

DustCart Urban Robot

Datasheet

DustCart is a Urban Robot available as a tool for providing robotic services in different urban scenarios. It is a 6 wheels mobile base equipped with a differential GPS capable of centimetric resolution (NTRIP provider needed), laser scanner, touch screen and head with multicolor LED in the eyes.

The robot supports also a container to carry objects of different size and weight. Its nice cover in fiber glass is customizable in different colors.

The mobile base consists of a mechanical chassis with two central actuated wheels and four passive wheels: the 6 wheels are linked by joints and shock absorbers allowing the robot to adapt to and compensate road disconnections.

The container can be automatically opened/closed on the rear part of the robot and is available in two different versions: one with the opening on top and a sliding bottom to allow the loading/unloading of its content from above/bottom; and another one with actuated rollers and an opening side on the back to allow loading/unloading of its content from the back.

Available space for objects in containers is about 60 liters in volume and 15 kg of weight.

The Human-Robot interaction is implemented by means of the moving head, the multicolor LEDs in the eyes, the touch screen mounted on the left side of the robot and the speakers reproducing sounds and vocal messages.

The navigation sensors consist in a laser scanner positioned on the front of the robot, IR and US sensors and two GPS and two antennas mounted on the back of the robot providing robot position and orientation with an accuracy of 5 cm and 1 deg with differential correction applied and enough visible satellites.

The control system of the robot is composed by an industrial PC running Linux Ubuntu and by different electronic control boards for controlling the main robot components, communicating with each other by means of CAN bus. The robot supervisor and the navigation software of the robot is based on ROS (Robot Operating System). The robot can be controlled also by means of a specific app for Android smartphones.

Technical specifications

Dimensions (l x w x h)	75 x 100 x 145 cm
Weight	About 150 kg
Actuation	2 Swissdrive 400 T hub motor by Micro-Motor AG, 24 VDC, 400W
Speed	Typical: 3 km/h, 0.83 m/s - Max: 4.5 km/h, 1.25 m/s
Maximum slope	20%
Localization system	Novatel FLEX6-D2L-ROG-TTR (GPS) plus FLEX6-D2S-Z00-00N (align unit)
Localization accuracy	Position < 3 cm, Heading < 0.1° (NTRIP provided and enough visible satellites)
Obstacle detection system	Hokuyo UTM-30LX Laser scanner and US/IR sensors
Obstacle detection range	0.1 – 30m
Power	24 VDC
Batteries	AGM batteries 2 x 12V 100Ah
Battery runtime	About 10h, Recharging time: about 6 hours
Container dimension (l x w x h)	45 x 35 x 40 cm standard container, 45 x 35 x 30 cm roller container
Container payload	15 kg
Display	12" touch screen
Software	ROS based. Autonomous navigation with obstacle avoidance

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