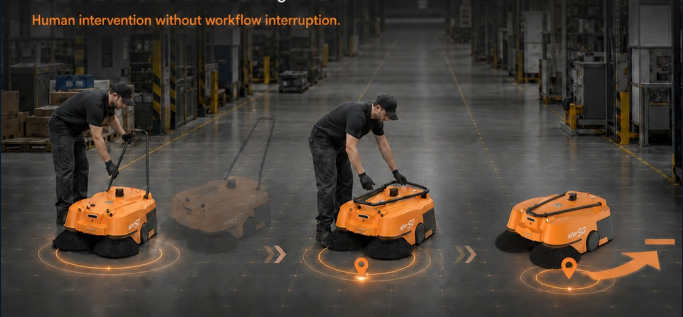
Typical intervention: find a controller

Star50: lift the handle

3 – LOWER THE HANDLE. KEEP THE MISSION.

Place Star50 anywhere in the valid mapped area. It relocalizes and continues the original task.

Human intervention without workflow interruption.



MANUAL WORKFLOW

Controller

Confirm

Restart

STAR50 WORKFLOW

Lower handle

Relocalize

Resume

01 Autonomous coverage

02 Lift handle & push

03 Relocalise & resume

No phone, app or remote • no new task required

33 cm low profile reaches beneath equipment

33 cm

Overall height / 33 cm

Reach conventional blind spots

Under machinery, shelving, furniture and low-clearance areas.

Reduce manual touch-up

Low height directly expands the cleanable floor area.



LOWER BODY • WIDER ACCESS

200W brushless suction for fine dust and industrial debris

200 W

Brushless suction fan

Powerful vacuum

Fine sand, dust and embedded carpet debris

Continuous operation

Brushless architecture supports long duty cycles

Airflow reuse

Exhaust airflow also protects the LiDAR zone



Sweep + vacuum • hard floor + carpet

Optional active LiDAR dust protection reuses fan exhaust

OPTIONAL FEATURE

01

Side brushes operate

Local dust clouds are generated

02

200W fan exhaust

Directed towards the front of the robot

03

Disperse dust ahead of LiDAR

Reduce interference from concentrated dust

04

More stable industrial navigation

Designed for real dusty environments

Key point: the design reuses suction-fan exhaust instead of adding a separate blower.

The airflow disperses dust clouds raised by the side brushes before they obstruct LiDAR.

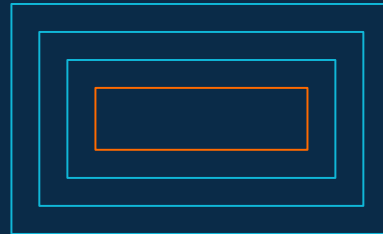
Three route strategies cover open areas, rooms and wall edges

Boustrophedon



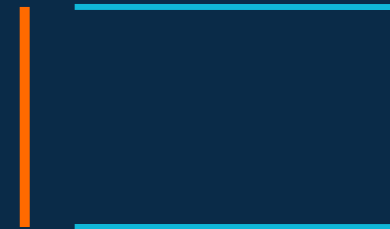
Open areas
Efficient parallel coverage

Spiral



Rooms and zones
Outside-in coverage

Wall following



Tracks wall edges
Reduces missed boundaries

Combine route strategies to match the space

Filter-panel interlock prevents fan start when incorrectly installed

Replace operator memory with active machine error-proofing



VALUE

Prevents dust entering the air path and damaging fan blades • Reduces customer repair and replacement cost

The system prevents fan start when the filter panel is missing or incorrectly installed.

All-brushless powertrain builds reliability into every core drive



Lower noise

Stable long-duty operation

Longer service life

Less maintenance

01

Main brush

Continuous floor contact

02

Side brushes

High-frequency edge cleaning

03

Suction fan

Continuous vacuum output

04

Drive system

Long-duration mobility

30L industrial dustbin + Cyclone-Catch extend productive runtime

30 L | 75 cm

Dustbin capacity | Cleaning width

Handles mixed debris

Dust, grit, wood chips, metal fragments and granular debris.

Cyclone-Catch flow path

Reduces debris rebound and improves usable bin volume.



Fewer emptying stops → longer continuous missions

A true 30L dustbin—roll it out and empty it with ease



Fully extended position

The independent 30L bin is fully accessible for fast emptying

1

Pull rearwards

The independent bin slides smoothly along its guides

2

Roller supported

Easy to move even when fully loaded

3

Empty directly

Roll it to the disposal point with less lifting

Pull out • roll easily • empty fast

Magnetic side brushes + press-release main brush enable rapid service

Fewer tools and less body-panel removal minimise routine service time.

1

Magnetic side brushes

Tool-free removal and installation

2

Press-release main brush

Press to release for rapid removal

3

Rapid consumable changes

Fewer tools and less panel removal

4

Reset and resume

Reduce on-site downtime

≤ 60 s

Typical routine-service target

Magnetic side brushes and the press-release main brush simplify routine replacement

Modular top access provides direct reach to core electronics



SERVICE ACCESS

Openable service cover on the upper deck

Industrial PC

Router

Motor drivers

Comms / power
modules

Buttons and lights remain on the perimeter • Wiring is concealed inside the surrounding shell

Fast core-module access / easier dealer service

Integrated core control unit: swap the box for rapid recovery

Upper layer • industrial computing

Perception • navigation • intelligent decisions

Lower layer • PolarX real-time control

Motion • cleaning • energy • safety

Unified software and hardware architecture

One control box integrates four core capabilities

Computing & decisions

Industrial computing board • IMU

Real-time control

Proprietary board • motor and cleaning control

Power & charging

Battery communication • power management • auto charging

External comms

Lift-control communication module

If the core control system fails, swap the complete box to restore operation quickly

Industrial physical controls remain intuitive with gloves

- | | | |
|----|---|---|
| 01 | Physical controls | Key functions are tactile and confirmable |
| 02 | Status lighting | See operating status from a distance |
| 03 | Industrial-grade electrical protection | Core electronics and PCBs are enclosed; connectors, terminals and wiring harnesses are industrial grade |
| 04 | Programmable shortcuts | Double-press starts all cleaning components for immediate manual spot cleaning |



Temporary spill or debris: double-press, then push and clean immediately • No phone or app

One hardware platform adapts to multiple floor types

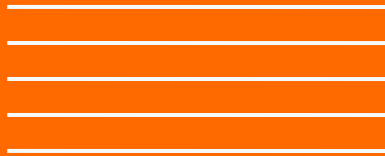
Concrete

Factories and warehouses



Epoxy flooring

Manufacturing floors



Commercial carpet (Optional)

Offices and public areas



Industrial hard floor

Logistics and assembly areas



Optional microfiber main brush for floor QR codes and location markers

Gently removes surface dust and marks, helping keep floor codes clear and machine-readable

Typical industrial use: autonomous in open areas, manual at complex stations



**ONE ROBOT.
TWO WAYS
TO CLEAN.**

Autonomous coverage. Human precision.

AUTONOMOUS MANUAL

Star50 Human-Robot Collaboration

Manufacturing floors

Dense equipment and changing workstations

Warehouse / logistics centre

Large areas, high frequency and long aisles

Assembly and maintenance areas

Human judgement and precise touch-up

Mixed hard floor + carpet

One mission across multiple surfaces

Remove floor debris before it becomes forklift tyre damage



**ONE ROBOT.
TWO WAYS
TO CLEAN.**

Autonomous coverage. Human precision.

AUTONOMOUS MANUAL

Star50 Human-Robot Collaboration

High-risk debris

Nails, screws, pallet splinters and metal fragments

Continuous removal

Dry sweeping captures debris during daily operation

Protect vehicle uptime

Less debris exposure helps reduce avoidable tyre damage

Cleaner traffic lanes

More reliable movement across shared industrial floors

Fully offline operation keeps cleaning independent of the cloud

On-robot autonomy

Navigation • mapping • mission execution

Local real-time control

Motion • cleaning • energy • safety

Four benefits for secure industrial sites

Local maps & tasks

Stored and executed on the robot

Network isolation

No external connection required for operation

Data control

Operational data remains inside the facility

IT compatibility

Supports security policies and isolated networks

No cloud dependency

Deploy in restricted or disconnected sites without sacrificing autonomous cleaning

Trust now matters alongside productivity, labour savings and ROI

Buyer question

Can the robot work without adding avoidable data or network risk?

Star50 response

Local operation, physical controls and serviceable hardware keep the site in control

Four questions buyers should ask

Data collection What is captured and retained?

Connectivity What must connect for the robot to work?

Local control Where do maps and operating data stay?

Service continuity How quickly can the local team restore operation?

Operational independence

Star50 keeps maps, missions and daily operation local

Star50 vs KEMARO K900: a fact-based operational comparison

COMPARISON	PolarX Star50	KEMARO K900
Height / low clearance	75 x 66 x 33 cm high; designed to reach beneath equipment and racks	79 × 72 × 35 cm; low-profile industrial design
Cleaning productivity	2,500 m²/h theoretical; approx. 1,000 m²/h real-world	Up to 1,000 m²/h at 0.7 m/s (official figure)
Dustbin	True 30 L; roller pull-out bin can be moved to the disposal point	35 L; updated reinforced handle and easier assembly
Human-robot interaction	Lift handle to push; lower it to relocalise and resume the mission	Remote control + WebApp / Sphere; Connected Maps across areas
Maintenance & protection	Filter interlock; enclosed electronics; industrial connectors and harnesses; openable top access	Automatic filter cleaning; IP54; professional installation, maintenance and remote service
Software & scalability	Fully offline operation; local maps and mission execution; no cloud dependency	Tasks, schedules, maps, no-go zones and reports; 2,500–20,000 m² per room

K900 data: official KEMARO product pages and Knowledge Hub (accessed 3 Aug 2026)

POLARX STAR50

Real industrial competitiveness means reliable operation and easy service

HybridSense human-robot collaboration

Low profile · powerful suction · dust-protected perception · multi-route coverage

Error-proof safety and rapid service

Filter interlock · all-brushless system · 60-second-class service · modular top access



Automation where it works. Human control where it matters.

SAFE · SIMPLE · STABLE · SUSTAINABLE