Innalabs®
Outdoor/Indoor Laser Mapping & Navigation System
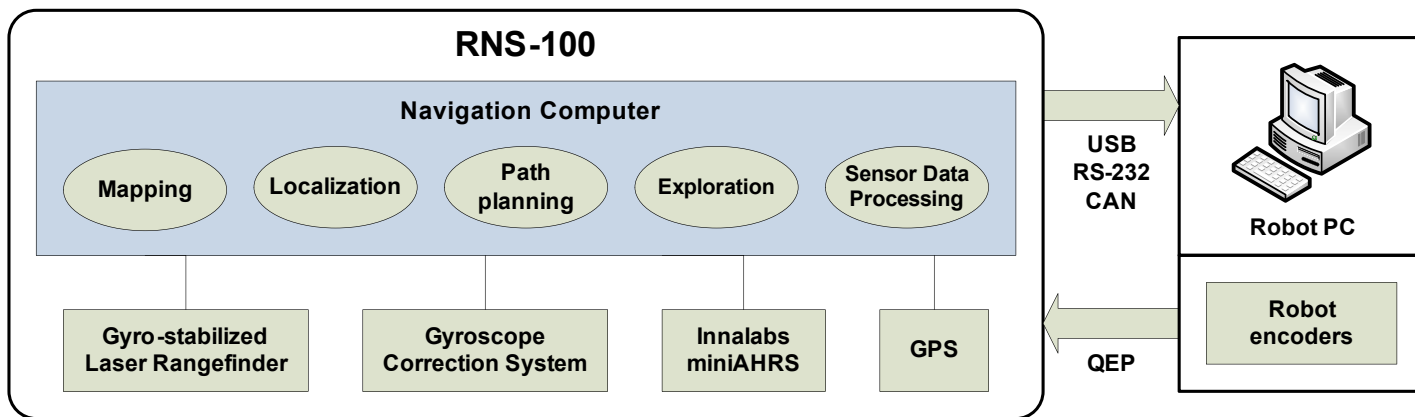

Heading: 358.40
Pitch: 4.37
Roll: 9.73
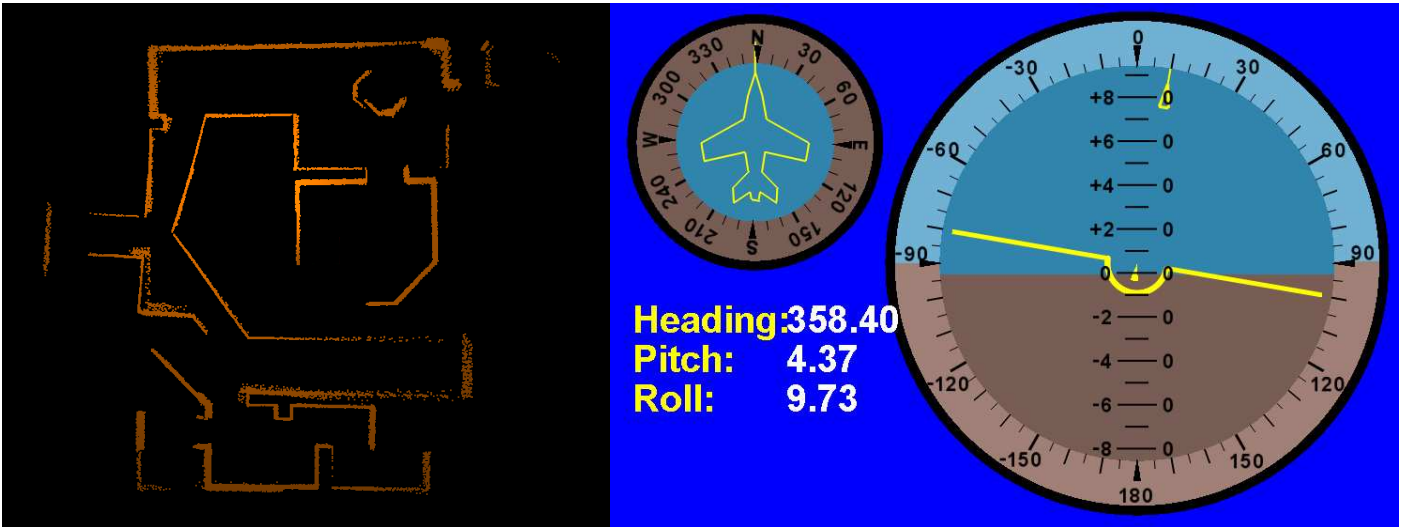
Description

RNS-100 is a comprehensive solution for high accuracy robotic navigation, mapping and path planning, composed of a Gyro-stabilized Laser Rangefinder, Gyroscope Correction System, Innalabs miniAHRS, GPS and navigation computer. It is designed both for outdoor and indoor robotic applications. RNS-100 is a unique device that takes navigation tasks upon itself while you are focused on more important solutions for your robot at the development stage, and allows you to enhance robot's functionality and substantially reduces its cost at production stage.
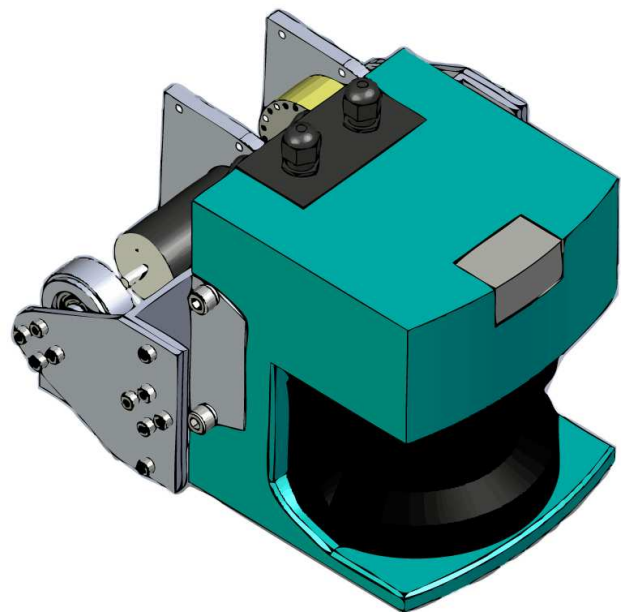
Features

RNS-100

Navigation Computer

| Mapping | Localization | Path planning | Exploration | Sensor Data Processing |

| Gyro-stabilized Laser Rangefinder | Gyroscope Correction System | Innalabs miniAHRS | GPS |

USB RS-232 CAN

Robot PC

Robot encoders

QEP

Mapping

RNS-100 builds 2-D virtual model of both indoor and outdoor environments.

Localization

RNS-100 determines robot current position on 2-D map.

Path planning

RNS-100 calculates optimal robot path from its current position to destination point. In case an obstacle is on the robot path an algorithm recalculates the path to avoid collision.

Exploration

Exploration enables a robot to determine the sequence of moves it will make in order to completely cover an area so that all reachable locations have been traversed. Exploration can either be done in a known environment or an unknown environment (in which case, the robot must simultaneously map and explore).

Gyroscope Correction System

Built in Gyroscope Correction System compensates odometer error caused by wheel or track slippage.

Gyro-stabilized Laser Rangefinder

RNS-100 contains Gyro-stabilized Laser Rangefinder fixed on a rotary base. RNS-100 determines robot's tilt angle and adjust Rangefinder to be always in a horizontal plane. This makes the system insensitive to the rough terrain and shaking. Ideal for use in two wheeled, humanoid and military robots.

Innalabs miniAHRS

Built in Innalabs miniAHRS determines robot's 3-D position (Pitch, Roll, Heading).

Full access to all sensors output data

Robot's position data, speed, angular orientation in the 3-D space, Laser Rangefinder data are available via USB/RS-232/CAN interfaces.

Applications

- AGV
- Mobile robot platforms
- Defense, rescue and security
- Cleaning robots
- Medical robots
- Entertainment and leisure robots
- Domestic robots
- Robots for personal transportation
- Home security and surveillance robots
- Robots for handicap assistance
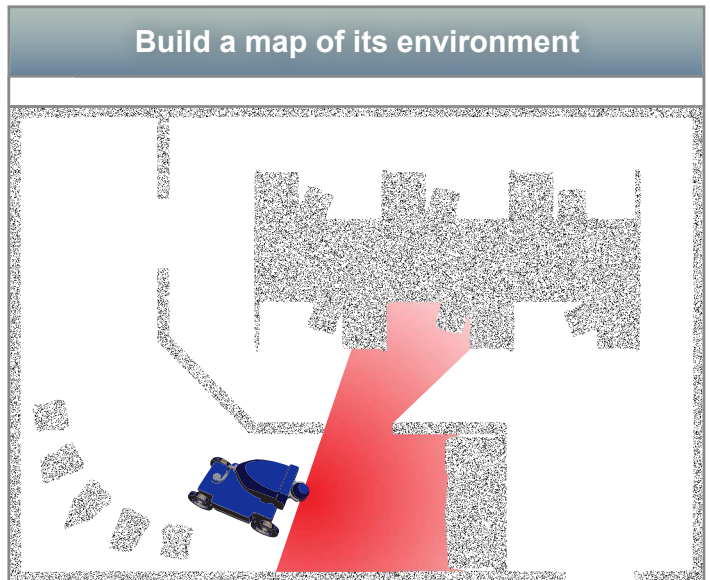- Electric Wheelchairs

RNS-100 usage examples
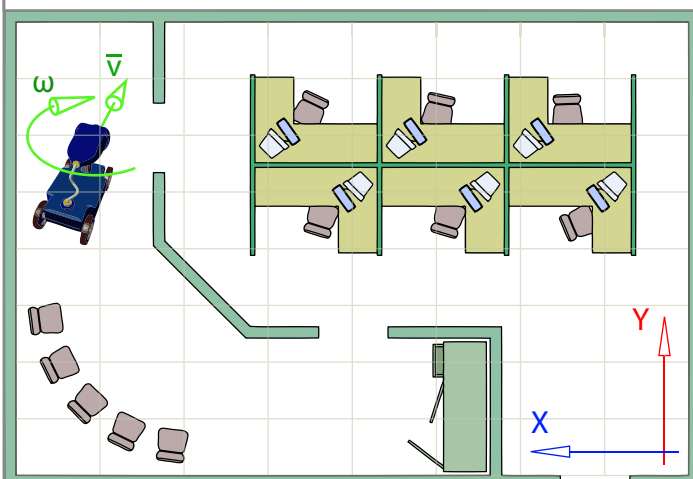
Your Robot with RNS-100 can:
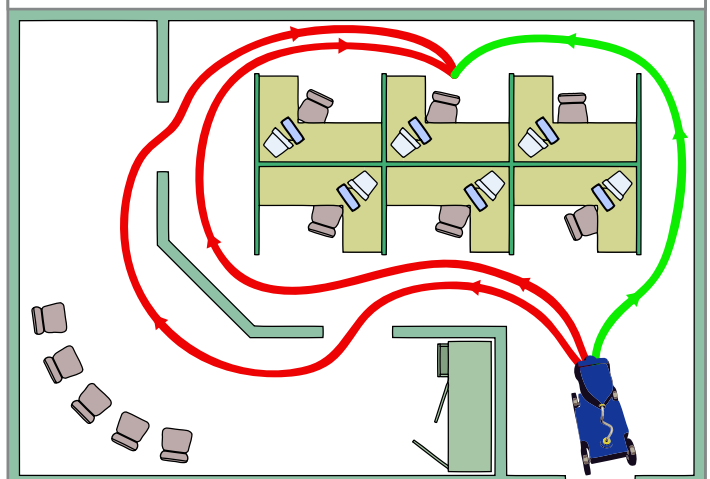
Move in unknown environment
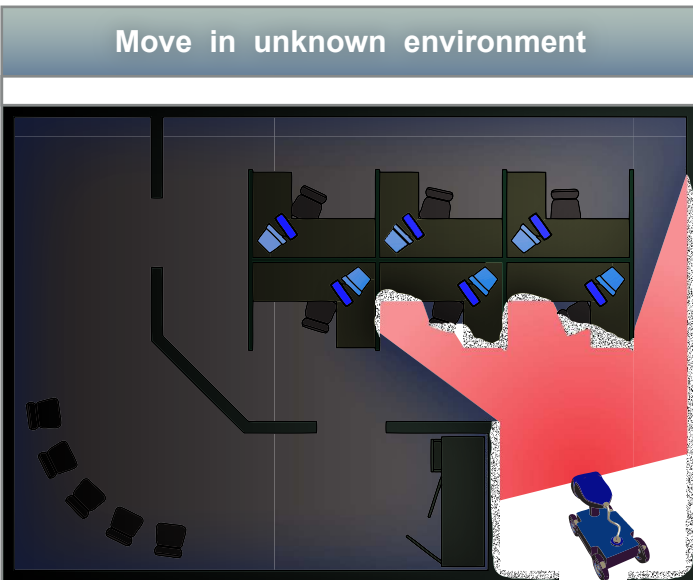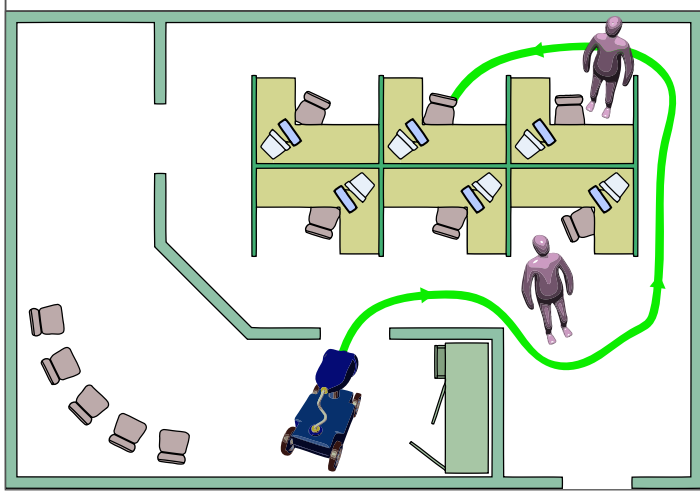

Build a map of its environment

Move in its environment with knowledge of its location, orientation angles in 3-D space, get Laser Rangefinder data and filtered data from robot encoders
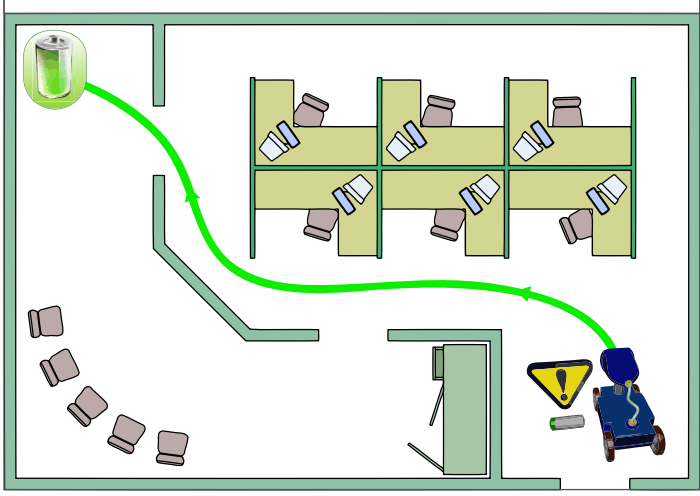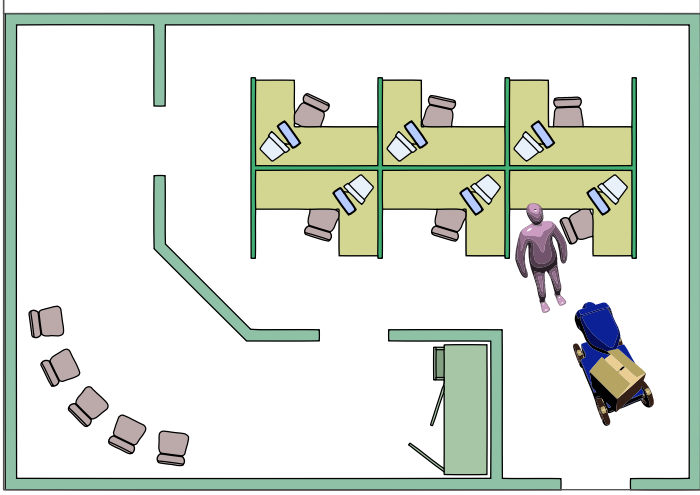

Plan optimal paths to reach destinations

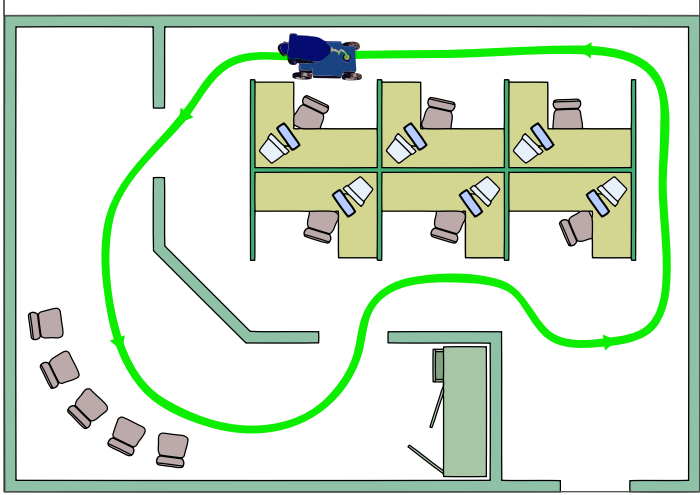## Avoid obstacles and hazards

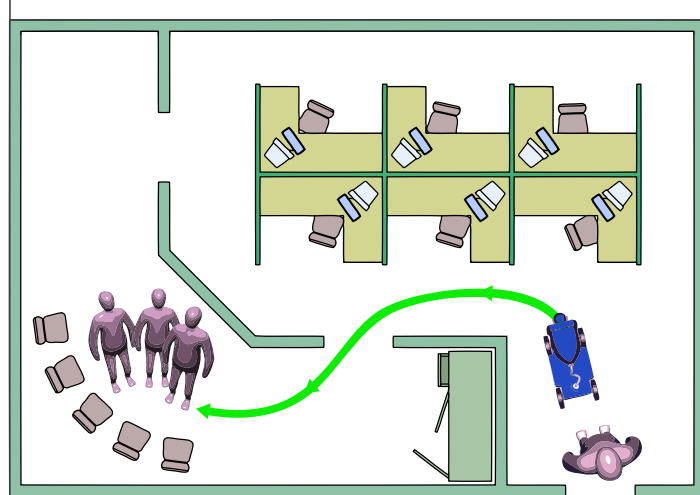## Locate and dock into stations to recharge its battery

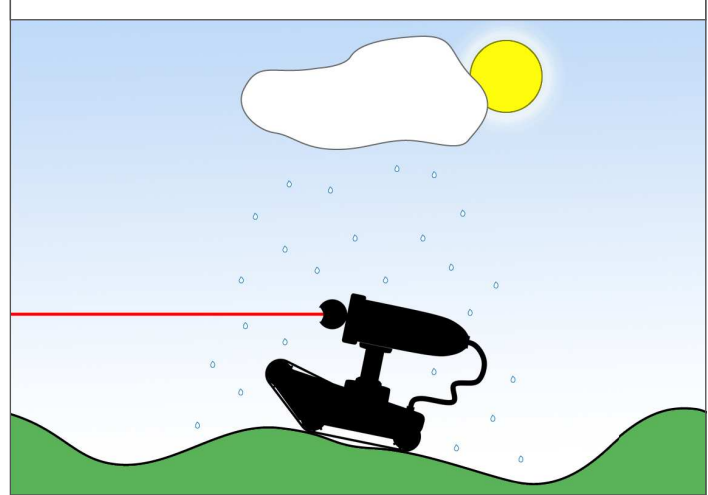## Deliver packages in workplaces

Thoroughly conduct security patrols

Guide visitors in busy environments

Operate in indoor and outdoor environments at any weather and with any relief

Technical Data

RNS-100 is available in three versions					
Model	Gyroscope Correction System	Laser Rangefinder*	Gyro-stabilized Laser Rangefinder	Innalabs miniAHRS	GPS**
RNS-100-A	Yes	LMS-200	Optional	Optional	Optional
RNS-100-B	Yes	URG-04LX	Optional	Optional	Optional
RNS-100-C	Yes	UBG-04LX-F01	Optional	Optional	Optional

* The device can be shipped with other models of Laser Rangefinders. For additional information, please contact us.

** 5 m, 2 m, 1 m, 20 cm, 10 cm, 6 cm GPS version are available.

Specifications of RNS-100			
#	Parameter	Unit	RNS-100
1.	Update rate	Hz	100
2.	Start-up Time	sec	≤ 1
3.	Mapping Accuracy (typical)		
3.1	Indoor	mm	≤ 10
3.2	Outdoor	mm	≤ 60
4.	Localization Accuracy (typical)		
4.1	Indoor	mm	≤ 10
4.2	Outdoor	mm	≤ 60
5.	Velocity Accuracy		
5.1	With connected encoders	m/s	Depends on the encoders resolution
5.2	Without connected encoders	m/s	≤ 0.01
6.	Attitude		
6.1	Range: Pitch, Roll	deg	±90, ±180
6.2	Static Accuracy	deg RMS	< 0.1
6.3	Dynamic Accuracy	deg RMS	< 0.4
7.	Heading		
7.1	Range	deg	0 to 360
7.2	Static Accuracy	deg RMS	< 0.3
7.3	Dynamic Accuracy	deg RMS	< 0.7
8.	Operating ranges		
8.1	Heading, Roll, Pitch Rate	deg/sec	±300
8.2	Acceleration	g	±2
8.3	Operating Temperature	deg C	-40 to +70
9.	Electrical		
9.1	Input Voltage	V	+6 to +70
9.2	Power Consumption	W	5
9.3	Interface	USB/RS-232/CAN	

Specifications of Laser Rangefinders			
Parameter	LMS-200	URG-04LX	UBG-04LX-F01
Range	80 m	0,06 m – 4 m	0,02 m – 5,6 m
Scanning angle (field of vision)	180°	240°	240°
Measurement accuracy	±15 mm	±10 mm	±10 mm
Update rate	75 Hz	10 Hz	35 Hz
Weight	4,5 kg	0,160 kg	0,260 kg

LMS-200

URG-04LX

UBG-04LXF01