



## YGGY SECOND GENERATION (G2)

### AUTONOMOUS MOBILE ROBOTS (AMRs)

#### *GENERAL-PURPOSE ROBOTIC VEHICLES FOR INDOOR APPLICATIONS*

*YGGY is a range of 3 robotic general-purpose platforms for indoor robots (AMRs).*

*They get the same functionalities:*

*Localization, navigation, obstacles avoidance and automatic return to the charging station.*

*They differ only by the size, the power, the payload accepted and the battery capacity.*

#### **Brochure**

Version : 2.0

Public usage



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## Introduction

YGGY is a range of medium-sized general-purpose robot platforms.

Developed by ip sum tek, they meet application requirements for service robots and light robots for industry.

Such as robots for reception, logistics, store guides or even robots for the home.

YGGY robots are fully autonomous AMR vehicles:

Their goal is to go from point A to point B, safely avoiding all obstacles on the calculated path.

When the battery level is low, they decide on their own to go to the docking station to recharge.

YGGY robots are equipped with a complete navigation/localization system using several sensors to safely navigate in their environment.

## Highlights

**The range of YGGY robots stand out with capabilities or functions not found on other platforms:**

### **A really cost-effective product**

YGGY bases are professional quality vehicles designed to be simple and efficient without unnecessary features. Just pay what you need.

### **Easy to maintain**

Most sub-parts and robotic components can be changed in less than 2 minutes. This maintenance carried out easily by the customer himself allows a continuity of service and a lowest cost of maintenance.

### **Robust localization**

Equipped with our Jack Slam© indoor localization.

This technology localizes with a single camera turned toward ceiling and upper parts of walls to reliably localize even if the environment has changed.

The robot is also able to localize with its LIDAR.

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This dual localization system is unique in the robotics world. It achieves a high level of robustness.

### Highly customizable

A need a for vehicle larger, smaller or with different functions?

Our robotic engineers can quickly customize any platform because we get a wide range of ready-to-use robotic components (already developed and largely tested and reliable).

You can also build a robot to your requirements because we provide the robotic components alone and ready to use.

## Differences between robots of the range



The 3 bases named YGGY 320, YGGY 420 and YGGY 500 get the same functionalities: Localization, navigation, obstacles avoidance and automatic return to their charging station. They differ only by the size, the power, the payload accepted and the battery capacity.

## Common specifications

<b>Drive</b>	Differential drive (2 motorized wheels)
<b>Height from ground</b>	204 mm
<b>Height from ground including</b>	233 mm
<b>Sensors</b>	LIDAR, RGBD camera, ultrasonic sensors, anti-tilts, RGB cam.
<b>Noise</b>	Totally fanless. Silent operation
<b>Temperature Range</b>	0°C to +50°C
<b>Max. Slope</b>	Max 8%
<b>Motors</b>	Brushless 60W/24VDC. Max torque 6 Nm
<b>Voltage</b>	24V Industry standard
<b>Maintenance</b>	Major components can be changed in less than 2mn
<b>Charging station</b>	Automatic return when batteries are low
<b>Battery type</b>	LiFePo4 / 24VDC (not explosive technology)
<b>Battery charge</b>	Full charge in less than 2 hours
<b>Interface</b>	Ethernet. Simple commands
<b>Emergency stop</b>	Direct action on motors (Safe Emergency Stop)
<b>Tele operation</b>	Joystick. Typical range 1km.
<b>TOP design sensors</b>	Up to 6 ultrasonic sensors in the TOP design

**YGGY 320** is a small, low cost and versatile base for light payloads.

It has large wheels of 180mm and is more destined for cramped or crowded environments.

Dedicated specifications of YGGY 320:

<b>Width</b>	320 mm
<b>Length</b>	350 mm
<b>Propulsion wheels</b>	2 fixed wheels
<b>Caster wheel</b>	1
<b>Wheel materials</b>	PU
<b>Propulsion wheel diameter</b>	180 mm
<b>Caster wheel diameter</b>	75 mm
<b>Max speed</b>	1 m/s
<b>Batteries</b>	180 Wh fixed
<b>Max TOP payload weight</b>	15 Kg
<b>Number of ultrasonic sensors</b>	4
<b>Number of anti-tilt sensors</b>	5

**YGGY 420** is a “classic” round base for medium payload.  
Its intermediate size will fit the vast majority of applications.

Dedicated specifications of YGGY 420:

<b>Diameter</b>	420 mm
<b>Propulsion wheels</b>	2 wheels on suspension
<b>Caster wheel</b>	4
<b>Wheel materials</b>	Propulsion wheels: rubber. Caster: PU
<b>Propulsion wheel diameter</b>	130 mm
<b>Caster wheel diameter</b>	75 mm
<b>Max speed</b>	0.8 m/s
<b>Batteries</b>	360 Wh. Removable
<b>Max TOP payload weight</b>	40 Kg
<b>Number of ultrasonic sensors</b>	4
<b>Number of anti-tilt sensors</b>	6

**YGGY 500** is a strong base for heavy payload and with a huge autonomy.  
Very stable vehicle for the most demanding applications.

Dedicated specifications of YGGY 500:

<b>Dimensions</b>	500 mm x 500 mm
<b>Propulsion wheels</b>	2 wheels on suspension
<b>Caster wheel</b>	4
<b>Wheel materials</b>	Propulsion wheels: rubber. Caster: PU
<b>Propulsion wheel diameter</b>	130 mm
<b>Caster wheel diameter</b>	75 mm
<b>Max speed</b>	0.8 m/s
<b>Batteries</b>	580 Wh. Removable
<b>Max TOP payload weight</b>	60 Kg
<b>Number of ultrasonic sensors</b>	6
<b>Number of anti-tilt sensors</b>	8

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## Features and functions

**YGGY robots are totally autonomous. They integrate many functions:**

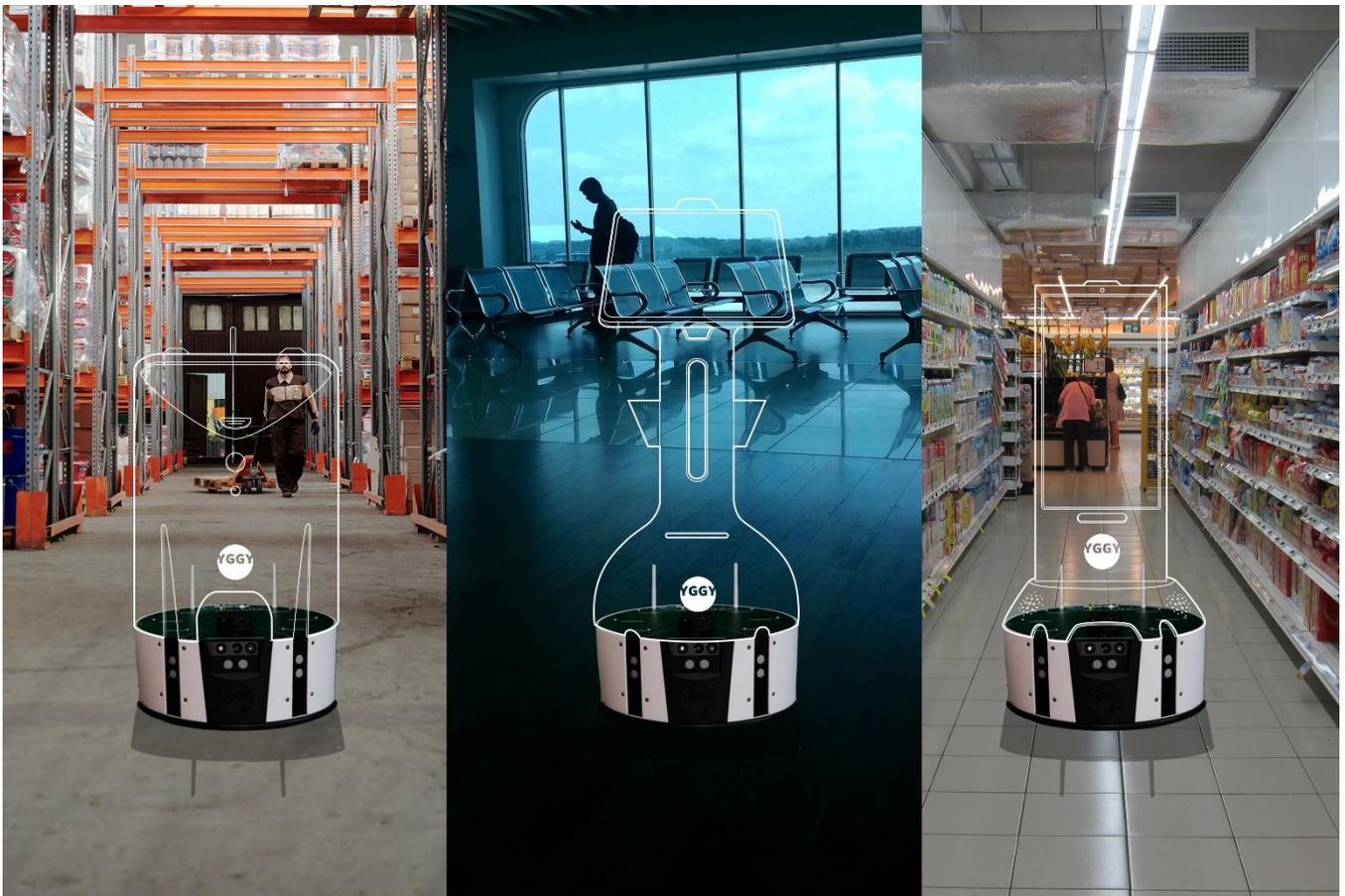
- *Built-in indoor localization*
- *Robust double localization system: LIDAR SLAM and Visual SLAM*
- *Localization with centimeters accuracy*
- *Embedded full navigation system with obstacles avoidance*
- *The map of the environment is generated automatically or manually (via tele operation)*
- *Map shared among a fleet of robots*
- *Independent suspension wheel system (except YGGY 320 which is 3 wheels robot)*
- *Works in no Wi-Fi zone without loss of functionalities*
- *Multi sensors to detect accurately and reliably all obstacles*
- *Anti-tilt sensors to prevent falling in stairs*
- *Accept any kind of TOP-client computer / OS*
- *3D camera and LIDAR for obstacles detection and map construction*
- *Performant and highly sensitive ultrasonic sensors*
- *Tunable sensitivity of ultrasonic sensors according to security wished*
- *Up to 6 extra ultrasonic sensors can be mounted in the TOP-client design*
- *Automatic return to charging station when battery is low*
- *Removable batteries permit to run the vehicle 24H a day (except YGGY 320)*
- *24VDC Industry standard*
- *Easy to interface. Simple commands. ROS2 interface*
- *Rich connector for TOP-client usage: Power, Wi-Fi and ethernet*
- *Fast emergency stop with a direct action on motors.*
- *Forbidden and low speed zones can be defined*
- *Tele operation*
- *Tag detector*
- *Follow a person (optional)*
- *Person skeleton detection (optional)*

# Application sectors

YGGY platforms can be used in many cases and many sectors:

- *General industry. Logistics and assembly plants (for light loads).*
- *Public places (hospitals, museums, airports, ...).*
- *Supermarkets and Retail stores.*
- *Offices.*
- *Security.*
- *Private houses.*
- *Research Labs.*
- *Retirement homes.*
- *Exhibitions and shows.*
- *Hotels and Restaurants.*
- *Farms and greenhouses*
- *Medical*

## TOP part design



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YGGY are reliable and perfectly operational vehicles to go, safely, from point A to point B. But it remains to build the application part that goes above this vehicle: The TOP.

The TOP is the physical payload, fixed above the YGGY base.

It expresses your know-how and your business knowledge.

The TOP is dedicated to your specific application and is equipped with its own computer running your application program.

Once you have connected the different interfaces to communicate with the vehicle, you can tell the robot to go to a destination point of the map...

Your robot will go this point avoiding safely all obstacles.

The YGGY range can acts as an OEM: The brand will not appear and you have a complete robot with your own trade-mark.

Throughout the integration step, ip sum tek engineers provide you with the support you need.

## Video

Here is a video demonstrating the YGGY range capabilities:

<https://www.youtube.com/watch?v=MpNYOvll61Q>