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MDT



UNMANNED GROUND SYSTEMS TECHNICAL PRODUCT MANUAL

ALL-TERRAIN ROBOTIC PLATFORMS · LJ-ZG01 · LJ-DG01

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ABOUT THIS DOCUMENT

This manual describes two all-terrain unmanned ground platforms offered by Mastoor Defense Technologies: the LJ-ZG01 legged platform and the LJ-DG01 wheeled-leg platform, together with the ground control terminal common to both.

It is a technical reference for evaluation, planning and integration. Specifications are those published by the platform manufacturer. The document carries no commercial offer; pricing, delivery terms and contractual conditions are issued separately on request.



LJ-ZG01
LEGGED PLATFORM



LJ-DG01
WHEELED-LEG PLATFORM

SCOPE

This manual covers the LJ-ZG01 and LJ-DG01 all-terrain robotic platforms and the integrated ground control terminal supplied with both. For each platform it gives the physical and performance specification, the sensing, communications and power configuration, the interfaces available for user payload integration, and scale general-arrangement drawings.

It does not cover installation, operating or maintenance procedures, which are issued with the equipment, nor payload-specific integration, which is agreed case by case.

TERMS USED IN THIS MANUAL

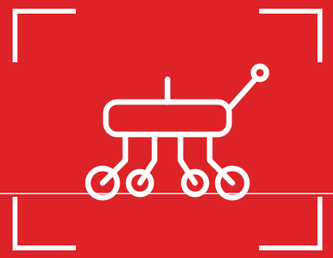
SLAM	Simultaneous localisation and mapping — the platform builds a map of its surroundings while tracking its own position within it
IMU	Inertial measurement unit, providing attitude and motion sensing
Axial-flux motor	Motor geometry giving high torque for its mass, used in the joint actuators
Power take-off	Regulated supply port on the platform for powering a user-fitted payload
SBus / PWM	Serial and pulse-width control channels available at the terminal for payload actuation
Ingress protection	IEC 60529 rating — first digit solid particles, second digit water
Secondary development	Manufacturer-supported access for user software running on the platform computer
Tri-band link	Control and video link able to operate across three separate frequency bands to hold connection in congested spectrum
Prone dimension	The platform envelope with legs folded and chassis lowered, as carried or stowed for transport

CONVENTIONS

All linear dimensions are in millimetres and all masses in kilograms unless otherwise stated. General-arrangement drawings are to scale within each figure; figures are not to a common scale between platforms.

Performance figures are manufacturer laboratory or open-environment test values. Endurance, detection range, speed and climbing performance will vary with load, terrain, temperature and electromagnetic environment.

Where a parameter is not stated by the manufacturer it is omitted rather than estimated. Confirm any figure critical to a procurement decision against the manufacturer's release documentation for the build standard offered.



PLATFORMS

ALL-TERRAIN
UNMANNED GROUND
MOBILITY SYSTEMS

Platform Family Overview

Unmanned ground platforms have moved from trial use into routine service across perimeter security, infrastructure inspection and logistics support. Legged and wheeled-leg robots reach ground that wheeled vehicles cannot — stairwells, rubble, trenching, plant rooms and unimproved terrain — carrying sensor and equipment payloads without placing personnel in the hazard.

Mastoor Defense Technologies supplies two complementary all-terrain robotic platforms. The **LJ-ZG01** is a 47.8 kg legged platform optimised for agility, endurance and sensor-led autonomy in confined and vertical terrain. The **LJ-DG01** is an 82 kg wheeled-leg platform built for higher payload and sustained speed across mixed ground. Both share a common tri-band data link, a common integrated ground control terminal, and an open interface set for user-developed mission payloads.

Legged All-Terrain Mobility

45° obstacle-surmounting, continuous stair ascent and a 0.9–1 m maximum step give access to ground closed to wheeled vehicles.

Sensor-Led Autonomy

Solid-state LiDAR with SLAM point-cloud output, depth imaging and IMU attitude sensing drive navigation and obstacle avoidance with low operator workload.

Tri-Band Resilient Link

800 MHz / 1.4 GHz / 2.4 GHz control and video, with optional 4G enhancement, hold the link across congested and obstructed environments.

Open Integration

Ethernet, RS-485 and CAN interfaces with 20–48 V power take-off and supported secondary development allow mission payloads to be integrated by the user.

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PLATFORM COMPARISON

Parameter	LJ-ZG01	LJ-DG01
Configuration	Quadruped, legged	Quadruped, wheeled-leg
Platform weight	47.8 kg	82 kg
Standing dimensions	929 × 556 × 656 mm	1100 × 610 × 745 mm
Prone dimensions	929 × 556 × 390 mm	1130 × 755 × 320 mm
Maximum working load	40 kg	80 kg
Maximum static standing load	120 kg	200 kg
Maximum movement speed	8 m/s	7 m/s
Endurance	6 h (no load)	4–8 h
Motor maximum torque	180 N·m	350 N·m
Obstacle-surmounting angle	45°	45°
Continuous stair-climbing height	25 cm	20–25 cm
Maximum climbing height	1 m	90 cm
Ingress protection rating	IP67	IP66
Primary sensing	Solid-state LiDAR + depth module	Solid-state LiDAR + RGB camera
External power take-off	1 × 20–48 V	2 × 12 V / 20–48 V
Charging time	2 h (0–100%)	1 h fast / 4 h slow

TYPICAL APPLICATIONS

- **Perimeter and site patrol** — routine and on-call sweeps of installations, depots and yards
- **Infrastructure and plant inspection** — confined spaces, gantries, substations and pipe racks
- **Hazardous-environment survey** — standoff assessment where entry is unsafe for personnel
- **Remote-handling support** — carriage of inspection and disposal equipment to the point of work
- **Logistics carriage** — load movement across unimproved and stepped ground
- **Mapping and survey** — LiDAR SLAM capture of interiors and unmapped structures

LJ-ZG01 All-Terrain Robotic Platform



IP67 Sealed Platform

Dust-tight and immersion-rated for rain, dust and wash-down, with a −20 °C to +55 °C operating envelope.

40 kg Working Payload

Carries 40 kg in motion and withstands a 120 kg static standing load on a 47.8 kg platform.

8 m/s Sprint Speed

Axial-flux joint motors with 180 N·m peak torque and dual encoders deliver high-rate gait control.

Solid-State LiDAR SLAM

120° × 90° field of view, 70 m range at 90% reflectance, true-colour SLAM or raw point-cloud output.

Six-Hour Endurance

Dual 59.2 V hot-swap batteries with anti-misoperation latching and a two-hour full recharge.

Open SDK & Power Take-Off

100 M Ethernet, RS-485 and CAN with a 20–48 V supply port for user-integrated payloads.

INTRODUCTION

The LJ-ZG01 is a quadruped all-terrain robotic platform for mobility-critical tasks in built-up, industrial and unimproved terrain. At 47.8 kg it carries a 40 kg working payload while sustaining 8 m/s movement, 45° obstacle-surmounting and continuous 25 cm stair ascent, with a 1 m maximum single-step climbing height.

Navigation is sensor-led. A solid-state LiDAR with a 120° × 90° field of view generates true-colour SLAM or raw point-cloud data, supported by a depth-imaging module and IMU attitude sensing. An onboard industrial octa-core computer with 16 GB RAM and 64 GB storage hosts navigation, obstacle avoidance, speed selection and health-monitoring functions, and is open to secondary development. IP67 sealing and a −20 °C to +55 °C operating envelope allow deployment in dust, rain and wash-down conditions.

MASTOOR DEFENSE TECHNOLOGIES

SPECIFICATIONS

Platform	Standing dimension	929 × 556 × 656 mm
	Prone dimension	929 × 556 × 390 mm
	Weight	47.8 kg
	Ingress protection rating	IP67
	Operating / storage temperature	−20 °C ~ 55 °C / −20 °C ~ 60 °C
Drive & actuation	Encoder / joint motor	Dual-encoder; axial-flux joint motors
	Motor maximum torque	180 N·m
Mobility & payload	Maximum movement speed	8 m/s
	Maximum working / static standing load	40 kg / 120 kg
	Maximum obstacle-surmounting angle	45°
	Continuous stair / maximum climbing height	25 cm / 1 m
	Endurance time	6 h (no-load)
Sensing	LiDAR	1 unit — solid-state LiDAR
	LiDAR detection range	30 m @ 10% reflectance (< 500 lux) 70 m @ 90% reflectance (< 500 lux)
	LiDAR field of view	120° horizontal × 90° vertical
	LiDAR point cloud	True-colour SLAM / raw point cloud
	Depth module	Equipped — 240 × 180 resolution Default 10 FPS, max 15 FPS
	IMU attitude sensor	Standard configuration
	Illumination lamp	Standard configuration
Communications & interfaces	Wi-Fi	Standard configuration
	Antenna quantity	2 units
	Video transmission band	Tri-band: 800 MHz / 1.4 GHz / 2.4 GHz
	Operating frequency range	806–826 MHz, 1427.9–1447.9 MHz, 2401.5–2481.5 MHz
	Transmit power	≤ 25 dBm
	4G module	Supported
	External communication ports	1 port — 100 M Ethernet + RS-485 + CAN (custom)
	External power supply port	1 port — 20–48 V
Computing & autonomy	System	Industrial-grade octa-core processor 16 GB RAM + 64 GB storage
	Onboard functions	Navigation, obstacle avoidance, speed selection, health monitoring, battery level indication
	Secondary software development	Supported
Power	Power supply mode	Dual-battery power supply
	Battery	59.2 V, 10 Ah × 2, 3.5 kg Anti-misoperation latch equipped
	Charging time	2 h (0–100%)

LJ-DG01 Wheeled-Leg Robotic Platform



80 kg Working Payload

Twice the carried load of the legged platform, with a 200 kg static standing capacity for mounted equipment.

350 N·m Peak Torque

Axial-flux joint motors rated at 50 N·m continuous with dual-encoder feedback on every joint.

Step & Slope Performance

45° obstacle-surmounting, 20–25 cm continuous stair ascent and a 90 cm maximum climbing height at up to 7 m/s.

Dual Power Take-Off

Two independent supply ports — 12 V at 20 A and 48 V at 10 A — with two RJ45 / RS-485 communication ports.

One-Hour Fast Charge

66.6 V 30 Ah pack giving four to eight hours of endurance, with a four-hour slow-charge mode for battery life.

IP66 Sealed Platform

Dust-tight with high-pressure jet protection across a −20 °C to +55 °C operating envelope.

INTRODUCTION

The LJ-DG01 is a wheeled-leg all-terrain platform built for payload and sustained mobility over mixed ground. Articulated legs terminating in driven wheels combine the load capacity and rolling efficiency of a wheeled vehicle with the step and slope performance of a legged system, giving an 80 kg working payload and a 200 kg static standing load on an 82 kg platform.

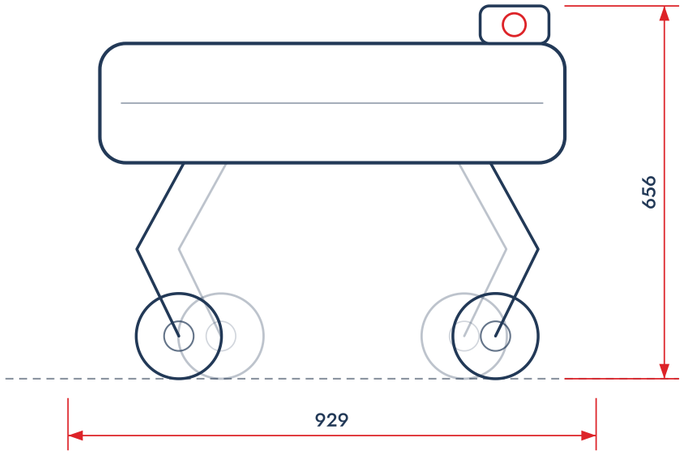
Axial-flux joint motors deliver 50 N·m rated and 350 N·m maximum torque, supporting 45° obstacle-surmounting, 20–25 cm continuous stair ascent and a 90 cm maximum climbing height at speeds to 7 m/s. Solid-state LiDAR and an RGB camera feed navigation and obstacle avoidance. Two independent power take-off ports and two RJ45 / RS-485 communication ports support heavier and more numerous mission payloads than the legged platform.

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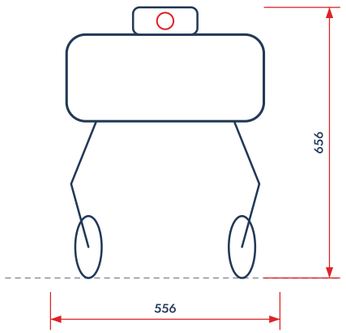
SPECIFICATIONS

Platform	Standing dimension	1100 × 610 × 745 mm (L × W × H)
	Prone dimension	1130 × 755 × 320 mm (L × W × H)
	Weight	82 kg
	Ingress protection rating	IP66
	Operating / storage temperature	−20 °C ~ 55 °C / −20 °C ~ 60 °C
Drive & actuation	Encoder / joint motor	Dual-encoder; axial-flux joint motors
	Motor rated torque	50 N·m
	Motor maximum torque	350 N·m
Mobility & payload	Maximum movement speed	7 m/s
	Maximum working / static standing load	80 kg / 200 kg
	Maximum obstacle-surmounting angle	45°
	Continuous stair / maximum climbing height	20–25 cm / 90 cm
	Endurance time	4–8 h
Sensing	LiDAR	1 unit — solid-state LiDAR
	LiDAR detection range	30 m ± 10%
	RGB camera	1 unit
	IMU attitude sensor	Standard configuration
	Illumination lamp	Standard configuration
Communications & interfaces	Wi-Fi	Standard configuration
	Antenna quantity	2 units
	Video transmission band	Tri-band: 800 MHz / 1.4 GHz / 2.4 GHz
	Operating frequency range	806–826 MHz, 1427.9–1447.9 MHz, 2401.5–2481.5 MHz
	Transmit power	≤ 25 dBm
	4G module	Supported
	External communication ports	2 ports — RJ45 / RS-485
	External power supply ports	2 ports — 12 V / 20–48 V 12 V 20 A max, 48 V 10 A max
Computing & autonomy	Onboard functions	Navigation, obstacle avoidance, speed selection, health monitoring, battery level indication
	Secondary software development	Supported
Power	Battery	66.6 V, 30 Ah, 10.2 kg Anti-misoperation latch equipped
	Charging time	1 h fast charge / 4 h slow charge

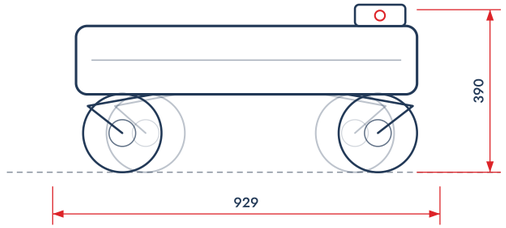
LJ-ZG01 General Arrangement



SIDE ELEVATION — STANDING



FRONT ELEVATION



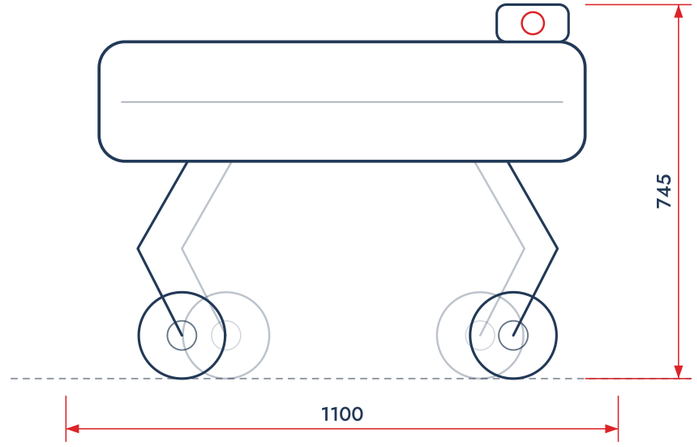
SIDE ELEVATION — PRONE

OPERATING ENVELOPE

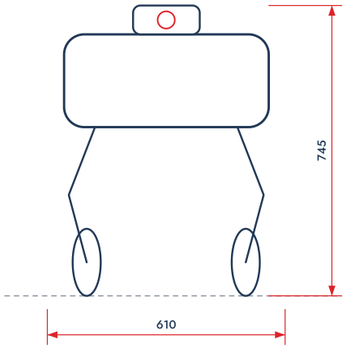
Maximum obstacle-surmounting angle	45°
Continuous stair-climbing height	25 cm
Maximum climbing height	1 m
Standing / prone height	656 mm / 390 mm
Maximum working load	40 kg

All dimensions in millimetres. Drawings are representative of the platform envelope and are not manufacturing drawings.

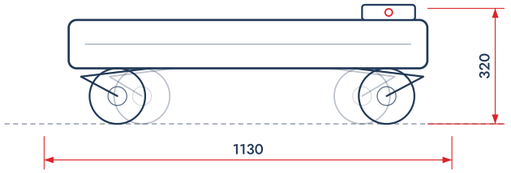
LJ-DG01 General Arrangement



SIDE ELEVATION — STANDING



FRONT ELEVATION



SIDE ELEVATION — PRONE

OPERATING ENVELOPE

Maximum obstacle-surmounting angle	45°
Continuous stair-climbing height	20–25 cm
Maximum climbing height	90 cm
Standing / prone height	745 mm / 320 mm
Maximum working load	80 kg

All dimensions in millimetres. Drawings are representative of the platform envelope and are not manufacturing drawings.

Integrated Ground Control Terminal

Both platforms are operated from a common integrated controller-and-display unit, removing the separate tablet or laptop from the operator position. A 6.97-inch 2000-nit touchscreen stays readable in direct sunlight, and a ten-hour battery matches a full working shift without a change-over. An optional 4G-enhanced video transmission module improves link stability where the direct radio path is obstructed.

Sixteen-channel SBus and eight-channel PWM outputs, together with USB-A, USB-C, HDMI and a micro SD slot, allow mission payloads and recording devices to be driven from the same terminal that flies the platform. The unit is sealed to IP56 for field use.

2000-nit Sunlight Display

6.97-inch touchscreen legible in direct sun, with 32 GB of onboard storage for imagery and logs.

Ten-Hour Endurance

A full shift of operation from the terminal battery at a 1220 g carried weight.

IP56 Sealed Enclosure

Dust-protected and water-jet resistant for handheld use in weather and dust.

4G-Enhanced Link

Optional mini-PCI-E 4G module strengthens video transmission beyond direct radio line-of-sight.

16-Channel SBus Output

Sixteen SBus and eight PWM channels available for user payload control.

Unified Interface Set

USB-A, USB-C, HDMI and micro SD on a single integrated controller-display unit.

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SPECIFICATIONS

Display & construction	Screen size	6.97-inch
	Display brightness	2000 nits
	Integrated design	Integrated remote-controller-display unit equipped
	Ingress protection rating	IP56
Data & interfaces	Storage capacity	32 GB
	External interfaces	USB-A, HDMI, micro SD card slot, USB-C, mini-PCI-E 4G module interface
	Output channels	16-channel SBus, 8-channel PWM
Link	4G-enhanced video transmission	4G-enhanced video transmission module supported for improved transmission stability
Physical & power	Weight	1220 g
	Endurance time	10 h

SUPPLY & SUPPORT

Minimum order quantity

10 units.

Indicative production lead time

30 working days for a 100-unit order. Lead time is subject to model, quantity and final purchase order confirmation.

After-sales service

Warranty, spare parts, operator and maintainer training, installation, commissioning and technical support. The scope of each is fixed by the final contract or purchase order agreed between the parties.

END-USE COMPLIANCE

These platforms are supplied as civil-use products. The purchaser and every end user must comply with applicable export control and economic sanctions law, and with any further export-compliance requirements notified in writing by the manufacturer.

The products must not be used, directly or indirectly, for military combat purposes, for the proliferation of weapons of mass destruction, or in connection with terrorist activity.

The purchaser is required to pass these obligations to its own customers and end users. Breach entitles the manufacturer to suspend delivery and terminate the supply relationship.

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