

# KIT R&D ROS 1 & ROS 2

AgileX Robotics Compatible

**Performance Package**



R&D kit created for mobile robots from AgileX Robotics

This kit offers a ready-to-develop robotic solution, created to save assembly time.

- ✓ Mechanics: integration of components into the mobile base
- ✓ Electrical: connecting all equipment together
- ✓ Software: installation of component ROS packages

## Our goal

As soon as we receive the mobile robot equipped with its ROS R&D kit, our customers can immediately start developing their program and working on their application. The R&D kit eliminates the need to develop an information system first.

## Software expertise: OS installation, ROS, and VNC

In addition to electronic and mechanical integration, our engineers handled the software side, installing the OS on the PCs via Linux Ubuntu.

This procedure includes the integration of ROS (Robot Operating System) and the various packages of essential components.

Alongside ROS, we also deploy an indispensable tool, VNC (Virtual Network Computing), which offers a dedicated page for connecting to the on-board computer's desktop.

This makes it possible to check the computer's status at any time, as well as to receive feedback from the sensors integrated into the kit.

# Specifications

## KIT

### DIMENSIONS

Length: 580 mm  
Width: 400 mm  
Height (without LiDAR): 220 mm  
Weight: ~ 10 kg

### INCLUDED IN KIT

- ✓ Ouster OSO 128 LiDAR (Rev 7)
- ✓ Intel® RealSense D435 Depth Camera
- ✓ NVIDIA Jetson Nano JN30D
- ✓ Teltonika 5G router

### OTHERS

Materials: aluminum and plastic  
Black powder-coated finish  
Compatible with the majority of AgileX Robotics robots  
Rain-resistant  
Ventilated

## SYSTEM INTEGRATION

Operating system (OS): Ubuntu 20.04 and ROS 1  
Version: NOETIC

## DEVELOPMENT TOOL

### ARDUSIMPLE RTK2B

Chip: ZED-F9P

#### Precision:

- < 1 cm with a base station up to 35 km
- < 1 cm with NTRIP up to 35 km
- < 4 cm with SSR corrections
- < 1.5 m in standalone mode
- < 0.9 m in standalone mode with SBAS coverage

Startup Time: First Fix Position: 25 seconds (cold start), 2 seconds (hot start)  
First RTK Correction: 35 seconds (cold start)

## INTEGRATION

### MECHANICAL INTEGRATION

Design the housing, place all components inside the box and secure the box to the robot.

### ELECTRICAL INTEGRATION

Connect all sensors and PCs. Connect network.

### IT INTEGRATION

Installation of the PC and ROS, installation of the network, installation of all ROS drivers, creation of the URDF, creation of a launch file that starts all components when the PC is booted.

## LIDAR

### Ouster OSO 128 (Rev 7)

Vertical resolution: 128  
Min. range : 0.5 m  
Max. range : ~ 100 m  
Accuracy:  $\pm 0.5$  cm to  $\pm 5$  cm  
Vertical field of view: 90°  
Vertical angular resolution: 0.7°  
Protection class: IP68, IP69K  
Operating temperature range :  
-40°C to 70°C  
Weight: 447 g

## CAMERA

### Intel® RealSense D435

Depth frame rate: up to 90 fps  
Min. depth 10.5 cm  
Depth output resolution: up to 1280 x 720  
Sensor resolution: up to 1920 x 1080  
Connectors: USB-C 3.1 Gen 1  
Dimensions: 90 x 25 x 25 mm

## DEVELOPMENT KIT

### Nvidia Jetson AGX Orin 32GB

GPU: 1792 cores in NVIDIA Ampere architecture (with 56 Tensor cores)  
AI performance: 200 TOPs  
Maximum GPU frequency: 930 MHz  
CPU: 8-core, 64-bit Arm® Cortex®-A78AE v8.2 CPU  
2 MB L2 + 4 MB L3

## MAIN COMPUTER

### ZOTAC CI669

Dimensions: 204 mm x 129 mm x 68 mm  
Processor: Intel Core i7-1355U Random Access  
Memory (RAM): 1 X Crucial RAM 16GB DDR5 5200MHz + 1 X SO-DIMM 262 pins (DDR5, max 32GB/slot)  
Storage: 1 X Kingston 480GB SSD + 1 X M.2 - PCI-E 4.0 4x (M.2 2242 or M.2.2230)

#### USB Ports:

- ✓ 1 x USB C 3.1 (Front)
- ✓ 3 x USB A 3.1 (Back)
- ✓ 1 x USB A 2.0 (Back)

Network: Dual LAN (2.5Gbps / Gigabit) 2 X Female RJ45  
Wi-Fi: Wi-Fi 6  
Bluetooth: Bluetooth 5.2  
Power: USB-C PD

## SPATIAL PHIDGET

### GENERAL INFORMATION

Sampling interval: 1 s/sample to 4 ms/sample  
Operating temperature : - 40°C to 85°C

### ACCELEROMETER

Max. acceleration measurement :  $\pm 2,5$  g  
Acceleration measurement resolution: 10  $\mu$ g

### GYROSCOPE

Max. gyro speed (X axis, Y axis):  $\pm 125^\circ$ /s  
Gyroscope resolution (X axis, Y axis): 1E-05°/s

### MAGNETOMETER

Max. magnetic field :  $\pm 49,2$ G  
Magnetometer resolution: 1.5 mg