QADIR

Quadruped Robot P105 V6

Engineering & Application Guide

It Can Be Anything

Just Give It the Right Gear



P105 V6 field-test footage

Designed around real-world missions, with a compact quadruped platform built to reach the places that matter.

QADIR Corporation · www.qadircorp.com

V1.8 | English review edition

01 | P105 V6: Engineered Around Real Missions

1.1 More Than a Robot Dog: A Mobile Quadruped Platform

P105 V6 is a compact quadruped platform developed by QADIR. Combining articulated legs, joint drives, motion-control software, and task-specific equipment, it can move to different locations and collect on-site information. It provides a foundation for industrial inspection, environmental sensing, remote observation, and robotics research.

The value of P105 V6 is not how many features come installed. It is how well the platform fits the task. QADIR starts with site conditions, available clearance, operating methods, and mission goals, then engineers an appropriate combination of mechanisms, sensors, communication, and power.

1.2 Compact Size Opens Up More Work Areas

Robots do not have to be large. Narrow spaces between factory equipment, warehouse aisles, paths through crops, and other confined areas call for compact mobility. P105 V6 gives customers a different way to collect information in places where large platforms or fixed equipment may be impractical.

1.3 Engineering the Whole System, From Ground Contact to Mission

QADIR can begin with lower-leg geometry and length or the size and shape of the foot pads, then evaluate joint drive capacity, payload, control, sensors, and operator interfaces as one system. This is a defining feature of P105 V6: a mission-oriented quadruped platform designed for continued adaptation.



P105 V6 live demonstration; equipment and configuration are tailored to the mission.

02 | Quadruped Mechanics & Mobility

2.1 Engineering Fundamentals of Four-Legged Motion

P105 V6 coordinates joint drives and motion-control strategies across all four legs to move and adjust posture. Leg geometry, ground contact, payload, and gait have to be engineered together so that the mechanism and control system work in concert.

QADIR brings a mechanical-engineering perspective to joint loads, ranges of motion, structural dimensions, and ground conditions, refining the design through hands-on testing.

2.2 Adaptation to Different Work Sites

Smooth floors, paths between crops, outdoor soil, and uneven surfaces call for different leg and foot characteristics. For a given mission, P105 V6 can be configured with suitable leg lengths, pads, and control parameters.

[Core platform: quadruped mechanism and basic operation | Terrain-specific configurations: project customization]

03 | Customization Starts at the Lower Legs & Feet

[Project customization | Earlier P105 development examples identified separately]

P105 V6 customization goes beyond mounting equipment on the body. QADIR can start where the robot meets the ground, tailoring lower-leg geometry and length, as well as pad size, curvature, material, and contact characteristics to the mission environment.

3.1 Lower-Leg Geometry and Length

Lower-leg geometry and length affect foot reach, ground clearance, joint loads, and body posture. QADIR evaluates mechanical design, drive capability, and motion control together to select a combination suited to the work environment.

3.2 Foot Pad Size, Shape, and Material

The pad is a critical interface between the quadruped and its surroundings. Different pad sizes and curved or other geometries enable different contact and load-distribution characteristics. Materials and surface finishes can be selected for the ground conditions.

During development of the P105 family, QADIR built large spherical foot pads and demonstrated them on agricultural soil and concrete farm paths. This hands-on work provides an engineering basis for further foot-end customization.



Large spherical feet, leg, and linkage details | Earlier P105 development example.



Spherical-pad configuration in an agricultural environment | Earlier P105 development example.

04 | What Can P105 V6 Do for Customers?

4.1 Industrial Equipment Inspection

[Application solution: project customization | Cameras and sensing modules: optional]

In factories, P105 V6 can carry task-appropriate cameras and sensors to gather information from multiple locations. Personnel can observe equipment conditions, examine specific areas, or build inspection records. Thermal imaging, data transmission, and remote operation can be integrated to match project needs.

4.2 Warehousing & Security Observation

[Video and remote viewing: optional | Control room and CCTV/VMS integration: project customization]

A mobile robot can complement fixed cameras by changing its observation position. P105 V6 supports project planning for image transmission, operator-side viewing, and control-room integration based on the site network and monitoring requirements.

4.3 Agriculture & Unpaved Areas

[Site-specific configuration: project customization | Photographs: earlier development examples]

Farm fields, access paths, grass, and passages between crops vary in terrain and clearance. QADIR draws on the P105 family's field testing in agricultural settings to engineer appropriate leg, foot-pad, and sensing configurations.



P105 series demonstration on a soil path in a farm | Earlier development example.

4.4 Utility Passages and Confined Spaces

[Real-world test record / project application assessment]

The P105 family has also been tested in confined spaces and pipe-related scenarios. A compact quadruped can help explore locations that are difficult for people to inspect directly. Mission design addresses clearance, communications, camera viewing angles, and safe retrieval.



P105 V6 learning and motion tests before entering a sewer pipe | On-site R&D record.

05 | Demonstrated on Hardware: Thermal Imaging & Object Recognition

P105 V6 has demonstrated real-time thermal imaging and object recognition on the physical robot. These results show how the platform can both move and acquire and process mission-relevant information on site.

5.1 Thermal Imaging

[Demonstrated on hardware | Thermal camera: optional / project integration]

P105 V6 can integrate a thermal camera to provide live thermal-distribution images for observing equipment heat sources, inspecting surroundings, and supporting specialized inspection missions. Measurement capability depends on the selected sensor.



P105 V6 live thermal-imaging demonstration | Fuji TV Mezamashi TV footage (publication rights pending).

5.2 Object Recognition

[Demonstrated on hardware | Object classes and models: mission-specific customization]

P105 V6 has demonstrated real-time object recognition. With a camera and vision software, it can identify designated targets in the video stream. Recognition classes, application logic, and output interfaces can be tailored to the project.



P105 V6 live object-recognition demonstration | Fuji TV Mezamashi TV footage (publication rights pending).

06 | Live Video, Communications & Control Rooms

6.1 Live Video Transmission

[Optional / project integration]

With suitable camera and communications equipment, P105 V6 can send live imagery to an operator for remote observation and task support. QADIR has practical demonstrations of video transmission and operator interfaces as a foundation for customer solutions.



P105 family live operator display | Delivered interface varies by project.

6.2 Control Rooms & Surveillance Systems

[Project customization]

For factory and warehouse applications, QADIR can integrate control-room PC operation, video viewing, and sensor-data transmission. Video integration with existing CCTV/VMS infrastructure can also be evaluated. Control and video-management functions are engineered for the mission.

6.3 Communications Architecture

[Configured for the site; optional equipment]

Wireless networking, external antennas, dedicated remote controllers, and network infrastructure can be selected to suit the site. QADIR evaluates both the downlink for control commands and the uplink bandwidth needed for video and sensor data.

07 | Power, Runtime & Autonomous Functions

7.1 Task-Specific Batteries and Power

[Project configuration]

Battery capacity, runtime, and charging arrangements are engineered around payload, mission duration, and onboard equipment instead of being fixed across every P105 V6 configuration.

7.2 External USB Type-C Power Extension

[Planned capability / electrical validation in progress]

A USB Type-C connector is planned for the back of P105 V6, enabling compatible external power-bank solutions to extend mission runtime. Supported input power, connection during operation, and power management depend on the final engineering configuration.

7.3 Localization, Navigation & Return-to-Home

[SLAM, UWB, return-to-home and related features: optional / project integration]

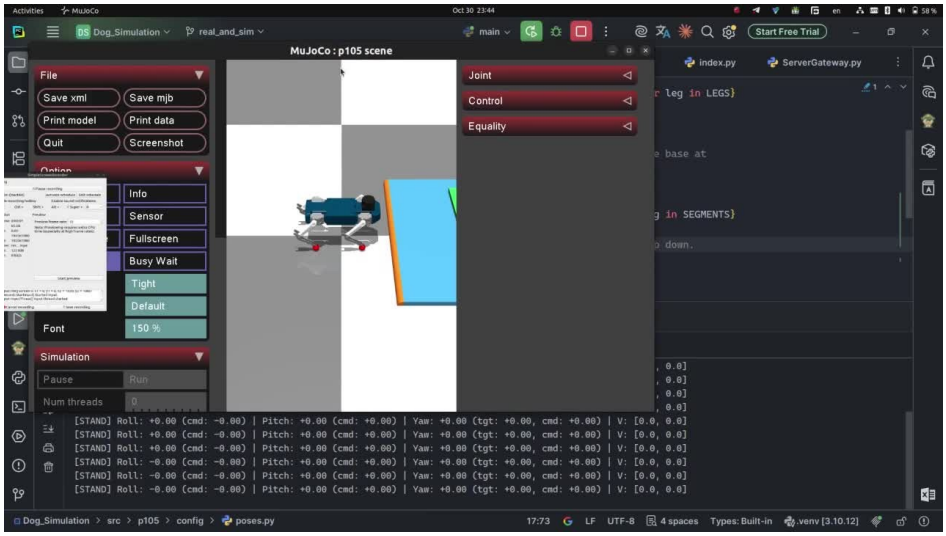
Depending on the mission, P105 V6 can integrate random roaming, mapping, UWB-assisted localization, low-battery management, and return-to-home strategies. Customers requiring scheduled routes can add waypoint patrol and mission-management capabilities.

QADIR develops localization, control, and safety strategies for the working environment and documents validated capabilities in each project specification.

7.4 Advanced Motion Control

[Reinforcement learning: deployed on hardware | Advanced terrain control: ongoing R&D]

QADIR develops quadruped motion-control policies in the MuJoCo physics simulator and has deployed reinforcement-learning results to physical P105 V6 robots. Combining IMU feedback, joint actuation, and quadruped mechanics, P105 V6 can move across soil, mounds, rubble, and other irregular ground.



MuJoCo simulation: P105 quadruped mechanics and terrain-motion research.

08 | QADIR Engineering Makes Customization Possible

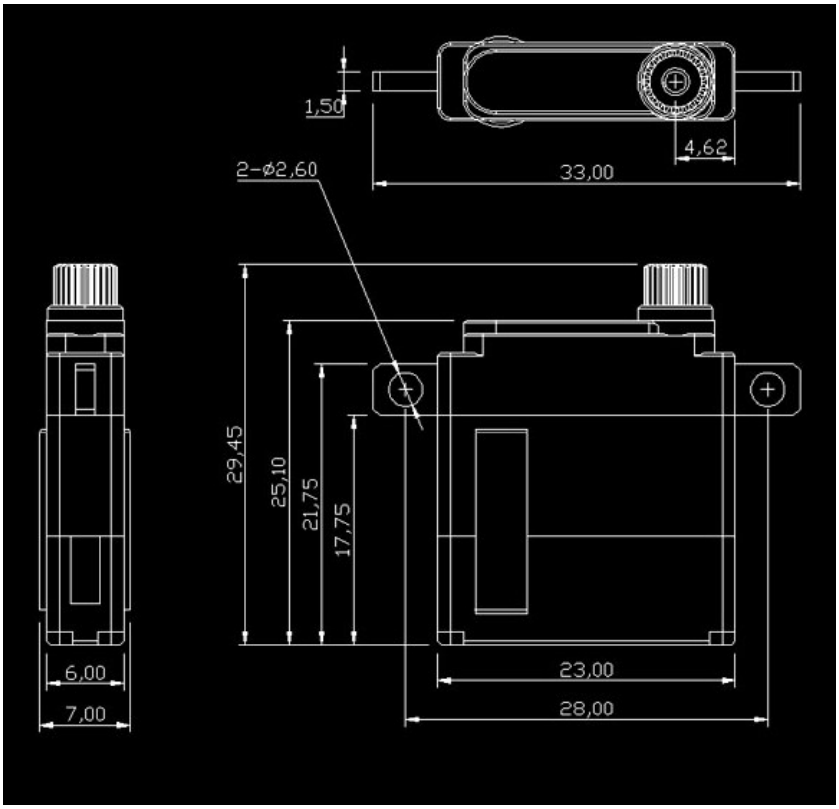
8.1 Built on Mechanical Engineering & Factory Automation

QADIR has long developed mechanical systems, production equipment, and factory automation solutions. We understand worksite processes, mechanical constraints, and integration needs. P105 V6 follows the same philosophy: understand the job first, then engineer the right electromechanical solution.

8.2 RC Servo: A Deliberate Engineering Choice

Following system-level engineering evaluations during P105 development, QADIR selected an RC Servo joint-drive architecture. QADIR performs the engineering calculations, mechanical design, and manufacturing drawings, while specialist manufacturing partners produce the motors to our design.

This design capability lets QADIR evaluate joint actuation together with leg geometry and whole-robot control, and apply experience from real engineering projects throughout the P105 family.



QADIR-designed RC Servo engineering drawing | Internal review; a simplified diagram can be used for publication to protect manufacturing details.



QADIR RC Servo, model P105S-55-4 | Earlier drive design; relationship to the current V6 configuration to be verified.

09 | From Mission Requirements to Your P105 V6

Start by telling us what the robot needs to accomplish, where it will operate, what information it should collect, and how you want to control it.

QADIR evaluates site conditions, terrain, clearance, payload, task equipment, sensors, runtime, communications, and safety requirements to design an appropriate quadruped system configuration.

9.1 Configuration Process

Requirements	Mission, environment, use case, acceptance goals
Mechanical configuration	Lower legs, length, pads, payload and whole-robot design
Equipment & control	Cameras, thermal sensors, recognition, communication, navigation and power
Engineering validation	Integration testing, operating conditions and acceptance
Project delivery	Confirmed configuration, documentation and support

Our goal is to select what the task truly needs, not to add equipment that brings no practical benefit.

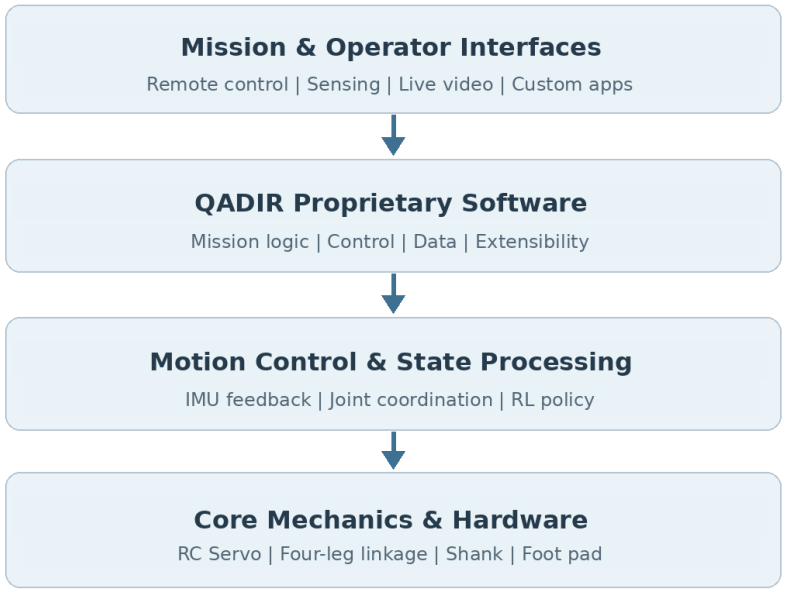
Engineering Appendix | Proprietary Control, Reinforcement Learning & External Connectivity

This section illustrates the functional layers of P105 V6 hardware and software. The diagrams show engineering relationships rather than internal implementation details.

Proprietary Control Architecture & Source-Code Ownership

01 P105 V6 Software & Control Layers

Functional architecture | Not a hardware wiring diagram

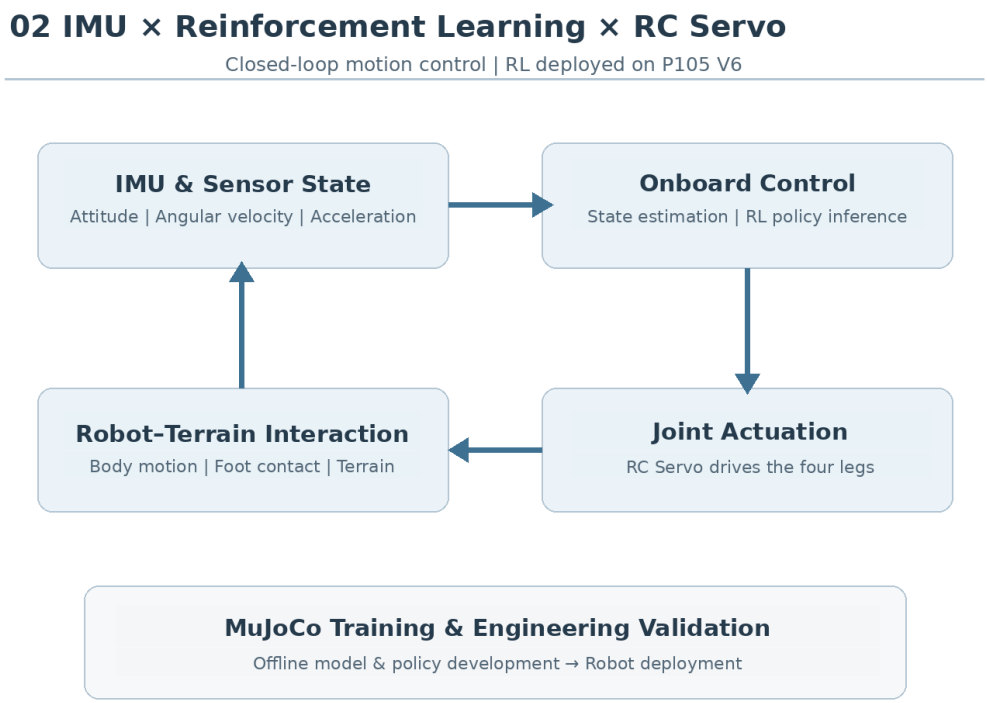


Core motion control runs without ROS/ROS 2; QADIR owns its developed source code.

P105 V6 uses control software developed by QADIR, and its core motion control does not depend on ROS/ROS 2. With the exception of the underlying third-party operating system, QADIR controls the complete source code of its own software and can maintain, modify, extend, and upgrade it to fit customer sites.

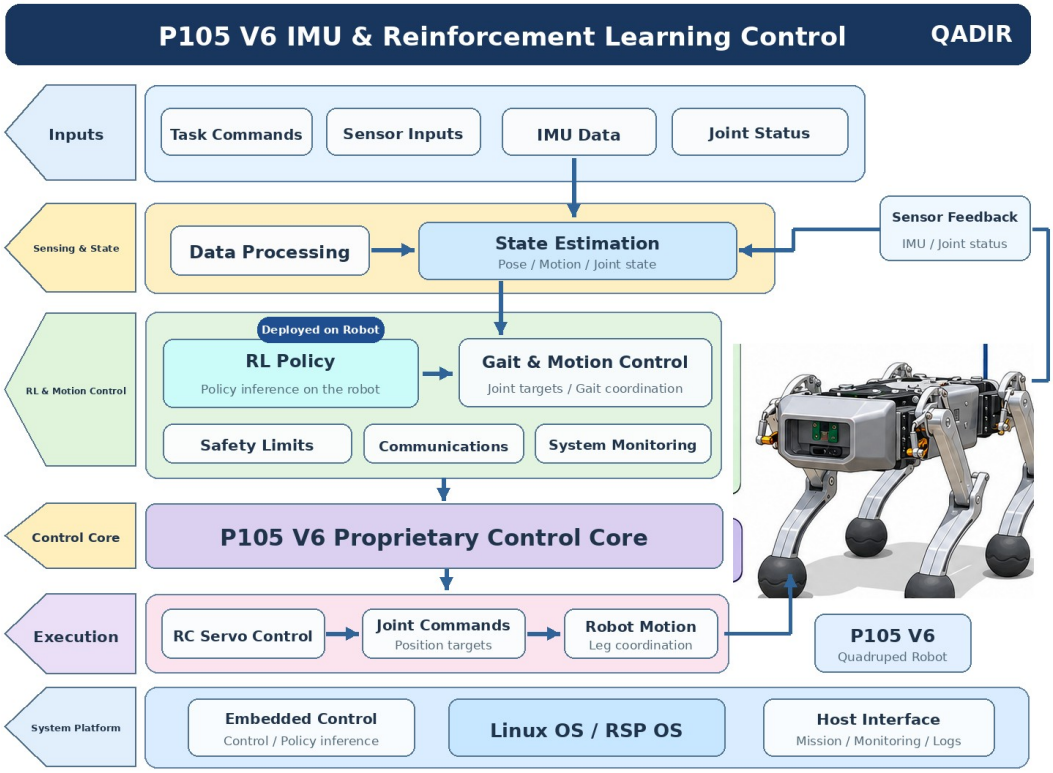
Diagram: conceptual engineering architecture; actual modules, interfaces, and control paths depend on implementation.

IMU & Reinforcement-Learning Motion Control



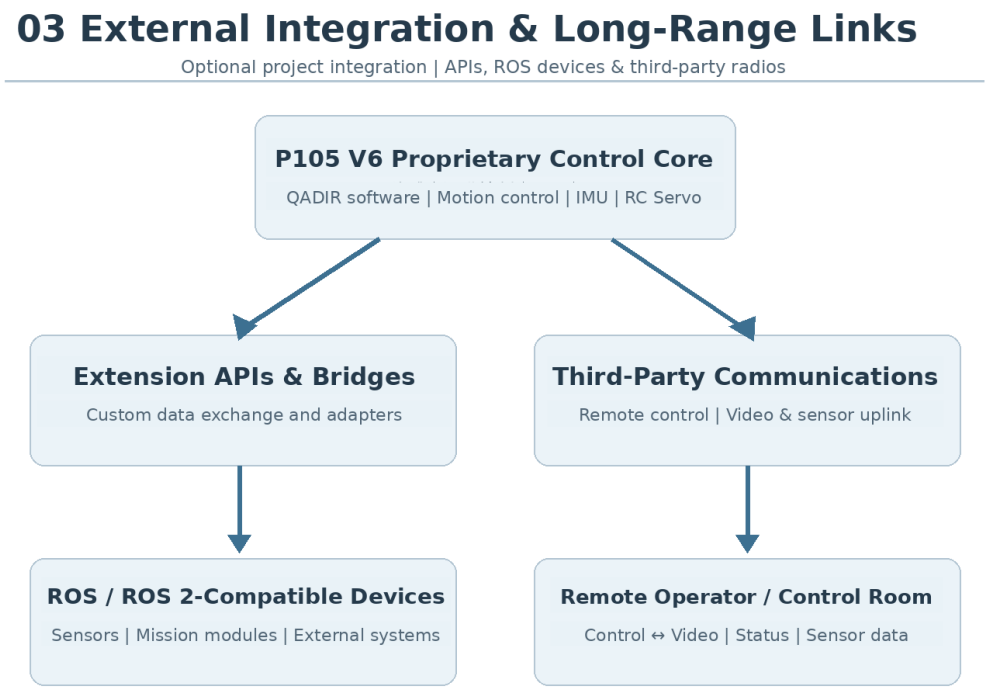
P105 V6 runs reinforcement-learning control policies on the physical robot. IMU-derived motion data and joint-control feedback work with RC Servo drives and the four-leg mechanism to support movement over soil, mounds, and irregular terrain. MuJoCo is used for simulation and offline policy development and is shown separately from real-time operation.

Diagram: conceptual engineering architecture; actual modules, interfaces, and control paths depend on implementation.



Detailed IMU & reinforcement-learning control architecture | Original P105 V6 robot artwork retained.

APIs, ROS-Compatible Devices & Long-Range Communications



API/ROS bridges and long-range modules are project-specific options.

P105 V6 maintains an independent control core while QADIR can build project-specific APIs and bridges to connect ROS/ROS 2-compatible devices and third-party modules. For long-distance control, third-party communication hardware can be mounted and integrated to support two-way commands, video, and sensor-data links. These integrations are project-specific options.

Diagram: conceptual engineering architecture; actual modules, interfaces, and control paths depend on implementation.

Appendix | Function Categories & Delivery Information

P105 V6 is configured for each mission. This guide presents demonstrated capabilities, available options, and ongoing R&D. Equipment and functions supplied to each customer are itemized in the project configuration sheet.

Core platform	Four-leg mechanism, drives and basic

	operation as specified for delivery
Optional equipment	Camera, thermal sensor, communication devices and other selectable equipment
Project customization	Mission-specific legs, pads, recognition models, control rooms and system interfaces
R&D	Technology under simulation, prototype or ongoing validation
Delivery specification	Exact equipment, features, test conditions and support for each project

Reference Specifications

Model	QADIR P105 V6 compact quadruped mobile platform
Reference dimensions	49 × 19 × 20.5 cm
Reference mass	Approx. 3.1 kg
Reference payload	1.1 kg nominal; 2 kg peak (conditions to be confirmed)
Configuration	Legs, pads, power, sensors and communications per mission

Publication & Safety Notes

Function availability, device compatibility, control strategies, and test conditions are confirmed against individual project configurations and validation records. Operating requirements for power, communications, mobility safety, and special environments are included in delivery documentation.

Fuji TV stills are used in this internal draft only. Public PDF or printed editions require appropriate permission or replacement with imagery owned by QADIR.

Before publication, verify the relationship between the P105S-55-4 and current RC Servo, identify the robot generation shown in outdoor footage, and confirm the USB Type-C implementation status.

Closing | The Right Gear for the Right Mission

QADIR starts with the customer’s mission and integrates quadruped mechanics, actuation, control, sensors, and communications so P105 V6 can keep evolving with the task.

What would you like a robot to do for you?

It Can Be Anything

Just Give It the Right Gear

QADIR Corporation | Robotic Automation System Specialists

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