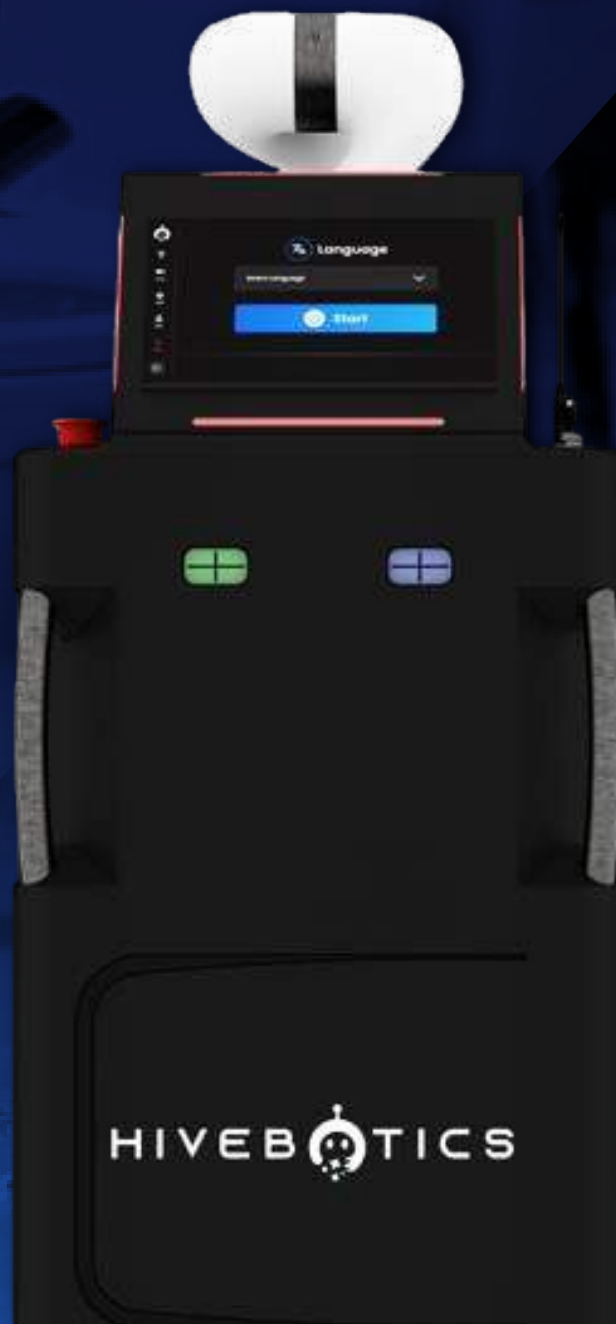


HIVEBOTICS

Enter a New Era of **AI Robotics**

Abluo MK-2 Brochure | March 2026



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COMPANY OVERVIEW

Hivebotics® is a Singapore-headquartered robotics company that builds autonomous robots to modernize facility sanitation.

Powered by our proprietary AI operating system - HiveOS, our flagship system Abluo automates restroom cleaning using robotic manipulation, AI perception, and contactless steam sanitation.



ABLULO

AI RESTROOM CLEANER



PRODUCT SUMMARY

Abluo Mark 2 is an **AI-powered** autonomous cleaning robot designed for high-traffic facilities like airports, hospitals, schools and commercial buildings.

Working alongside facility staff, **Abluo Mark 2** automates repetitive cleaning workflows and helps organizations maintain reliable hygiene standards with greater operational visibility and control.



KEY FEATURES

Fully Autonomous Cleaning

Autonomous restroom cleaning workflows requiring minimal staff supervision.

AI-Powered Vision & Navigation

AI vision and mapping enable safe navigation and precise operation in complex facility environments.

Consistent & Measurable Quality

Standardized cleaning workflows deliver consistent and measurable hygiene



Multi-Function Cleaning

Complete automated sanitation cycle: seat lifting, flushing, contactless steam cleaning, chemical jetting, and blow drying

Safety by Design

Integrated sensors and advanced safety monitoring enable reliable operation in public

Operational Data & Predictive Maintenance

Real-time data for performance tracking and reduced downtime

Reduced Labour

Cuts labor intervention in restroom cleaning by approximately 60–70%

APPLICATIONS IDEAL ENVIRONMENTS

Abluo is designed for facilities requiring high-frequency, high-standard cleaning, including:



Commercial & office buildings



Airports & transportation hubs



Educational campuses



Shopping malls & public venues



Hospitals & healthcare facilities



Industrial & mixed-use facilities

CLEANING ZONES:

★ Urinals

★ Toilet Bowls

★ Floors

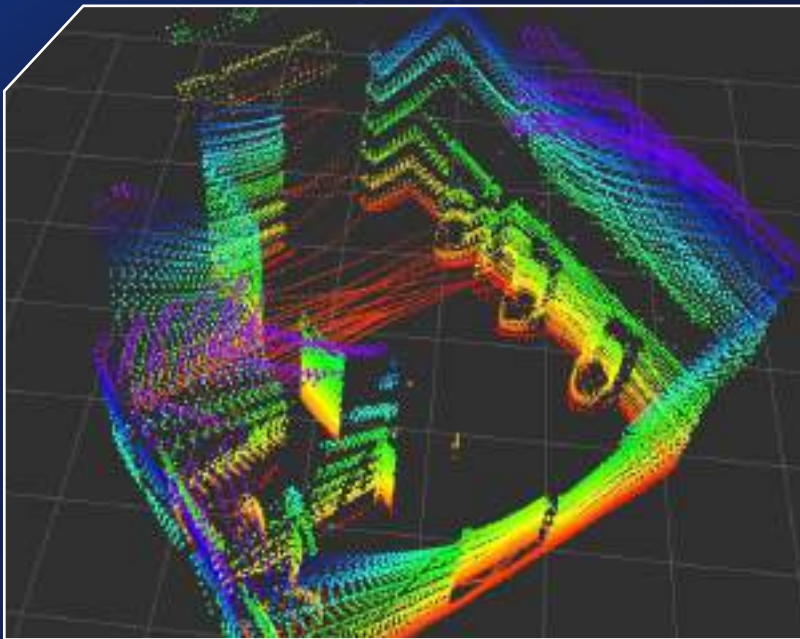
★ Sinks & Mirrors



Abluo delivers seamless, end-to-end restroom sanitation with minimal human intervention.

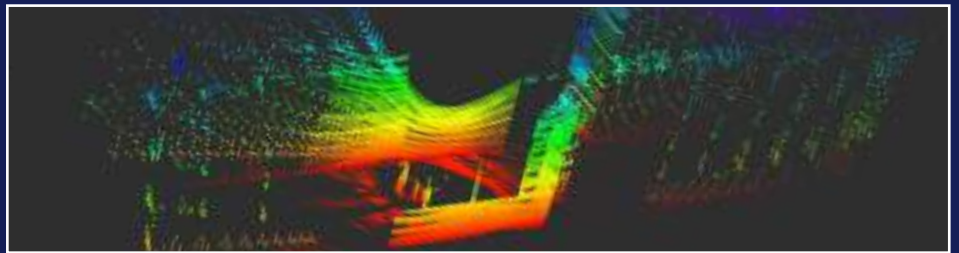
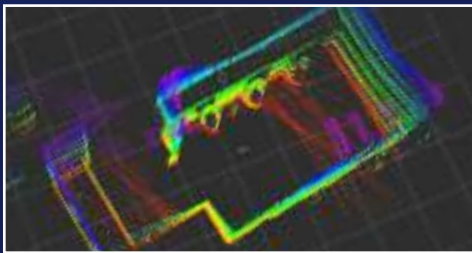
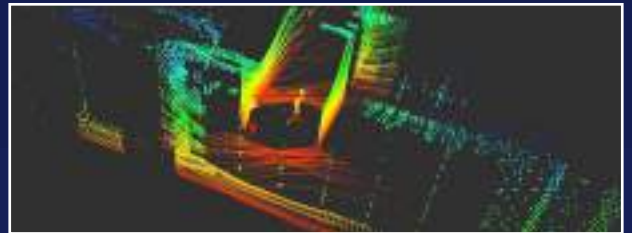
CLASS LEADING WITH 3D SLAM

INDOOR NAVIGATION



Abluo uses a multi-sensor perception system combining **3D LiDAR**, depth cameras, and ultrasonic sensors to build a real-time 3D map of its environment. This allows the robot to safely navigate complex restroom layouts, detect obstacles, and operate reliably in busy public facilities.

With advanced 3D SLAM, Abluo continuously updates its understanding of the environment, enabling precise navigation, efficient route planning, and safe operation around people.



NON-STOP CLEANING

Docking Station (optional)

The optional docking station enables fully autonomous operation. After each cleaning cycle, Abluo automatically returns to the station to recharge, refill water, and replenish cleaning solutions.



Swappable Batteries

Abluo Mark 2 is designed for continuous operation in high-traffic facilities. Its high-capacity battery modules can be quickly swapped, minimizing downtime and maximising ROI.



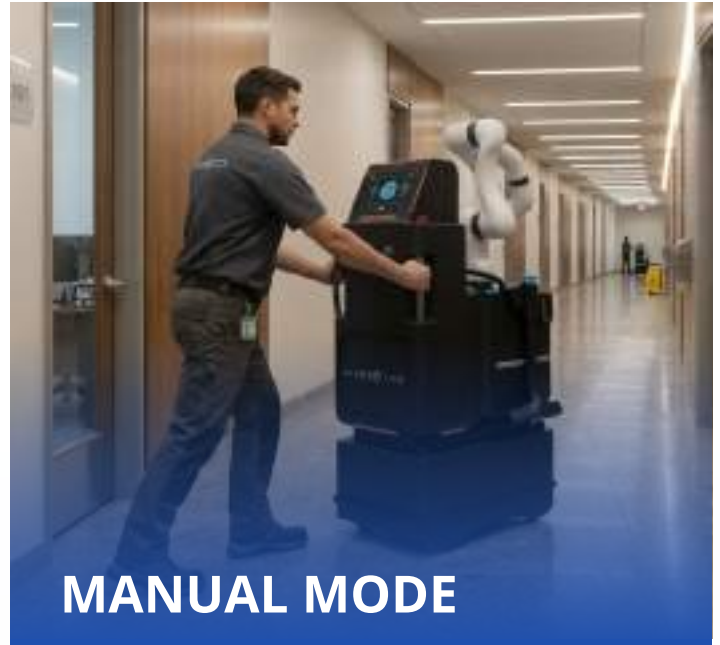
EASY TO USE, ALWAYS

The Abluo Mark 2 maximises accessibility with multiple modes of interaction — giving users maximum flexibility in all cleaning situations.



AUTOMATIC MODE

Fully autonomous movement within same floor and within restrooms



MANUAL MODE

Easy to train cleaners & supervisors on maintenance, transport and upkeep



INTUITIVE CONTROLS

Robot can be operated with just onscreen touchscreen or a mobile app. Every access is authenticated secure and timestamped.

SPECIFICATIONS

Dimension		
Length	75	cm
Width	46	cm
Height	150	cm
Weight (without Water)	180	kg
Weight (with full water & chemical)	200	kg
Battery		
Capacity	7560	Wh
Voltage	50.4	V
Operating Time per Charge	3	hours
Charging Time (to full)	2.5	hours
Charging Mode	1. Battery Swapping 2. Wall plugged 3. Docking Station	
Computing		
CPU	AMD Ryzen™ Embedded 8845HS	
GPU	NVIDIA Quadro RTX A400 GPU	
Network & Connectivity		
Mobile module (SIM)	Support 4G LTE Cat 4 up to 150 DL/50 UL Mbps	
Wireless mode	802.11b/g/n (Wi-Fi 4)	
Wi-Fi security	WPA2-Enterprise	
Location Tracking	GPS (optional) Geofencing configurable	
Cleaning System		
Cleaning Modes	1. Steam Cleaning 2. Hot Water Spray 3. Cold Water Spray 4. Chemical Spray 5. Wet & Dry Vacuum 6. Blow Drying	
Steam Pressure (3 Modes)	3/5/8	bar
Steam Temperature (Max)	173	Celcius
Steam Volume	75	g/min
Steam Start Up Time	7	min
Water Tank Capacity	13	L
Waste Tank Capacity	5	L
Chemical Tank Capacity	2	L
Water Jet Flow Rate	550	ml/min
Detergent Flow Rate	550	ml/min
Water Temperature (Hot)	70	Celcius
Water Temperature (Cold)	24	Celcius
Vacuum Negative Pressure (Max)	25.4	kPa
Sound pressure level LpA	67	dB(A)
AMR		
Speed (max)	0.8	m/s
Drive System	Omni-directional Drive	
Turning Angle	0	Degree
Max Floor Clearance	5	cm
Slope Tolerance	7	Degree
Accuracy Tolerance	3	cm

3D Lidar		
Scan Range	0.1 - 40	m
Accuracy	2	cm
Field of View	360 x 59	Degree
Frame Rate	10	Hz
IP Rating	IP67	
Power	6.5	W
Ultrasound (Safety)		
Scan Range	2 - 300	cm
Response Time	<750	ms
Accuracy	1	cm
Cliff Sensor (Safety)		
Scan Range	20 - 150	cm
Scan Coverage	360 Degrees of Robot	
Bumper Sensor (Safety)		
Coverage	360 Degrees of Robot	
Response Time	<70	ms
Robot Arm		
Working Range (max)	850	mm
Working Speed	1	m/s
Repeatability	0.02	mm
Degree of Freedom	6	dof
Payload	5	kg
Camera (Depth)		
Active Pixels	1280 x 800 @120fps	
FOV	89.5	
Shutter Type	Global Shutter	Degree
Camera (RGB)		
Active Pixels	4056 x 3040 @60fps	
FOV	78	Degree
Shutter Type	Rolling Shutter	
Performance (Estimates)		
Time to Clean 1 Toilet Bowl	5	mins
Water Consumption per Toilet Bowl	0.2	L
Time to Cleaning 1 Urinal	3-5	mins
Water Consumption per Urinal	0.2	L
Time to Clean 1 Sink	2-4	mins
Water Consumption per Sink	0.5	L
Time to Clean 1sqm of Floor	0.3	mins
Water Consumption per 1 sqm of Floor	0.075	L
Time Taken Per Cleaning Cycle (for 3 Toilets, 3 urinals, 3 sinks & 30sqm)	~40	mins
Water Consumption per Cleaning Cycle (for 3 Toilets, 3 urinals, 3 sinks & 30sqm)	~5	L
Cleaning Cycle per Refill (Water) (for 3 Toilets, 3 urinals, 3 sinks & 30sqm)	2-3	cycles
Refill Time (Water)	3	mins
Cleaning Cycle per Disposal (Waste)	~8-12	cycles
Disposal Time (Waste)	5	mins
Cleaning Cycle per Refill (Chemical)	Variable	
Refill Time (Chemical)	2	mins
Robot Operating Time per Full Charge	3	hours
Robot Charging Time	2.5	hours