

Mobile Disinfection Robot

A mobile disinfection agent has been designed and developed for carrying out sanitization in public spaces. The robot can be easily maneuvered in tight spaces and wirelessly controlled using a tablet based GUI. Two modes of sanitization have been provided: UV-C based and liquid sanitizer based. Both the UV-C lights and spraying nozzles are provided on all the four sides and at three varying heights for effective sanitization. For indoor spaces, the first level of mast corresponding to UV-C lights is automatically lifted up and sanitization is carried out. For outdoor spaces, sodium hypochlorite or hydrogen peroxide based sanitizer can be used and the robot is equipped with nozzles on all sides with the top second level spray mast reaching up to height of 1.8 meter.

Salient features of the system are as follows:-

1. Robot type: 4 wheeled Drive Mobile robot
2. Wheel type: Mecanum wheels
3. Possible robot motions: Forward and reverse line, crabbing, 45° angled motion, in-place turn
4. Power supply: 48V-20A Li ion battery
5. Sanitization modes: UV-C based and sodium hypochlorite spraying based
6. UV lights coverage: Total 22 lights (8 bottom level, 8 mid-level, 6 top-level on extendable mast). Each tube light is 8watt rated and one feet in length
7. Spraying coverage: Total 22 fine misting nozzles (8 bottom level, 8 mid-level, 6 top-level on extendable mast). Each nozzle has 0.1mm orifice and throw distance of around 2 feet
8. Sanitization control: On-Off control from GUI
9. Sanitizer tank capacity: 20 liter
10. Remote control: 802.11n Wi-Fi based
11. Operation software: Android app on tablet. Windows application also provided.
12. Onboard camera: 04 nos (one each at front, rear, left & right side)



Figure: (left) Robot in retracted condition; (middle) UV-C based disinfection; (right) Spray based disinfection