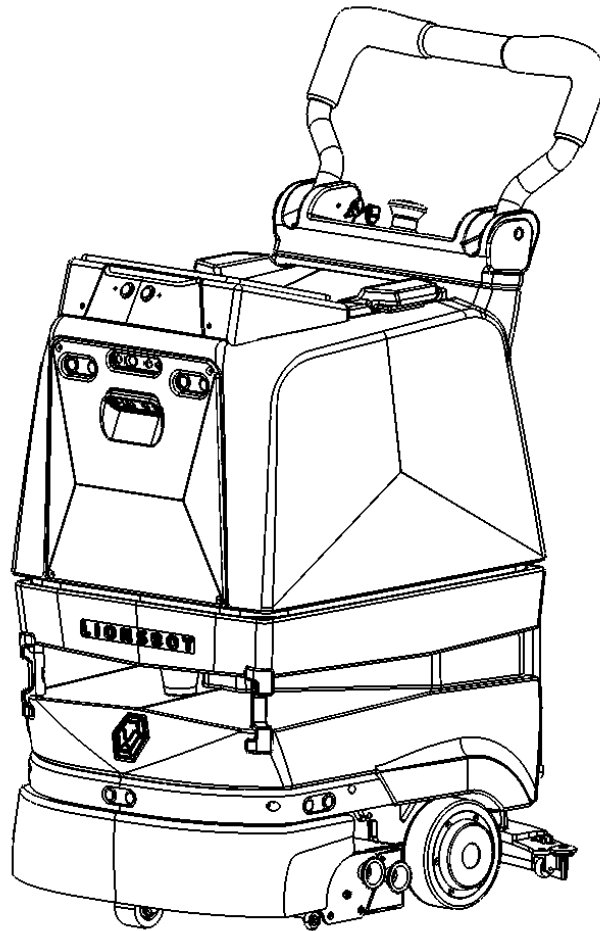


R3-SCRUB – OPERATION MANUAL



AUTONOMOUS CLEANING ROBOT – FLOOR SCRUBBING

ENGLISH (EN)

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OPERATION MANUAL

Rev 0.9 (04-2022)



ORIGINAL INSTRUCTIONS MANUAL



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INTRODUCTION TO THE R3 SCRUB

The R3 SCRUB is an autonomous floor-scrubbing developed by Lionsbot. The R3 SCRUB is equipped with one brush for floor scrubbing and a squeegee with vacuum suction for wiping the floor dry. The brushes, vacuum and squeegee are activated automatically or manually during cleaning operations.

All work with the R3 SCRUB can be carried out through the Touchscreen or LionsClean mobile app.

This document introduces the user to the overall structure and components of the R3 SCRUB, safety precautions related to its use, and the procedures for work preparation, cleaning and maintenance with the R3 SCRUB. Any questions pertaining to this manual or R3 SCRUB operation in general should be directed to the respective distributor or the original manufacturer (see [‘DISTRIBUTOR INFORMATION’](#) or [‘CONTACT INFORMATION’](#) sections).

This machine will provide excellent service. However, the best results will be obtained at minimum costs if:

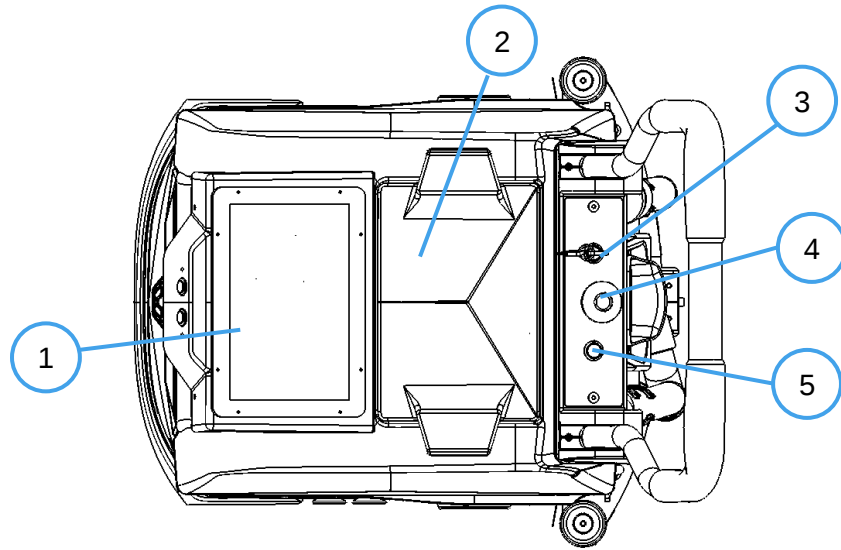
- The machine is operated with reasonable care.
- The machine is maintained regularly - per the machine maintenance instructions provided.
- The machine is maintained with manufacturer supplied parts.

 	Read this manual completely and understand the machine before operating or servicing it.
---	--

 	PROTECT THE ENVIRONMENT Please dispose of packaging materials, used components such as batteries and fluids in an environmentally safe way according to local waste disposal regulations.
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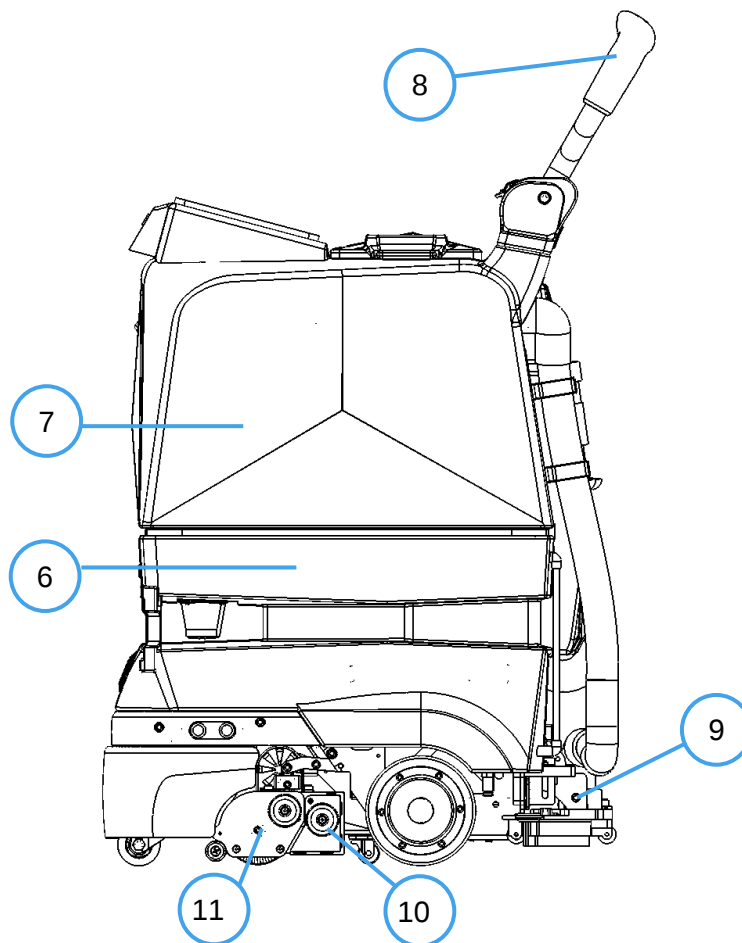
This operator manual contains information to allow for quick start-up of the R3 SCRUB, powered by LionsOS. This document may be periodically revised. The R3 SCRUB, can be used in manual mode or as a robotic scrubber. Use in robotic (autonomous) mode requires a subscription to Lionsbot International Autonomy Services. It is important to follow all provided instructions and warnings. Failure to adhere to instructions could result in damage to the machine and injury. The R3 SCRUB is a commercial floor scrubber powered by LionsOS software. The powered scrubber is capable of functioning in either manual or robotic (autonomous, self-driving) modes. When in robotic mode, the LionsOS software enables autonomous navigation. This product may be covered by one or more patents or pending patent applications. Email LionsBot International for details. Discrete portions of this product were made possible by open-source software. Please email LionsBot International for details.

MAIN R3 SCRUB COMPONENTS



1. TOUCHSCREEN
2. TANK HATCH
3. KEY SWITCH
4. EMERGENCY STOP
5. RESET BUTTON

Fig. 1



6. CLEAN WATER TANK
7. WASTE WATER TANK
8. HANDLE BAR
9. SQUEEGEE ASSEMBLY
10. DEBRIS TRAY
11. BRUSH FLOOR TOOL ASSEMBLY

Fig. 2

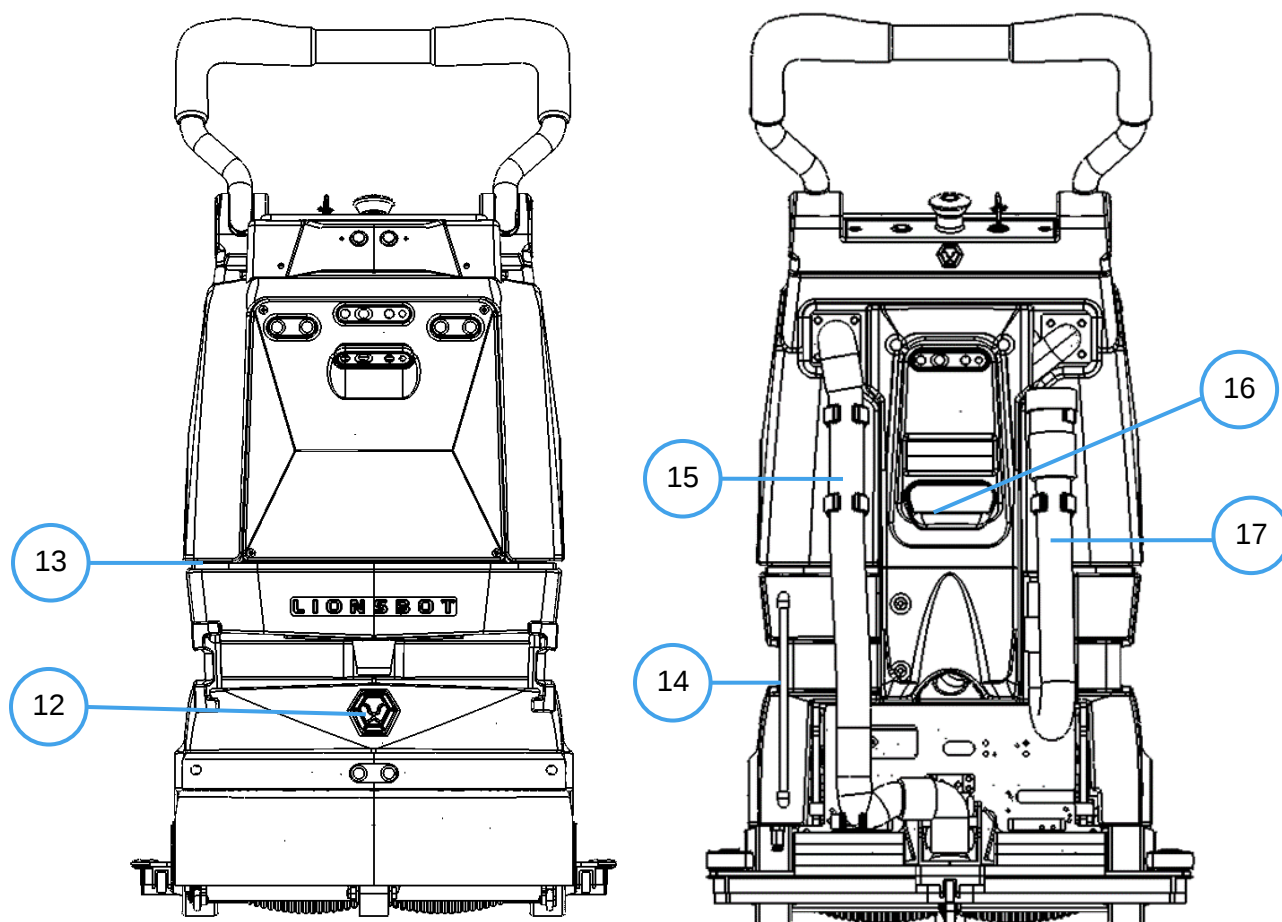


Fig. 3

12. LIONSBOT LOGO

13. LEDS

14. WATER LEVEL TUBE

15. VACUUM HOSE

16. CLEAN WATER INLET

17. DRAIN HOSE

INTENDED USAGE ENVIRONMENT

The R3 is designed and built for the cleaning (scrubbing and drying) of smooth, compact flooring in an enclosed environment (ex. offices spaces, corridors, meeting rooms, classrooms, laboratories etc.) by a qualified operator in proven safety conditions. It is only intended to be used in an enclosed indoor environment. This machine is not intended for use on public roadways and narrow areas less than 10 m². Only use this machine as described in operation manual.

Use the machine in approved environments in accordance with the LionsBot Software End User License Agreement (EULA). Approved environments shall also be limited to cleaning areas with adequate cellular communication signals permitting cellular data communication with the machine to enable periodic safety-related updates.

The operator is responsible for the use of each R3 in both manual and robotic mode. As the machine begins robotic operation, observe scrubbing performance to ensure that all components are functioning properly. Each operator must be mindful to use the machine in accordance with its intended use and precautions at all times. Operators will not engage in any of the following conduct or activities with respect to the Autonomy Services or LionsOS:

- Transmission of any software or other materials that contain any viruses, worms, trojan horses, defects, spyware, spiders, screen-scrapers, or other items of a destructive or disruptive nature;
- The machine onboard cameras may capture images of people who happen to be in its surrounding. There may be local laws of operation relating to use of technology with cameras. Please comply with all applicable laws, including using signage or obtaining consents as required; Lions cloud does not store any images or video captured by the robot.
- Exploitation of the Autonomy Services, LionsOS, hardware in any unauthorized manner, including by trespassing or burdening server or network capacity or infrastructure;
- Framing, mirroring, or reselling any part of the Autonomy Services or LionsOS without written authorization from Lionsbot International;
- Unauthorized collection of user information; or
- Attempting to deliberately damage the Autonomy Services or LionsOS, or undermine the legitimate operation of the Autonomy Services or LionsOS.

GENERAL SAFETY

This section consists of safety information which must be read and understood by the user before the first usage of the robot. Operator cooperation is paramount for accident prevention; most workplace accidents are caused by a failure to adhere to safety regulations. An attentive and careful user is the most effective guarantee against accidents.

The following symbols are used to indicate any potentially hazardous situations. Please take the necessary precautions to protect people and objects that may be present around the R3.

DESCRIPTION OF SYMBOLS

The following symbols categories explain the level of harm or damage that can occur if warnings are not observed and the machine or related equipment is used incorrectly. Understand these symbols and their correlating meanings before reading the remainder of this manual.

	DANGER: Indicates an imminent hazardous situation which, if not avoided, could result in serious injury or death.
	WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in injury or major damage to the equipment.
	CAUTION: Indicates a situation which, if not avoided, could result in major damage to the equipment.

PICTORIAL INDICATIONS

The following pictorial indication categories explain information to be observed. Read this guide after thoroughly understanding the information.

	NOTE: Indicates safety information, precautions on dos and don'ts to ensure safe product usage and/or user safety.
	COMPULSORY: Action based on instruction must be performed.
	PROHIBITED: Not allowed action. Do not perform any operation not given in this manual. Use of the machine in a manner inconsistent with this manual may lead to personal injury or significant physical damage or property damage.
	NO WATER EXPOSURE: Do not expose to water or moisture.
	UNPLUG: Unplug from power outlet.
	Recycling symbol: Informs the user to carry out the operations in compliance with environmental regulations in force in the place of usage of the appliance
	Bin Symbol: To indicate that separate collection for waste electric and electronic equipment (WEEE) is required.
	Wear Gloves
	Wear Protective Eyewear

BATTERY CHARGING



DANGER



- **Warranty shall be voided if instructions in this manual are not followed.**
- If the battery charge cable is damaged or broken, it should be replaced by the manufacturer or authorized service personnel or a qualified person in order to prevent hazards.
- Keep sparks, flames and incandescent materials at a safe distance from the batteries.
- Keep the tank hatch closed during the entire battery recharging cycle, and only perform the procedure in well-ventilated areas.



- The socket for the battery charger cable must have a prescribed earth connection. Do not modify the polarized plug to fit a non-polarized outlet or extension cord.
- Before charging check that the electric cable that connects the battery charger to the batteries is not damaged, and if it is damaged do not use it and contact technical assistance. Do not use with a damaged plug or lose power outlet.



- Do not disconnect the battery charger cable from the machine socket when the battery charger is operating. This is necessary to prevent electric arcs forming. To disconnect the battery charger when charging, first disconnect the power cable from the mains socket.
- Do not use extension cords or outlets with inadequate current carrying capacity.
- The robot charger should not share an AC plug point with any other devices. Do not use more than one charger per AC plug.
- Do not charge frozen batteries.
- Do not unplug by pulling on the cord. To unplug, grasp the plug and not the cord.
- Do not replace the battery without contacting authorized distributor center.
- Do not expose the battery charger/ docking station to high temperatures or allow moisture/ humidity of any kind to come in contact with the battery charger/ docking station.
- Do not leave the battery to charge unattended/ overnight as a safety precaution for the Lithium-polymer batteries. Unplug the charger after the charging is complete (a typical full charge cycle takes about 2 hours).



DANGER



- Do not mutilate or incinerate batteries as they will explode at high temperatures.
- Do not attempt to open the battery charger/ docking station. Repairs should only be carried out by a qualified service personnel.



- Unplug the battery charger/ docking station from the outlet when not in use and before servicing.



- Do not charge the robot if it is wet.
- Do not use outdoors or on wet surfaces.



WARNING



- Install the battery charger in a location that can be easily accessed by the robot. Away from water, on a flat surface and elevated.
- Do not pull or carry by the cord, use the cord as a handle, close the door on the cord, or pull the cord around sharp edges or corners. Keep the cord away from heated surfaces.
- Never smoke in the machine's vicinity while the batteries are charging.
- Use only a compatible battery charger with purchased batteries.



- The charger surface becomes hot while charging.

USING THE R3 SCRUB



DANGER



- **Warranty shall be voided if instructions in this manual are not followed.**

- Immediately discontinue use if anything unusual is noticed during use, recharging, or storage such as noise, smoke, odour, etc. Failure to do so may result in fire, injury, electric shock, damage, malfunction, overheating, leakage, chemical explosion, or other damage to the machine, battery charger and docking station.
- Report machine damage or faulty operation immediately.
- Use the machine within an ambient temperature range of 2°C to 40°C, humidity of 10% to 80%. Also, store in a dry environment with no dust in an ambient temperature range of 2°C to 40°C. Failure to do so may result in fire, injury, electric shock, damage, malfunction, overheating, leakage, chemical explosion, or other damage to the machine, battery charger, battery or docking station.
- In the event of danger, promptly activate the emergency stop push-button to immediately stop all robot motion.
- In areas where the machine is inoperable or unmovable due to power not turning on, move the machine to a safer location.
- **If wearing an implanted cardiac pacemaker or implanted defibrillator, consult with the manufacturer of such medical device to confirm a safe operational distance from the machine.** Electric signals may affect the operation of the pacemaker or defibrillator.



- **Do not use in a healthcare environment or near electronic medical devices.** *The machine does not comply with UL or IEC 60601 standards (or equivalent standards).
- Flammable materials can cause an explosion or fire. Do not use flammable materials in tank(s).
- Do not use the robot in a potentially combustible atmosphere (such as near dusty areas, candles, desktop lamps or a fireplace).
- Do not use the robot to collect gases, explosive/ flammable liquids or powders, nor acids or solvents – including gasoline, paint thinners, acetones, aluminium and magnesium powders.
- Do not operate machine in environments requiring fail-safe performance (areas where machine failure could lead to personal injury or property damage).
- Do not block the machine's ventilation vents. Doing so may cause fire, injury, electric shock, damage, malfunction, overheating, leakage, chemical explosion, or other damage to the machine, battery charger.



WARNING



- Machine can only be operated by trained and authorized users. Operator must be mentally and physically capable of following machine instructions. Operator must read and fully understand the manual.
- This machine is for dry use only. On floors with hard surfaces of 0 % incline.
- Use and store only indoors (i.e., in an enclosed and covered environment).
- Always operate machine in manual mode when going into elevators or through automatic doors, transport loading and unloading. Robotic routes should never include going into elevators or through automatic doors.
- Use robots only in environments, with minimal glare. Do not expose robot to direct sunlight, light sources or environments with high brightness and reflectivity.



- This machine may be equipped with technology that automatically communicates over the cellular network. If this machine will be operated where cell phone use is restricted because of concerns related to equipment interference, please contact a Lionsbot representative for information on how to disable the cellular communication functionality.
- This machine is **not suitable** for picking up hazardous dust.



- In the event of a fire, use a fire blanket, powder or carbon dioxide extinguisher. Do not use water.
- Do not handle the robot or charger with wet hands.
- Do not operate the robot if it has been damaged in any way.
- Do not operate in a very crowded location
- Do not allow children to play with the robot unattended.
- Do not allow unauthorized persons near the machine.
- Do not operate on slopes or uneven terrain or low traction environments (ice, oil, etc.)
- Do not attempt to ride, climb or sit on machine or allow machine to be used as a toy, transport or any other function other than its intended purpose in this manual.
- Do not leave electrical cords or low-profile items (anything having a height of less than 10 cm from ground) in area of machine operation.
- Do not use ladders, scaffolds, or other temporary constructed structures in area of machine operation.



CAUTION



- This machine is for indoor use only.
- Clean the water level limiting device regularly and examine it for signs of damage.
- Avoid operating the robot in places/ times frequented by elderly visitors, general public for noise hazard concerns.
- Exercise caution when running the robot autonomously near visually impaired persons.
- Always keep your eyes on the robot when controlling it via remote control.
- If Operator is allergic to rubber or metal. Gloves must be worn when operating machine.



- Do not operate near cliffs, escalators, stairs or moving platforms in an area of machine operation. Near is defined as 3x robot length or 5 m. (The higher value is used)
- Do not drive the robot over steps or curbs higher than 2cm.
- In manual mode, do not operate the robot over uneven surfaces and steep slopes more than 5 % grade (2.9 degrees).
- In autonomous mode do not operate on slopes, the floor must be flat.
- Do not use any acidic, strong solvents, chlorine based and flammable chemicals.
- Do not press the ultrasonic sensors.
- Do not put any weight on the robot. Do not stand on the Squeegee assembly.
- Do not use the robot to pick up anything that is burning, such as cigarettes or matches.



- Do not leave the robot unattended and stationary in a public area.



- Check the clean water and waste water tanks' water levels when turning the robot on or off.
- Check the battery level of the robot regularly.
- Check that the LIDARs and cameras are clean and dry before starting.
- Follow mixing, handling and disposal instructions on chemical containers.
- Place proper floor cleaning signage in areas where the machine is operating and people are present, in accordance with standard floor cleaning practices.
- Follow site safety guidelines concerning wet floors.
- Operator cooperation is paramount for accident prevention; most workplace accidents are caused by a failure to adhere to safety regulations. An attentive and careful user is the most effective guarantee against accidents.

STATUS MONITORING SYSTEM

R3 is equipped with a status monitoring system. This system acts as a secondary channel for the robot's navigation related safety system. The system receives a heartbeat status signal from the computer at a pre-defined frequency (2Hz). The system only drives the traction motors and other moving parts such as brush motors & vacuum motors if the heartbeat is regularly updated. This ensures that the robot cannot move if the IPC (Industrial PC) is switched OFF or spoilt half-way through the autonomous or manual operation.

This system is to prevent R3 from moving on its own without receiving correct instructions from on-board computer.

DEACTIVATION AND STORAGE



WARNING



- Store the robot in a dry, sheltered place.
- Stop the robot on a flat surface. Turn the key switch off and remove the key.



- Do not store the robot near combustible materials.

CLEANING AND MAINTENANCE



WARNING



- Do not spray water directly at the robot to clean it.



- Do not use chemicals such as benzene, thinner, acetone or alcohol to clean the robot.
- Do not attempt to modify, disassemble or repair the robot. Repairs should only be carried out by a qualified service personnel.



- Stop robot on a level surface. Turn off robot and remove the key before cleaning or activate E-STOP before maintenance of the robot to prevent activation.
- Wear personal protective equipment as needed and where recommended in this manual.
- Avoid moving parts. Do not wear loose clothing, jewellery and secure long hair.
- Block machine wheels before jacking.
- Jack machine up at designated locations only.

TRANSPORT



CAUTION The R3 SCRUB can be pushed manually in **manual mode** or moved using the remote-control function of the app. When moving around narrow areas, it is easier to push the R3 SCRUB.

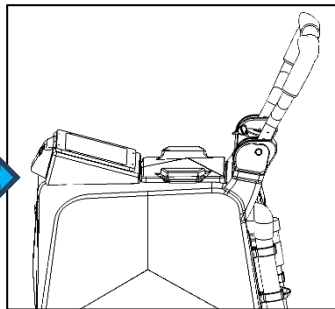
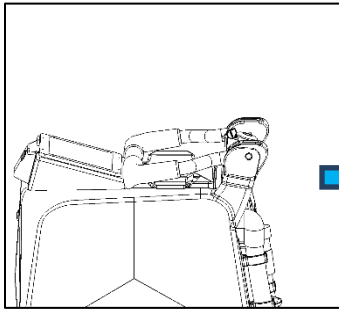


Fig. 1

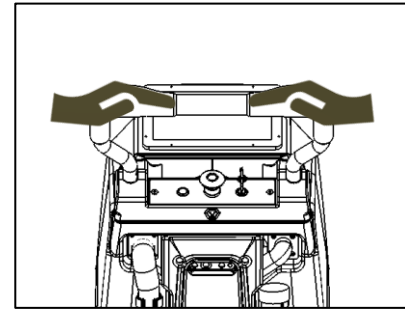


Fig. 2

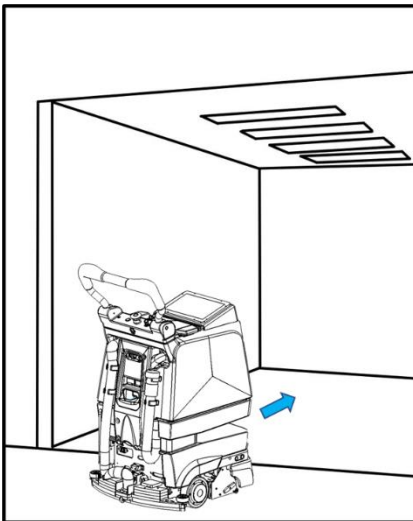


Fig. 3

- Use the touchscreen and select **manual mode** to move the robot.
- Pushing the R3 SCRUB manually: Lift up the handle from the rest position as shown (Fig. 1). Ensure that the handle is being clasped into the fitting of handle mount bar.
- Use both hands to push from the handle as shown (Fig. 2).
- Moving the R3 SCRUB into lifts: reverse in, as the smaller front wheel can get stuck (Fig. 3).
- Moving over uneven surfaces (humps, steps): in any situation that could cause the R3 SCRUB to tilt or tip over an obstacle while moving, always use the foot pedal to move over the obstacle.



WARNING: Do not drive the robot over steps or curbs higher or lower than 2cm. Check your surrounding environment for hazards (people, slopes, escalators etc.) before moving the robot.



NOTE: For R3 Scrub dimensions and turning radius in narrow corridors see [‘Technical Data’](#).

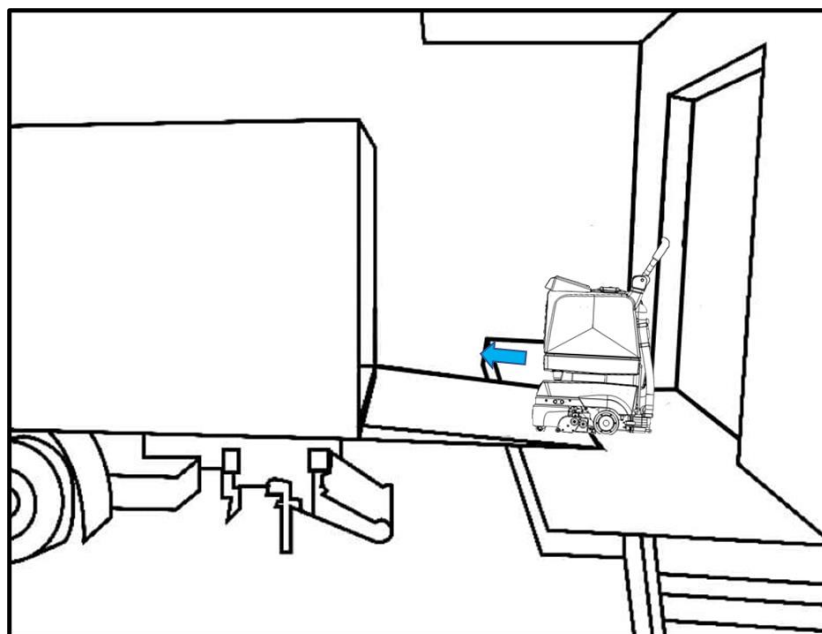


Fig. 4

- Transporting in a truck:
 - Drain both tanks before transport.
 - Use ramp, truck or trailer that will support the weight of the machine and operator.
 - When moving the R3SCRUB onto a hydraulic ramp of a truck, reverse in (Fig. 4).
 - Do not load/unload on ramp inclines that exceed 10% grade / 6°.
 - Do not drive on a slippery ramp.
 - When the R3 SCRUB is on the ramp, keep both hands on the handle to prevent it from sliding.
 - Block machine tires.
 - Lower down the brush and squeegee.
 - Turn off machine and remove the key.
 - Use tie-down straps to secure machine.



WARNING: The user is at risk of tipping over the robot and subject to crush hazards when loading/ unloading the robot. The operator and spotter are responsible for identifying and mitigating loading/ unloading hazards and taking safety precautions.

ROBOT RECOVERY

In event where robot battery is dead, do not push the robot to charging point or refuel station.

1. Lift the robot on to a trolley.
2. Secure robot on the trolley using tie down strap.
3. Move robot to charging point or refuel station.



WARNING: Pushing robot when manual mode is not engaged, or in a power off state may cause damage to the motor clutch. Damage will result in the robot being in a free wheel state. Notify the LionsBot service team in event of damage.

DISPOSAL



NOTE: Due to the presence of toxic or harmful materials inside the R3 SCRUB (e.g., batteries, IPC), the robot should not be left unattended at the end of its working life. See section on '**DISPOSAL**' for instructions on scrapping.

EMERGENCY STOP ACTIVATION



WARNING:

- If you anticipate any imminent danger to the R3 SCRUB or its surroundings, or in operating the robot in any novel situation, always be on standby to trigger the emergency stop button either directly on the robot or through the app (see the section on ['EMERGENCY STOP'](#) for details on usage).
- After the Emergency stop button is pressed, all of robot motor operations will stop immediately, cleaning functions and traction motor will cease operation. **The robot traction break will not be active**
- The operator is to secure the robot when emergency stop is activated.
- Before resuming normal operation, the operator must check the robot's condition and surrounding for safety.
- After releasing the emergency stop and pressing the reset switch the operator can resume operation using the touch screen application.

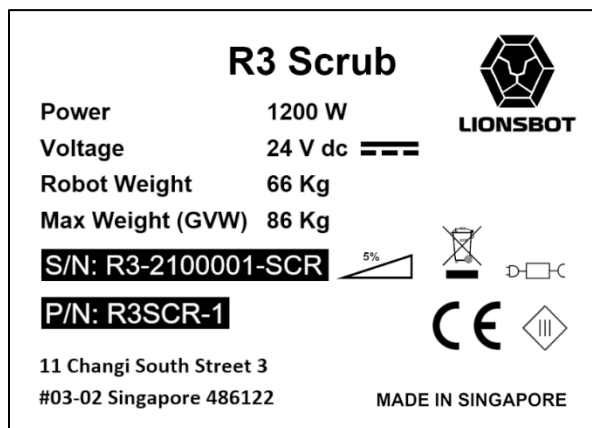
WARNING ON NOISE LEVEL



WARNING: R3 SCRUB noise level is about 65dB during cleaning operation.

NAME PLATE

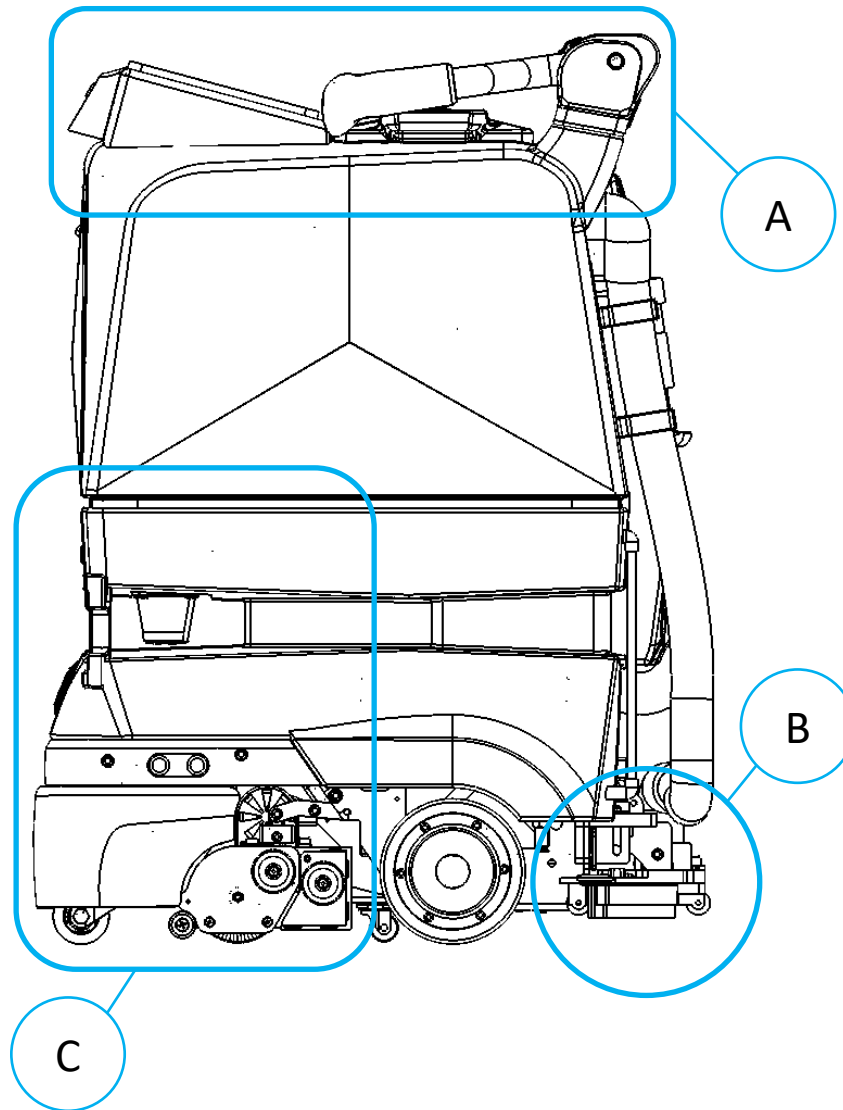
The serial number sticker is located on the robot left side. Please provide this serial number along with any request for assistance/ servicing or spare parts purchase.



The Serial Number is formatted as follows:

1. First two Alphabets (R3).
2. Next seven digits (2100001) encode the year (YY) and sequential number of the product
3. Next three alphabets (SCR) denote the product type.

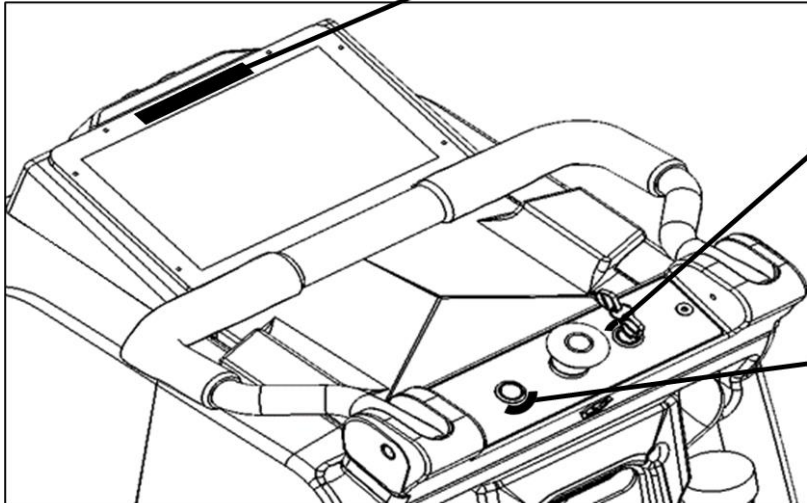
SYMBOLS ON THE R3 SCRUB



A



Read and fully understand operation manual before using this machine

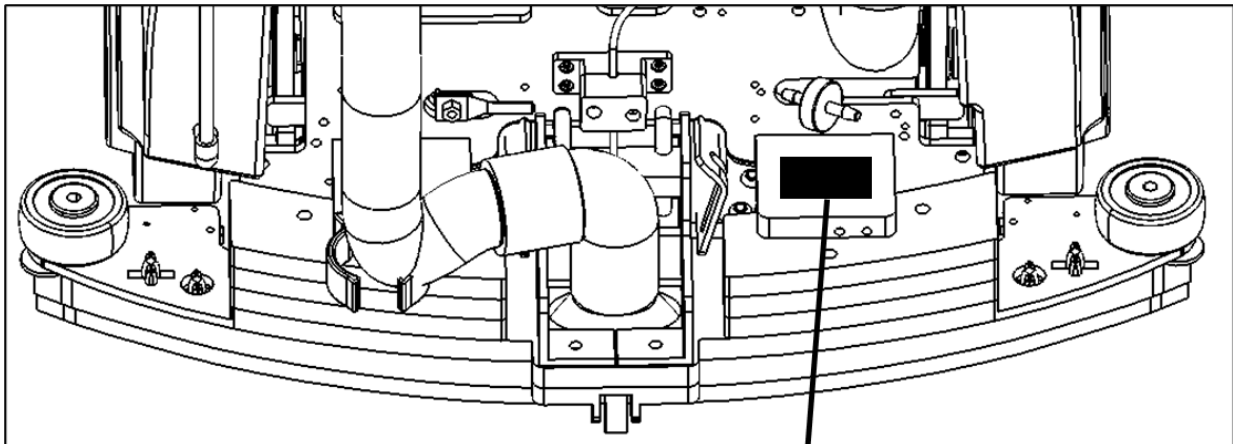


Off/On Button



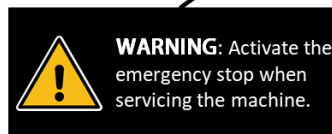
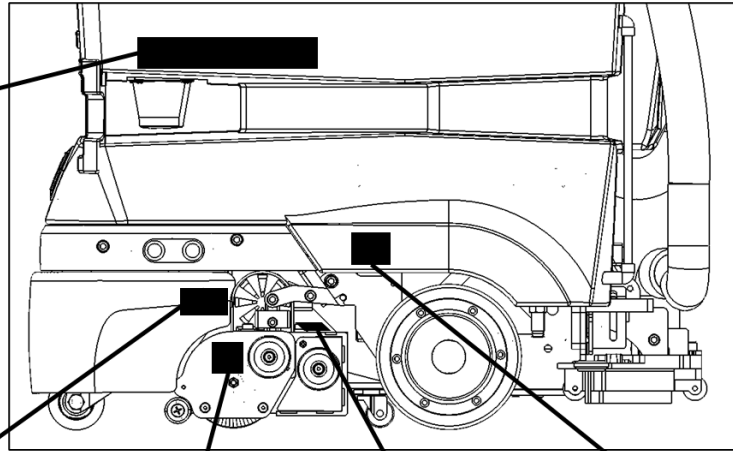
Reset Button – Reset safety bumpers and emergency stop.

B



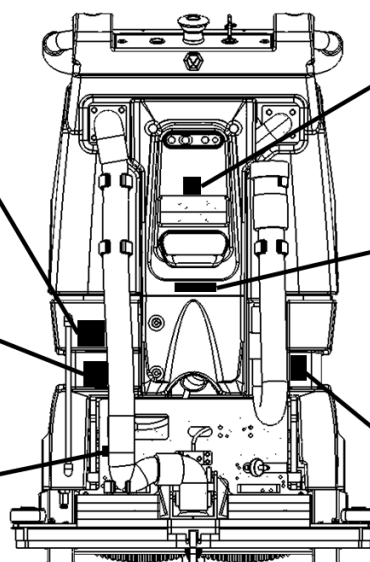
 STEP
HERE

C

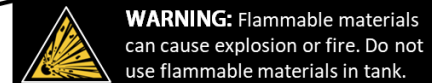


Rear View

R3 Scrub	
Power	1200 W
Voltage	24 V dc
Max Weight	86 Kg
S/N: R3-2100001-SCR	
P/N: R3SCR-1	
11 Changi South Street 3 #03-02 Singapore 486122	
MADE IN SINGAPORE	



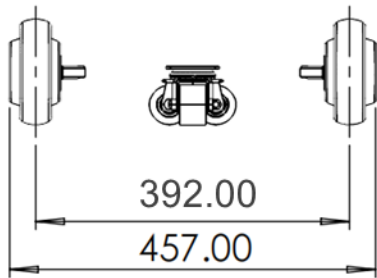
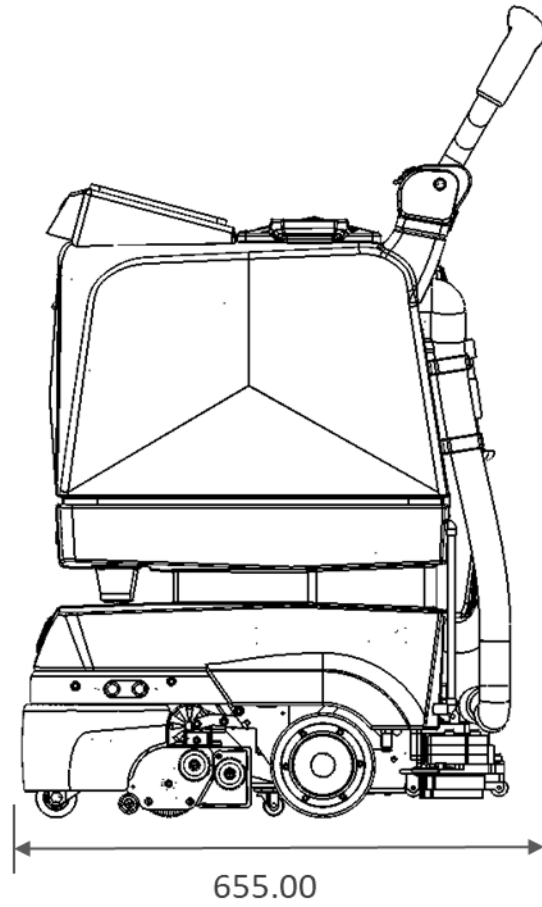
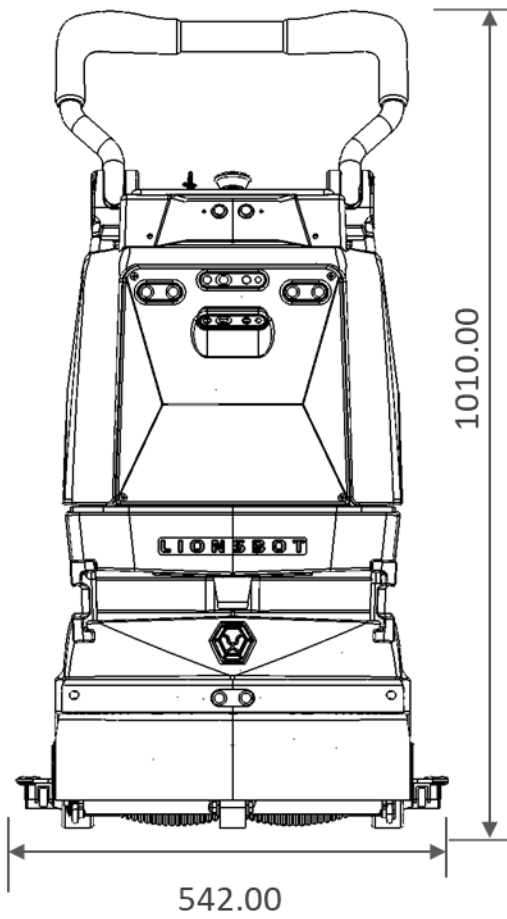
Electric Shock Warning



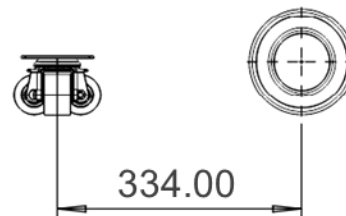
TECHNICAL DATA

Technical Data	SI [KMS]	Value
Rated machine power	W	1150
Working capacity ¹	m ² /h	864
Working width	mm	360
Squeegee width	mm	540
Brush head brushes/roller (number /external Ø / Length)	No./ mm	1/80/380
Brush RPM (Low/Medium/High)	RPM	500/850/1200
Brush head motor (voltage / nominal power rating)	V /W	24V/288
Maximum weight exerted on brush head	Kg	35
Battery (nominal voltage / capacity) ⁽²⁾	V/Ah	25.6/40
Traction motor (voltage /rated power)	V/ W	24/200
Traction wheel (external Ø / width)	mm/mm	204/52
Maximum slope during ascent and descent during transport	%/°	10.5/6
Maximum ambient temperature for machine operation	°C	40
Minimum temperature for using the scrubbing function	°C	2
Front wheel (external Ø - width)	mm/mm	25/12
Rear wheel (external Ø - width)	mm/mm	130/39
Maximum forward speed during transport (manual) ⁽³⁾	m/s	1.5
Maximum forward speed during cleaning (autonomous)	m/s	0.6
Maximum reverse speed	m/s	0.15
Vacuum motor (voltage - nominal power rating)	V / W	24/200
Maximum clean water tank capacity	L	21
Maximum waste water tank capacity	L	24
Turning radius during cleaning	m	1.2
Minimum turning radius	m	0.56
Robot dimensions (length – width - height)	mm	655 x 542 x 1010
Robot weight during transport ⁽⁴⁾	kg	65
Robot weight during cleaning ⁽⁵⁾	kg	86
Sound pressure level	dB	65
Maximum altitude	m	<2000
Storage temperature with tanks and hoses empty	°C	-20 to 45
Storage humidity	%RH	20 to 93

- (1) Calculated based on cleaning in a straight line with no obstacles at 0.6 m/s, and is not indicative of actual cleaning performance.
- (2) Capacity dependent on batteries purchased, see battery datasheet for specification.
- (3) Touchscreen manual mode is on.
- (4) Both tanks empty and with batteries
- (5) Clean water tank full and with batteries (Gross Vehicle Weight)



Front View



Back View

SAFETY FEATURES OF THE R3 SCRUB

Distance sensors, safety bumpers and obstacle avoidance behaviors are paramount to the safety of people and objects around the R3 SCRUB, and the R3 SCRUB itself. These features are described below to better equip the user for safe and productive working with the R3 SCRUB.

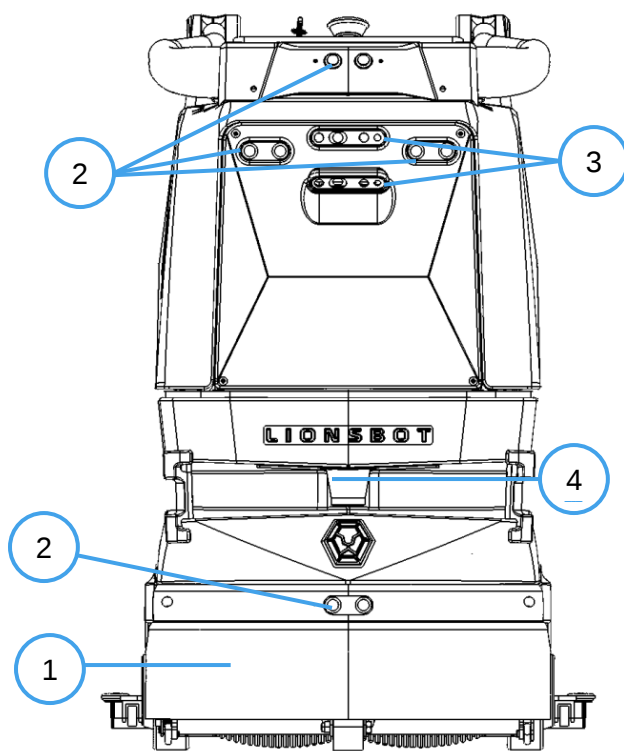


Fig. 1

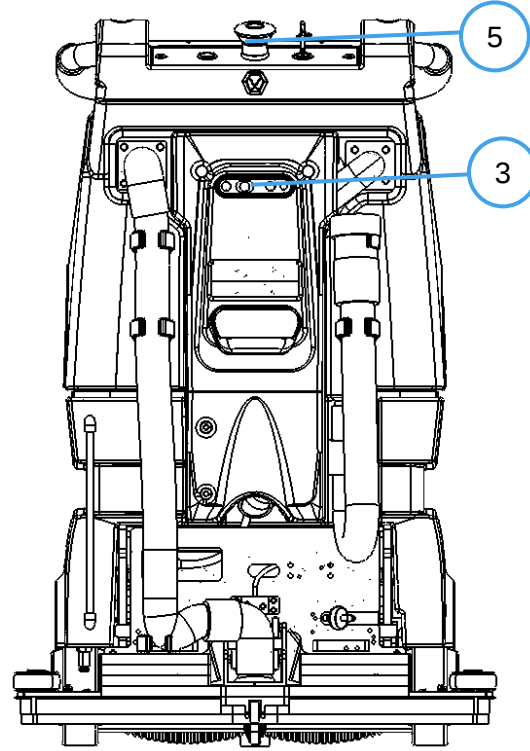


Fig. 2

1. BUMPER
2. SONARS
3. DEPTH CAMERA

4. 2D LIDAR
5. EMERGENCY STOP

DISTANCE SENSORS

1. LIDAR

The 2D LIDARs provide distance measurements to objects or features in front of the R3 SCRUB. The LIDAR is located at the base of the R3 SCRUB above the logo (Fig. 1 - 1).

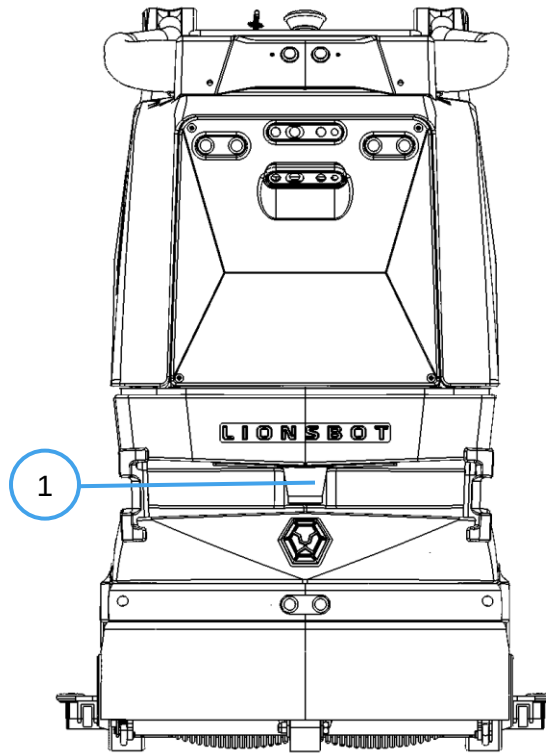


Fig. 1



WARNING: The LIDAR does not work with glass and performs poorly with reflective surfaces and black surfaces. Do not attempt to run robot autonomously in areas with glass and reflective and black surfaces.



NOTE: As the LIDAR operates in the Infrared region, the R3 SCRUB can be operated at night.

The Table below and Fig. 2 illustrate the field of view of the front LIDAR.

Technical Data	Unit	Value
2D Lidar	°	180
Effective Radial Range	m	20
Height above ground	cm	18

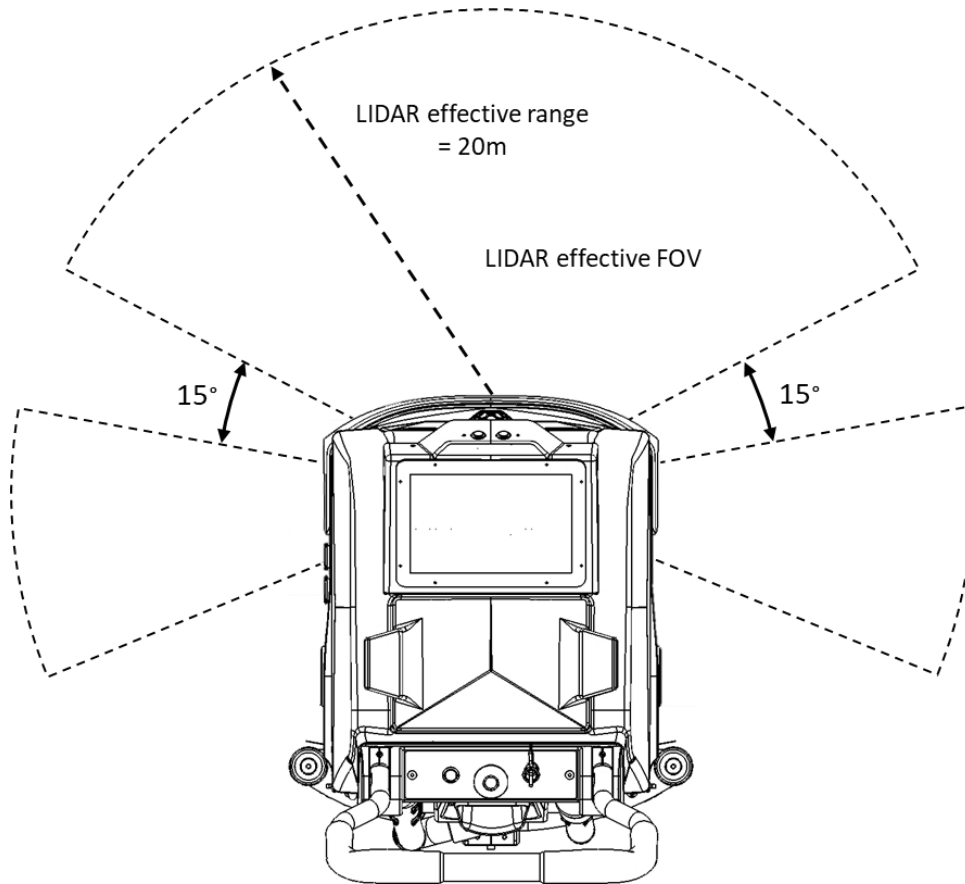


Fig. 2

2. SONARs

The long-range SONARs supplement the LIDARs by measuring distance to obstacles close to the body of the robot, in their line of detection. The R3 SCRUB is equipped with six sonars shown below.

Technical Data	Unit	Value
Sonar array Field of Vision	°	20
Effective Range	m	0.9

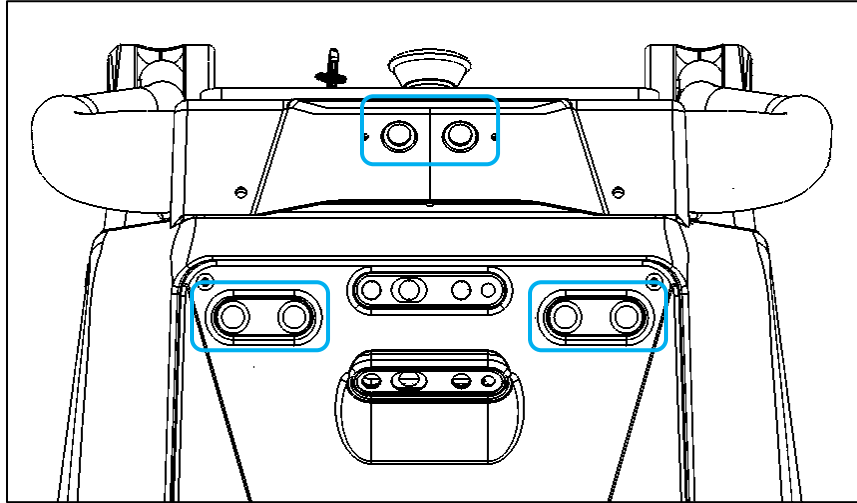


Fig. 3

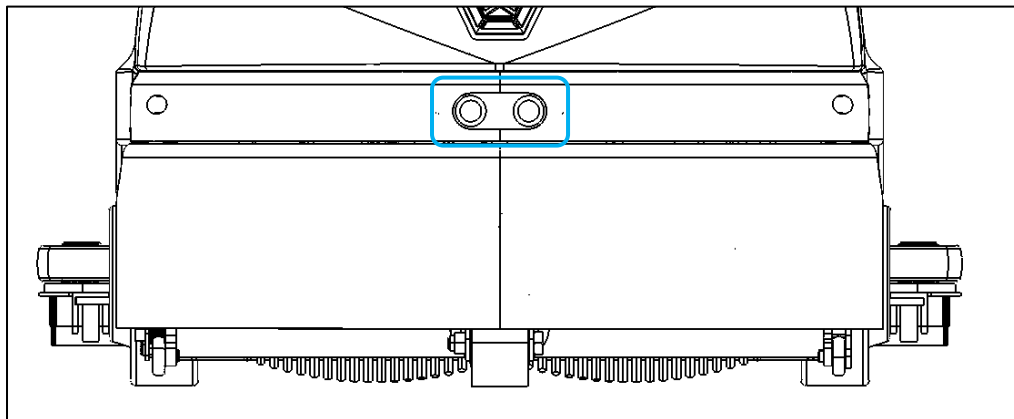


Fig. 4

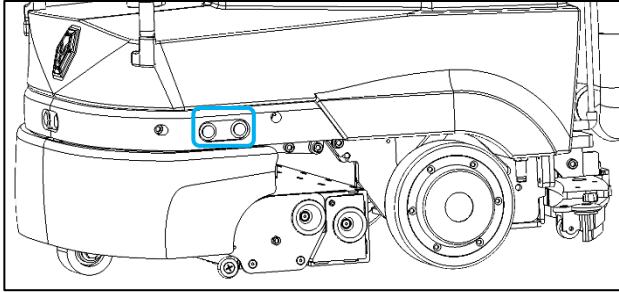


Fig. 5

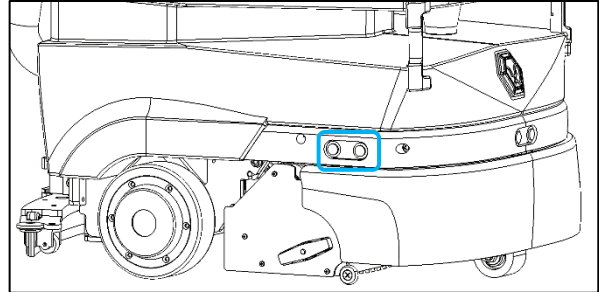


Fig. 6

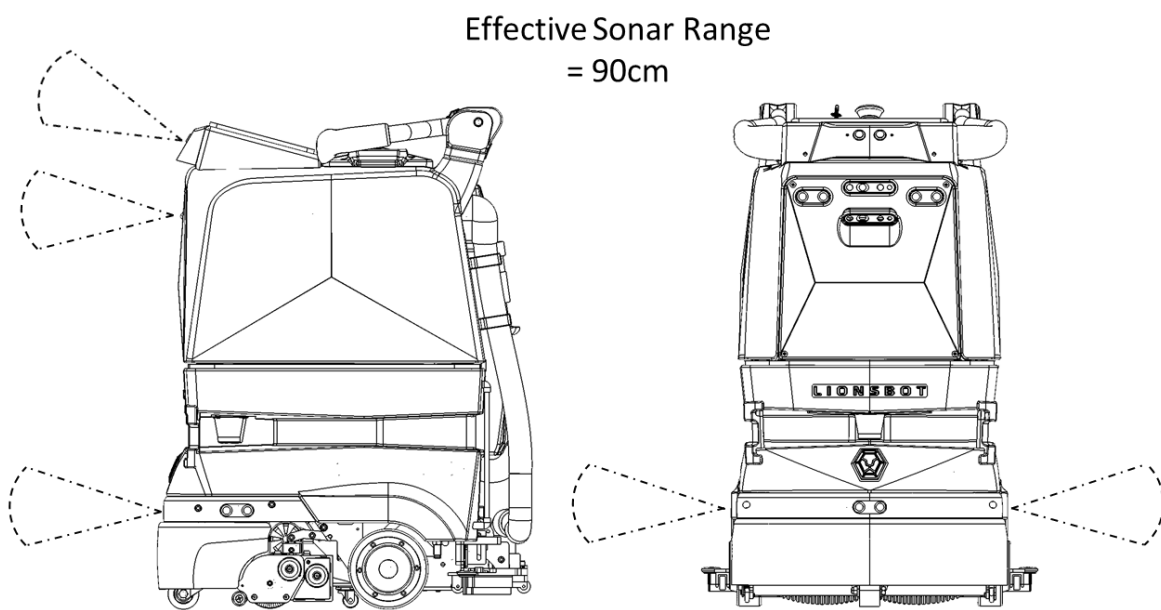


Fig. 7

3. DEPTH CAMERA

The depth camera also supplements the LIDAR in helping the R3 SCRUB gauge the distances to objects in front of it. It is placed on the front of the robot (Fig. 7) and back (Fig. 8). Note that it does not record pictures of the scene.

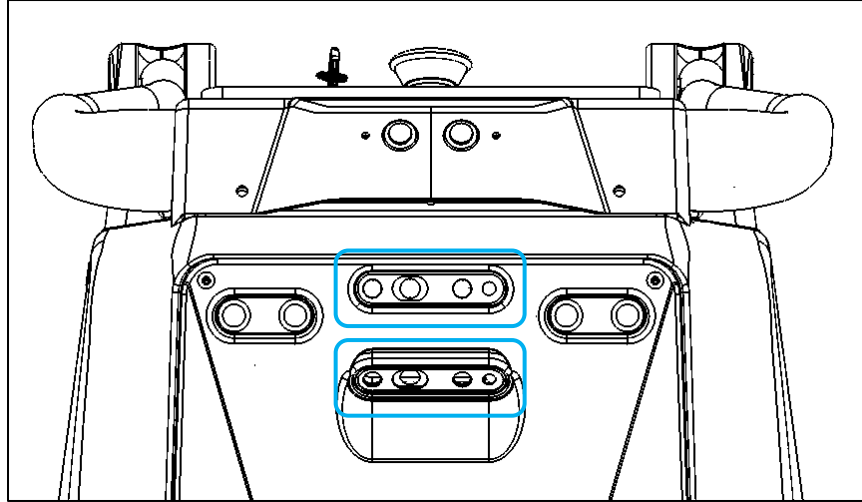


Fig. 7

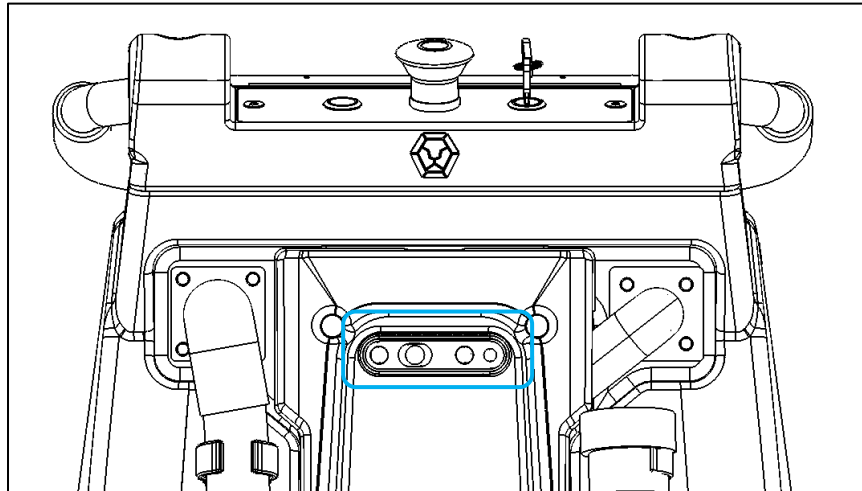


Fig. 8

Technical Data	Unit	Value
Front Camera Horizontal field of vision	°	87
Front Camera Vertical Field of Vision	°	58
Back Camera Horizontal Field of Vision	°	87
Back Camera Vertical Field of Vision	°	58
Front Camera Effective Range	m	2
Back Camera Effective Range	m	2

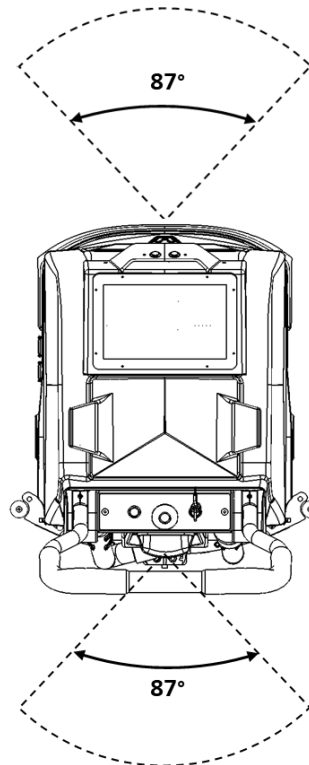


Fig. 9

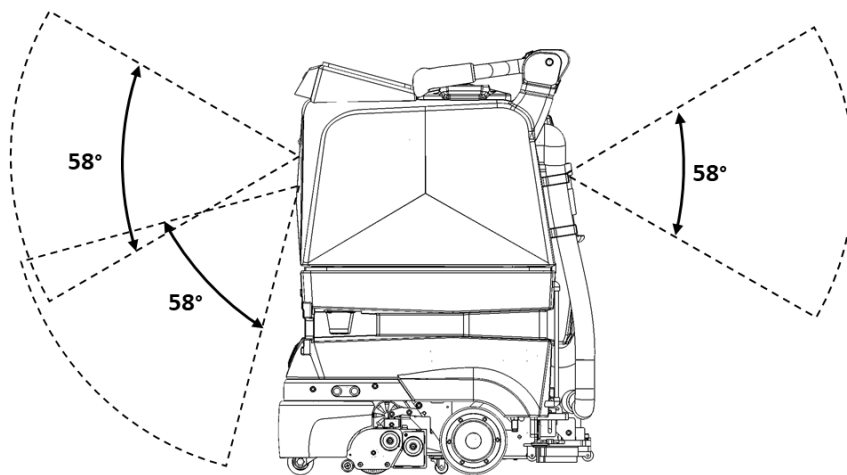


Fig. 10

BUMPER

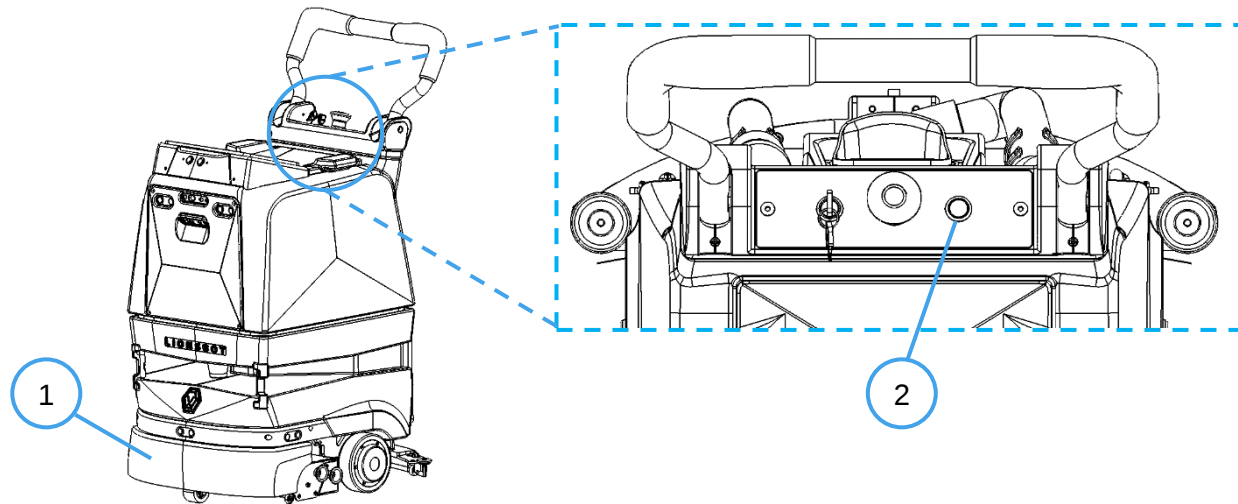


Fig. 1

The R3 SCRUB is equipped with a bumper (Fig. 1 - 1) at the front edge of the drawer. The bumper will trigger when it hits an obstacle, robot will pause for 4 seconds before engaging obstacle avoidance mode:

Obstacle Avoidance Mode

- All movements and cleaning processes will stop.
- The robot's lights will flash amber.
- The robot will reverse and avoid obstacle.

(Optional) To release the R3 SCRUB:

1. Move the obstacle away from the safety bumper.
2. Robot will replan path of travel.
3. If path planning fails, operator must reset the robot (Fig. 1 – 2).

If the obstacles are fixed or cannot be moved (etc. wall), **Activate the ESTOP first**. Manually move the robot instead by slowly pulling it away from the obstacle before attempting to reset the robot.



WARNING: Do not push or tow machine for a long distance or damage may occur to the propelling system.

OBSTACLE AVOIDANCE

The robot is equipped with obstacle avoidance behavior as an essential safety feature. When the R3 SCRUB encounters an obstacle, it waits to see if it moves away, and if it doesn't, the robot tries to plan a new path for its cleaning.

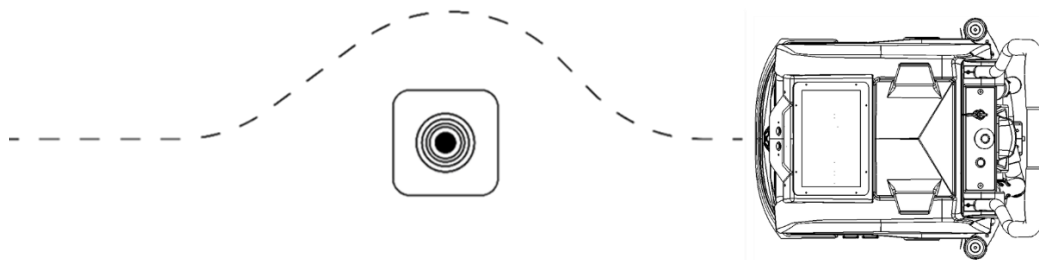


Fig. 1

EMERGENCY STOP

The emergency stop can be activated in two ways to immediately stop all robot motion:

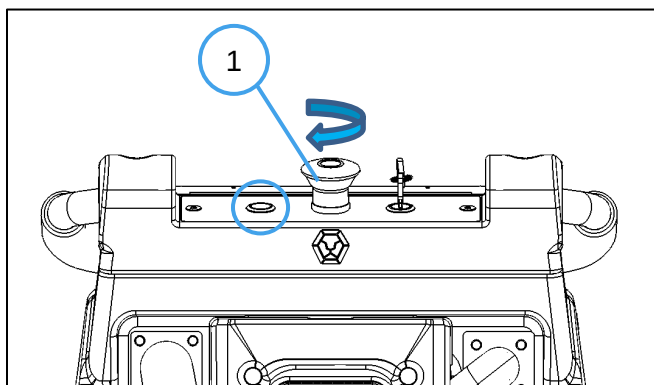


Fig. 1

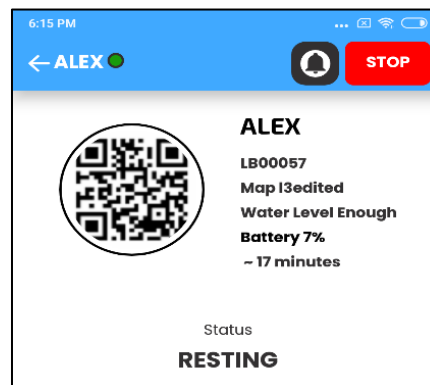


Fig. 2

1. Manually through the R3 SCRUB:

- A red emergency button is located at the top of the robot (Fig. 1 - 1).
- Depressing this button cuts off power to the internal motors of the robot, and causes all lights on the R3 SCRUB to blink red.
- To resume function of the robot, gently turn the button clockwise to reset the emergency stop trigger. Press the reset button (Fig. 1 blue circle highlighted) to return the robot to a usable state.

2. Through the app:

- The E-stop push button is located at the top right-hand corner of every app screen (Fig. 2).
- Pushing this button causes the robot to stop any action it is performing.
- Press the reset button (Fig.1 blue circle highlighted) to return the robot to a usable state.

PERSONALITY OF THE R3 SCRUB

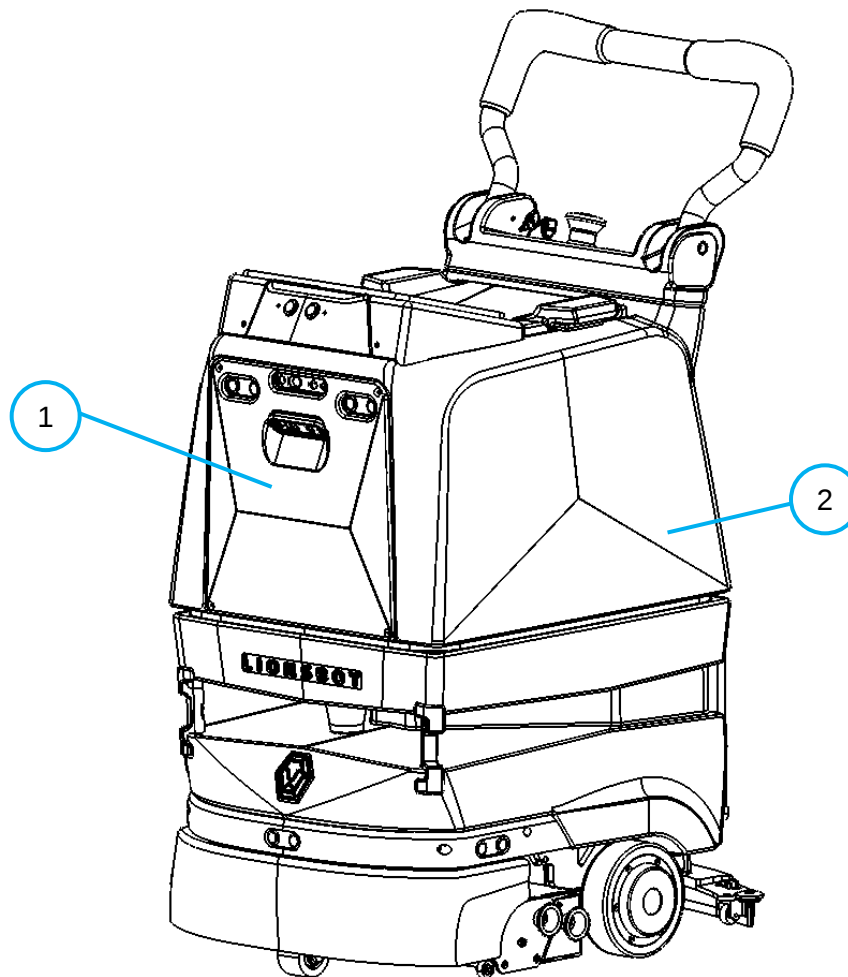


Fig. 1

The physical user interface of the R3 SCRUB – including the LED Matrix, LED lights, and speakers - imparts it the personality of a friendly cleaning companion.

LED LIGHTS

The R3 SCRUB is equipped with LED strip on the sides (Fig 1 – 2). The LED lights help to convey various state of the robot – for example, when the robot is under emergency stop all the lights will blink red.

EYE PANEL

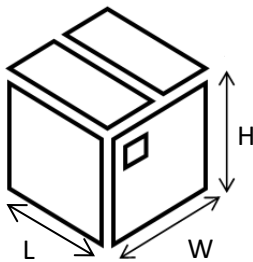
The eye panel (LED Matrix, Fig. 1 – 1) conveys the mood or emotion of the LeoBot. The eyes appear happy, sad, or tired depending on the circumstances and state of the robot.

RECEIVING AND PREPARING THE R3 SCRUB

The R3 SCRUB ships with the brushes and squeegee assembly detached from the body. Some accessories are also included to facilitate charging and maintenance operations.

HANDLING THE PACKAGED ROBOT

The robot's overall packaged weight is 85kg.



L	71.5 cm
W	58 cm
H	97 cm

It is recommended to keep the packaging components for future transportation needs.

UNPACKING THE ROBOT

1. Open the crate and take off any protective packaging material around the robot.
2. Verify the package contents against the following packing list:

ITEM	QTY
R3-SCRUB	1
Battery Charger	1
Roller Brush	1
Front Squeegee Rubber	1
Back Squeegee Rubber	1

3. Power on the robot as described below ("[POWERING ON/OFF THE R3 SCRUB](#)") and push it out of the crate in reverse to avoid the risk of tipping.

BATTERY INSTALLATION/REPLACEMENT

For Installation and Replacement:

Contact authorized service provider or LionsBot for battery installation and replacement. See section [‘CONTACT INFORMATION’](#) or [‘DISTRIBUTER INFORMATION’](#) for contact details.



Warning: Do not tamper with or attempt to replace the battery yourself.

Installing the battery:

Ensure Robot is powered OFF before installing the batteries.

(Optional) Make sure the clean water tank is empty.

1. Close the water valve and unplug the clean water tubes on the left and right shown (Fig 1).

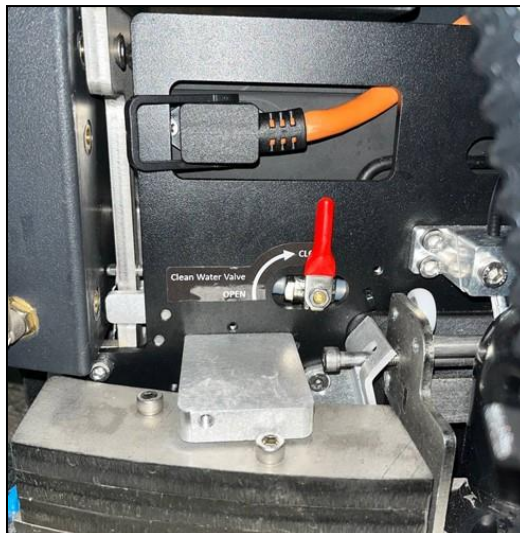


Fig. 1

2. Plug the unplugged tube shown (Fig 2)

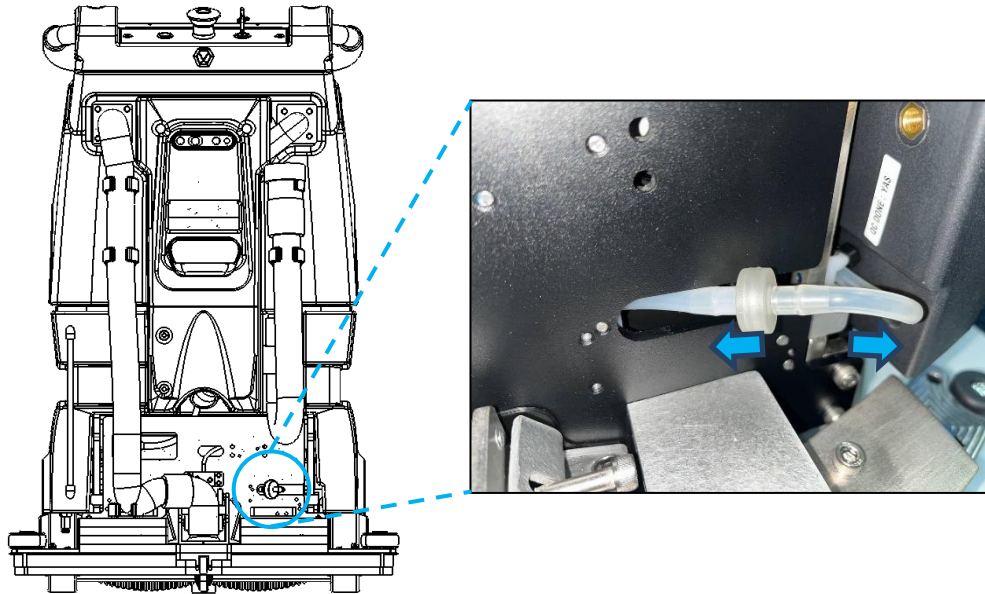


Fig. 2

3. Unscrew the four screws on the weights of the squeegee assembly (Fig. 3). Remove the weights (Fig. 4).

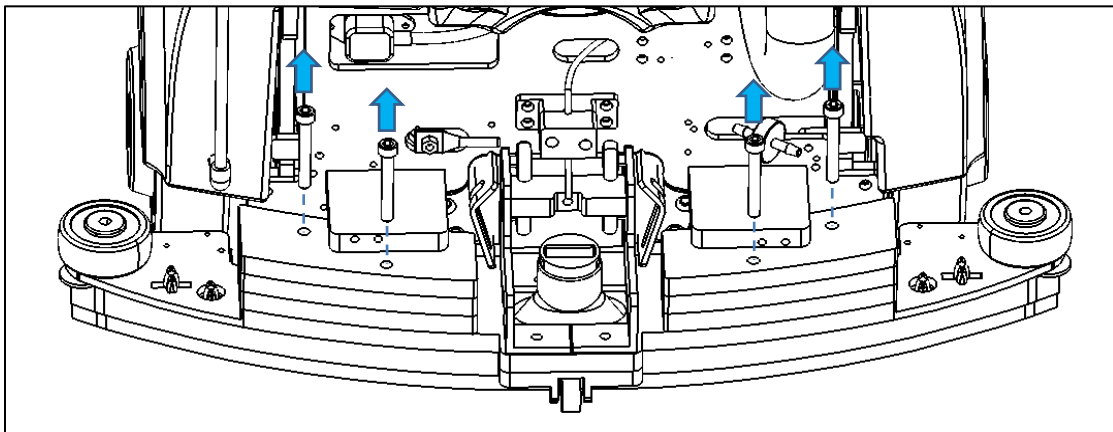


Fig. 3

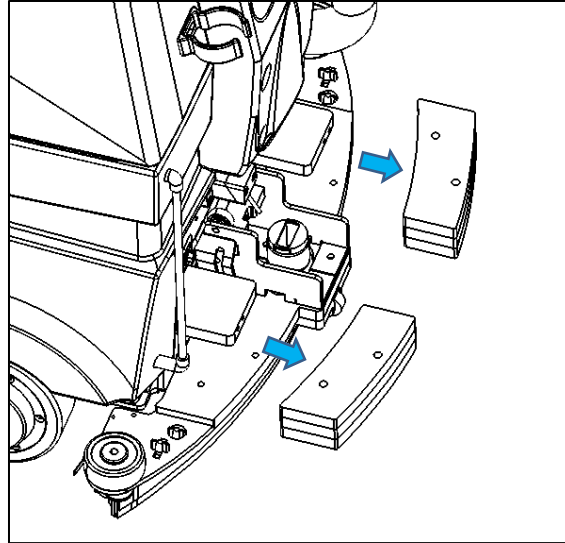


Fig. 4

4. Unscrew the four screws located at the side of the backplate (Fig. 5 – Left, Fig. 6 – Right) and remove the backplate (Fig. 7 – 1).

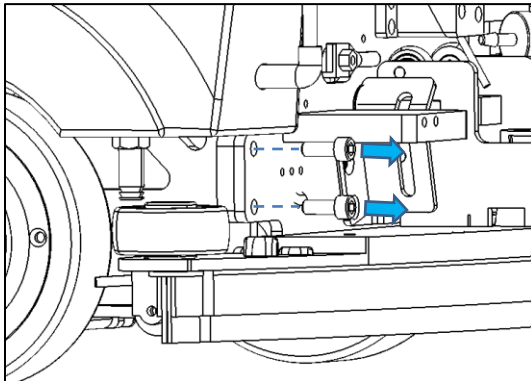


Fig. 5

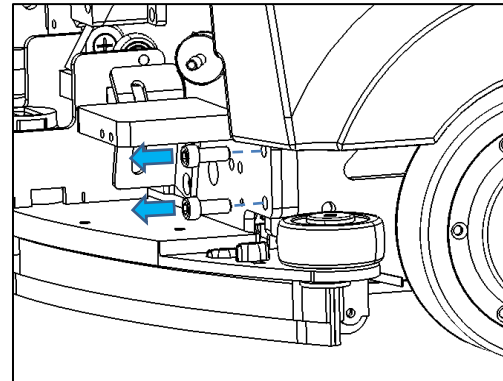


Fig. 6

5. Unplug the actuator connector (Fig. 7 – 2, Fig. 8 & 9) It is recommended to remove the back cover to gain better access to the connector (Fig. 10).

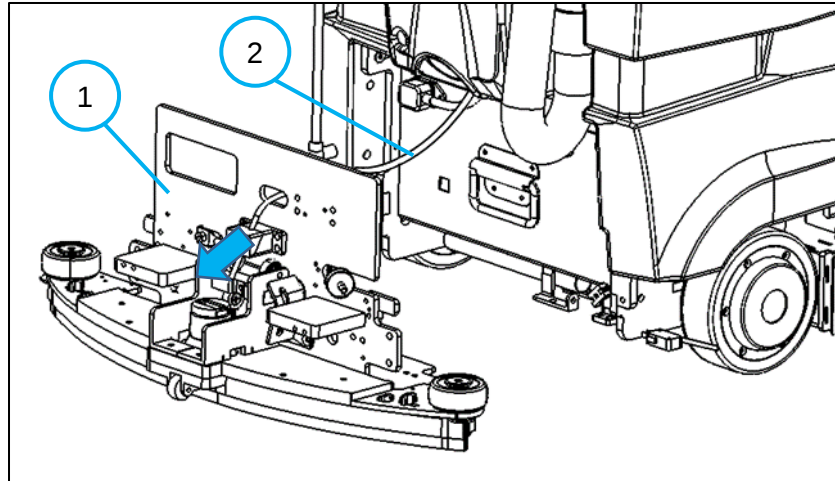


Fig. 7



Fig. 8

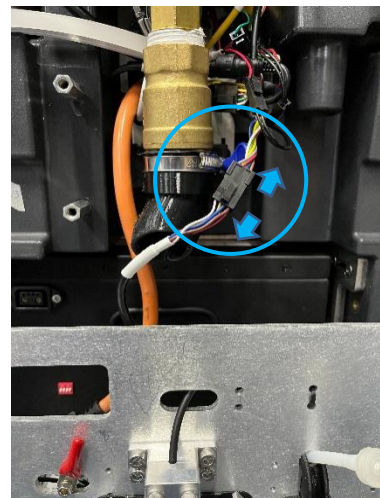


Fig. 9

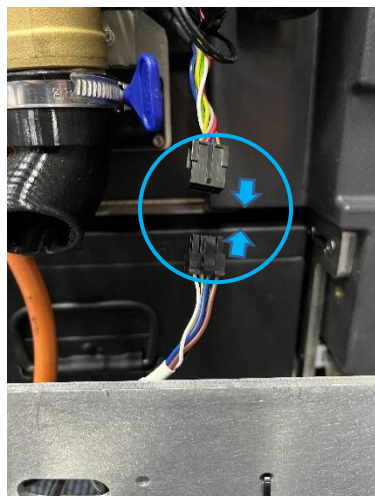


Fig. 10

6. Unplug the power cord (Fig. 11 – circled) and pull the battery out (Fig.11 - 1). Replace with a new battery.



Fig. 11

7. Reconnect the actuator connector. Reattach the back cover if necessary.
8. Clean off old Loctite on all the screws using Isopropyl Alcohol (IPA) and a cloth.
9. Apply new blue Loctite onto all the screws.
10. Mount back the backplate and secure it with the screws removed earlier.
11. Place back the weight and lock it in place with the screws removed earlier.
12. Re-attach clean water tubes.

CHARGING THE BATTERY



Caution:

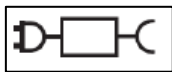
1. Only use the battery charger provided by an authorized distributor.
2. The robot charger should not share an AC plug point with any other devices.
3. Refer to disposal information for disposal of the R3 SCRUB and battery inside.
4. If the battery is not charging, contact the authorized distributor immediately.
5. The following actions must be carried out by qualified personnel.
6. The charger surface becomes hot while charging.



Note: R3 SCRUB does not come with on-board charger. Please use the charger provided by the authorized distributor to charge the batteries on the R3 SCRUB



Note: Before first use, Users are advised to charge the battery to 100%.



This symbol on the nameplate informs the user to use the robot only with the supported battery charger (Model No: WTL2420PMG)



A typical full charge cycle takes about 2 hours.

1. Charge the battery daily after usage to prevent over-drainage of the battery.
2. The R3 SCRUB's Battery Management System (BMS) will prevent over-drainage of the R3 SCRUB's battery by stopping any cleaning command when the battery percentage is below 5%.

To charge the battery:

1. Pull out the power cable from the battery port (Fig. 1 highlighted).

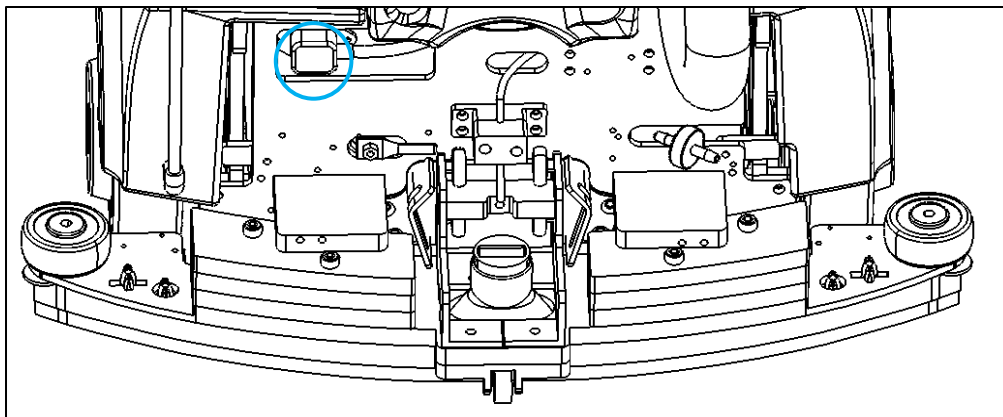


Fig. 1

2. Insert the battery charger plug (Fig. 2) into the battery port.
3. Turn on the charger.

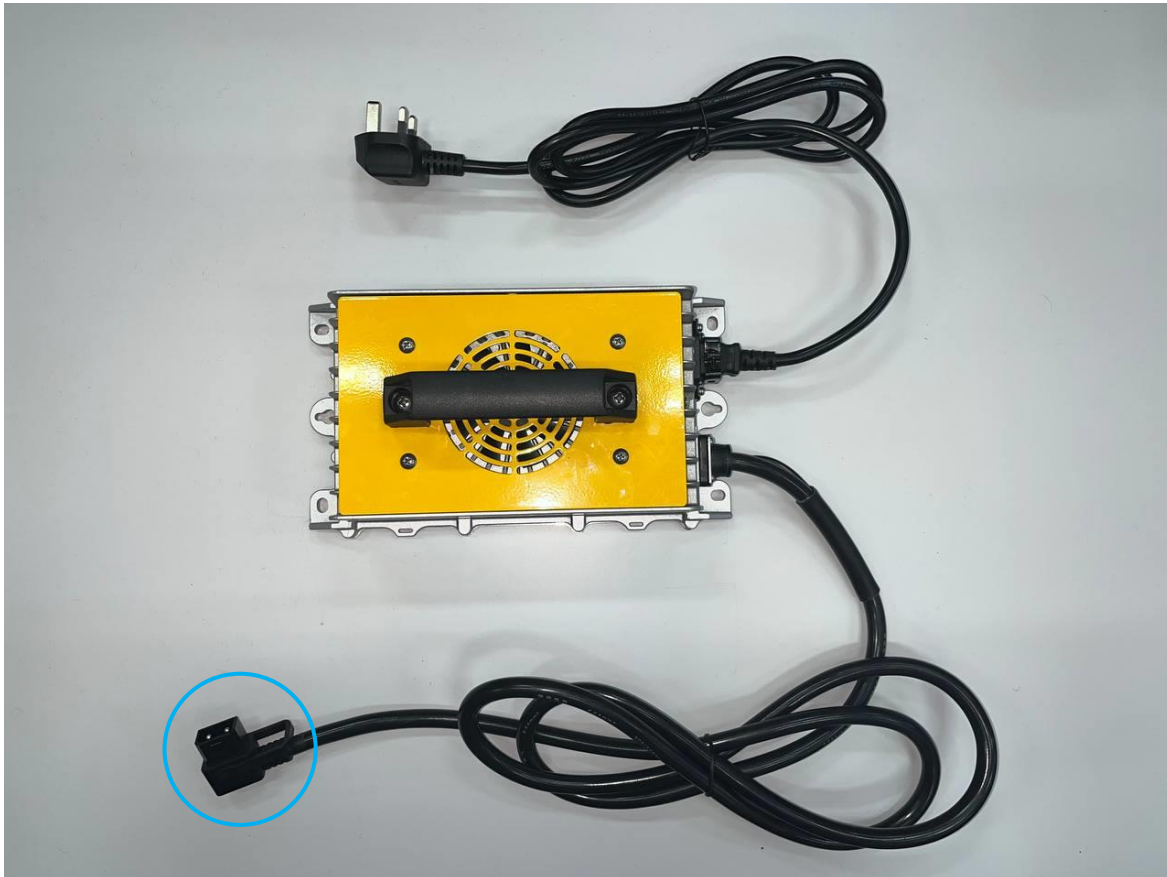


Fig. 2

POWERING ON/OFF THE R3 SCRUB



NOTE: This power switch is cutting off positive power line from battery to rest of the circuits when power switch is at off position.

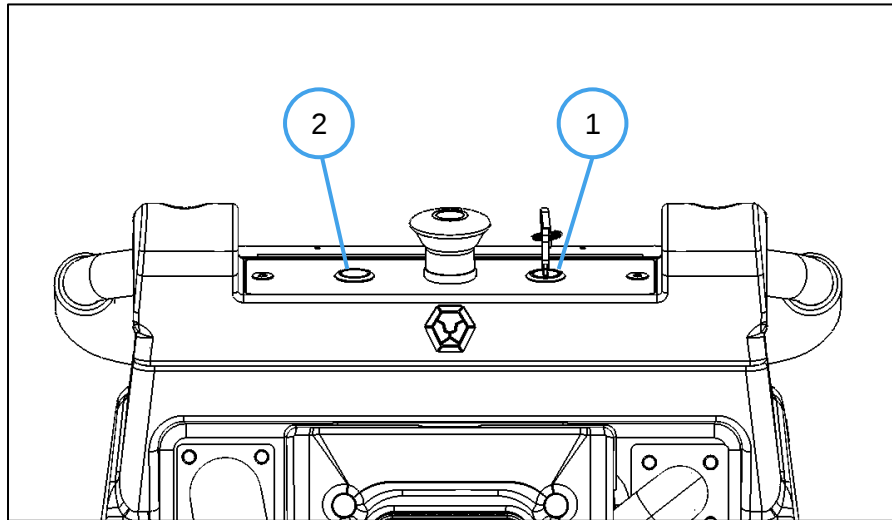


Fig. 1

To power on:

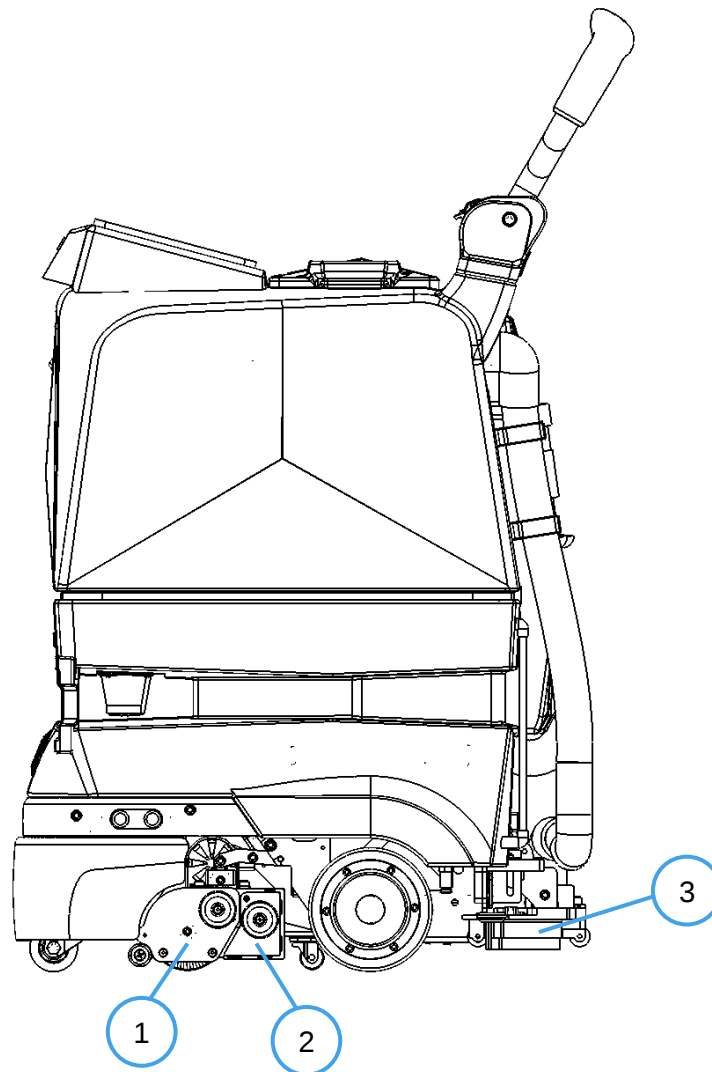
1. Insert Key into switch as shown (Fig. 1 -1).
2. Turn the key switch to the 'ON' position.
3. The operator may remove the key from the switch.
4. Push the RESET button (Fig. 1 - 2) to the left of start panel; the robot LEDs will turn blue, and a 'Engine' sound will be heard indicating startup.

To power off:

1. Turn the key switch (Fig. 1-1) in an anti- clockwise motion to the 'OFF' position until a 'CLICK' is felt.

FLOOR TOOL INSTALLATION

Refer to below for instructions on Installing the floor tools. This section can also be used as reference for replacing floor tools.



1. BRUSH FLOOR TOOL ASSEMBLY
2. DEBRIS TRAY
3. SQUEEGEE ASSEMBLY

INSTALLING THE BRUSH

1. Detach the brush cover on the right side of the robot by pulling the knob (Fig. 1).

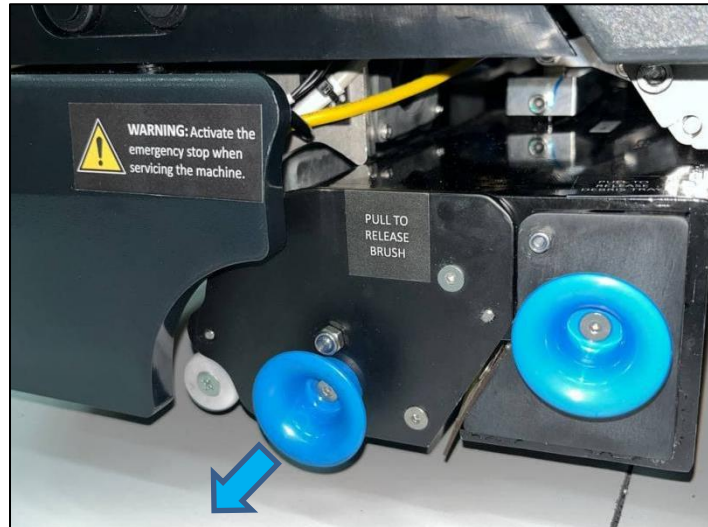


Fig. 1

2. Locate the end of the brush with the female alignment and lock feature (Fig. 2 – 1) and place it into the brush slot.

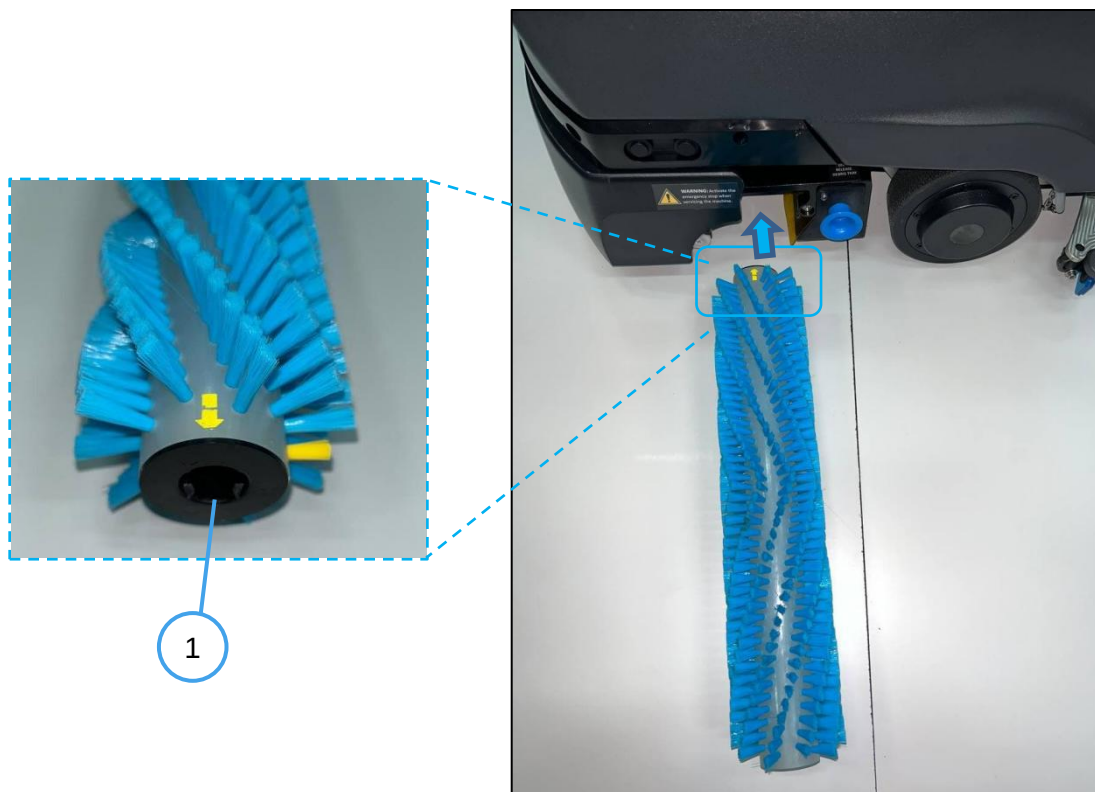


Fig. 2

3. Slide the brush in until the brush alignment feature sits on the male alignment and lock feature (fig. 3 – 1).

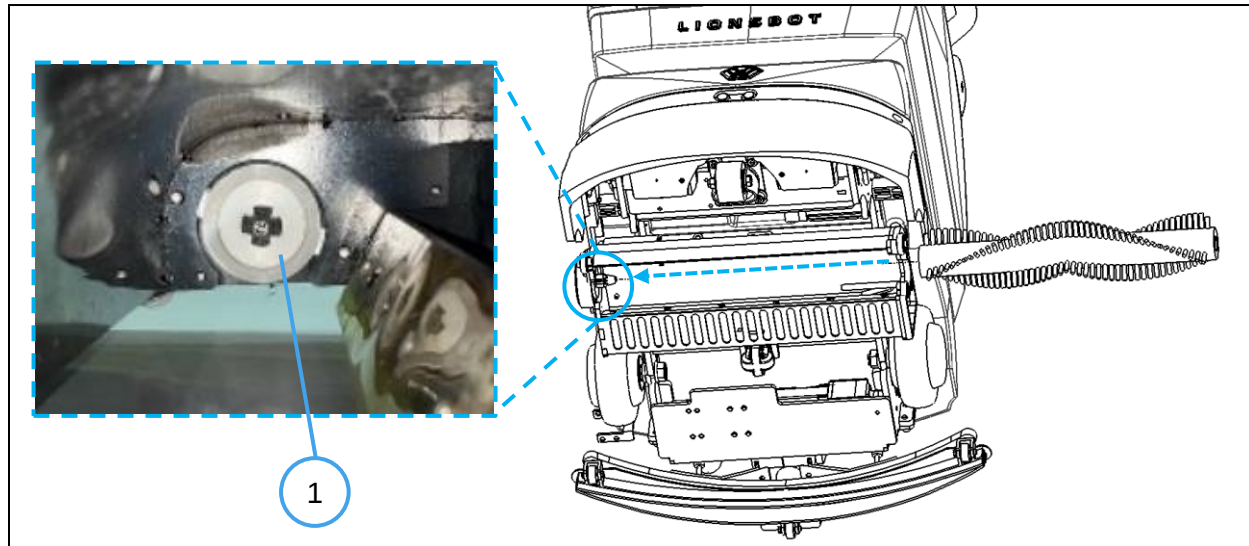


Fig. 3

4. Place the brush cover back on the robot (Fig. 4). The protrusion on the cover should fit into the slot on the brush. Ensure cover is flush to housing.

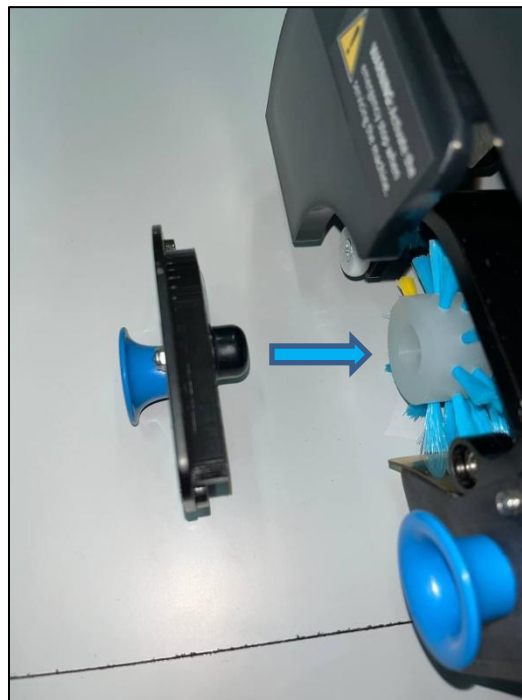


Fig. 4

INSTALLING THE DEBRIS TRAY

1. The debris tray slot is located on the right side of the robot beside the brush. (Fig. 1)
2. Hold the tray, with the knob facing outside, parallel to the floor and slide it inwards.
3. The magnet on the end of the tray should automatically pull it into place.

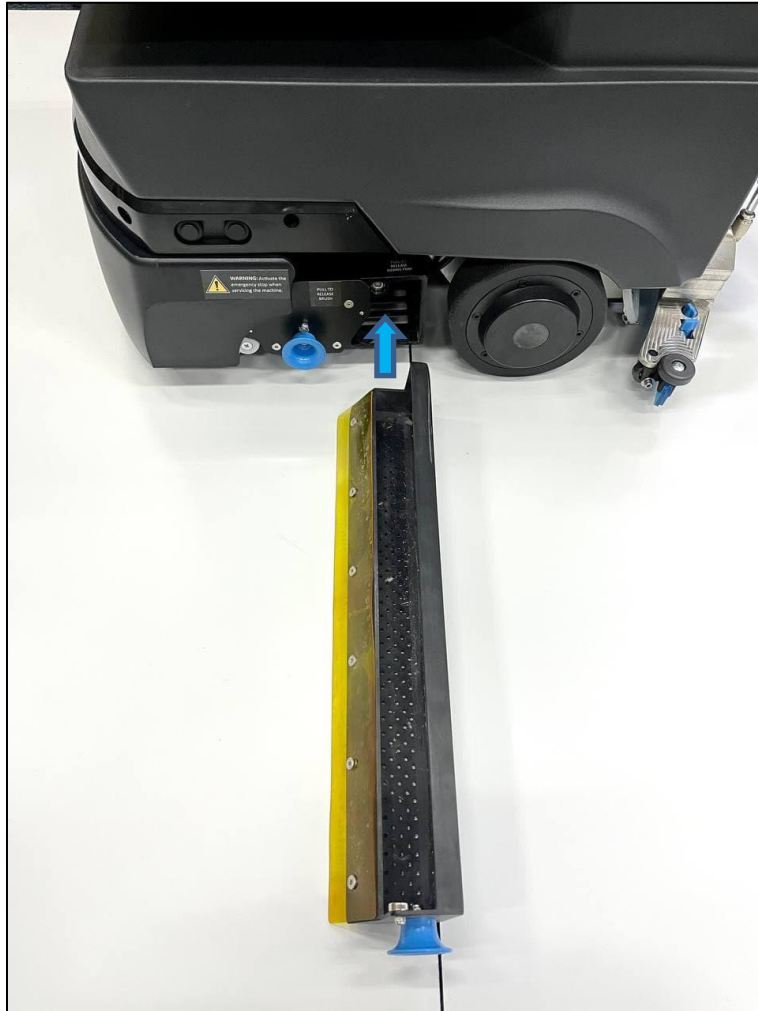


Fig. 1

INSTALLING THE SQUEEGEE RUBBER

1. Turn the two fasteners (Fig. 1) until they align with their hole (Fig. 2).

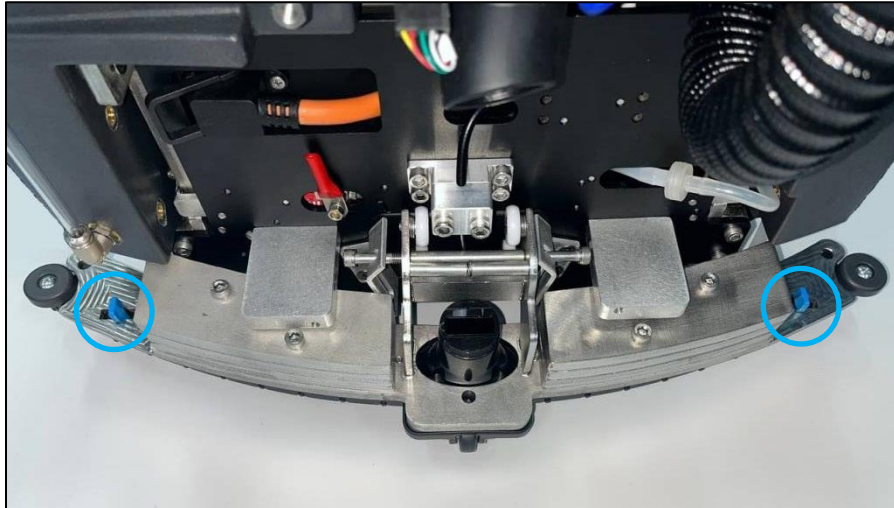


Fig. 1

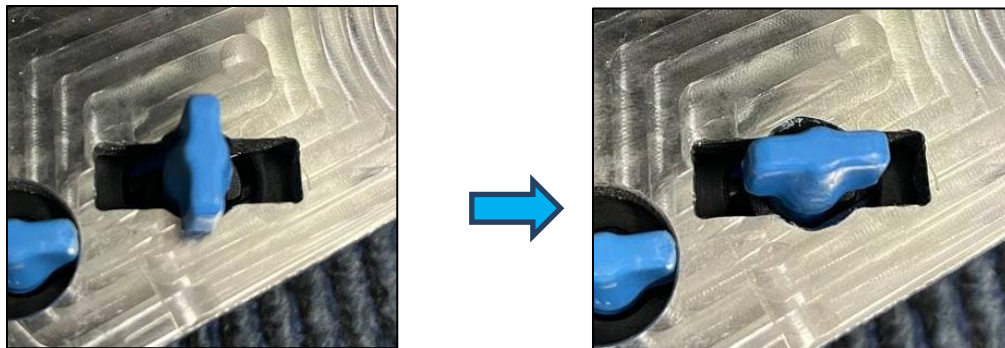


Fig. 2

2. Detach the Squeegee cartridge from the mount by pushing both fasteners out of their hole (Fig. 3).

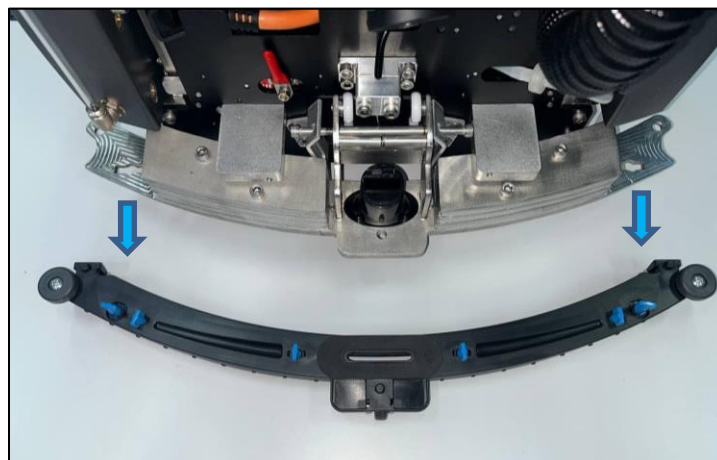


Fig. 3

3. Turn the four shorter fasteners (Fig. 4) until they align with their holes (Fig. 5) and push them through the holes to detach the rubber cartridge (Fig. 6).



Fig. 4

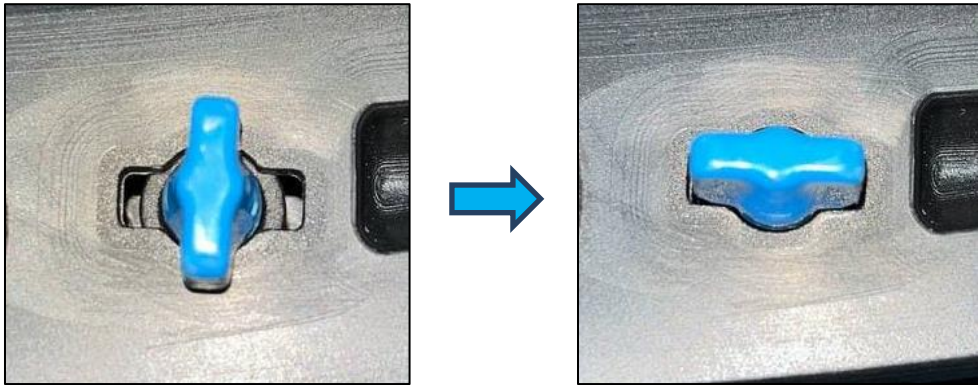


Fig. 5

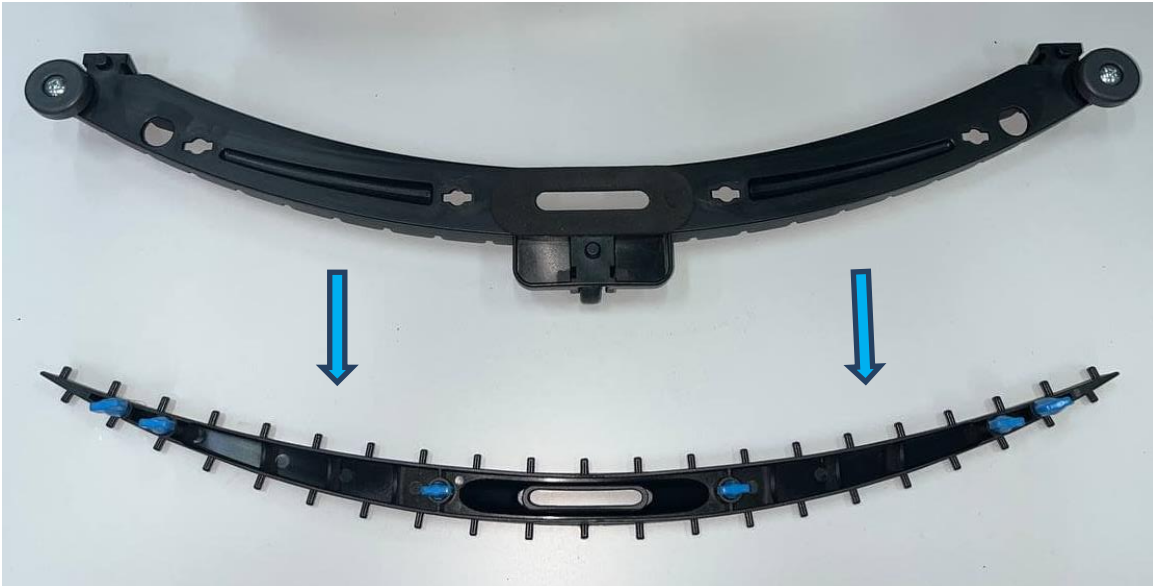


Fig. 6

4. Attach new rubber blades to the front and back of the rubber cartridge, aligning the rubber slots with the protrusions provided (Fig. 7 – 1).

Note: Front rubber has semicircle cutouts.

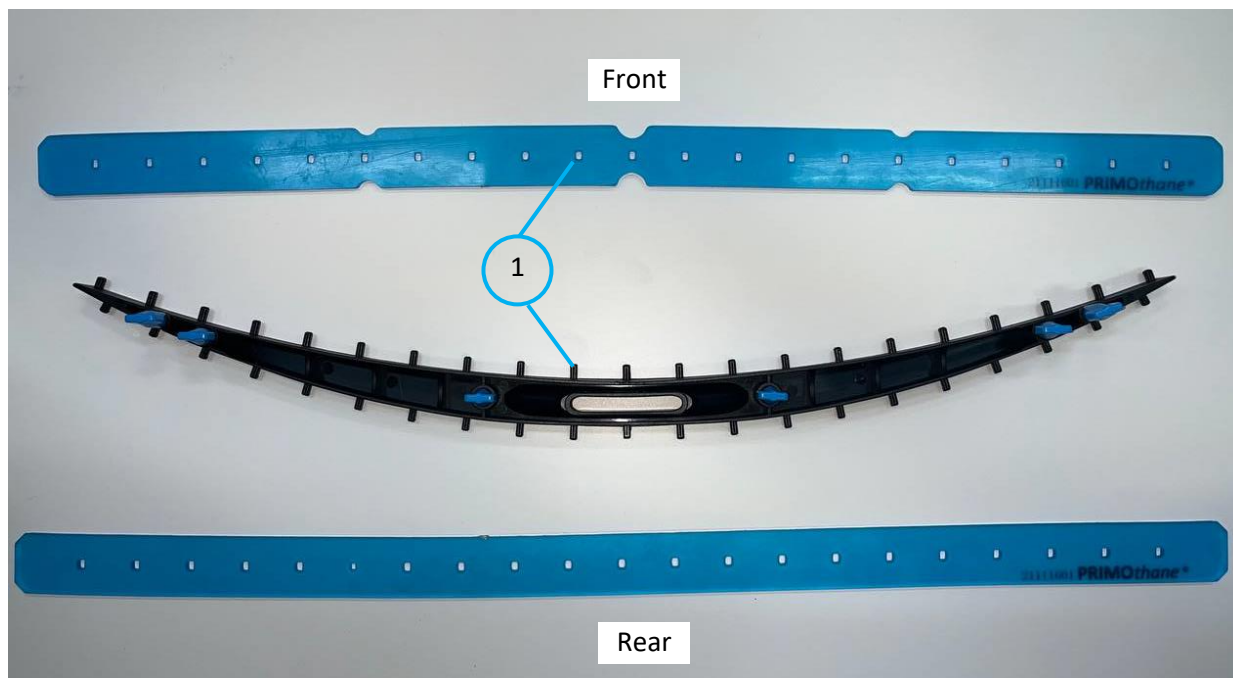


Fig. 7

5. Realign the four fasteners on the rubber cartridge with the holes on the squeegee cartridge (Fig. 8)



Fig. 8

6. Turn all four fasteners 90 degrees to lock it in place. (Fig. 9)

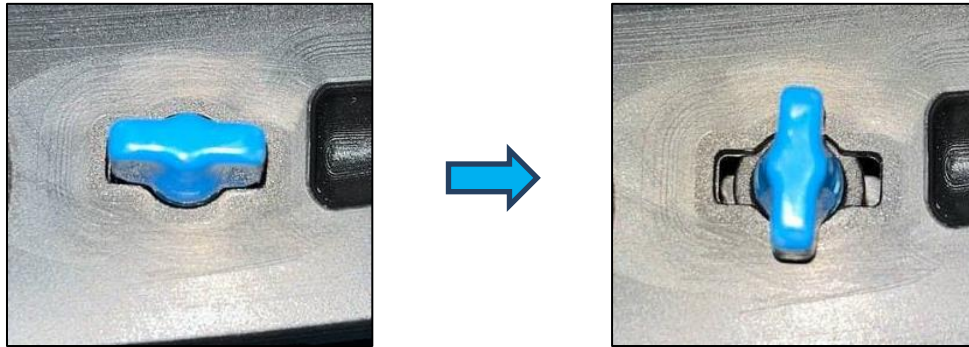


Fig. 9

MOUNTING THE SQUEEGEE CARTRIDGE

1. Align the two outer fasteners on the cartridge with the holes on the Squeegee mount (Fig. 10).

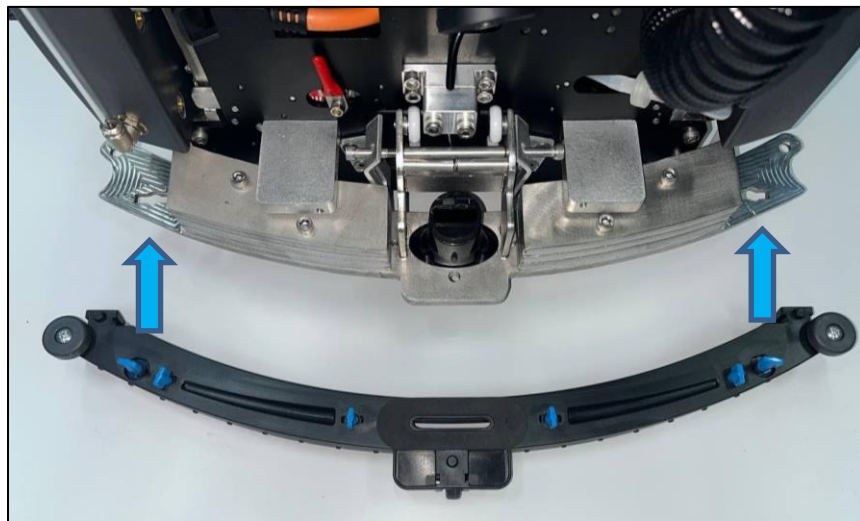


Fig. 10

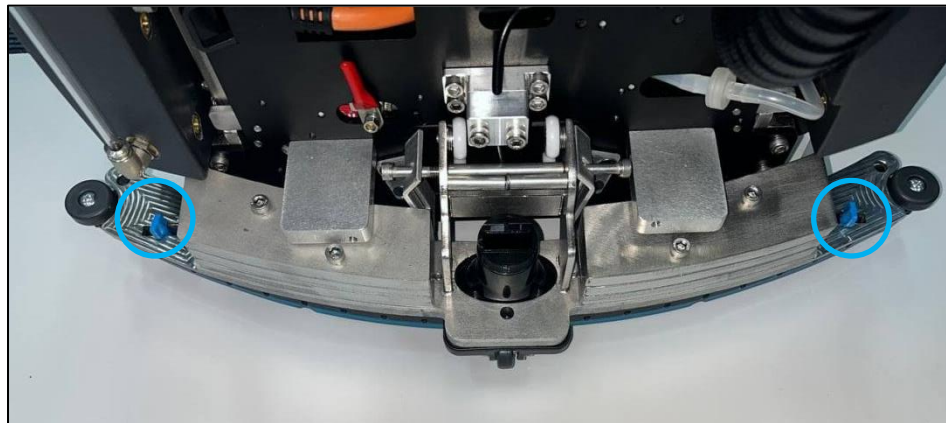


Fig. 11

2. Turn both fasteners 180 degrees to lock it in place. (Fig. 12)

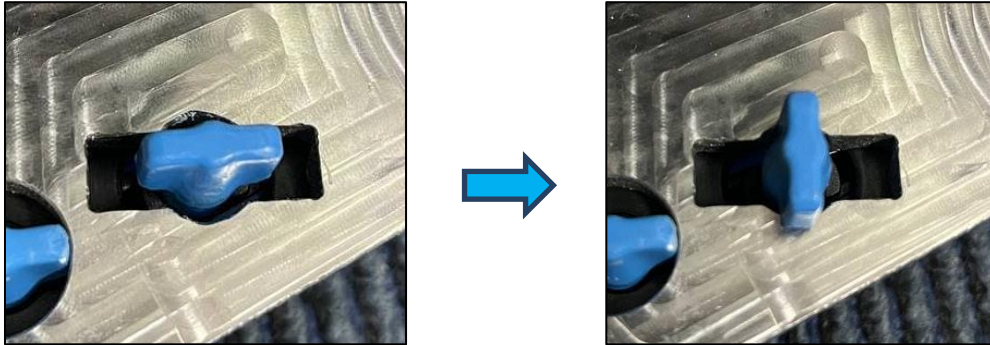


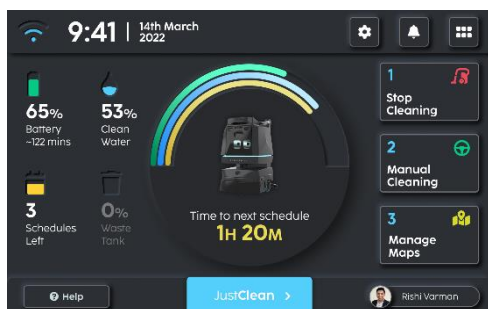
Fig. 12

R3 SCRUB TOUCHSCREEN SETUP

The following section describes the setup procedure by using the LCD screen on the R3 SCRUB. The LCD screen uses the LionsClean app.

The LionsClean app is used to communicate to and work with the R3 SCRUB. Each certified R3 SCRUB user is assigned a unique user id and password for use with the app. The user must be logged-in to be able to interface with a R3 SCRUB.

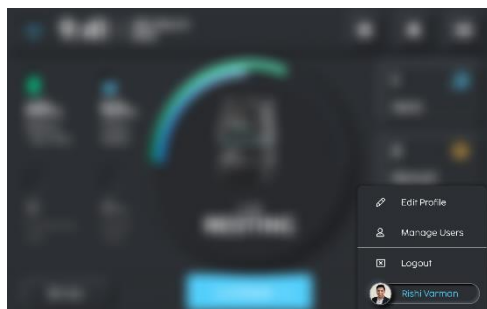
This section provides an overview of the main functions provided by the touch screen user interface, accessible through the Home page, Home Menu and just clean, and manual page of the app. More details on using the R3 SCRUB with the available app commands can be found in '[OPERATION OF THE R3 SCRUB](#)'.



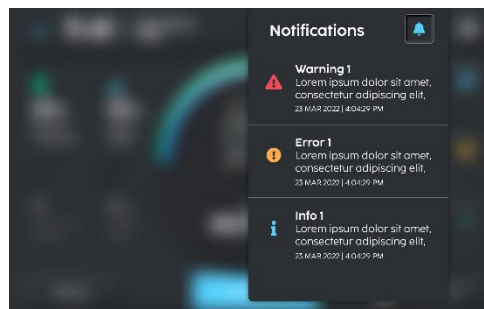
Home page



Home Menu



User Profile



Notifications

INITIAL SETUP

The following section describes the setup procedure by using the LCD screen on the R3 SCRUB.

1. Turn on the R3 SCRUB and note the 'LOADING VIDEO' screen on the LCD (Fig. 1).
2. Scroll down and select your language (Fig. 2).
3. Read and agree to the Terms of Use and Privacy Policy (Fig. 3).
4. Enter your account name (Fig. 4).

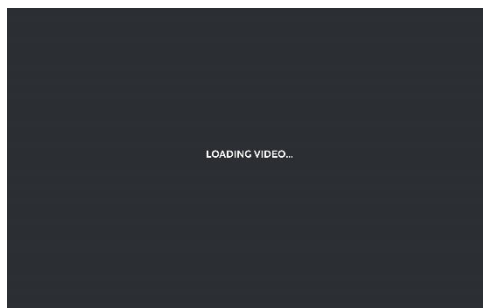


Fig. 1

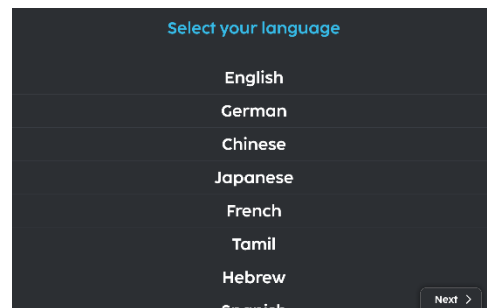


Fig. 2

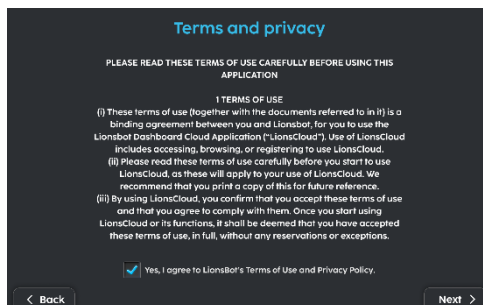


Fig. 3

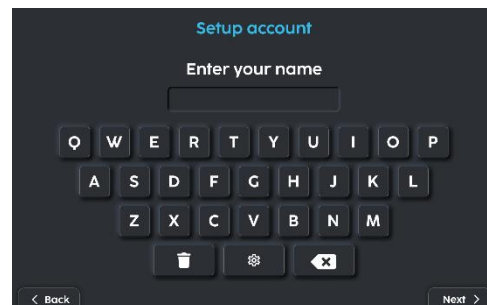


Fig. 4

5. Key in your password (Fig. 5).
6. Confirm your password (Fig. 6).

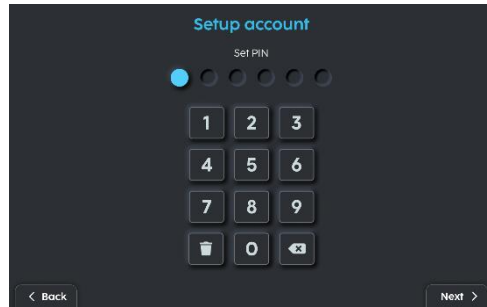


Fig. 5

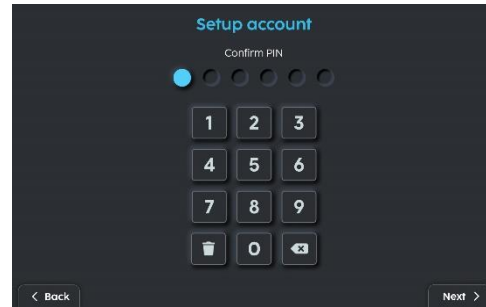


Fig. 6

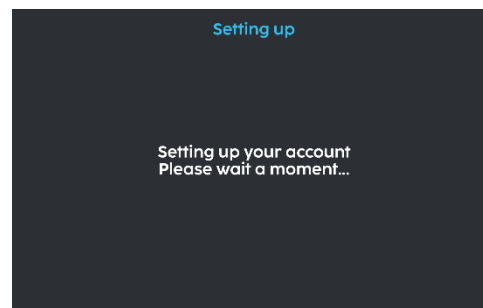


Fig. 7

7. Wait for your account to be setup (Fig. 7).
8. Read and acknowledge usage instructions (Fig. 8).
9. You may choose to [create a map](#) or go direct to the home screen (Fig. 9 & 10).



Fig. 8

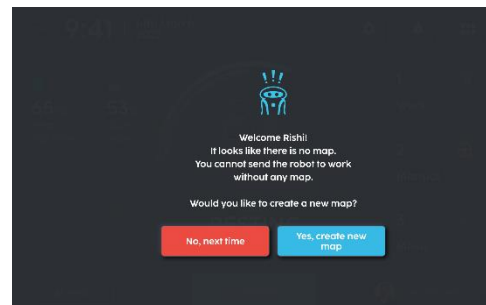


Fig. 9



Fig. 10

LOGIN WITH LOCAL ACCOUNT

The following section describes the local account procedure by using the LCD screen on the R3 SCRUB after initial setup.

1. Select the local account for login (Fig. 1).
 2. Enter your user name and pin. (Fig. 2).
 3. If password is incorrect try again (Fig 3).
- or
4. Scan the QR Code using the LionsClean App (Fig 4).
 5. View the 'HOME' page.

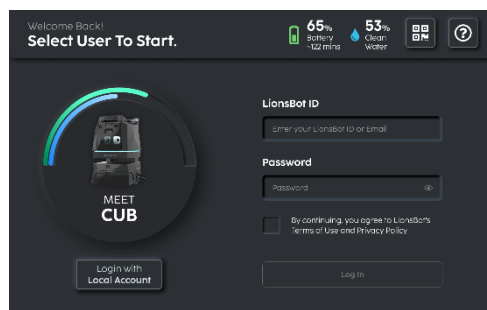


Fig. 1

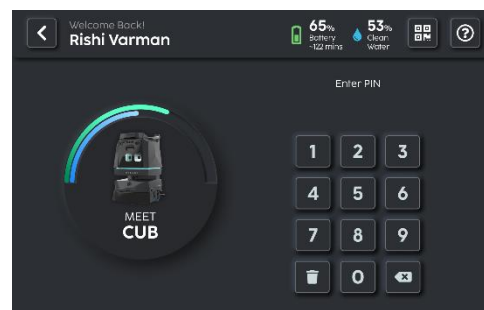


Fig. 2

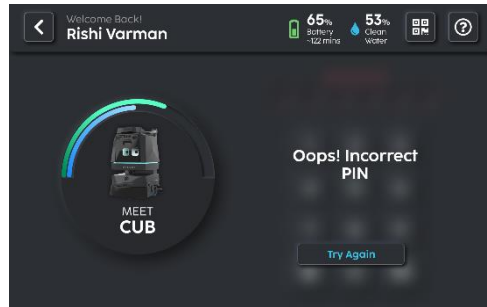


Fig. 3

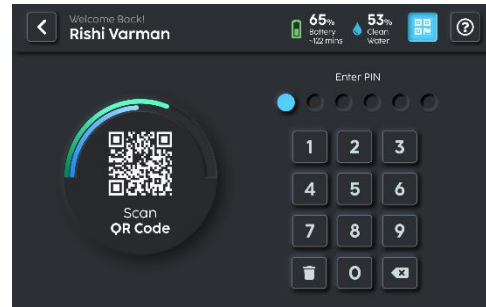


Fig. 4

LOGIN WITH LIONSBOT ID (OPTIONAL)

The following section describes the Lionsbot ID login procedure by using the LCD screen on the R3 SCRUB.

1. Tap on the 'LOGIN WITH LIONSBOT ID' button at the bottom of the screen (Fig. 1).
2. Key in your User name and password (Fig. 2) or scan QR code with the LionsClean App.
3. View the 'HOME' page.



Fig. 1

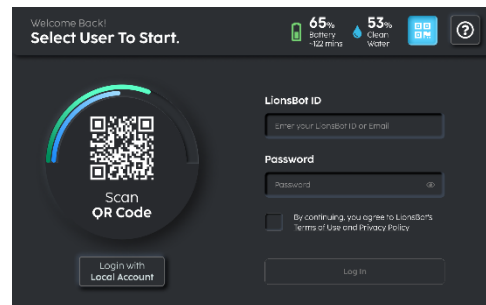


Fig. 2

LOGIN WITH LIONSCLEAN APP (OPTIONAL)

The following section describes the LionsClean app login procedure by using the LCD screen on the R3 SCRUB.

1. Tap on the 'QR' button at the top right of the screen (Fig. 1).
2. Scan the QR Code on the LCD screen through the app (Fig. 2).
3. Enter the OTP into the app (Fig 3).

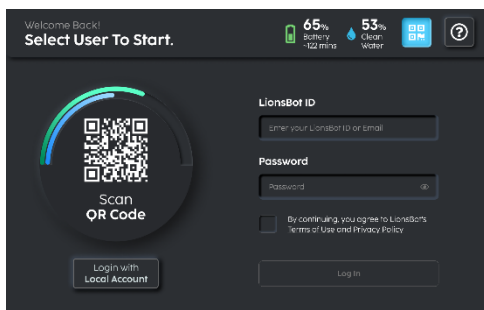


Fig. 1



Fig. 2

USER ACCOUNT MANAGEMENT

This section provides instructions for adding/ removing users.

1. From the User menu select 'MANAGE USERS'.
2. On the 'USERS MANAGEMENT' screen select 'NEW USER'.
3. Enter the user's name and role.



Fig. 1

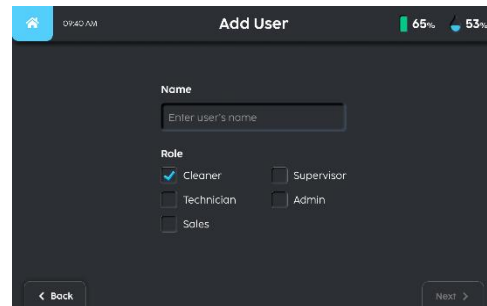


Fig. 2

4. Assign a 6-digit pin to the user.
5. Re Enter 6-digit pin.
6. Confirm User.

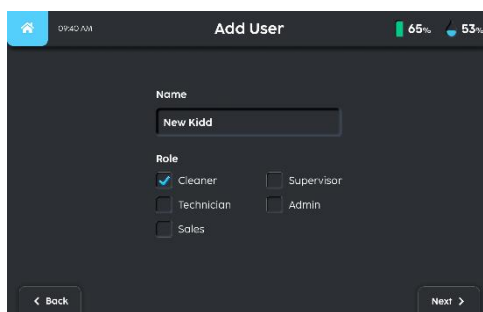


Fig. 3

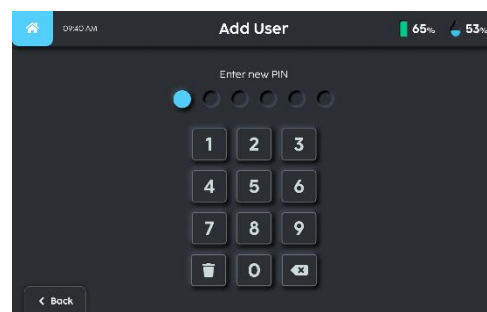


Fig. 4

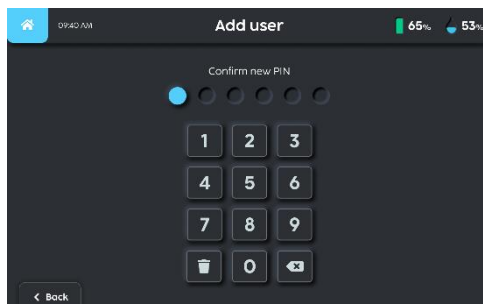


Fig. 5

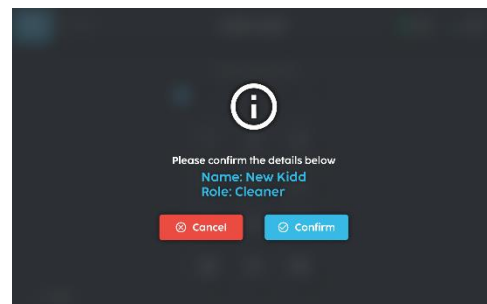


Fig. 6

7. The user account setup is complete.

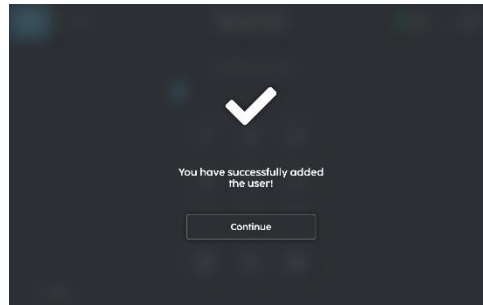


Fig. 7

To delete a user profile

1. Select the user profile.
2. Select 'Delete user'.
3. Select 'Delete'.

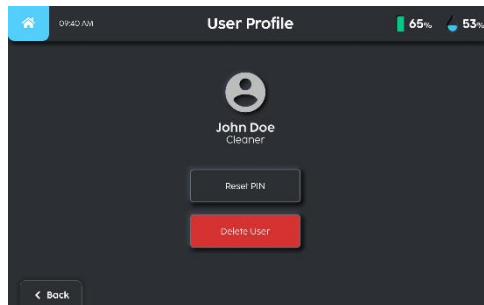


Fig. 8

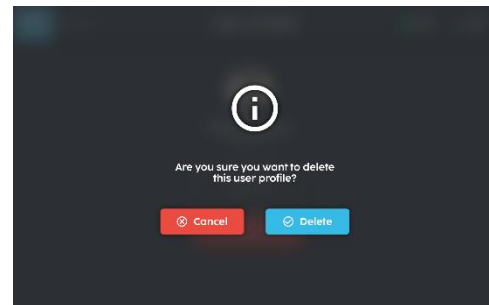


Fig. 9

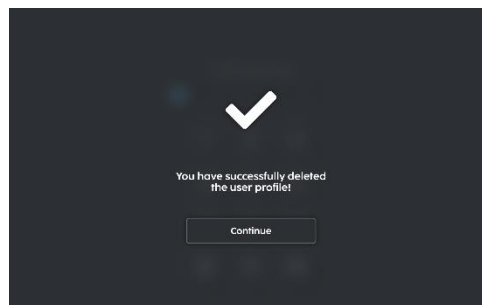


Fig. 10

MANAGE MAPS

The following section instructs the user on how to add, change or delete the mapped environment in which R3 SCRUB is operating.

Add/Create New Map

1. On the 'More Options' page, select 'Manage Maps'.



Fig. 1

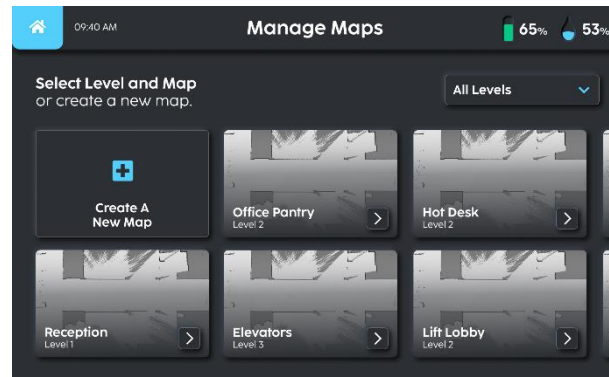


Fig. 2

2. Select 'Create A New Map'.
3. Move Robot slowly. If motion is fast robot will instruct operator to slow down.

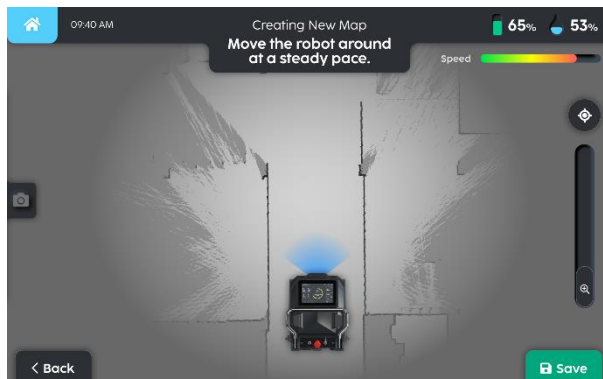


Fig. 3



Fig. 4

4. Once operator has mapped the cleaning area. The operator can save the Map.
5. Key in the map name and level, then click save.

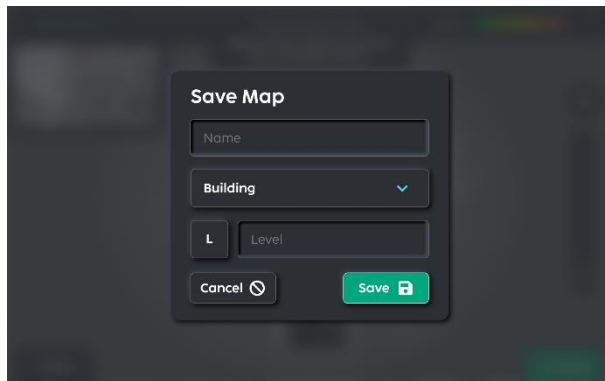


Fig. 5

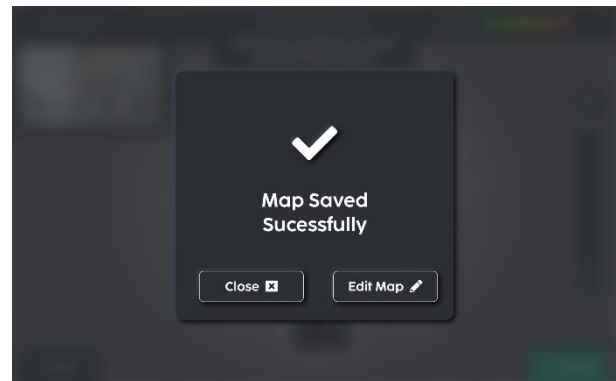


Fig. 6

Delete Map

1. Select the map to be deleted.
2. Select delete map.

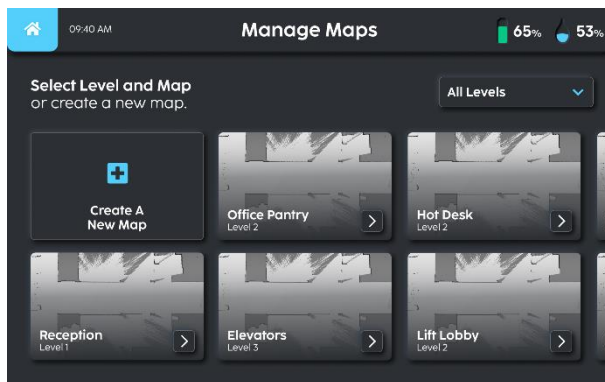


Fig. 7

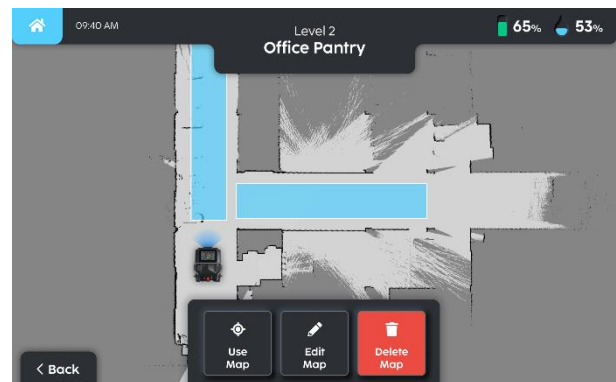


Fig.8

Map Edit

Map edits allows the operator to add cleaning zones, restricted zones, touch-up map features, add locations, create sections and add home and dock points.

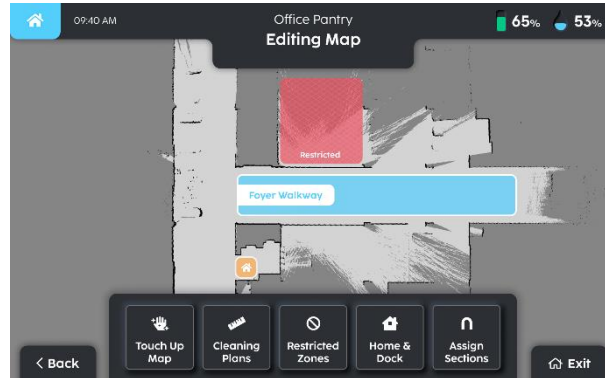


Fig.9

For More information on map editing contact LionsBot Robot Service Team.



WARNING: The operator must check map loaded on robot matches the physical location of the robot. The operator is to take appropriate safety measures to place barricades and cones in or near restricted zones (stairs, cliffs, lifts and escalators). Restricted Zones if any must be visible on the map.

1. Define the 'CLEANING ZONE' in the 'EDIT MAP' page (Fig 9).
2. Define the 'RESTRICED ZONE', e.g., such as stairs and escalators.
3. Identify 'LANDMARKS' in the mapped environment.
4. Alternatively, click on 'AUTO ZONING' to zone the map.



Note: does not cover restricted zones.

WORK ROBOT

The 'WORK' function is used to select the cleaning location and set cleaning settings for the location.



Note: Ensure the robot is localized before using this function. To select map or localize robot refer to the '[LOCALIZE THE ROBOT](#)'.

1. From the home page, select 'WORK'.



Fig. 1

If Robot Is Not Localized

2. Set robot's location on the map and select 'START' (Fig 3).
3. Wait for the 'LOOKING AROUND' screen (Fig 4).
4. If localizations failed select 'Try Again' (Fig 5).

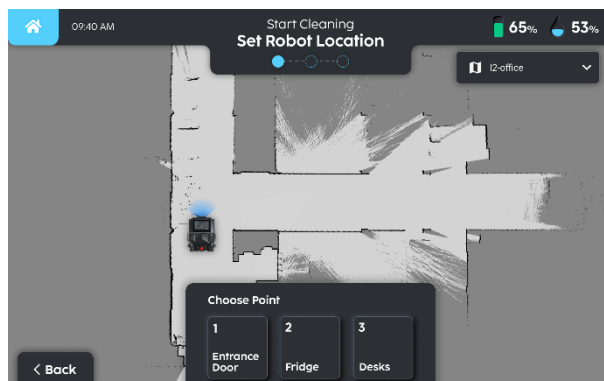


Fig. 2

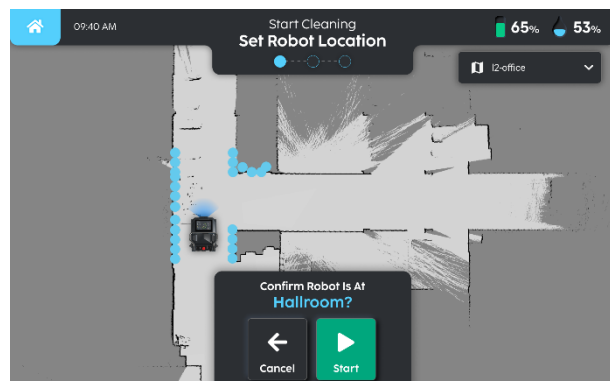


Fig. 3

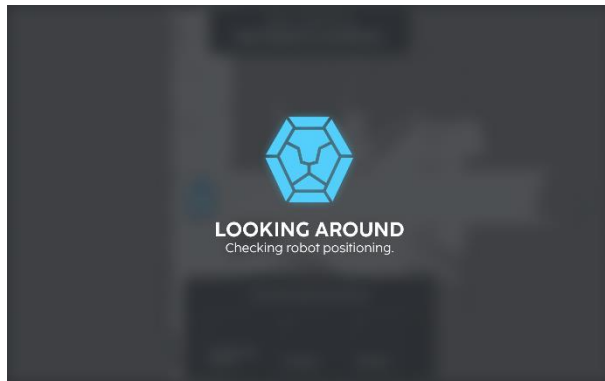


Fig. 4

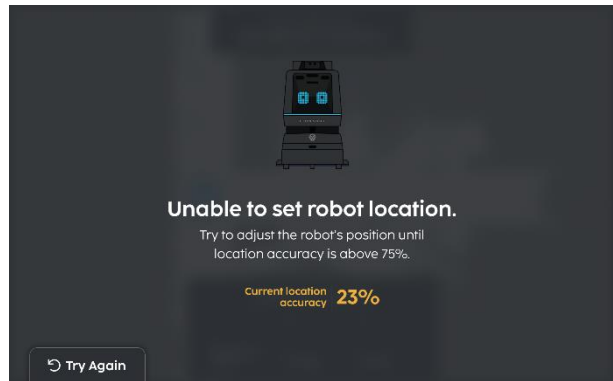


Fig. 5

If localization is not successful go to section '[LOCALIZING THE ROBOT](#)'.

Localized Robot

5. Select the cleaning area and confirm the area (Fig 6).
6. Before confirm zone, operator may adjust cleaning settings (Fig 7).

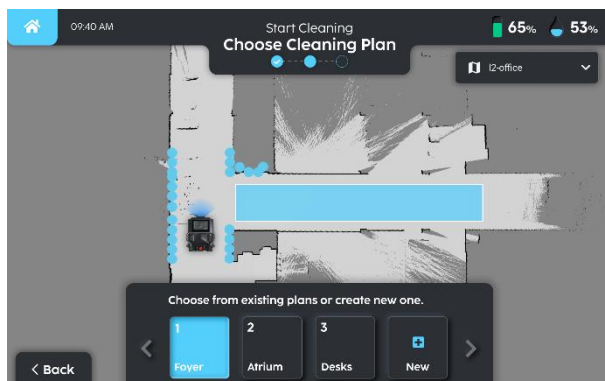


Fig. 6



Fig. 7

7. Place the handle bar down to start cleaning (Fig 8).
8. The robot shall start the cleaning operation, the operator may pause or stop cleaning at any time (Fig 9).

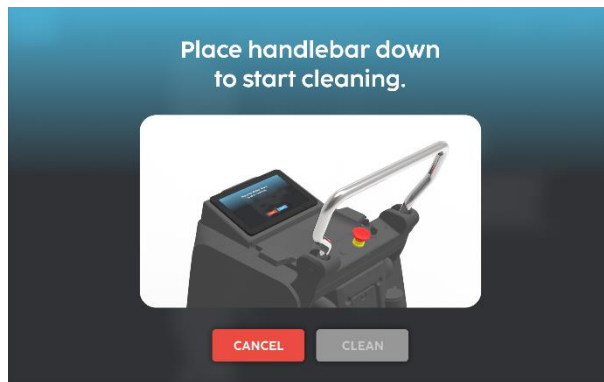


Fig. 8

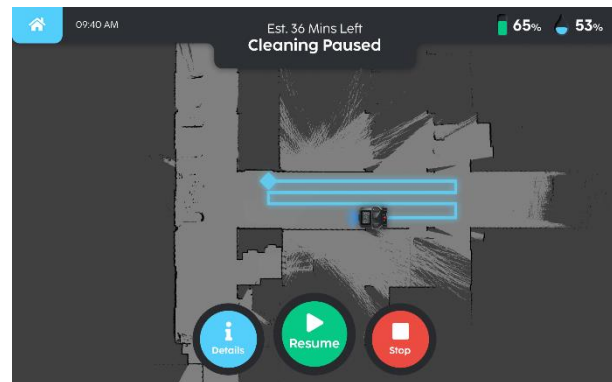


Fig. 9

9. Should there be an interruption in the process the 'Cleaning Unsuccessful' screen will show (Fig 10).
10. A cleaning report is generated after a zone is cleaned (Fig 11).

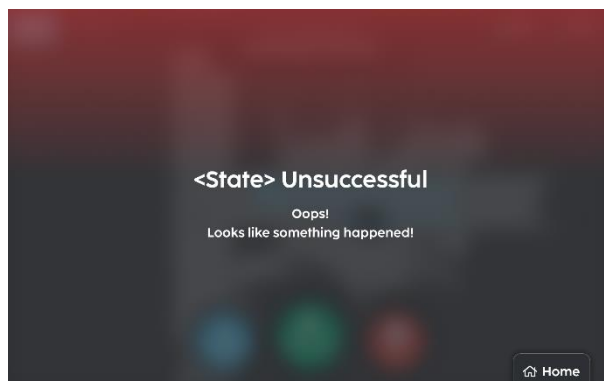


Fig. 10

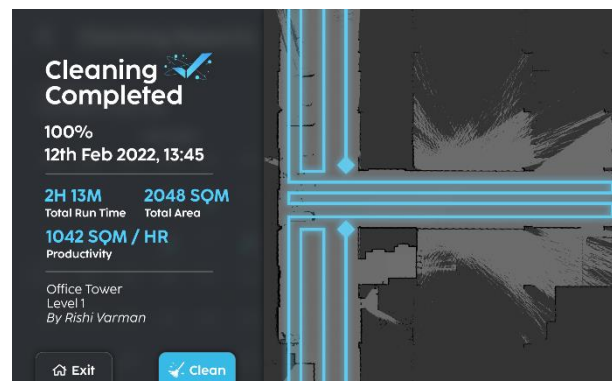


Fig. 11

JUST CLEAN

1. On the 'HOME' screen select 'Just Clean' (Fig1).
2. If there is no TAG, create one. Select 'Create a new Just Clean job' (Fig2).
3. Bring robot near tag (Fig 4).
4. Robot has found tag (Fig 5).
- Or
5. Select location if robot is localized (Fig 2).
6. If Tag is not used select operation mode (Fig 6).



Fig. 1

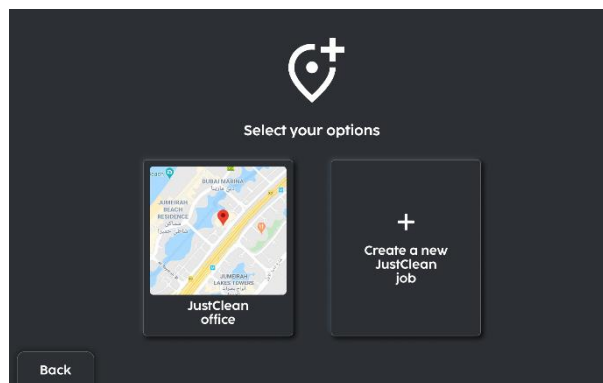


Fig. 2



Fig. 3

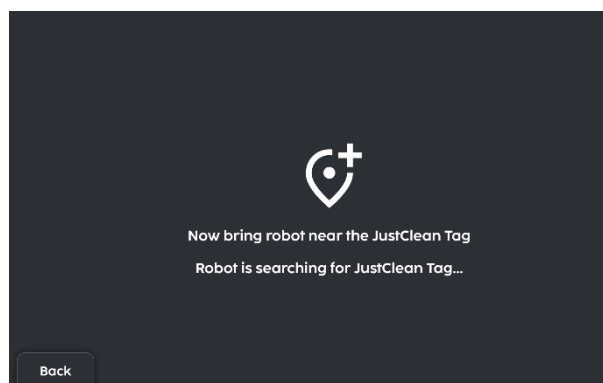


Fig. 4

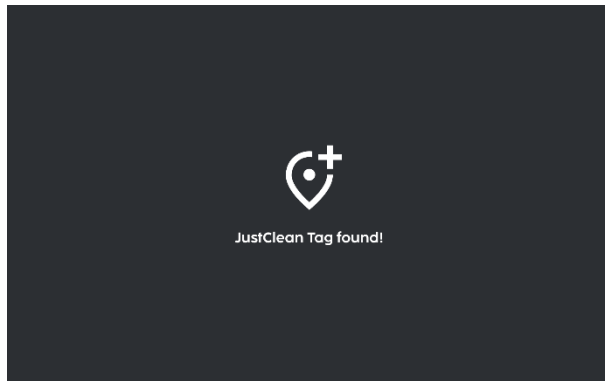


Fig. 5

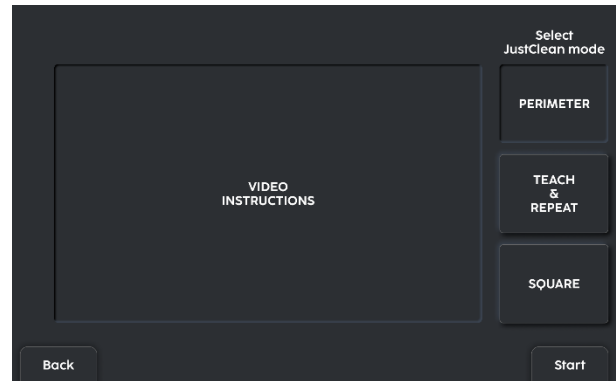


Fig. 6

Perimeter Mode

1. Select perimeter mode (Fig 10).
2. Manually Pilot the robot along the perimeter (Fig 11).
3. Once path is closed (Fig 12), press 'save' and map is saved (Fig 13).

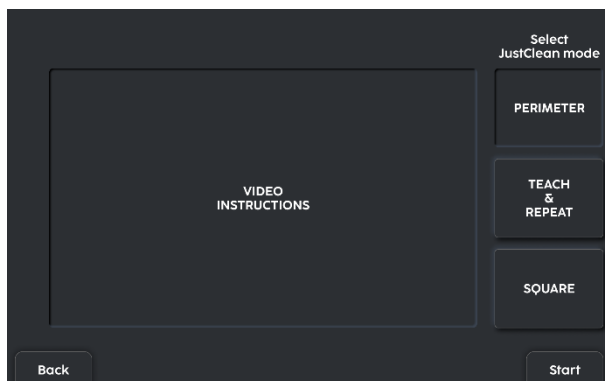


Fig. 10

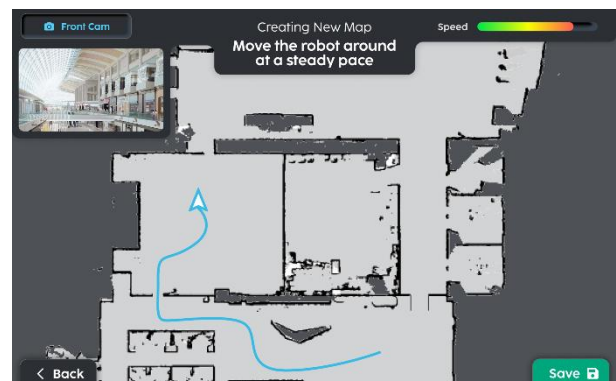


Fig. 11



Fig. 10

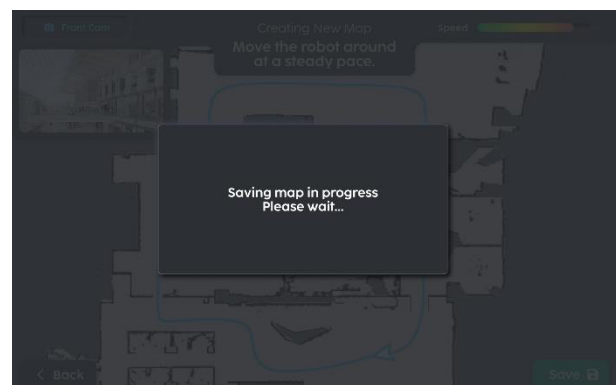


Fig. 11

4. Enter the Map Name and Location information.
5. Select Save and Clean, wait for the robot to get ready.
6. Place the handle bar down then press 'START'.

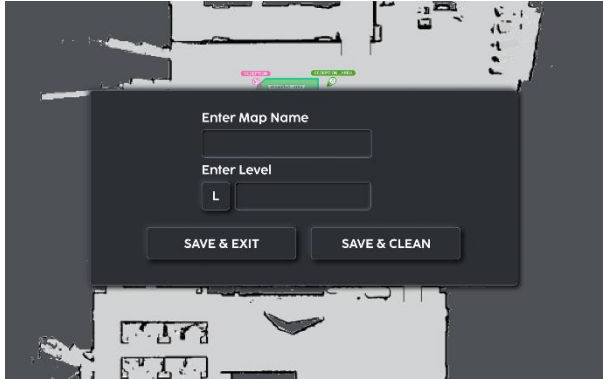


Fig. 12

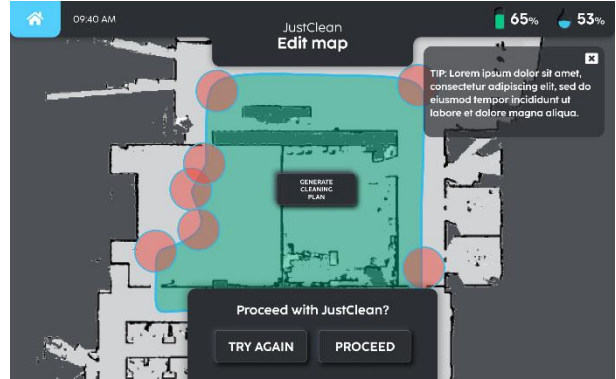


Fig. 13

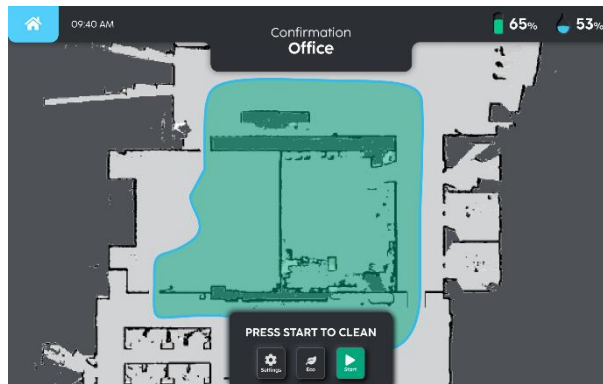


Fig. 12

CLEANING REPORT

A cleaning report is generated once cleaning is complete.

Go to the [REPORTS](#) section for more information.

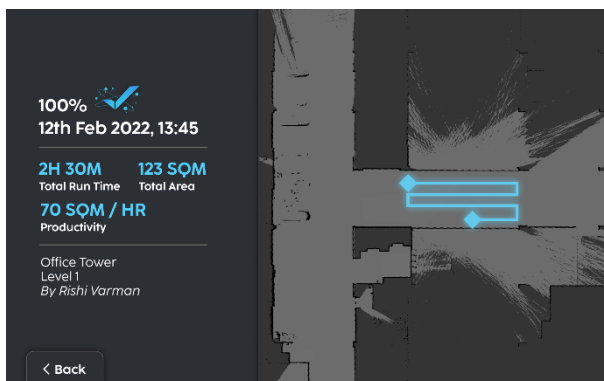


Fig. 8

MANUAL CLEAN

The following section instructs the user on how manual clean on the R3 SCRUB.

1. On the Home screen select the 'MANUAL CLEAN' button.
2. Select cleaning presets: 'MAX', 'ECO', 'DRY', 'CUSTOM 1', 'CUSTOM 2', 'SETTINGS'.
3. For custom 1 and 2 The sliders (Fig 2) controls robot water level, solution ratio, brush pressure, brush speed, vacuum suction and squeegee pressure. Select your custom settings and select save.
4. After selecting your settings select the 'START' button to start cleaning (Fig 1).
5. Start cleaning.

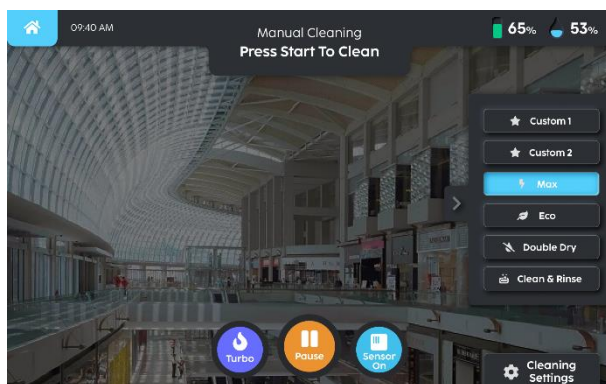


Fig. 1



Fig. 2

SETTINGS

This section instructs the user on changing settings on the LCD screen. The Setting page allows the user to change general settings, language, network and reset robot.

1. On the general settings page the user can adjust screen brightness, sound volume and screen timeout settings (Fig 1).
2. The user may change the language by clicking the language tab and scroll through the language window (Fig 2).

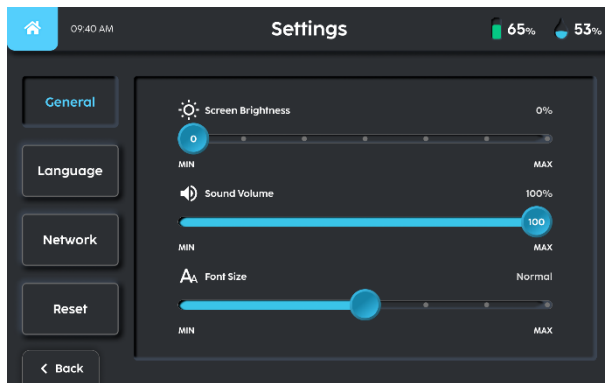


Fig 1

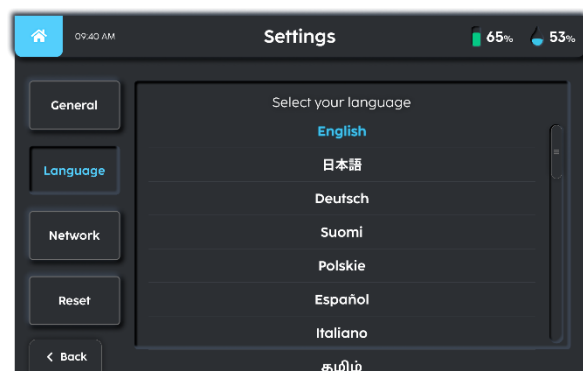


Fig 2

3. The user may change the operating network by selecting the 'Configure' button (Fig 3).
4. Select the network to configure or connect too (Fig 4).

WIFI

1. Enter the network password (Fig 5).

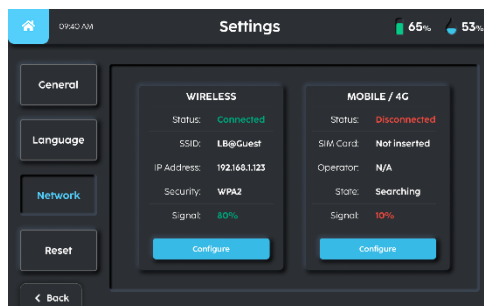


Fig 3

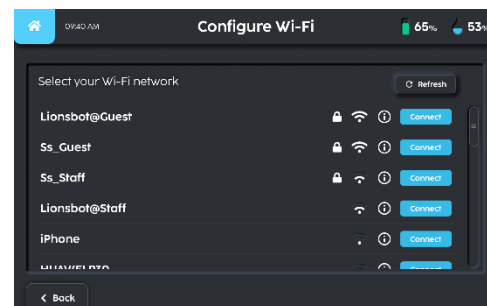


Fig 4

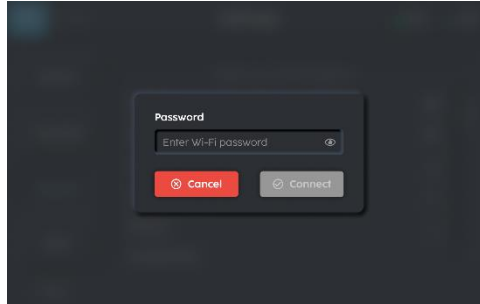


Fig 5

2. If the connection is successful (Fig 6), network change is successful.
3. Should the screen show fail to connect (Fig 7), check your network configuration and settings and try again. Otherwise contact your network administrator.

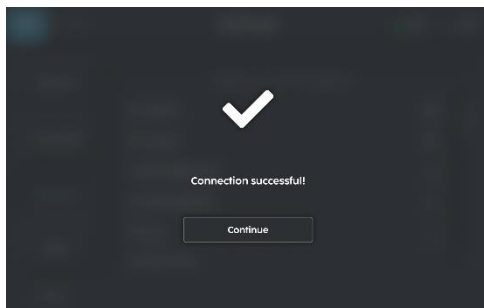


Fig 6

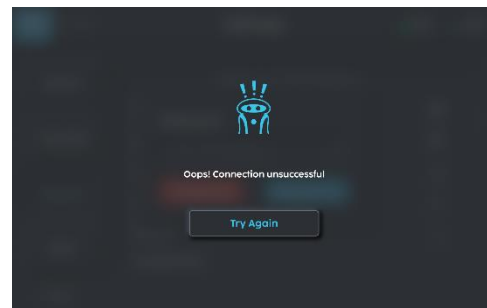


Fig 7

MOBILE/4G

1. The operator may configure mobile/4G settings (Fig 8)

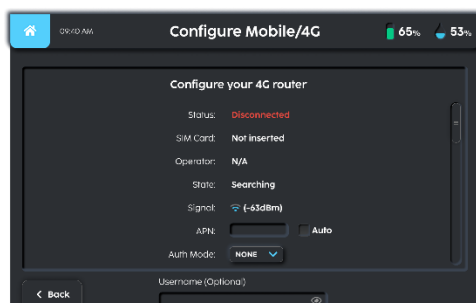


Fig 8

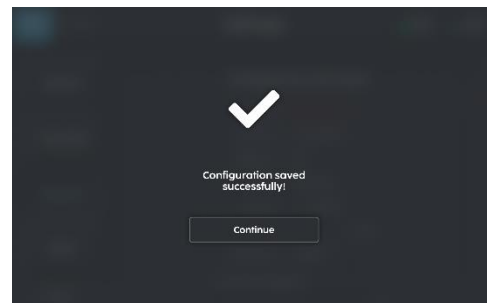


Fig 9

RESET ROBOT

1. Select 'Reset'.
2. Enter PIN.
3. If PIN entered is incorrect, select 'Try Again'.
4. Select Confirm.

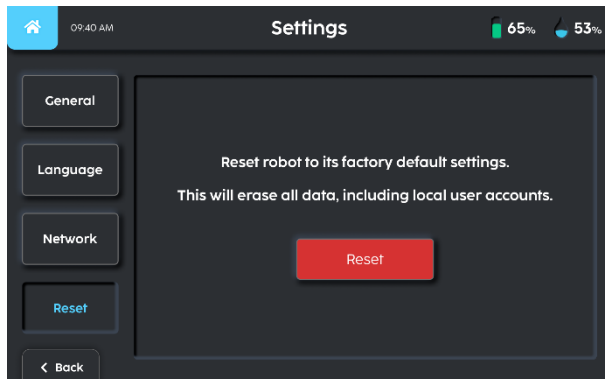


Fig 10

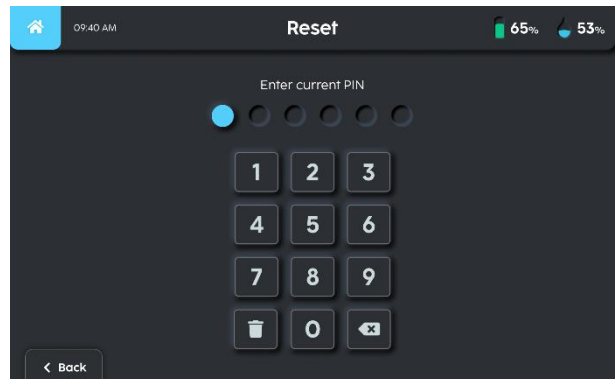


Fig 11

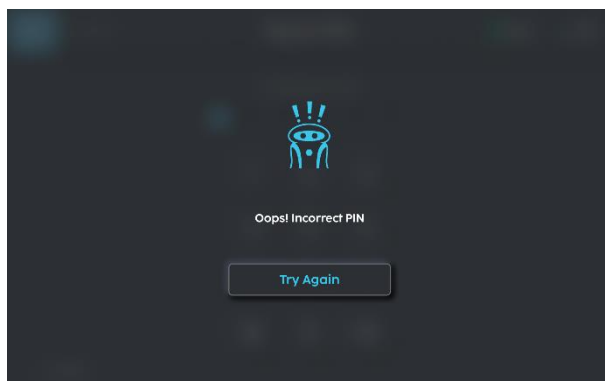


Fig 12

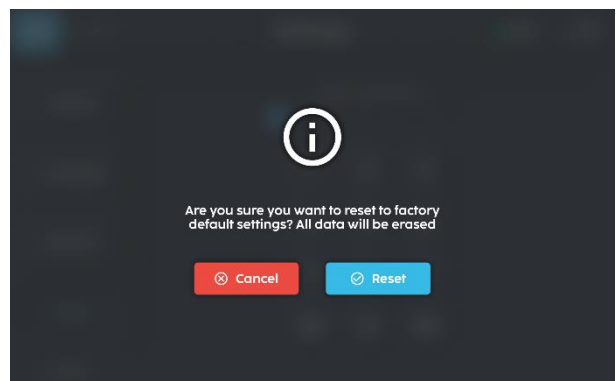


Fig 13

REPORTS

The following section instructs the user on how to access reports:

1. From the home page click on the user menu.
2. Select the reports icon.

Reports can be viewed on a monthly basis. A daily report basic cleaning data shown is time, mapped area, cleaning area covered and obstacles detected.



Fig 1

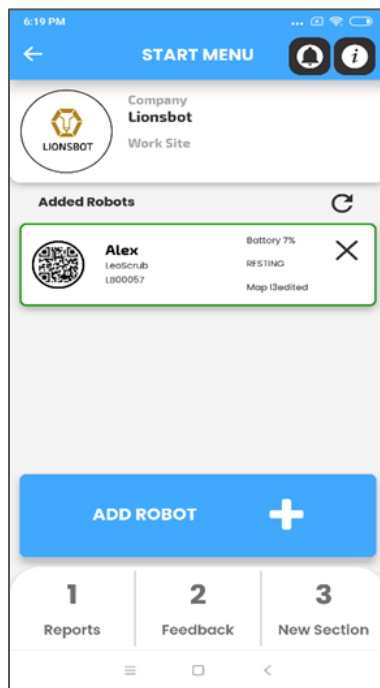


Fig 2

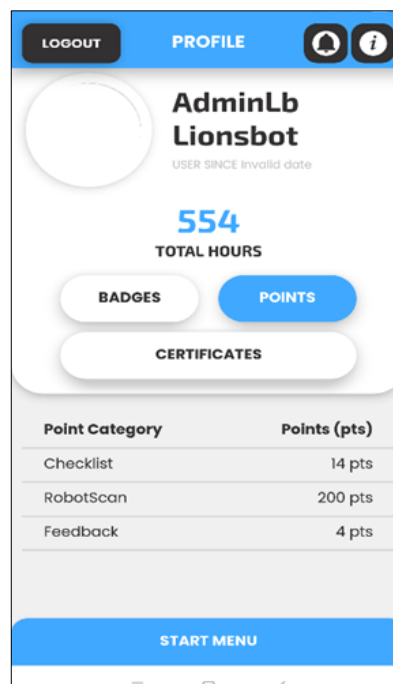
R3 SCRUB APP AND INITIAL SETUP

The LionsClean app is used to communicate to and work with the R3 SCRUB. Each certified R3 SCRUB user is assigned a unique user id and password for use with the app. The user must be logged-in to be able to interface with a R3 SCRUB.

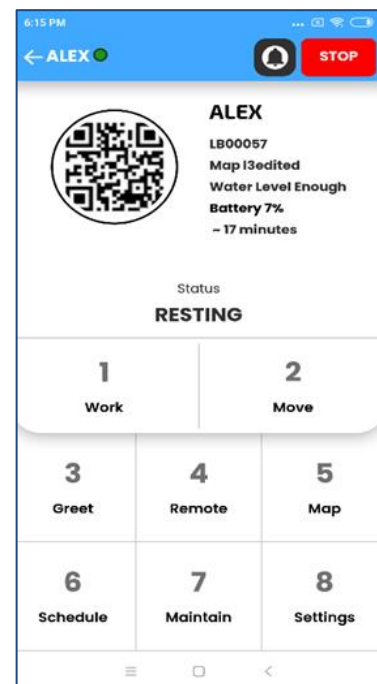
This section provides an overview of the main functions provided by the app, accessible through the user info page, robot and facility page, and commands page of the app. More details on using the R3 SCRUB with the available app commands can be found in '[OPERATION OF THE R3 SCRUB](#)'.



User info page



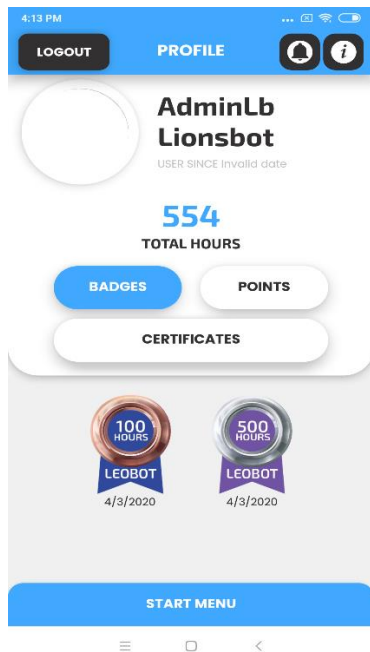
Robot and facility page



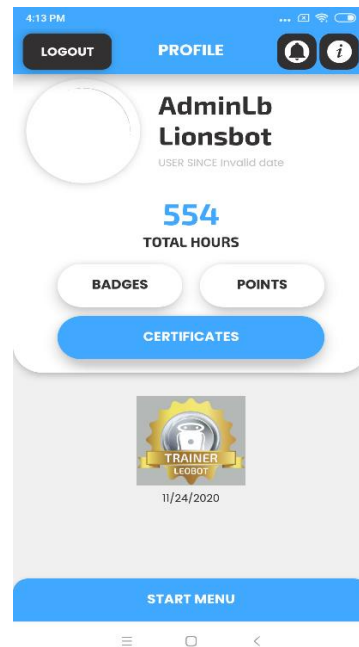
Commands page

USER INFO PAGE

This is the first page that appears upon user login. The user info page summarizes the user profile, with information such as the user's name, cleaning hours accumulated, and accolades earned – including badges for good performance and certificates for completion of training courses.



Badges



Certificates

ROBOT AND FACILITY PAGE

The Robot and Facility page can be accessed by swiping right on the screen for the user info page. This page enables the user to manage the R3 SCRUB and facility he/she is associated with. To add a new robot,

1. Click on 'ADD ROBOT' on the Robot and Facility page (Fig. 1).
2. Scan the QR code provided on the robot's Touchscreen, aligning it inside the green box on the app screen as shown (Fig. 2).

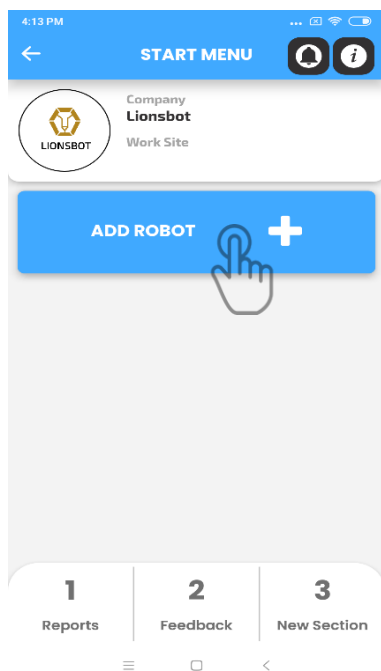


Fig. 1

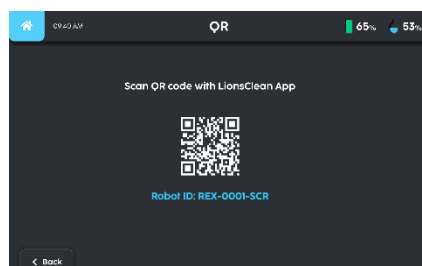


Fig. 2

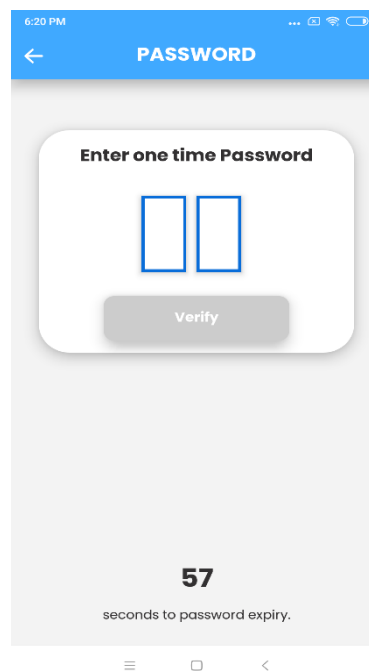


Fig. 3

3. The app will then prompt the user for a one-time password to be entered within 1 minute (Fig. 3). This is a 2-digit password that will be displayed on the touchscreen. Input this on the screen and click on verify (Fig. 4).
4. Upon submission, the R3 SCRUB name will appear on the Robot and Facility page (Fig. 5).



Fig. 4

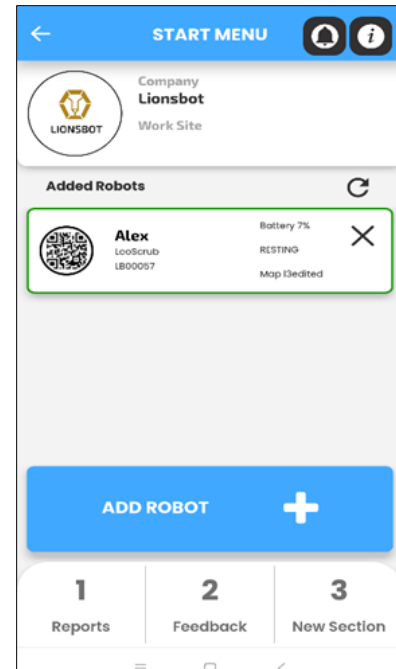


Fig. 5

COMMANDS PAGE

This page provides access to the actual commands for working with the R3 SCRUB. To access the commands page (Fig. 3), click on the R3 SCRUB to work with on the Robot and Facility page (Fig. 1).

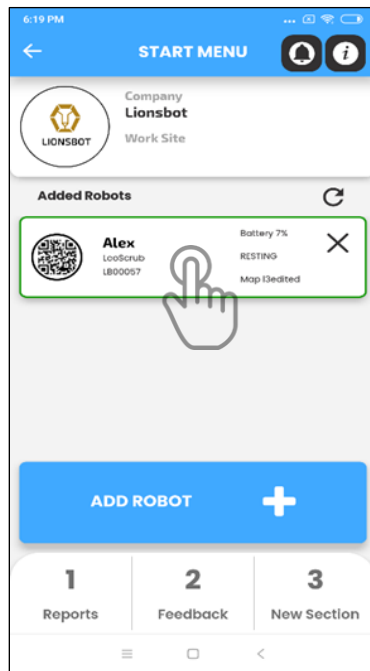


Fig. 1

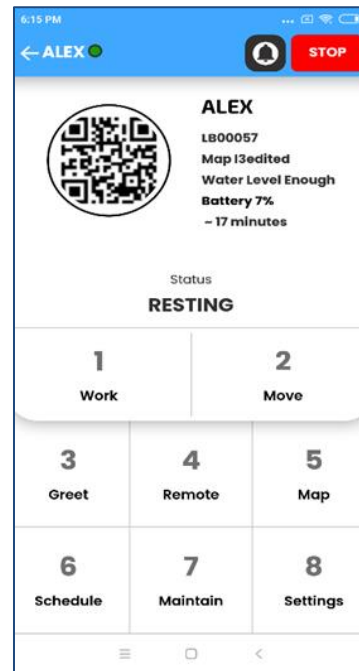


Fig. 2

SETTINGS

Click on the 'Settings' button to modify R3 SCRUB settings such as speaker volume, font size, themes etc.

ALERTS

The LionsClean App is notified with periodic alerts on situations arising with the R3 SCRUB. These alerts appear as notifications on the phone hosting the app, and can also be accessed later by clicking on the bell icon on the Robot and Facility Page or the Commands Page for a particular R3 SCRUB. These alerts are categorized as 'Red', 'Yellow' or 'Green' depending on their severity. Use the display selector ribbon at the bottom of the screen to display selected alert categories (Fig. 1 – All, Fig. 2 – Yellow). The 'Filter' button on this page can be used to refine the filter search and display by robot name and alert date (Fig. 3).

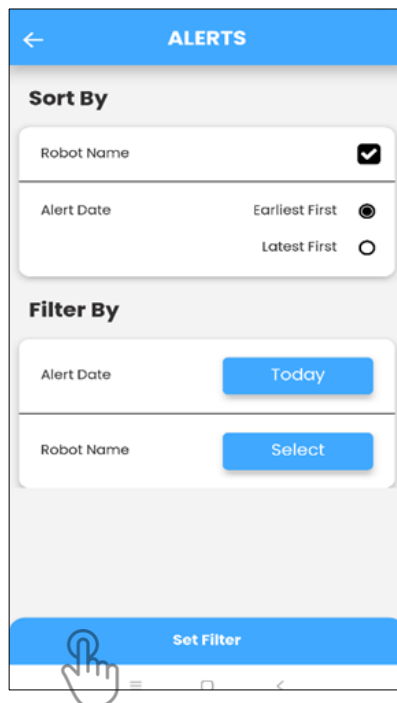


Fig. 1

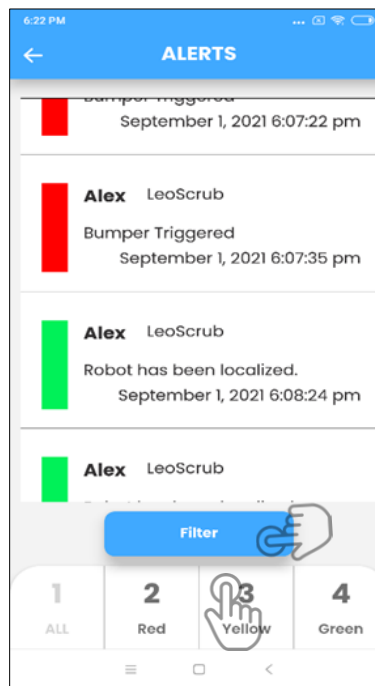


Fig. 2

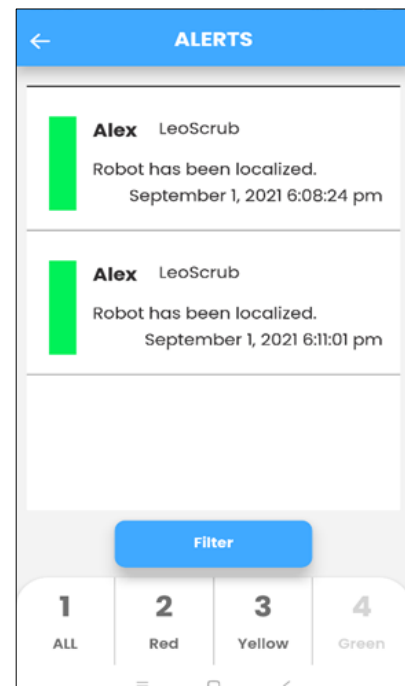


Fig. 3

REPORTS

The Commands Page of the added R3 SCRUB gives access to daily, weekly and monthly reports (Fig. 1 and Fig. 2) of the robot's operations through the 'Report' button. The Reports capture cleaning, greeting and public interactions completed by the R3 SCRUB. To see a report focused on cleaning (area covered and time), swipe right on the report display to move to page 2 of the display (Fig. 3).

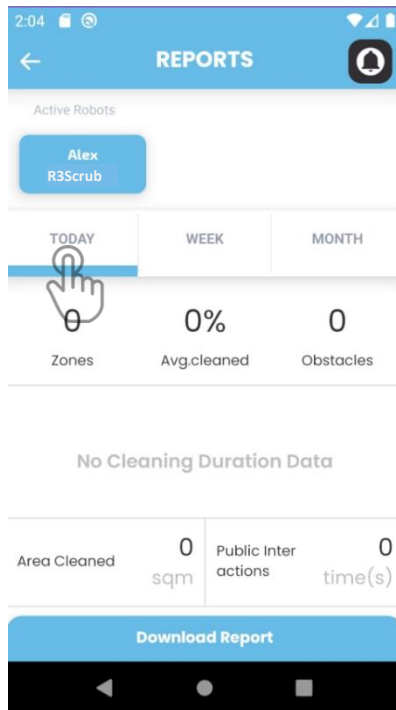


Fig. 1

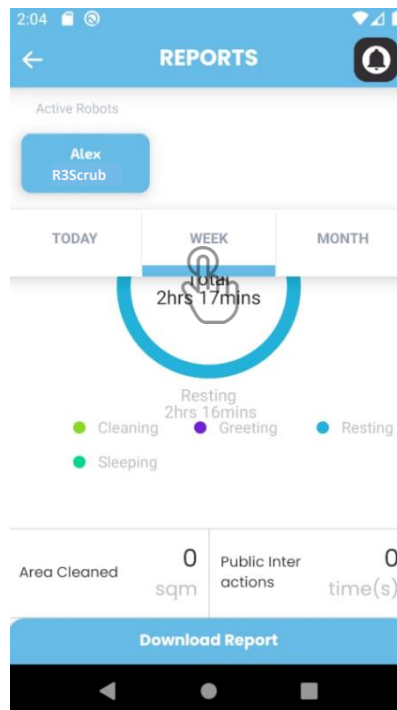


Fig. 2

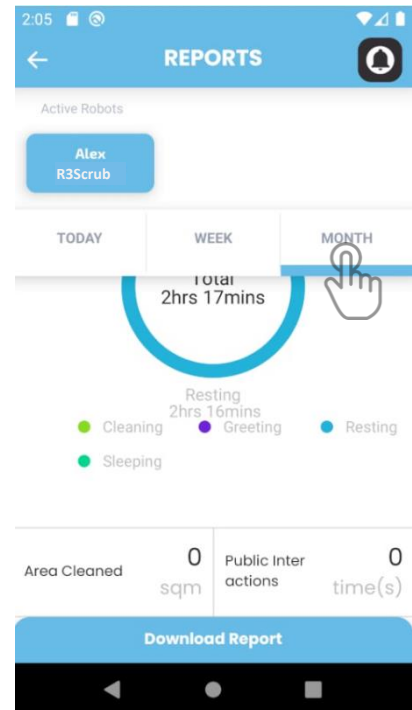
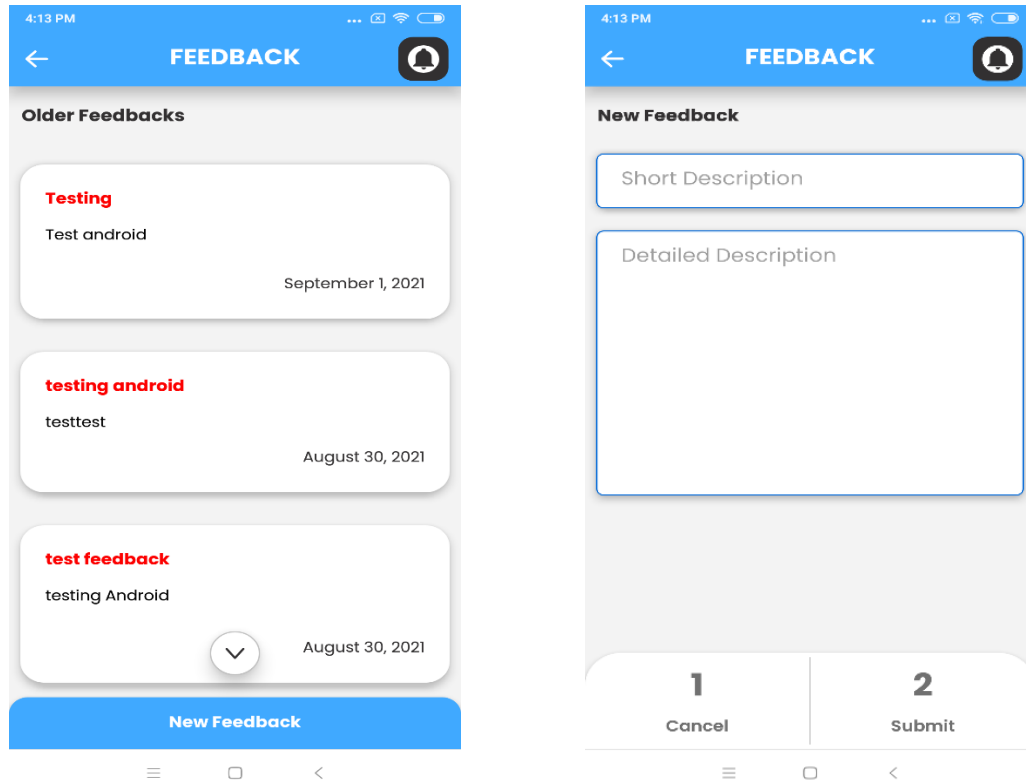


Fig. 3

FEEDBACK

The Feedback button on the Commands Page of the added R3 SCRUB can be used to submit feedback on the R3 SCRUB or LionsClean app, as well as to view previously submitted feedback.



Feedback

ABOUT

Use this button to view information about the added R3 SCRUB such its name, type, and manufacturing date (Fig. 1).

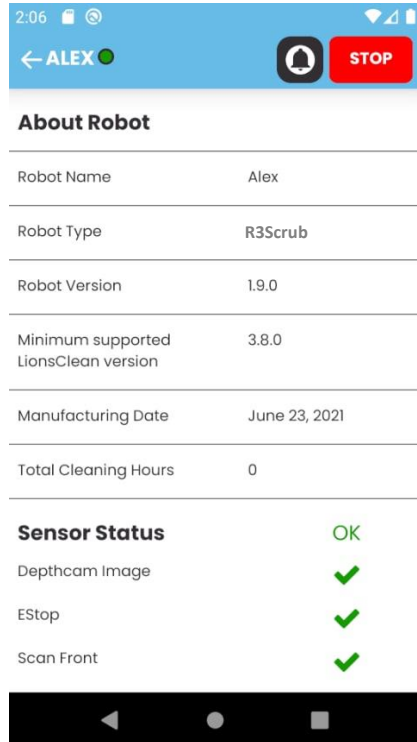


Fig. 1

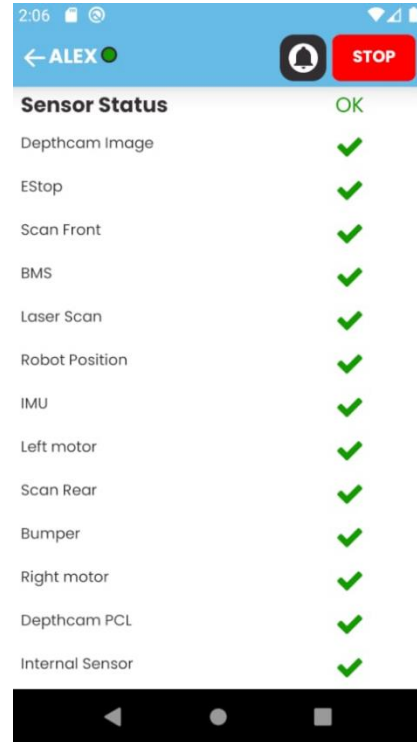


Fig. 2

FACILITY MAP



Caution: A properly created facility map is key to ensuring that the R3 SCRUB avoids dangerous spots in its navigation/ operation. Maps must be created through an authorized distributor by professionally trained personnel.

The LionsClean app should have a pre-created map for the areas of interest in the facility the R3 SCRUB is working in. This can be accessed using the map option on the Commands page, and is necessary for localization of the R3 SCRUB (see '[LOCALIZING THE R3](#)'). For assistance with creating/ adjusting a map, please contact an authorized distributor.

BEFORE R3 SCRUB USE

Power on the robot as described in the section [“POWERING ON/OFF THE R3 SCRUB”](#) to be able to move and operate it.

Follow this checklist of operations before beginning to clean with the R3 SCRUB:

- I. **Clean Water** level is sufficient. (refer to ‘FILLING THE CLEAN WATER TANK’)
- II. Chemical is replenished.
- III. Battery charge level is sufficient. (refer to ‘CHARGING THE BATTERY’)
- IV. No fluid leaks.
- V. Safety features and devices are operating.
- VI. Brakes and steering for proper operation.
- VII. R3 SCRUB is localized.
- VIII. R3 SCRUB can be moved to desired location.
- IX. E-Stop button is released before cleaning.
- X. Brushes/Pads are mounted securely (dependent on floor type)
- XI. Squeegee is clean of dirt
- XII. Debris cage is empty (See Fig 1)
- XIII. Waste water tank is empty



Fig 1

TRANSPORTING THE R3 SCRUB OUT OF STORAGE

Follow the stipulated safety requirements (see '[TRANSPORT](#)') to transport the R3 SCRUB out of storage to the working area.

CHECKING THE WATER LEVEL

Touchscreen:



Fig. 1

1. Check the clean water level (Fig. 1 - 1) on the touch screen attached to the R3 SCRUB.
2. Empty the waste water tank of any water before usage (see '[DRAINING THE WASTE WATER TANK](#)').

Physical:



Fig. 2

1. Check the clean water level (Fig. 2 arrow) on the water level tube attached to the back of the R3 SCRUB.

Note: The water level in the tube represents the water level in the tank.

FILLING THE CLEAN WATER TANK

If water level is insufficient, bring the robot near a water source to fill the clean water tank

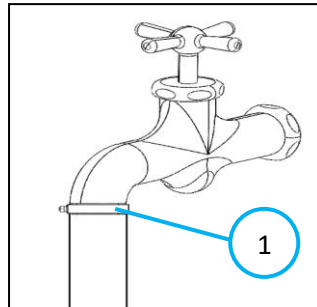


Fig. 1

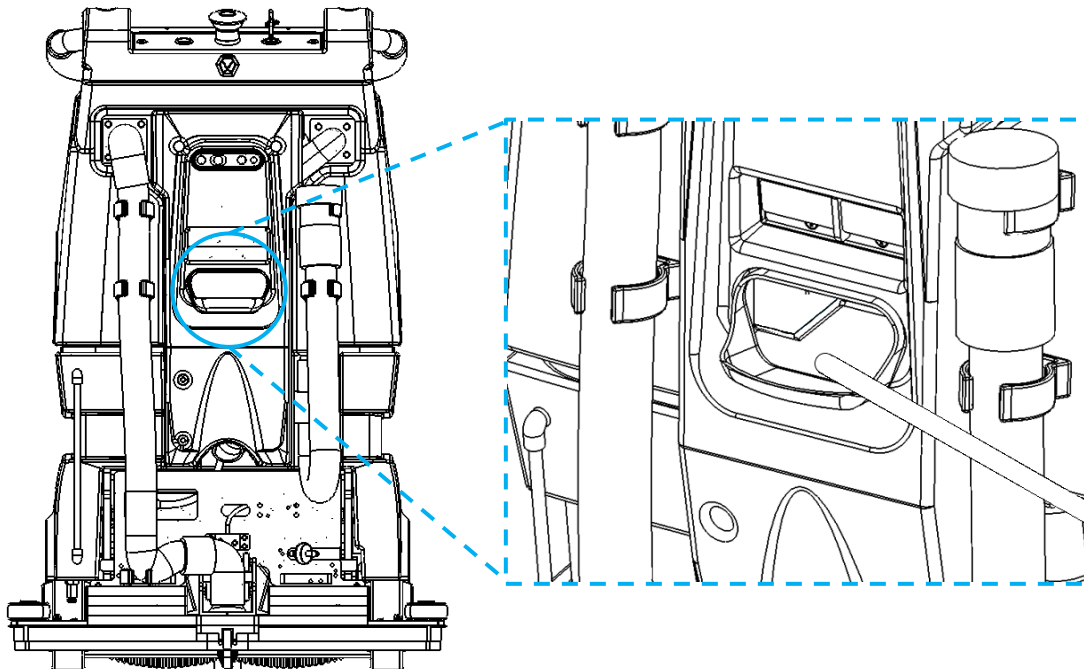


Fig. 2

Follow these steps to refill the clean water tank:

1. Prepare a hose for clean water.
2. Attach the hose inlet to a tap by pushing its rubber end onto the tap and tightening the hose clip (Fig. 1).
3. Insert the other end of the clean water hose into the clean water inlet. Push a significant length of the tube into the inlet to prevent it from dropping out during filling (Fig 2).
4. Turn on the water tap and fill to a sufficient level indicated on the water level tube or on the touchscreen.
5. Once done filling, turn off the tap and pull the water hose out of the inlet.

CHECKING THE BATTERY LEVEL

1. Refer to the Home page on the screen for the robot to check the battery level (Fig. 1)



Fig. 1

LOCALIZING THE ROBOT



CAUTION: Localization errors or navigation errors will happen under the following conditions:

1. Lidars' surfaces are dirty
2. Sudden loss of power to on-board computer.

The R3 SCRUB needs human assistance to ensure proper localization.

1. Access the map of the facility by clicking the 'Map' option on the HOME (EXPAND MENU) page (Fig. 1).

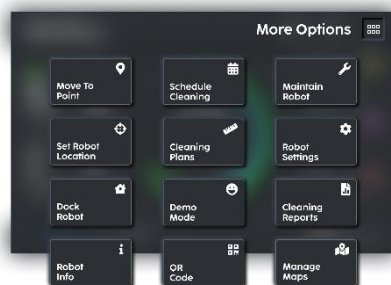


Fig. 1

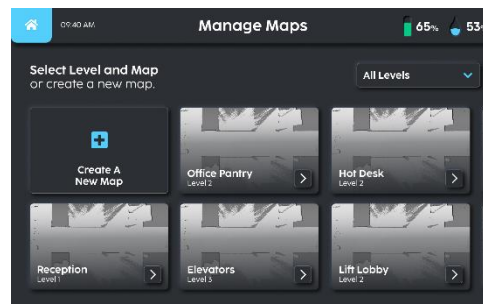


Fig. 2

2. Select the mapped area of operation (Fig 2), wait for the map to change.

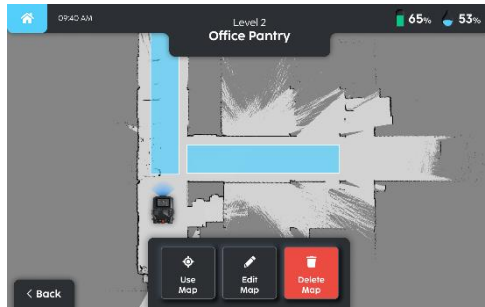


Fig. 3

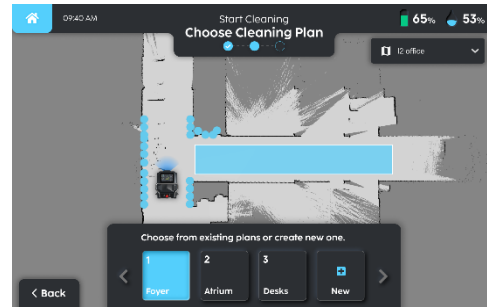


Fig. 4

3. Select the 'use map' option to change the map (Fig. 3).
4. The R3 SCRUB's position on the map is indicated by an arrowhead (Fig. 4). The points and segments on the map reflect the robot's vision through the LIDAR.
5. Manually move robot to a localization point selected on the map, then select the localize button. Wait for the robot to check its surroundings (Fig 5).
6. When localization is successful the robot will show on the screen.

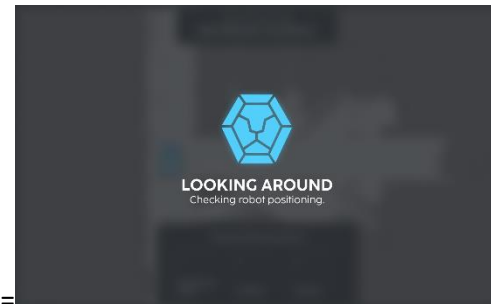


Fig. 5

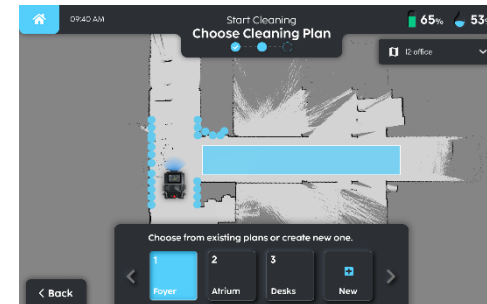


Fig. 6

VERIFICATION OF LOCALIZATION

1. With a properly localized R3 SCRUB, the LIDAR scan lines (indicated by red points and segments on the map) would closely match map features (displayed as black lines) (as seen in Fig. 7). If the R3's scan displayed on the app does not match the map features satisfactorily, the robot can be repositioned slightly to repeat the localization setting.

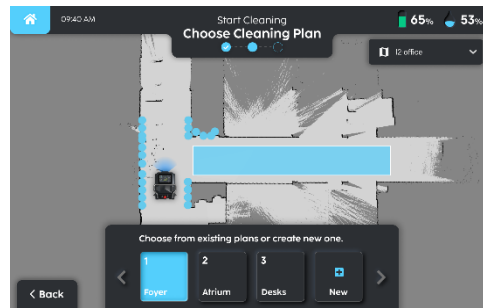


Fig. 1

2. Another indicator of good localization is successful point-to-point motion of the R3 SCRUB. Use the Move command as described in '[POINT TO POINT MOVEMENT](#)' to verify accurate movement to a set location.

OPERATION OF THE R3 SCRUB

The R3 SCRUB can be operated through the LionsClean app or through the touchscreen.

For LionsClean app operations:

Follow the procedure under '[R3 SCRUB APP AND INITIAL SETUP](#)' to get the R3 SCRUB running with LionsClean and to perform localization.

For touchscreen operations:

Follow the procedure under '[R3 SCRUB TOUCHSCREEN SETUP](#)' to get the R3 SCRUB running and to perform localization.

Complete the final maintenance checklist below before beginning to work with the R3 SCRUB. This maintenance checklist will also appear as a reminder on the app.



WARNING: If either the E-stop or bumper are not found to be working as expected, do not proceed to clean with the R3 SCRUB and contact an authorized distributor for assistance.

- ✓ Verify the physical E-stop and LED warning light are functioning.
- ✓ Verify the bumper and LED warning light are functioning.
- ✓ Verify that the obstacle avoidance behavior is functioning.
- ✓ Check lidar surfaces for any dirt.
- ✓ Verify that the tank hatch is closed.
- ✓ Verify that the drain hose is lidded and secured.
- ✓ Verify that the clean water inlet is emptied of excess water.

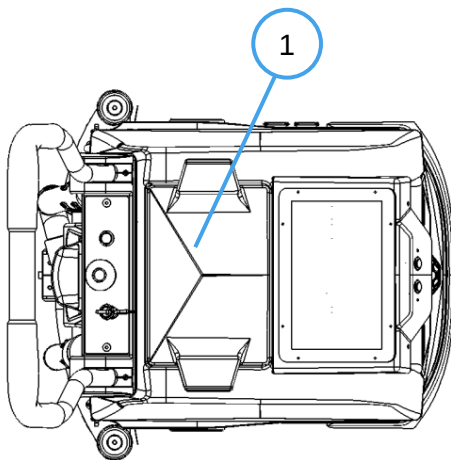


Fig. 1

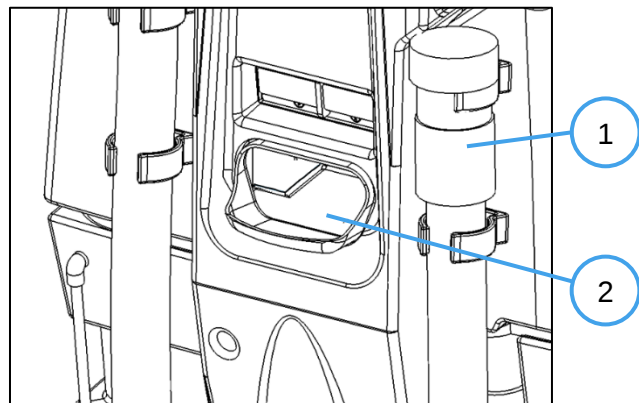


Fig. 2

1. **Verify the physical E-stop function:** After depressing the E-stop, push the robot manually to verify that the brakes have been disengaged and also verify LED lights are flashing Red color. Release the E-stop and press the reset button to verify LED lights go back to original color.
2. **Verifying the bumper function:** In automatic, point to point travel mode depress the bumper, to verify that the robot replans the path and also verify LED lights are flashing.
3. **Verify that the obstacle avoidance behavior is functioning:** Use the remote-control function of the LionsClean app with the 'Sensor On' to move the robot towards an obstacle (directly in front or on the sides) and verify that the robot avoids the obstacle (see '[REMOTE CONTROL](#)' section).
4. **Verify Lidar surfaces are clean:** Check visually lidars surface for any dirt, dust. Wipe lidar surface with a small cloth to clean away if there is any dirt or dust on its.
5. **Verify waste-water hatch is closed:** (Fig. 3).

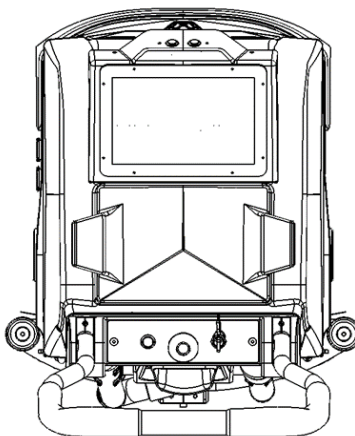


Fig. 3

6. **Verify drain hose is lidded and secured:** Tightly close the drain hose lid (Fig. 4.) and rest the hose on the anchor points provided.
7. **Verify clean water inlet is free of water:** (Fig. 4).



Fig. 4

POINT TO POINT MOVEMENT

1. Use the 'Move' option (Fig. 1) on the Expanded Menu page to select a point on the map (Fig. 2) for the robot to move to from its current location.
2. The Move page allows the user to select a pre-set point to move to from the bottom selection ribbon (ex. 'MCDONALDS' in Fig. 2) or provide a custom location by clicking on the map.
3. Upon confirming the selection (Fig. 3), the pause/ stop button bar appears with a pull-up banner for the move mission status, which shows the mission progress as a percentage. Expanding this pull-up banner shows more details about the specific motion (start and end location).
4. Should there be obstacles or an interruption in the process a 'UNSUCCESSFUL' page shall show. The operator may either select 'HOME', 'JUST CLEAN' or 'MOVE' functions to adjust the process.
5. Upon completion of the mission the app will display a completion page (Fig. 5).



Fig. 1

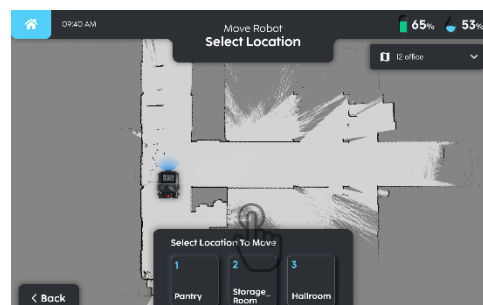


Fig. 2

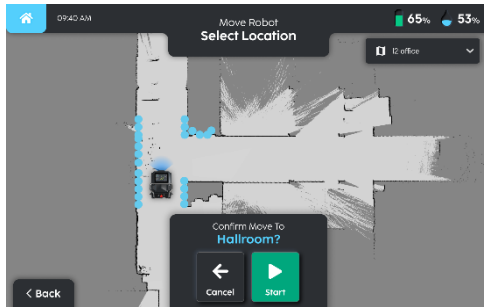


Fig. 3

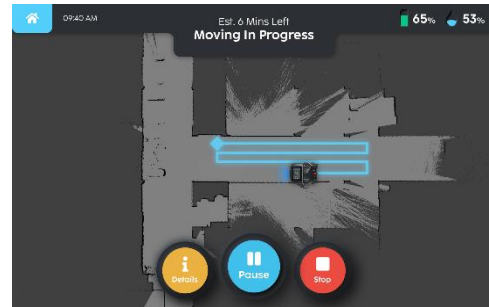


Fig. 4

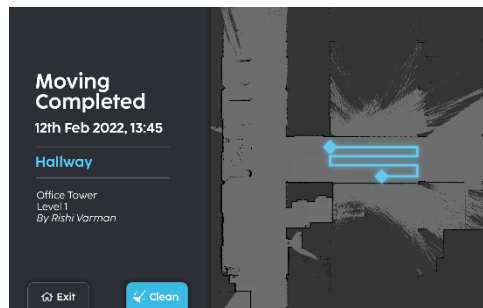
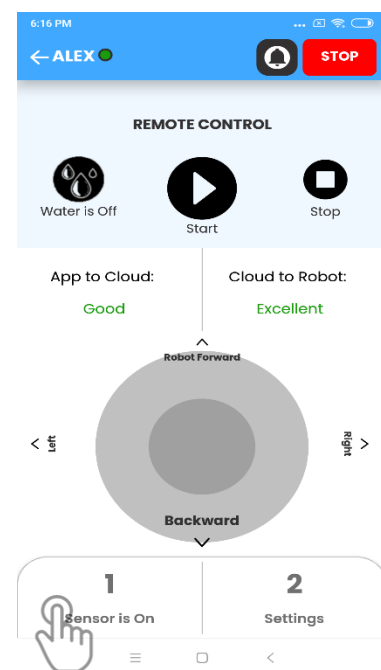
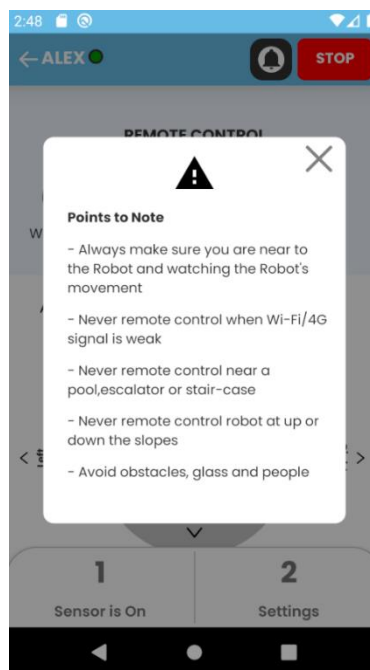
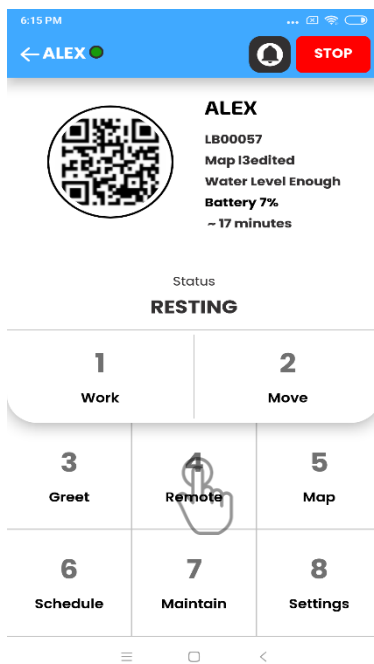


Fig. 5

REMOTE CONTROL VIA APP

The remote function of the app is useful for manual cleaning of spots, edges, or in tight spaces (ex. going through a door).



*Fig. 1**Fig. 2**Fig. 3*

1. Use the Remote option (Fig. 1) on the Commands page to activate the remote function on the app.
2. A dialog box appears with cautionary notes for remote controlling the R3 SCRUB. Carefully note these points before proceeding to the Remote-Control page (Fig. 3).
3. The R3 SCRUB can be controlled in two modes, 'Sensor On' and 'Sensor Off' as indicated by the toggle button at the bottom left of the screen (Fig. 4 and Fig. 5 respectively). 'Sensor On' is the normal operation of the mode of the R3 SCRUB – featuring obstacle avoidance behaviors using various distance sensors and cameras (see ['HUMAN SAFETY FEATURES OF THE R3'](#)). The 'Sensor Off' mode is useful for navigating through tight spaces that would otherwise be prohibited by the R3's sensors.



CAUTION: Exercise extreme caution when remote controlling the robot in 'Sensor Off' mode. Always keep your attention on the R3 SCRUB and switch back to the 'Sensor On' mode as soon as feasible.

4. Use the virtual joystick to move the robot forward/back/left/right as annotated on the app screen. Pulling the inner circle further out from the center causes the robot to move faster.



CAUTION: Slow down when approaching tight spaces.

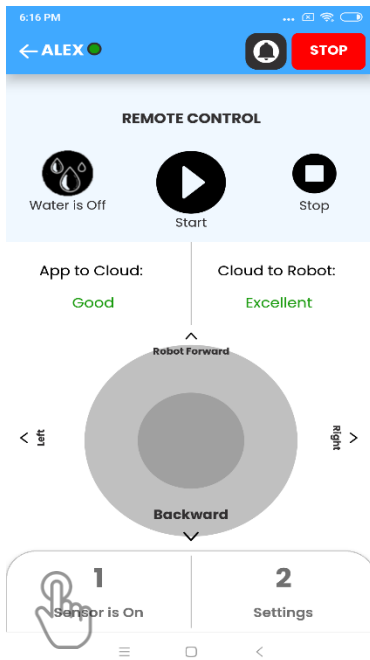


Fig. 4

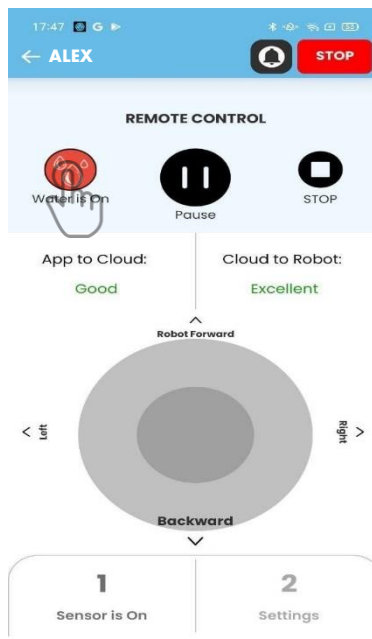


Fig. 5

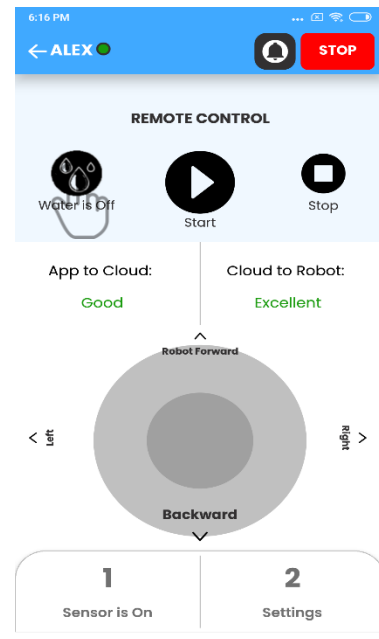


Fig. 6

5. To start cleaning during remote control, click on the 'Start' button. The cleaning function is initiated in about 5 seconds with the water spray on by default, as indicated by the 'Water is On' toggle button on the top left, highlighted in red (Fig. 5).
6. Toggle this button to turn the water spray off if desired (Fig. 6). The button displays 'Water is Off' in its usual black color.

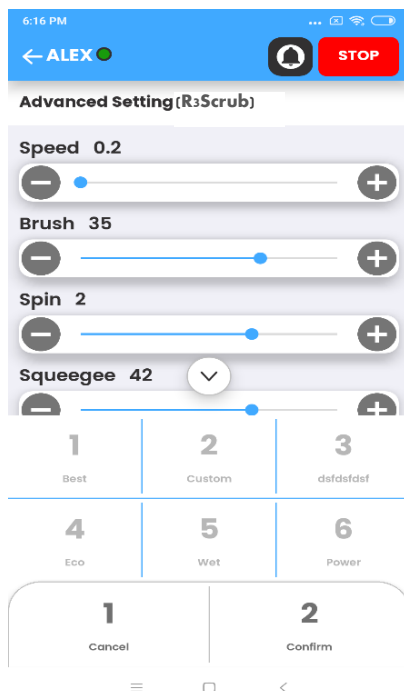


Fig. 7

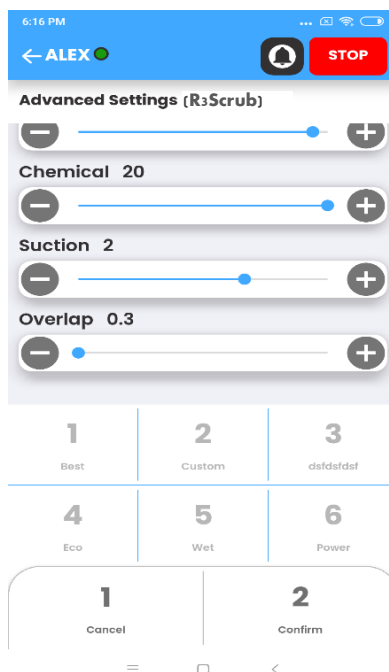


Fig. 8

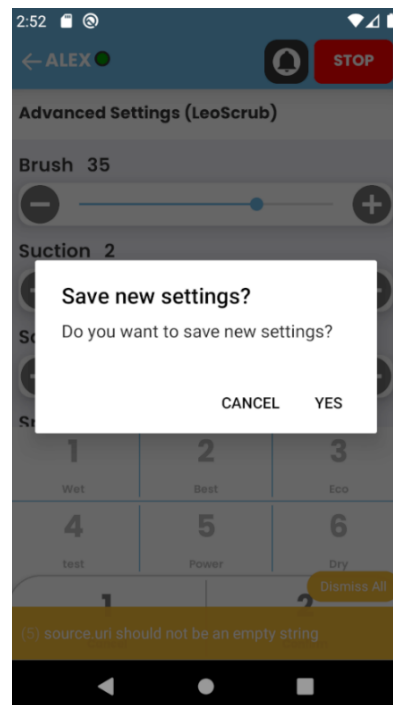


Fig. 9

7. To change the cleaning settings, click on the 'Settings' button to open the advanced cleaning settings page. Adjust the values of the various cleaning parameters (brush pressure, water flow rate, squeegee pressure, suction power, brush spin rate, robot speed, and cleaning path overlap) as desired (Fig. 7 & 8) and save the settings (Fig. 9).



CAUTION: In case of emergency, press the red STOP button to activate the Estop.



CAUTION: While cleaning, only move the robot forward.

RECOMMENDED MAINTENANCE

Complete this checklist of operations after cleaning with the R3 SCRUB:

- ✓ Stop on a level surface.
- ✓ Drain the waste water tank.
- ✓ Wash the waste water tank.
- ✓ Empty debris cage in the waste water tank.
- ✓ Optional: Drain clean water tank.
- ✓ Remove and clean the squeegee.
- ✓ Move the robot back to storage.
- ✓ Charge the robot.
- ✓ Power off the robot.
- ✓ Wipe down the outer skin of the robot, lidar covers and cameras with a dry cloth.

The 'Maintain' page of the LionsClean app can be used to keep record of post-cleaning maintenance operations on the R3 SCRUB. Refer to ['R3 APP AND INITIAL SETUP'](#) for setting up the app with the R3 SCRUB, and click on 'Maintain' on the Commands Page.

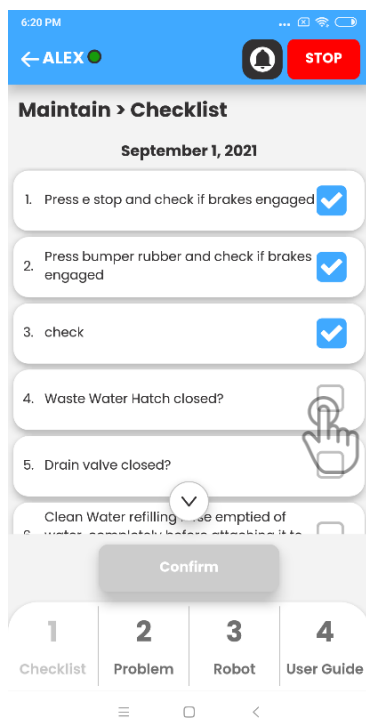


Fig. 1

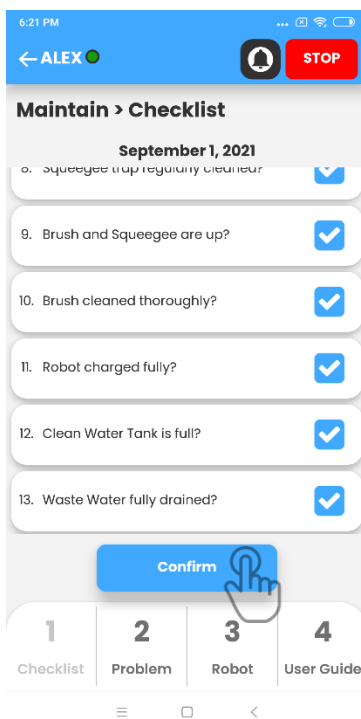


Fig. 2

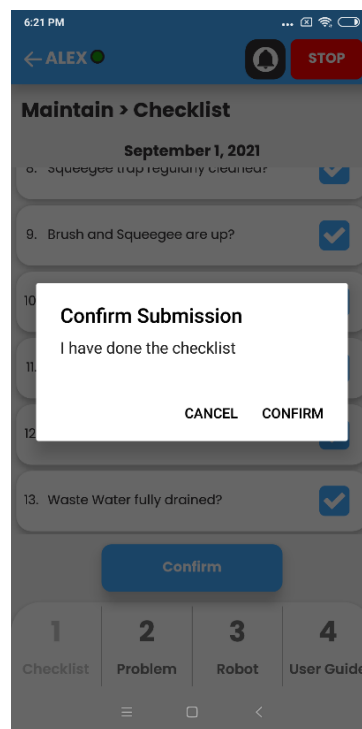


Fig. 3

1. Fig. 1 shows the checklist of recommended maintenance operations after cleaning with the R3 SCRUB. Check these operations as they are performed and confirm the completion (Fig. 2 & 3).

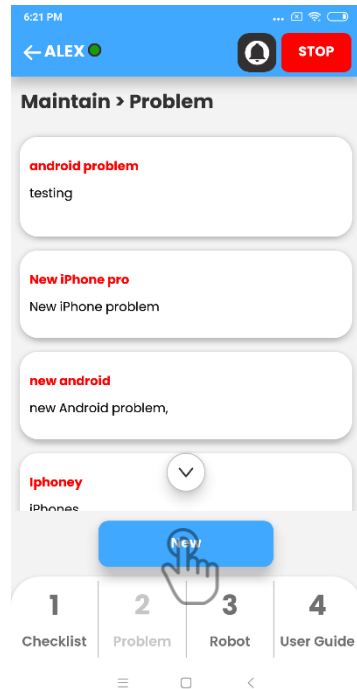


Fig. 4

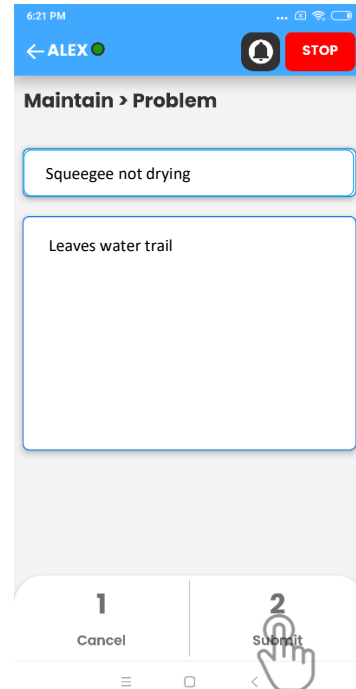


Fig. 5

2. The Maintain page can also be used to report new issues with using the R3 SCRUB by clicking on the 'Problem' button and providing a description of the issue (Fig. 5).

The following sections illustrate these recommended maintenance operations after cleaning with the R3 SCRUB. To begin,

1. Move the R3 SCRUB to a washing area with a tap or other water source.
2. Power off the robot as described in ['POWERING ON/OFF THE R3 SCRUB'](#), keeping the back door open till the tank maintenance operations are complete.

DRAINING THE WASTE WATER TANK

1. If waste water tank has fluid, use the manual drain hose to drain fluid (Fig 1 – 1).
2. Point hose towards a drain or appointed disposal location, uncap the hose (Fig. 1 – 2).
3. Once fluid has been drained and tank is empty of fluid, refer to '[CLEANING THE WASTE WATER TANK](#)' section to remove left over debris inside the tank.
4. Once cleaning is complete. Close cap on the manual drain hose.
5. Place drain hose back on the holder.

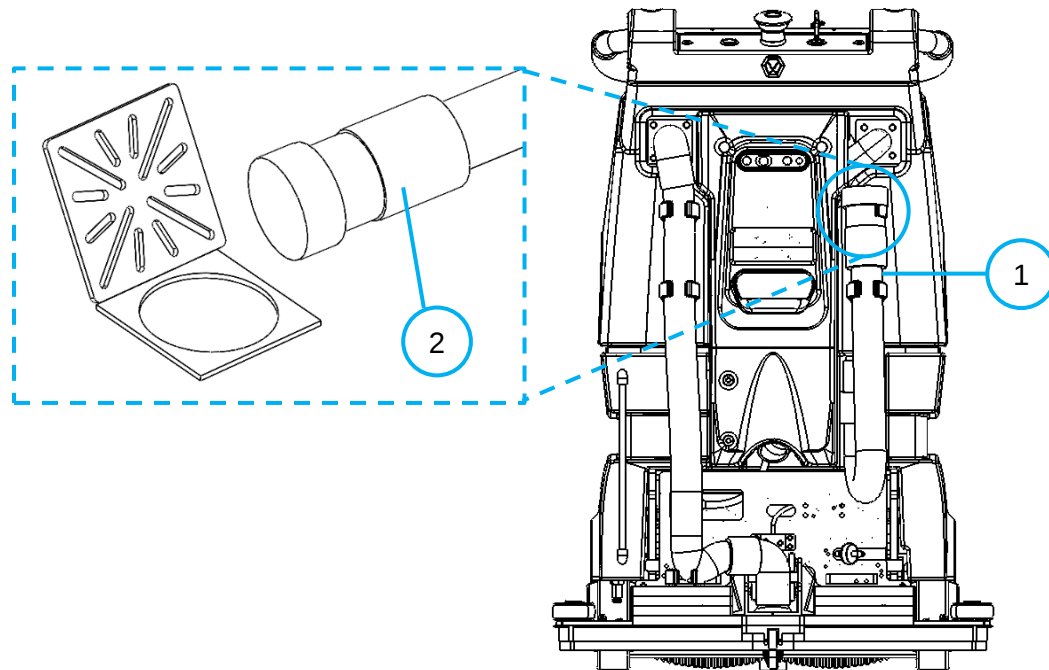


Fig. 1

CLEANING THE WASTE WATER TANK



The waste water tank should be cleaned regularly to prevent the build-up of sludge, grime, dirt etc.

1. Unmount the manual drain hose from the hooks provided (Fig. 1 – 1).
2. Point hose towards a drain or appointed disposal location and uncap the hose (Fig. 1 – 2).

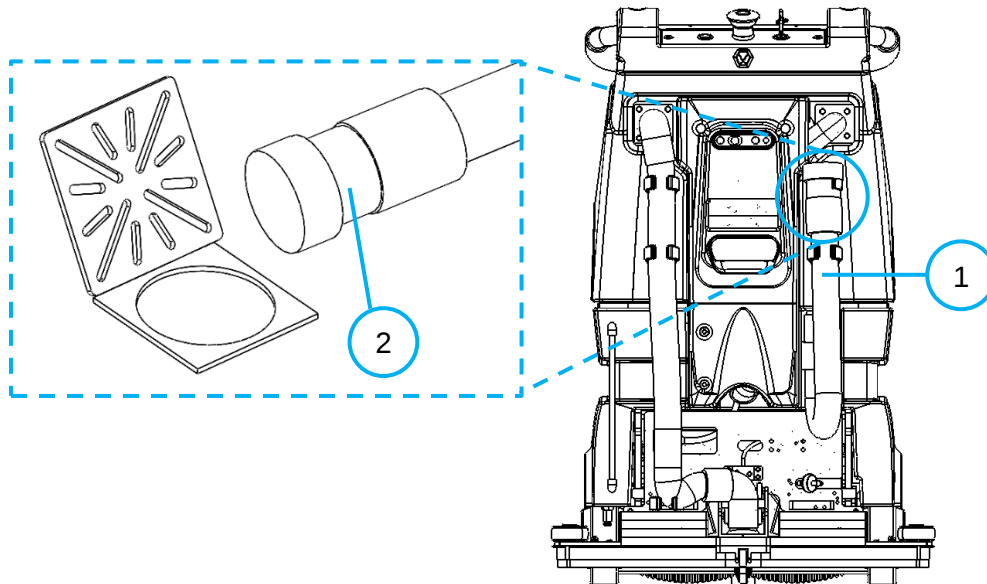


Fig. 1

3. Remove the top hatch (Fig. 2) and carefully store it.

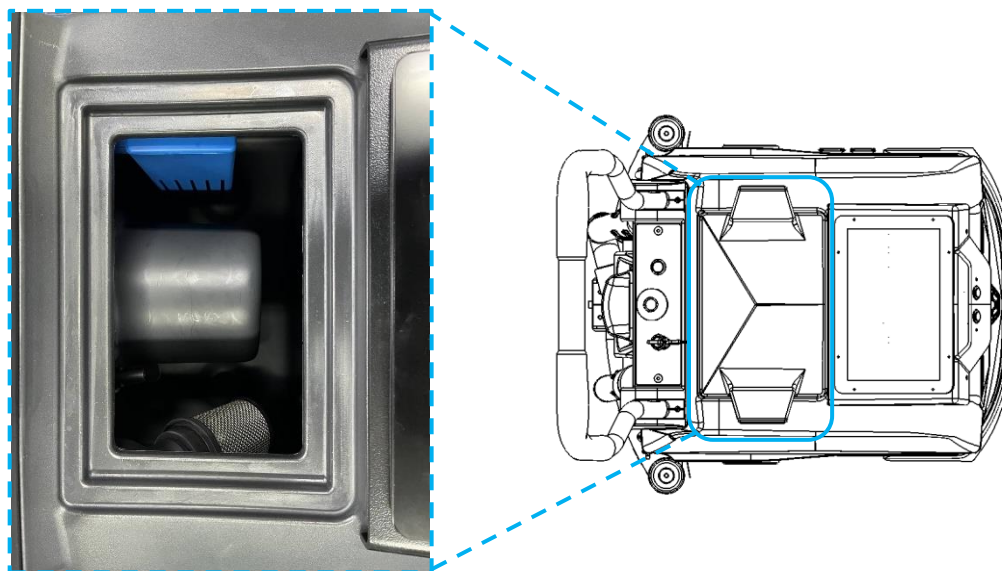


Fig. 2

4. Remove the debris cage (Fig. 3), empty and wash if necessary.



Fig. 3

5. Optional: Remove the float ball cage (Fig. 4), check for debris and wash if necessary.



Fig. 4

6. Inspect the waste water tank for debris. Flush it with clean water and use a sponge or scrub to clean grime off walls.
7. Check for clogging at the drain hose fitting (Fig. 5) on the inside of the tank. Clean if necessary.



Fig. 5

8. Replace the float ball cage and debris cage before placing back the hatch.
9. Tighten the drain hose and mount it back onto the hooks provided.

DRAINING THE CLEAN WATER TANK

1. Locate the clean water level tube on the back of the robot (Fig. 1).

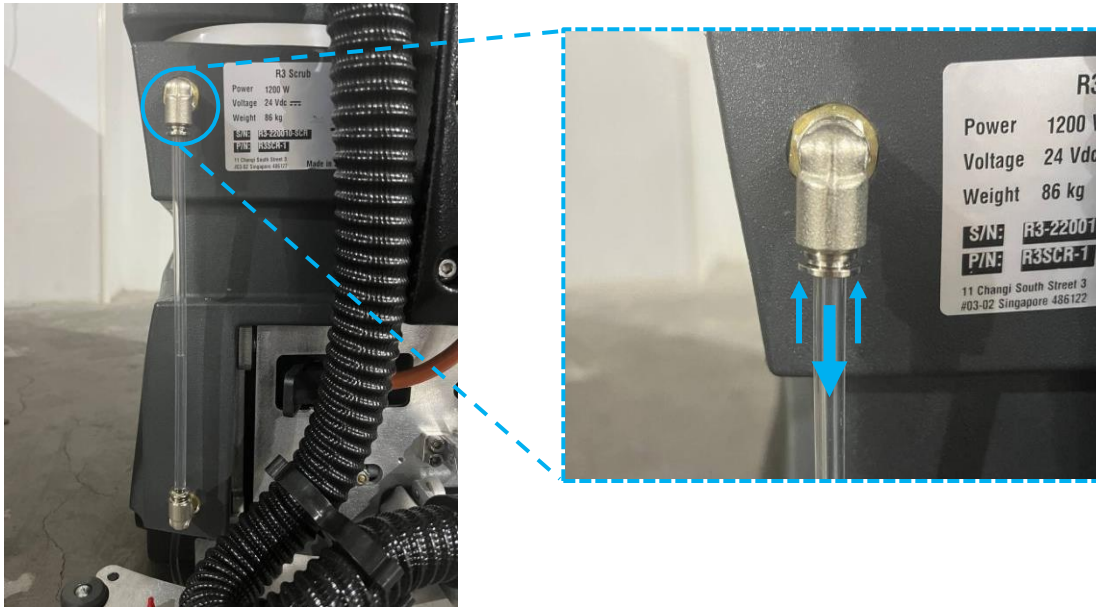


Fig. 1

2. Push the outer metal ring of the tube fitting (upwards) and pull the tube out (downwards) at the same time (Fig. 1)

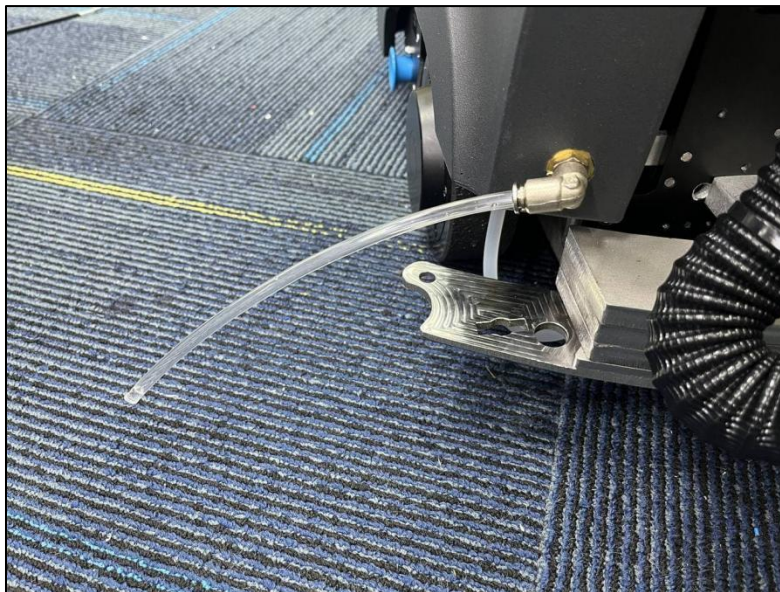


Fig. 2

3. Point the end of the tube towards the drain. The fitting can be rotated (Fig. 2).
4. After draining, push the end of the tube back into the tube fitting. Pull on the tube to ensure that it is secured.

CLEANING THE CLEAN WATER TANK

1. Drain the clean water tank, refer to '[DRAINING THE CLEAN WATER TANK](#)'.
2. Leave the hose pointing at the drain.

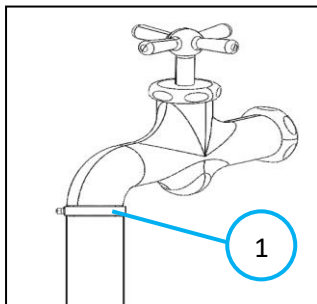


Fig. 1

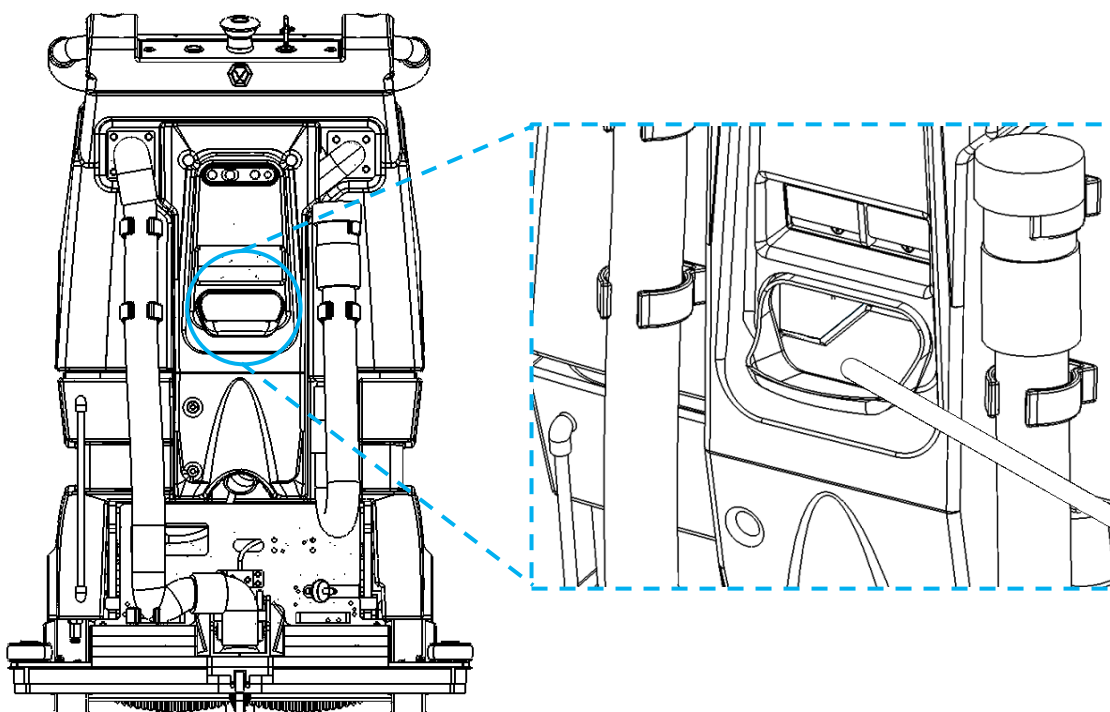


Fig. 2

3. Attach a hose to a tap by pushing its rubber end onto the tap and tightening the hose clip (Fig. 1)
4. Place the other end of the hose into the clean water inlet and flush the clean water tank by filling it with water (Fig 2).
5. Turn off water supply after flushing.
6. Place the end of the water level tube back into its tube fitting. Pull on the tube to ensure that it is secured properly.

CLEANING/REPLACING THE FLOOR TOOLS

Refer to below for instructions on cleaning the floor tools.

CLEANING THE BRUSH

Keeping the brushes clean enables better cleaning of the floor and a longer lifespan of the brush gearmotors. Brushes are advised to be replaced every month or as needed to get better cleaning performance. To detach the brushes for cleaning, follow these steps:



Inspect the brush bristles for wear/ abrasion resulting in shortening. As a rule of thumb, replace the brushes when the cleaning bristles (white) have been worn down by half a centimeter, or monthly/ as needed.

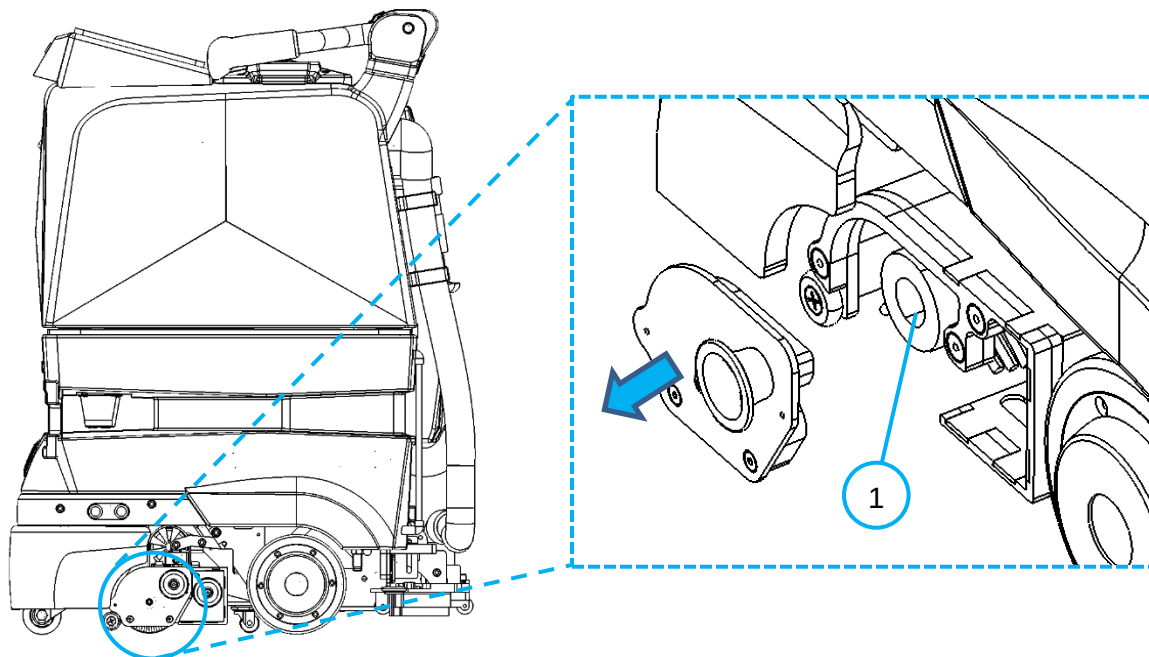


Fig. 1

1. Pull the brush cover knob to release it from the magnetic catch (Fig. 1).
2. Pull out the brush (Fig. 1 – 1) and clean under a stream of running water to remove impurities from the bristles.
3. Check the wear status of the bristles and replace the brush if necessary.
4. Upon checking and cleaning the brushes, re-assemble them onto their clutches as described in the [‘INSTALLING THE BRUSH’](#) section.

CLEANING THE DEBRIS TRAY

Keeping the debris tray clean regularly enables better collection of debris during cleaning. To detach the debris tray from the robot for cleaning, follow these steps:



Inspect the debris tray for wear/cracks resulting in holes. As a rule of thumb, replace the debris tray once there are cracks on the tray.

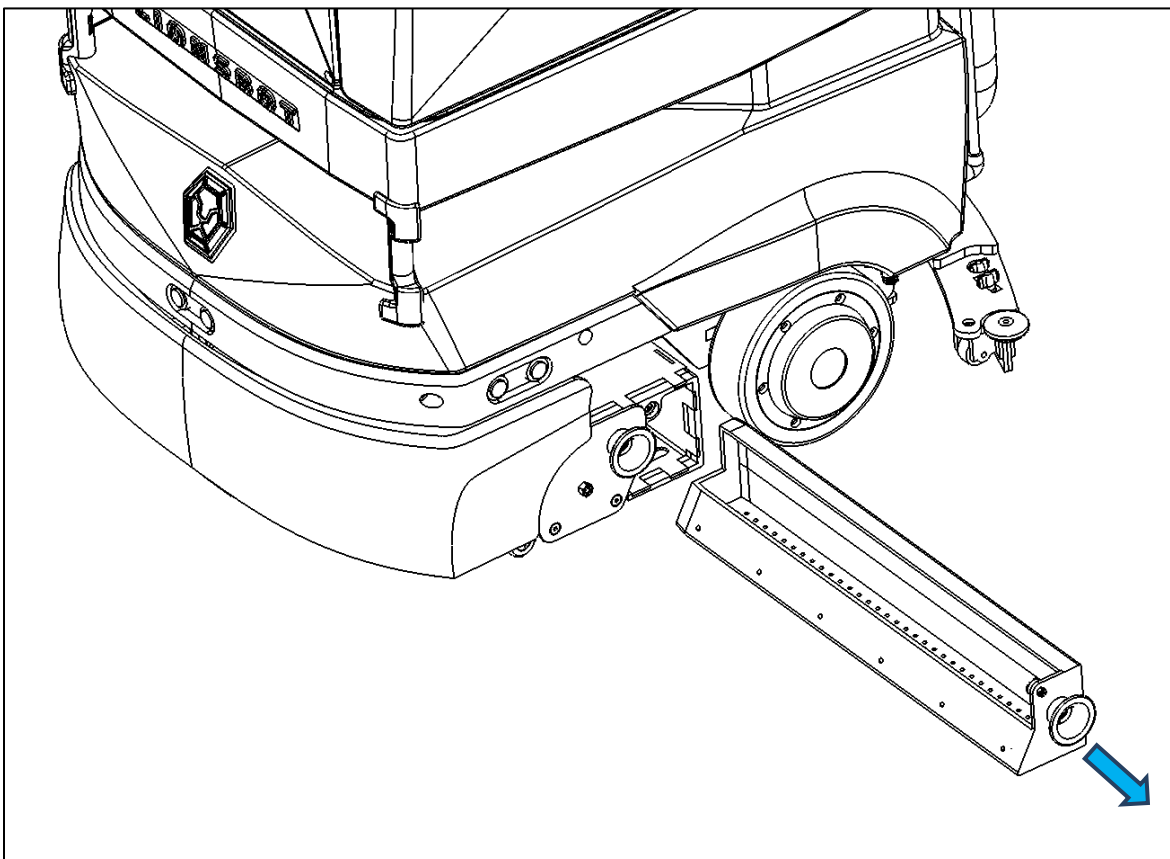


Fig. 1

1. Pull the debris tray knob to release it from the magnetic catch (Fig. 1).
2. Empty the tray and clean under a stream of running water to remove impurities.
3. Inspect the tray for cracks and replace as necessary.
4. Re-assemble it onto the machine by returning it back into the debris tray slot.

CLEANING THE SQUEEGEE RUBBER

Keeping the squeegee clean enables better drying of the floor and a longer lifespan of the rubber blades. To separate the squeegee cartridge from the robot for cleaning, follow these steps:



Inspect the squeegee rubber for wear resulting in shortened height/ tearing. Replace monthly or as needed.

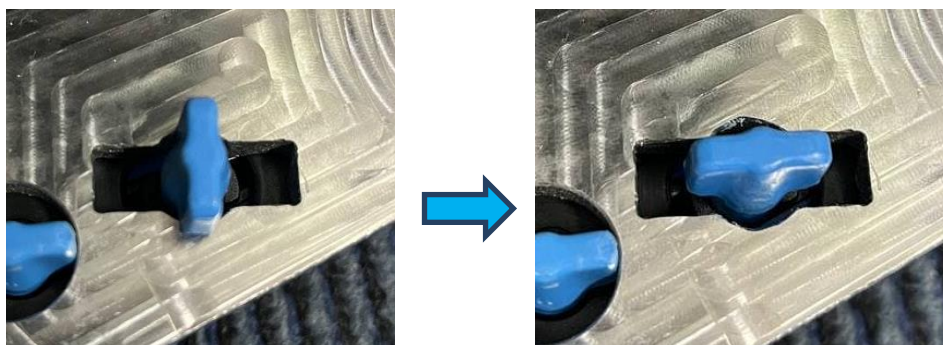


Fig. 1

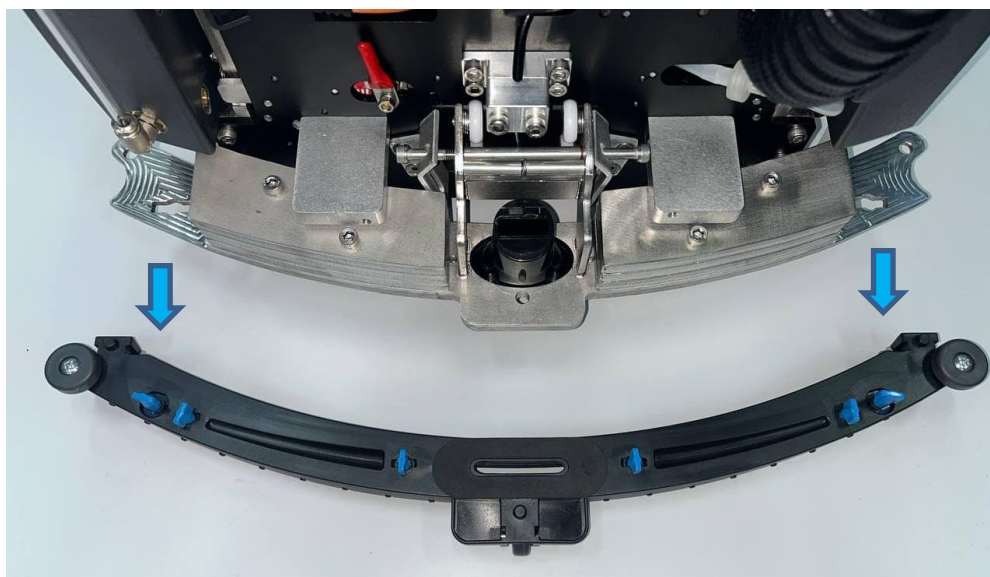


Fig. 3

1. Locate the two fasteners at both ends of the Squeegee mount.
2. Align both fasteners with their hole (Fig. 1) before pulling the squeegee cartridge out (Fig. 3).
3. Clean the rubber blades under a stream of running water or with a damp cloth to remove impurities.
4. Inspect the rubber blades for wear and tear and replace as necessary before reassembling. Refer to ['INSTALLING THE SQUEEGEE RUBBER'](#) section to replace the rubber blades.
5. Re-assemble the squeegee cartridge onto the mount or refer to ['MOUNTING THE SQUEEGEE CARTRIDGE'](#) section.

CLEANING THE SQUEEGEE TRAP/HOSE



Detach the squeegee hose to inspect the squeegee hose/ squeegee trap for obstruction, and clear the choke as necessary:

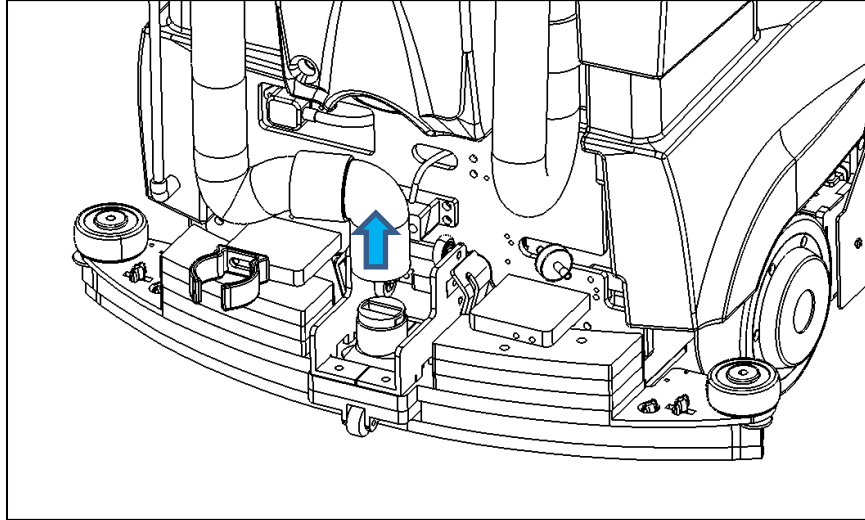


Fig. 1

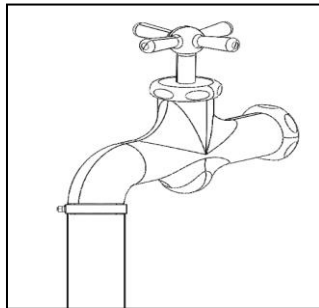


Fig. 2

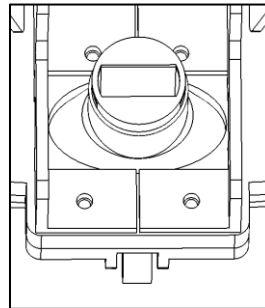


Fig. 3

1. Remove the vacuum hose (Fig. 1), keeping a cloth handy in case of dirty water spillage.
2. Inspect the squeegee hose for debris and clean as necessary.
3. Prepare a hose. Attach the hose to a water supply main (Fig. 2).
4. Using the hose, clean the trap (Fig. 3) under a stream of running water. check that the trap is free of debris after cleaning.
5. Reattach the squeegee hose onto the trap.

WIPING DOWN THE R3 SCRUB

1. Ensure that the robot is powered off.
2. Wipe down the outer skin of the robot using water (or Z-water: no harsh chemicals) and cloth.
3. Do not hose down the robot.

STORAGE IN COLD CLIMATES

Where robot is used in environments where frosting may occur, the robot clean water tank, waste water tank and hoses shall be emptied of fluid, to avoid cracking, bursting, and clogging of hoses caused by freezing. The robot shall be stored in a dry and warm place.

PERIODIC MAINTENANCE

RECOMMENDED MAINTENANCE SCHEDULE

OPERATION	AFTER EACH USE	DAILY	WEEKLY	MONTHLY	ANNUALLY
Draining waste water tank					
Cleaning squeegee					
Cleaning brushes					
Wipe down sensors					
Wipe down robot					
Washing wastewater tank					
Charging batteries					
Filling clean water tank					
Clean squeegee hose					
Replacing squeegee rubber					
Replace brushes					
Check the brush for wear					
Check clean water filter					
Clean and check battery terminals and cables for damage.					
Chassis fastener Inspection					(1)
Check seals for wear					(1)
Check wires, tubing and fluid fittings for wear.					(1)
Motors and battery inspections					(1)
Wheel inspection for wear					

(1) = This maintenance procedure must be performed by an authorized service centre or distributor.



CAUTION:

1. Switch off the robot before performing any form of periodic maintenance.
2. For filling of the clean water tank, ensure that the water pressure is between 40 to 45 psi (tap water from normal commercial buildings is at 40 to 45 psi).
3. If any water leakage is seen from the water tank or tubing, contact the authorized distributor immediately.

RECHARGING THE BATTERY

1. The charging port (Fig. 1 – 1) is located on the rear of the robot at the bottom left above the squeegee.

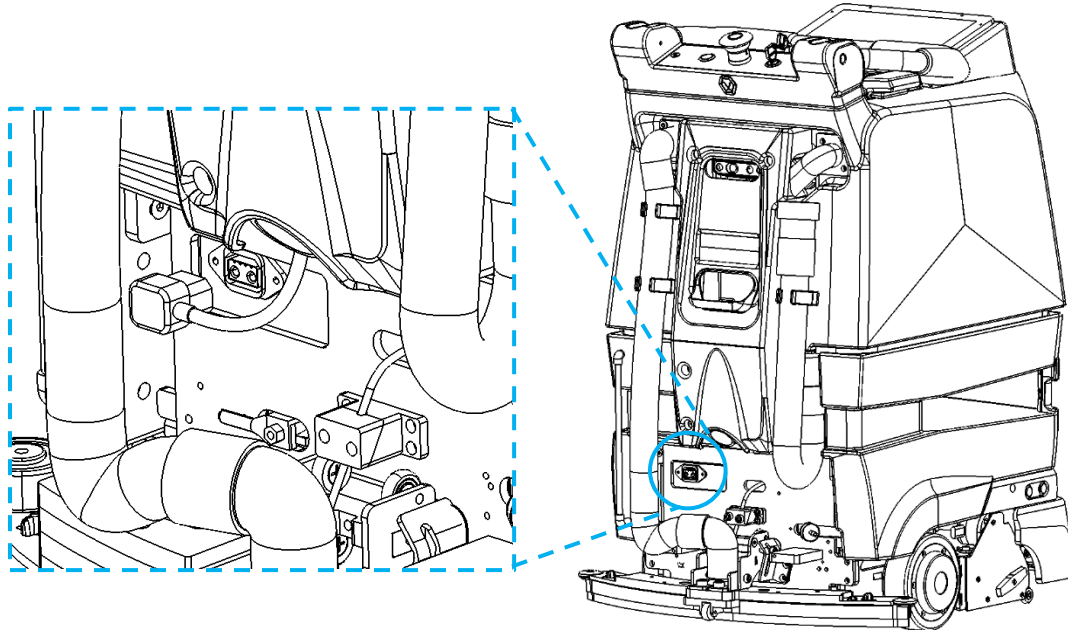


Fig. 1

2. Plug a battery charger into 240V AC mains.
3. Grab the charger cable and plug it into the charger port (Fig. 1). The cable should fit snugly; it requires some force to be inserted.
4. Turn the charger on. When charging, the battery charger displays a flashing RED light. A typical full charge cycle takes about 2.5h.
5. When charging is finished, the battery charger will display static GREEN light. Then, turn off the charger.



Note: The charging system is isolated from the robot (Fig 2).



Fig. 2

For Battery replacement, refer to [‘BATTERY INSTALLATION/REPLACEMENT’](#) section.

CHANGING THE WATER FILTER

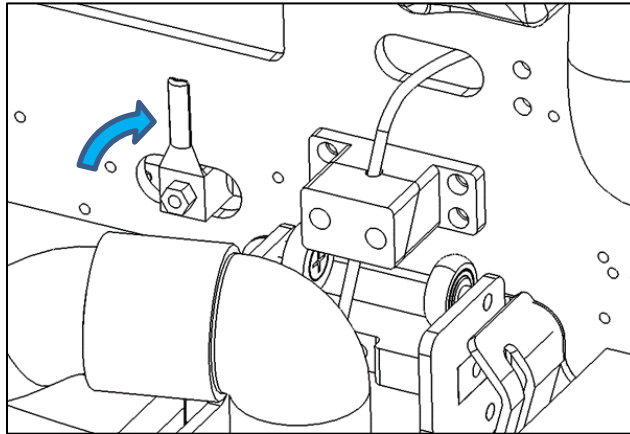


Fig. 1

1. Close the clean water tank valve.

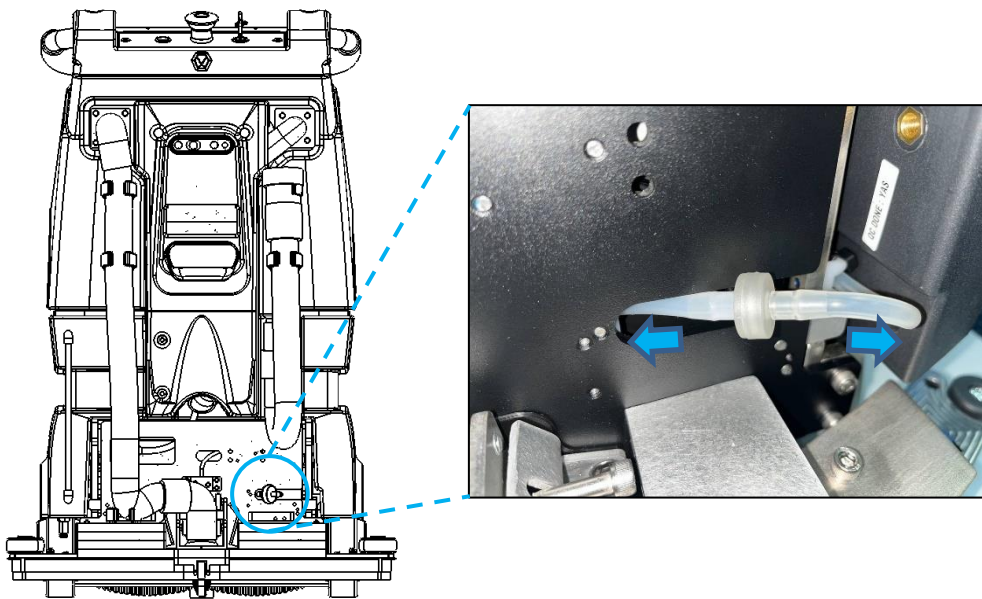


Fig. 2

2. Unplug the pipes from both end of the water filter (Fig 2).
3. Throw away the old filter and replace with a new filter.

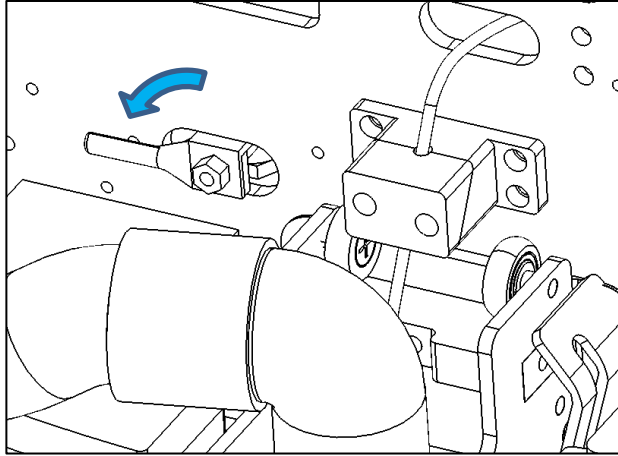


Fig. 3

4. Plug the pipes back onto the new water filter before opening the valve (Fig. 3).



NOTE: Water filter can be installed in either direction.

FLOOR TOOL REPLACEMENT

BRUSH:

The R3 SCRUB is equipped with a brush (polyacetylene and grit bristles) generally suitable for scrubbing on a variety of floor types.

DEBRIS TRAY:

The R3 SCRUB is equipped with a debris tray for the brush to deposit debris picked up during cleaning.

SQUEEGEE RUBBER:

The R3 SCRUB squeegee assembly is equipped with a set of squeegee rubber generally found in floor cleaning tools. The flat and smooth surface of the rubber ensure that excess water is pushed into the vacuum hose, keeping the floor dry after cleaning. Long period of use could result in shortening of the rubber.

Replacement Floor Tools and parts can be purchased as consumables and order codes are listed below:

CODE	QTY	NOTES
BRS-0019-C1	1	SOFT ROLLER BRUSH (80 MM DIAMETER, 380 MM LENGTH)
FLT-0009-C0	1	WATER FILTER (TUBE ID 4MM)
RBR-0036-C0	1	SWEEPER RUBBER
RBR-0031-C0 RBR-0032-C0	1	SQUEEGEE RUBBER (FRONT AND BACK)
HOS-0034-C0	1	DRAIN HOSE
HOS-0033-C1	1	SQUEEGEE HOSE

UPDATING THE MAPS

If there are permanent changes (for examples: obstacles, decorations) to the cleaning regions that may affect the robot's operation using the facility maps, the maps need to be updated immediately. Contact an authorized distributor to confirm and test a new map for operation.

DISPOSAL

Contact an authorized distributor for the proper disposal of the R3 SCRUB. Before scrapping the robot, it is necessary to separate out different categories of materials for proper collection and disposal in compliance with local environmental regulations. Take particular care in handling the batteries and electronic parts.

BATTERY DISPOSAL

It is important to dispose of the battery safely and in accordance with local environmental regulations. The battery must be removed from the robot before scrapping. Contact an authorized distributor for battery replacement. The battery characteristics are provided for reference below.

Characteristics	Parameter
Type	LiFePo4
Nominal Capacity	40 Ah
Nominal Voltage	25.6V
Max charge voltage	29.0 ± 0.2V
Cycle Life	>1500



NOTE: dead batteries are classified as dangerous waste and as such must be delivered to an authorized body for disposal.



DANGER: Following instructions can only be done by qualified personnel from distributor center.

1. Battery must be removed from the appliance before it is scrapped.

The appliance must be disconnected from the supply mains when removing the battery.

TROUBLESHOOTING

The table below lists some useful troubleshooting tips for simple issues that may arise with the robot. If preliminary troubleshooting is unsuccessful, please contact an authorized distributor for assistance.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE ROBOT DOES NOT START	The battery is out of charge	Perform a complete recharge cycle and attempt restarting the robot.
THE ROBOT DOES NOT MOVE	The E-Stop is triggered, indicated by red blinking lights	Release the E-stop and press the reset button, then wait 30s.
	The safety Bumper is mounted incorrectly, indicated by amber blinking lights	Remove and reassemble bumper.
THE ROBOT DOES NOT CLEAN WELL	Brush pressure is not suitable for the floor type	Consult an authorized distributor for help with adjusting brush pressure.
	The brushes/ pads are worn out	Replace with new brushes/ pads
THE SQUEEGEE LEAVES A TRACE OF WATER LEFT BEHIND	Vacuum has not started upon power on	Restart the robot and check if vacuum starts correctly
	Squeegee has not lowered upon power on	Restart the robot and check if squeegee lowers correctly
	The vacuum unit is obstructed	Make sure the squeegee trap is free of obstructions
		Make sure the vacuum tube is free of obstructions
		Make sure the squeegee hose is clear; flush if necessary
	The squeegee rubber blades are worn	Replace with new squeegee blades
THE ROBOT MOTION IS OFF THE LOCATION SET BY THE 'MOVE' COMMAND	There is an error in localization	Repeat the localization procedure, making sure the robot LIDAR scans match map features well
USER CANNOT LOGIN TO APP	Mismatched user id and password	Check the user id – password combination. Password is case sensitive. Contact an authorized distributor if necessary
CAN'T ADD ROBOT TO APP	Either the robot or app phone cannot connect to the internet	Check the network connection on both the robot and phone
CANNOT LOCALIZE ROBOT/ NAVIGATION ERRORS DURING OPERATION	Wrong map settings or robots' sensor not working	Check map and confirm the choice of the right map and place. Check LIDAR scans match map features well; clean LIDARS if necessary.

CONTACT INFORMATION

Original Equipment Manufacturer for R3 SCRUB:

LionsBot International Pte Ltd

11 Changi South Street 3

#03-02 Singapore 486122

Email: hello@lionsbot.com

T: +65 6595 4565 | DID: +65 6595 4552

DISTRIBUTOR INFORMATION

APPENDIX A

Refer to below Safety Data Sheet when handling with Z Water

HAZARDS IDENTIFICATION

GHS Classification

Harmful to health ⓘ

- Acute toxicity (oral): Category 5
- Acute toxicity (inhalation, mist): Category 5

Harmful to the environment ⓘ

- Aquatic environment acute toxicity Not classified

COMPOSITION / INFORMATION ON INGREDIENTS

Component Name	CAS	Composition
Water	7732-18-5	>99%
Potassium hydroxide	1310-58-3	0.17%



FIRST-AID MEASURES

General Advice:

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Seek medical advice if you feel unwell. Show this safety data sheet to the doctor in attendance.

Inhalation:

If it is inhaled, move the person to a place with fresh air and keep him/her rest in a position comfortable for breathing.

Skin Contact:

If there is contact with skin, rinse with running water and wipe it dry. If there is symptom of inflammation, seek medical help.

Eye Contact:

If there is contact with eyes, immediately rinse eyes with running water for more than 15 minutes. Remove contact lenses and rinse the lenses. Seek medical help if necessary.

Ingestion:

If it is swallowed, drink large amount of water and seek medical help if necessary. Do not induce vomiting unless instructed by a physician.

EXPOSURE CONTROLS / PERSONAL PROTECTION



Hands protection:

Use rubber gloves.

Skin and physical protection:

Long sleeve, long pants, rubber boots.



Eye protection:

Wear safety glasses as a minimum eye protection. Conditions may warrant the use of chemical goggles and possibly a face shield. Consult your standard operating procedure or safety professional for advice.

Sanitary precaution:

In the case of allergy, wash hands and face after handling.