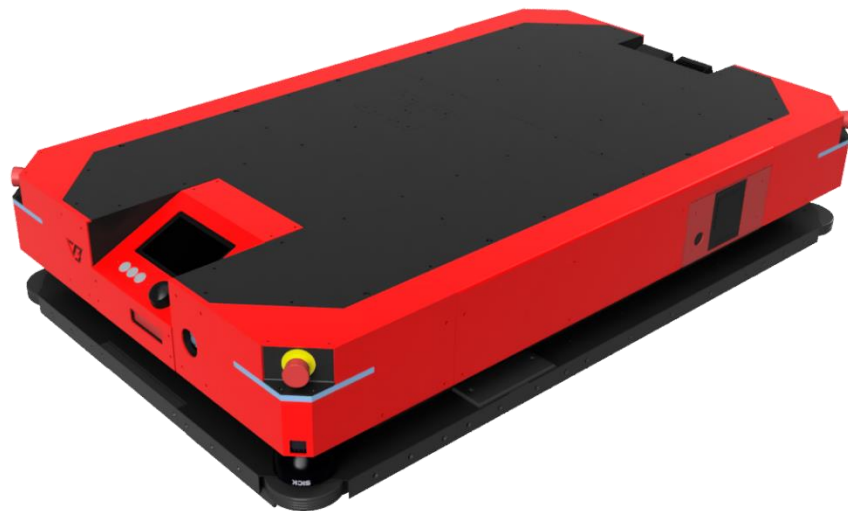

Autonomous Mobile Robot VERSABOT 1500 Specification



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1. Specifications

1.1. General Specifications

Dimensions (L. × W. × H)		1514× 925× 308mm ¹ 1520× 1062× 639mm ²	¹ No attachments ² With roller conveyor
Weight		460 kg ¹ 660 kg ²	¹ No attachments ² With roller conveyor
Environment	Noise emission	< 70 dB (A)	
	Temperature	5 to 40°C	
	Humidity	5 to 90% RH	Non-condensing
	Environment	Indoor use only, No excessive dust, No corrosive gas	Direct sunlight may cause safety laser false positive
	IP Class	IP22	
Payload	Maximum payload	1500 kg	No attachment or lift module

1.2. Specifications (details)

Floor conditions	Floor requirements	Level surface, Hard concrete or polymer, No water, dust, or oil	
	Flatness and levelness	F _F 25 / F _L 20 <i>ACI 117 standard</i> ¹	¹ ACI 117: American Concrete Institute standard for concrete floors: F _F is flatness, F _L is levelness. F _F 25/F _F 20 is fairly lenient specification.
Navigation	Routing	Autonomous routing by localizing with Safety Scanning Laser based on environment mapping.	
	Environmental map making method	Scanning with SLAM (Simultaneous Localization and Mapping)	
Mobility	Maximum floor slope	3%	Tilt in which the mechanical brake keeps the robot steady (with a maximum permissible load)
	Maximum speed	1,8 m/s	With full load
	Rotation speed	< 0,3 m/s	Linear speed measured for the element farthest away from the center of rotation
	Docking accuracy	± 10 mm, ± 1,5°(rotation)	
	Acceleration / Deceleration	< 0,3 m/s ²	
Drive wheels	Material	2, hard elastomer PU, non-conductive	
	Size (dia. x W)	250 × 60 mm	
Passive casters	Material	4 two-wheeled, hard elastomer PU, non-conductive	
	Size (dia. x W)	75 × 20 mm	two-wheeled caster width: 45 mm
Power	Batteries	Li-Ion, 52 V	
	Nominal Capacity	60 Ah	
	Run time	> 8 h with half load	
	Recharge time	< 1,5 h	
	Battery life cycles	> 1000 recharge cycles	
	Charging method	Automatic / manual	

Specifications (details) (cont.)

Standard	Safety standard	ISO 3691-4:2020, EN ISO 13850	
	Wireless	IEEE 802.11 a/b/g/n/ac	
Safety	safety Scanning Lasers	SICK microScan3 Pro 1 at front, 1 at rear	106 mm above floor, 220° Safety range: 5.5 m Measurement range: 40 m Laser class 1 (eye-safe) Type 3 (IEC 61496) SIL2 (IEC 61508) SILCL2 (EN 62061) Category 3 (EN ISO 13849) PL d
	Emergency stop	4, on each corner	
	Lights	4 Light bars (1 at each robot corner) 2 "Blue Spots", at front and rear of the robot	
	Sound	2, at front and rear of the robot	
Operator Interface	Operator Panel	Start / Stop Button Power train Activation Button Safety Reset Button Error Signalization Indicator Graphic Interface Panel	
Wireless communication	Wi-Fi	IEEE 802.11 a/b/g/n/ac	Communication with Configuration software and Plant Logistics System
Wired Input / Output	Serial Ports	1 x Ethernet	Maintenance Operations Use

1.3. Communication requirements



To ensure proper communication between the robot and the configuration software (as well as the infrastructure elements controlling the transport process), all following requirements for a wireless network in the robot environment must be fulfilled.

The robot control software (including navigation system) does not require any communication or data exchange with the environment. However, connection to a local Wi-Fi network is necessary to give the robot commands in Process Mode by an external IT or logistics system and to communicate with the configuration software.

1. Wi-Fi network access requirements

- Wi-Fi signal coverage along the entire route of the robot.
 - One static IP address for each robot with open ports:
 - 22 tcp,
 - 80 tcp,
 - 443 tcp,
 - 22222 tcp,
 - ICMP protocol.
 - One dynamic IP address for each computer with configuration software active session.
 - One dynamic IP address for each element of the infrastructure that communicates with the robot in order to issue a command or read the robot's state (dock, user's IT system, ANDON, etc.).
 - The data rate capacity for each element of the system should be 300 KiB.
 - Preferred authentication method: WPA2 Personal (preferred) or WPA2 Enterprise.
1. Internet access (VPN access) for system installations where remote diagnostics is to be provided.

1.4. Dimension drawings

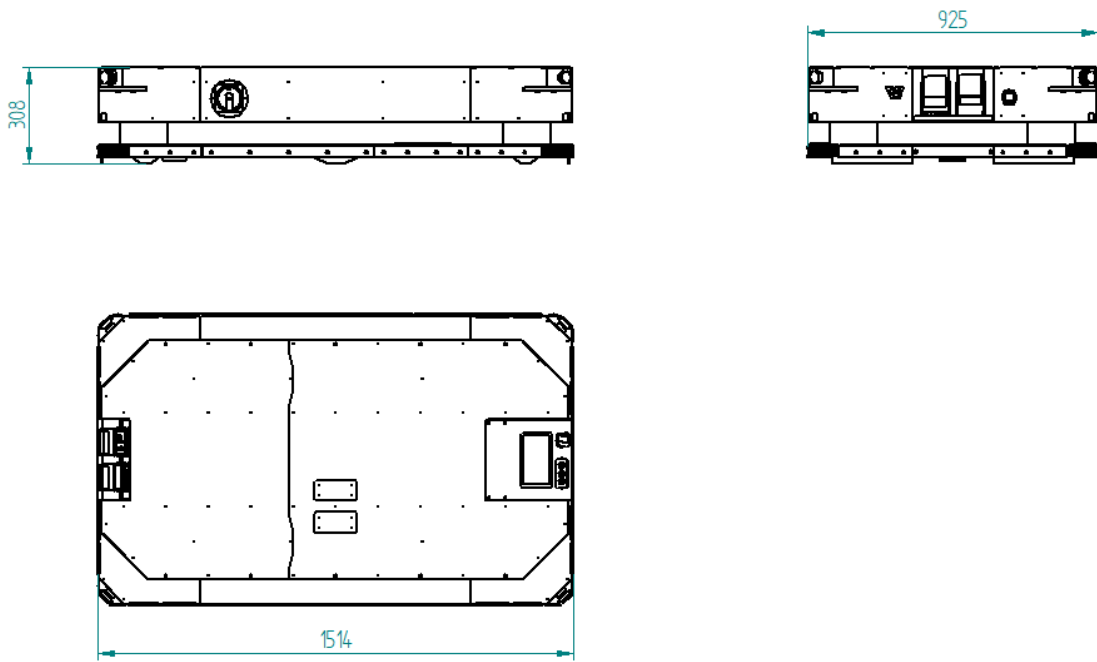


Fig. 1 VERSABOT 1500 Dimensions (no attachments)

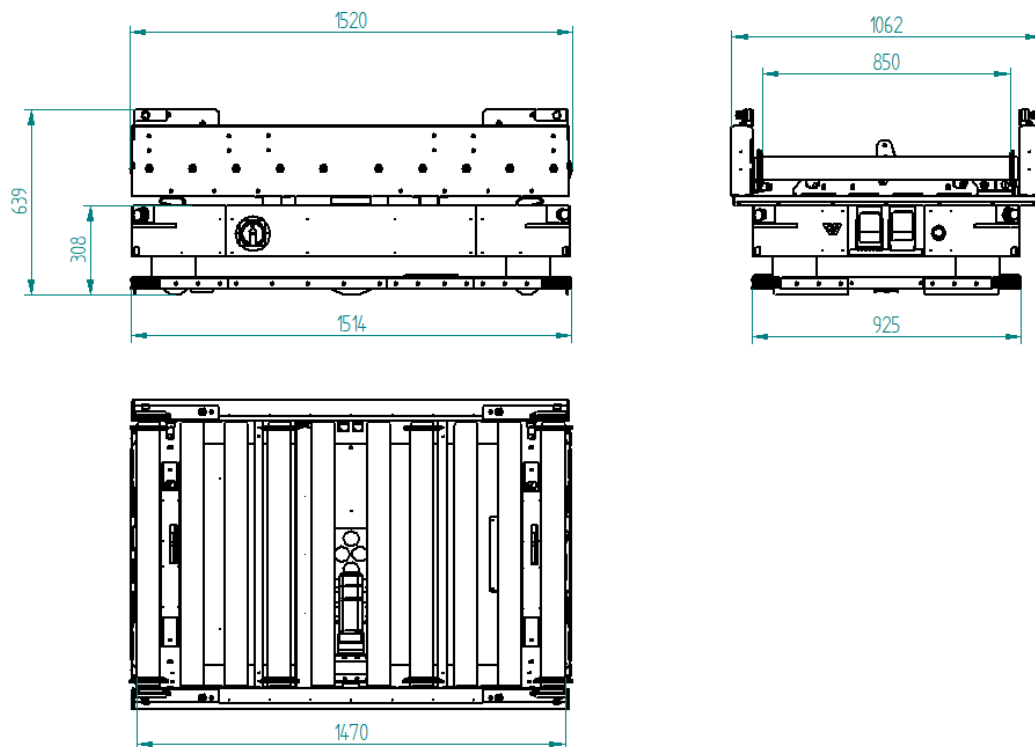


Fig. 2 VERSABOT 1500 Dimensions (with roller conveyor module)