robuROC 4

The powerful outdoor mobile robot for civil and military applications

State of the art of mobile robot for harsh environment :

Robosoft, facing the increasing demand on such platforms with high level of performances (for military application mainly) decided to buid the robuROC 4, a powerful and reliable wheeled mobile robot for serious outdoor applications. Power on board is delivered by a particularly high tech Li-Ion battery pack that brings good runtime and high torque/velocity to the whole system. The robot can climb standard stairs, run fast (5,55 m/s) or support up to 100 Kg, pending the configuration choosen.

Modular and flexible :

The robuROC4 being powered by iCORE technology, accepts quite all the robotic options that are introduced in our website (www.robosoft.fr/research.html) such as :

Vision systems
Laser system for different applications
infrared sensors
ultrasonis sensors
Pan and tilt unit for any kind of payloads
Wireless communications
Manipulators
.....

and the mechanical design can easily be adapted to specific requirements. For example the front face of the robot can feature a window in order to mount in the housing (body) of the robot some equipments such as a drive camera, or a laser system (LMS)....

A generic platform for different specific applications :

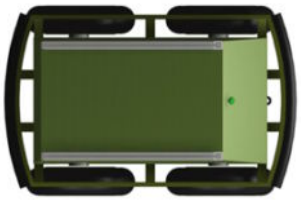
Able to carry up to 100 Kg of additional payloads, this platform is one of the most robust off the shelves outdoor mobile robot available today on the market. Our teams of engineers in electronics, software and mechatronics can bring their expertise to develop software and mechanical systems, and build for any customer a relaible turn-key complex robot to perform specific missions. Its modular design allows you to define the right configuration regarding your needs. More torque ? more velocity ? choose the capabilities of your robuROC 4 thank to the parameter described behind.

robuROC4 climbing a 45° slope at 3,6 m/s with 50 Kg payload !

robuROC 4 technical specifications

robosoft

Standard platform :



- RobuROC 4 outdoor mobile platform includes :

- Lenght : 105 cm
- Width : 80 cm (including wheels)
- Height : 70 cm
- Wheels diam. : 46,8 cm
- Estimated weight (incld. batteries) : 140 Kgr
- Step clearance : around 25 cm (capable to climb standard stairs)
- Max Speed 5,55 m/s Max slope : 45° Max Payload : Around 100 Kg
- Turn radius : 0 - turns on the spot.
- Power : 3 Li-ion battery pack
- 4 Brushless motors with resolvers
- High capacity charger
- Direct drive joystick
- Emergency stop (button and wireless system)
- Front and rear stop bumpers
- On board industrial and reduced Linux PC (em555) + RTai + SynDEX (real-time SDK)
- Embedded controller cb555 (motorola RSMPC 555 processor based)
- Control software : Serial command interpreter OR C++ Linux librairies to control the robot from any linux+rtai application (host PC) OR using SynDEX real-time low-level dev. toolkit (REQUIRES TRAINING SESSION) - controlling methods to be defined at order • control unit 1cb555 + 1 em555 (shoebox or biscuit type) with 6.4" display

robuBOX hardware controller with MICROSOFT® ROBOTICS STUDIO Dev. Tools

Maxi speed, depends on the battery level (* in Km/h):

Voltage level \ Ratios	Reduction 16	20	25	32
Full (25% of time)	20*	16*	13*	10*
Medium (50% of time)	17*	14*	11*	8*
Low (15% of time)	14*	11*	9*	7*

Torque Available \ Ratios	Reduction 16	20	25	32
Always available	28.80	35.50	43.94	56.24
16 s	51.10	63.80	79.80	102.10
8 s	73.96	91.20	114.00	145.92
4 s	109.44	136.80	171.00	218.86

Evaluate your needs, to choose the right ratio

Torque needed for slopes

Payload \ Slopes (deg)	5	10	20	30	40	50
Empty	6.75	13.45	26.50	38.74	49.80	54.80
Payload 50 Kg	9.25	18.44	36.31	53.08	68.24	75.10
Payload 100 kg	11.75	23.42	46.13	67.43	86.69	95.40

Torque needed for step clearance

Payload \ Step	5 cm	10 cm	15 cm	20 cm
Empty	40 N.m	81 N.m	112 N.m	132 N.m
50 Kg	55 N.m	112 N.m	154 N.m	181 N.m
100 kg	70N.m	144 N.m	195 N.m	229 N.m

Turn on the spot	
Empty	42.3 N.m
50 Kg payload	58.0 N.m
100 kg payload	73.6 N.m

Example :
Clearing a step of 15 cm with a payload of 50 kg needs 154 N.m. It means a ratio 1/32 (providing 145 N.m during 8s) is needed.

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