
FieldBots™

Our Partner

Dalhousie University

Located on Canada's welcoming East Coast, with campuses in the vibrant oceanside city of Halifax and an Agricultural Campus in the town of Truro, Dalhousie welcomes 21,000 students from across the country and more than 115 countries around the world.

We are Nova Scotia's leading research-intensive university, with 13 faculties that expand understanding through teaching excellence and a drive for discovery resulting in more than $210 million in external research funding each year.

More Information
https://www.dal.ca/about.html

DALHOUSIE UNIVERSITY

NOVA SCOTIA CANADA

Starting point

Why Automation at Dalhousie?

Canada's cleaning sector is experiencing a labour shortage, particularly in roles such as light-duty cleaners and cleaning supervisors. This shortage is driven by an aging workforce and high employee turnover, with demand outpacing supply in many regions.

Driving Factors Beyond Labour Shortage:

- **Quality:** Improved through more frequent cleaning cycles
- **Flexibility:** Enabled by on-demand cleaning and night-time operations
- **Security:** Enhanced by reducing the need for personnel inside buildings
- **ROI:** Microbots offer outstanding ROI

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Michael Campbell
Manager
of Facilities
Dalhousie University

"The main issue for me was to find an accompaniment to the high cost of labour. It was not meant to replace but to enhance staffing that is under pressure from budgets and shrinking enrollment."

Valerie Borgal
Custodial Services
Supervisor
Dalhousie University

"We've been short-staffed for a while, it's been tough finding qualified applicants. Automating the cleaning just made sense—it helps us keep things clean without putting additional work on the team we do have."

Choice of hardware

Test Setup

Based on the requirements, we opted for a test setup with two microbots. These robotic vacuum cleaners are particularly compact, **easy to replace in case of a malfunction**, and require **minimal to no operator training**. Both models — the ZACO X1000 and the CLEANFIX S170 Navi — are **fully integrated into FieldBots** fleet management.

Hardware Selection Criteria

- **Compact and efficient:** Ideal for navigating tight or hard-to-reach areas where larger machines struggle
- **No breaks, no training:** Operate continuously without the need for rest or extensive operator instruction
- **Resource-saving:** A major advantage when staffing is limited or teams are already stretched thin

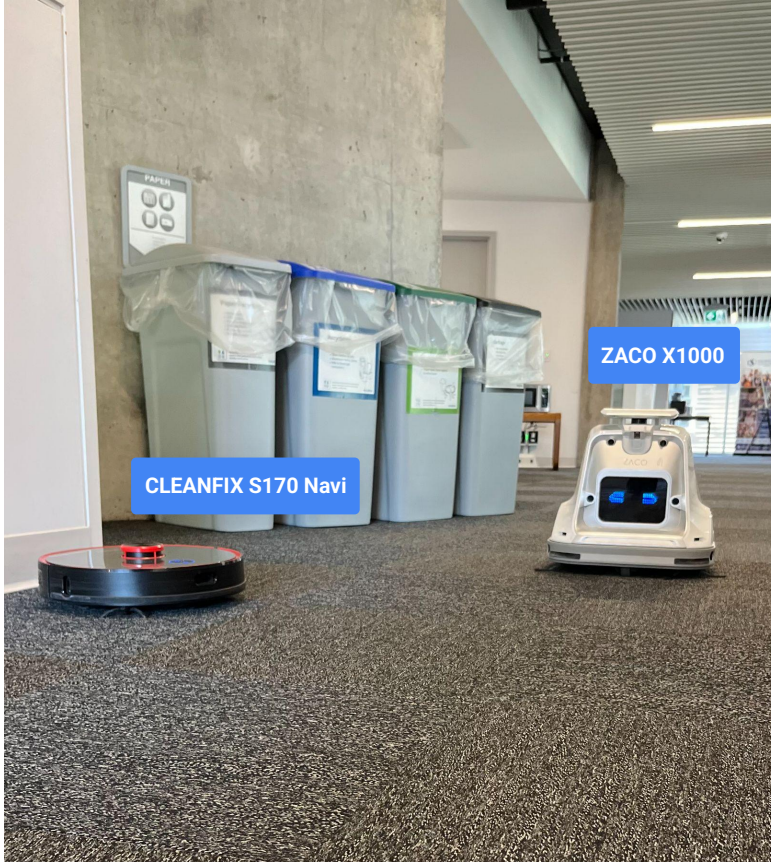

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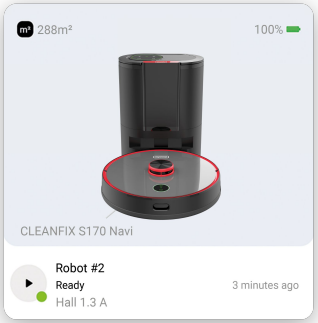
Photo: Dalhousie University

CLEANFIX S170 Navi



- **Dimensions robot:** 350 x 350 x 98 mm
- **Capacity Dust Collector:** 3.4 l
- **Maximum battery life:** 250 min
- **Recommended use:** Up to 300 sqm
- **Communication:** Wifi
- **Sensors:** Bumper, Ultrasonic, LiDAR

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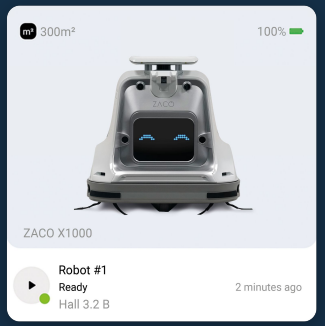
ZACO X1000



- **Dimensions robot:** 376 x 372 x 365 mm
- **Capacity Dust Collector:** 3 l
- **Maximum battery life:** 360 min
- **Recommended use:** Up to 1.000 sqm
- **Communication:** Wifi
- **Sensors:** LiDAR, 6-axis inertial sensor, ToF, Ultrasonic, Dual camera, AI obstacle avoidance

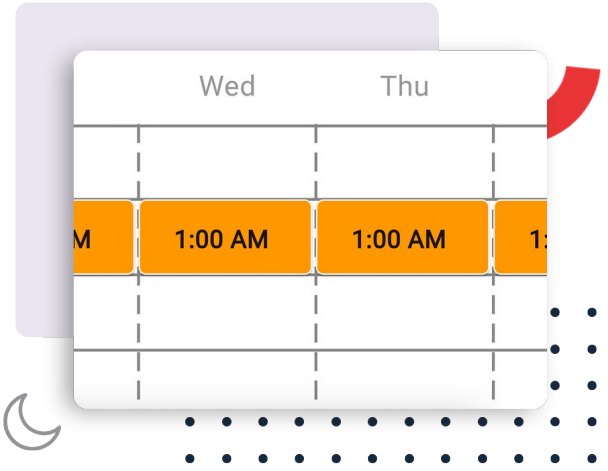
Test Setup

Obstacles and Solutions

There was a bit of a learning curve in the beginning—properly mapping the robots and fine-tuning their routines required some trial and error. We also experienced a few minor setbacks, such as curious students interfering with the robots and the units occasionally getting stuck on chairs. However, after a few adjustments, those issues have largely been resolved.

Solutions Enabled by FieldBots Fleet Management

- **Night-time cleaning** minimizes human-robot interaction, reducing the potential for disturbances or interference.
- **In "Do Not Disturb" mode**, robots return to base within two seconds of manual activation, preventing unauthorized starts and cleaning.



Test Setup

Setup-Phase

Solutions Enabled by Environmental Adjustments

Initially, there were occasional problems with cables (see picture) due to **adjustments to the robot's cleaning map**, but also through **slight modifications to the robot's spatial environment** these obstacles could be quickly removed. This ensured a smooth cleaning run.

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Test Setup

Setup-Phase

Solutions Enabled by Environmental Adjustments

To prevent unauthorized interaction, the Dalhousie staff constructed a **small enclosure** to keep the robots out of reach.

Andrew Bruckner
Director New Business Key Accounts
FieldBots

"The exciting part of the collaboration for me was that Valerie, Michael, and their team were genuinely committed to automation. They went above and beyond to ensure a successful rollout — they even built garages for the robots!"

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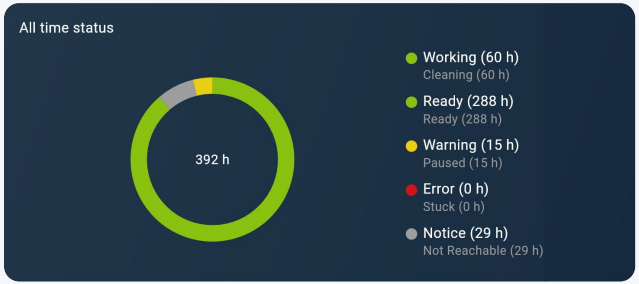
Results

After The Test

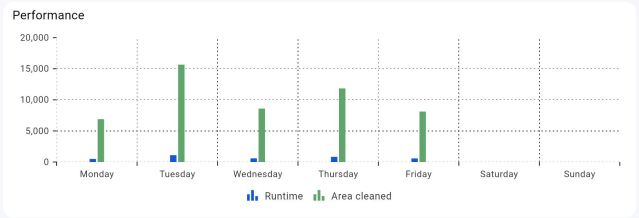
Results (1/3)

The all-time status of the Cleanfix device shows that, following the rollout and the adjustments described, a **smooth cleaning operation** was ensured. More than 60 working hours were quickly accumulated.

The robot was **used only on weekdays** and, in its final setup, **exclusively at night**. This allowed cleaning to take place **without disturbing faculty staff or students** in their work. The Faculty of Engineering was deliberately chosen, as the Dalhousie team expected the highest level of acceptance for the robots there.



All time status of the Cleanfix S170 Navi vacuum robot



Performance of the Cleanfix S170 Navi vacuum robot

After The Test

Results (2/3)

Yes, it has often been said in robotics circles: **robots are not here to replace humans**. But our results actually confirmed this. While repetitive and simple vacuuming tasks were handled by the robots at night, **the cleaning staff was able to focus on more complex yet quieter tasks during the day**.

This circumstance has led to s**trong acceptance among the staff**, who do not view robotics as a threat but rather as a **valuable aid in their daily work**. In our experience, personnel who support the use of robotics also tend to take better care of the autonomous helpers—and are quick to lend a hand when needed.

Valerie Borgal
Custodial Services Supervisor
Dalhousie University

"Having the robots run overnight made a big difference—they kept the place clean without getting in the way, and it freed up our staff to focus on more detailed work during the day."

After The Test

Results (3/3)

The collaboration between the Dalhousie University team and FieldBots was excellent. **Regular calls** were held to **work together on the software and to review cleaning results**. Once again, it became clear that having a **dedicated and responsible point of contact on the client side** is crucial to ensuring long-term success.

Michael Campbell
Manager
of Facilities
Dalhousie University

"The FieldBots team are our partners not the vendors."

Valerie Borgal
Custodial Services
Supervisor
Dalhousie University

"The FieldBots team has been great! Super helpful, quick to respond, and really easy to work with."

After The Test

ROI Calculation

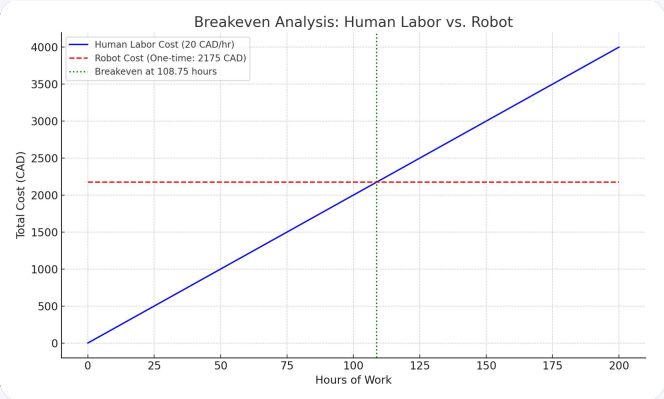
Note: The following calculations are illustrative only and are not based on actual salary data or acquisition costs from Dalhousie University. They rely on general Canadian hourly wage estimates and the manufacturer's suggested retail price (MSRP) of the CLEANFIX S170 Navi.

Breakeven Analysis for a CLEANFIX S170 Navi:

Estimated Hourly Wage: 20 CAD

MSRP Robot: 1,875 CAD
FieldBots License: 300 CAD per year
Total cost of robot 2,175 CAD

Breakeven point: 2,175 / 20 = 108.75 hours



After 109 hours of use, the robot pays for itself compared to human vacuuming labor.
Every hour after that saves money.

Conclusion

Dalhousie University has successfully integrated the Cleanfix S170 Navi into its Faculty of Engineering, where the robot's compact design and low height proved **ideal for cleaning efficiently under tables and chairs**. Following a s**uccessful pilot,** the university has adopted a structured cleaning robot initiative with **FieldBots as part of its broader automation strategy**. Due to **strong performance and low acquisition costs**, the facilities team has opted to expand the program, acquiring **five additional S170 Navi units**, all centrally managed via FieldBots.

We look forward to continuing the collaboration and applaud Dalhousie University's leadership in automated cleaning within Canada's higher education sector.

Michael Campbell
Manager
of Facilities
Dalhousie University

"Automation is our future as labour availability becomes difficult to attract and motivate, a replacement is needed to fill that gap."

Let’s build the future together!