

PAL SERIES

PAL



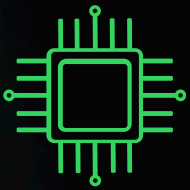
SDR-Native Robotic Arm Platform

Perception-Integrated End Effectors
Designed for Real-World Robotics

Practical Structure | Ethernet Interface | Sim-to-Real

Built for Deployment, Not Just Demonstration

Column robot is engineered for real-world deployment. From control to workflow, everything is designed to reduce complexity and get you to production faster.



01 BUILT-IN CONTROL.

**No external controller.
Just connect and run.**

Integrated control system simplifies your architecture and reduces integration time.

- No external controller required
- Run over standard network
- Lower system complexity



02 SERVICE-READY PERFORMANCE

**Optimized for real environments,
not factory assumptions.**

Balanced performance and practical design deliver reliability where it matters

- Balanced performance and cost
- Stable long-term operation
- Designed for practical use cases



03 SIMULATION-DRIVEN WORKFLOW

**Develop with confidence
before touching hardware.**

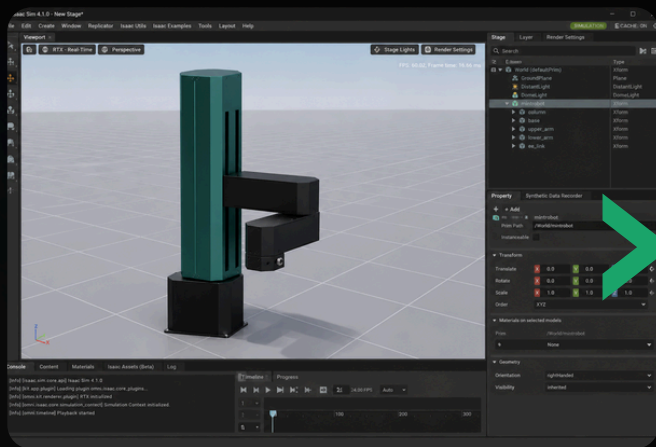
Validate in simulation and deploy to the real robot with the same control logic

- Validate in simulation
- Same control logic in real robot
- Minimize trial-and-error

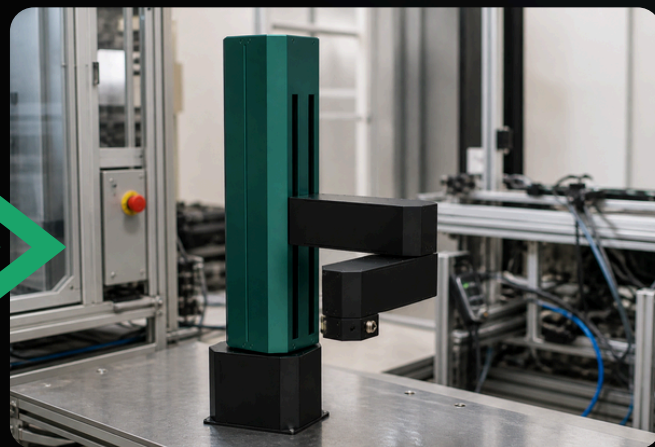
From Simulation to Reality, Seamlessly

Develop and validate your application in simulation, then deploy to the real robot without changing control logic.

SIMULATION



REAL ROBOT



One Control. **Two Worlds.** Zero Friction.



Simulation Ready

Support for NVIDIA IsaacSim enables realistic testing and validation.



Identical Control Interface

Use the same control interface and logic in both simulation and real robot



Real-World Execution

Deploy with confidence.
Run the same logic on the real robot.

Built for Real-World Service Automation

Column Robot brings practical manipulation capability to the environments where people live and work.

SOLVING REAL CHALLENGES IN REAL ENVIRONMENTS

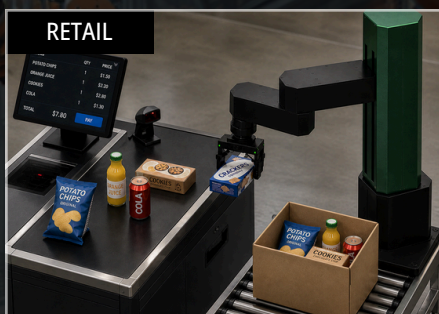
F&B



Beverage making, cup handling, topping, and conter task

Safe, compacy, and built to work alongside people.

RETAIL



Item pocking, packing and checkout assistance

Improve efficiency while enhancing the customer experience.

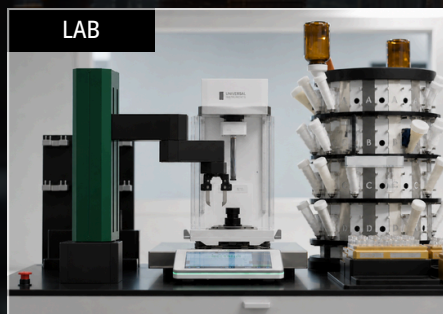
LOGISTIC



Sorting, kitting, and order preparation

Reliable performance in dynamic and space-constrained areas.

LAB



Lab automation, sample handling, and material transport

Clean, precise, and designed for human-centric environments.

HOSPITALITY

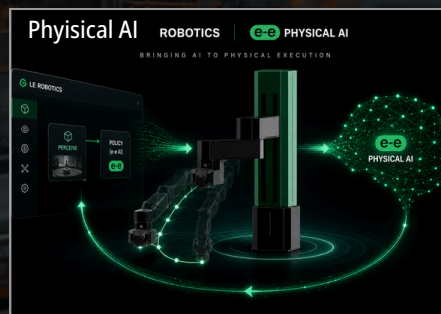


Room service delivery, amenity handling, and more

Quiet, reliable, and ready to deliver better guests experiences.

Physical AI **ROBOTICS** **PHYSICAL AI**

BRINGING AI TO PHYSICAL EXECUTION



Easy integration with AI driven system

Future-proof architecture for smarter operations.

“ From front-of-house to back-of-house, Column Robot adapts to your worlds.

 Work alongside people

 Safe, Reliable, and Compact

 Adapts to diverse tasks and space

COLUMN ROBOTIC ARM

Practical Manipulation for
Real-World Deployment.

The Missing Middle
in Robotics.



Built-in Structure

No external controller.



Service Automation

Optimized for living environment.



Sim-to-Real

One-stop deployment from simulation.

The Missing Middle in Robotics

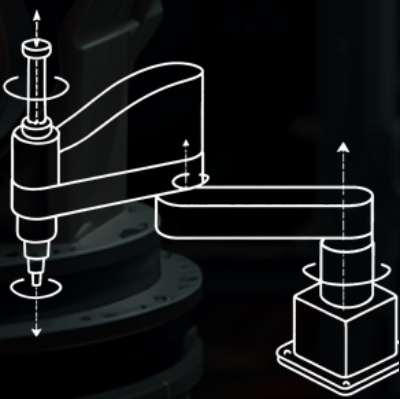
Industrial robots are powerful but complex.
Service robots are flexible but limited.

Column Robot fills the gap

A new category of manipulation system combining vertical motion and rotational reach in a compact architecture. Designed for real-world deployment, not just controlled environments.

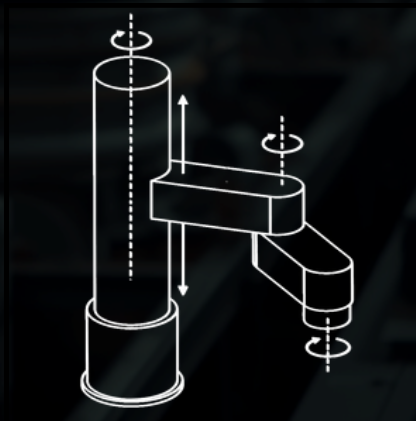
Three Approaches. Different Trade-Offs

SCARA



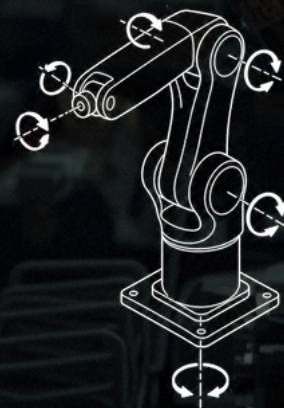
- Optimized for speed
- Limited motion range
- Fixed task workflows

COLUMN



- Flexible within compact space
- Vertical + rotational coverage
- Adaptable task execution

ARTICULATED



- Maximum motion freedom
- Large footprint
- Complex integration

Scalable within One Architecture

Choose the right level of capability
and scale as your needs grow.

1. BASE

4-DOF

Essential positioning
for simple tasks



Best for

Essential positioning
for simple tasks

2. INDEXED

5-DOF

Additional rotational axis
for flexible operation.



Best for

Variation of positioning

3. ARTICULATED

6-DOF

Full orientation freedom
for complex tasks.



Best for

Assembly



One Platform.
Multiple Possibilities.

- Same control, same interface
- Modular design for easy scaling
- Seamless upgrade path as your tasks evolve

P-CB-03

BASE (4-DOF)

Essential Positioning

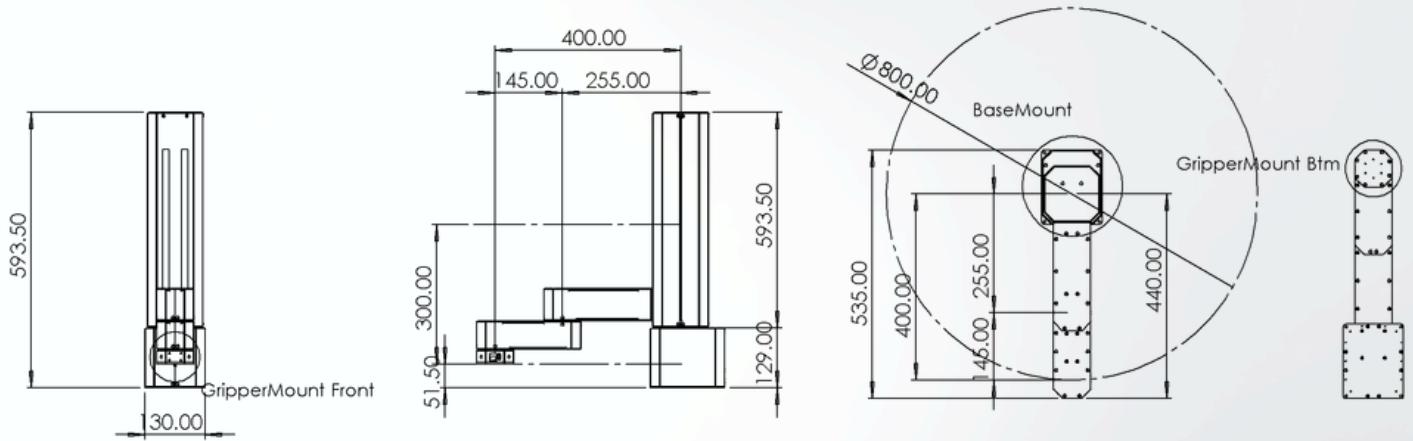
The base model provides manipulation for pick & place, material handling, and general automation tasks on the table space.



Technical Information

FEATURE	VALUE			REMARKS
Mechanical Specificaion				
Structure	R-P-R-R			
Arm Reeach	400mm			
Joints	Index	Range	Max. Vel.	
	J1	-165° ~ +165°	120° / s	
	J2	0mm ~ +300mm	30 mm / s	
	J3	-165° ~ +165°	120° / s	
	J4	-165° ~ +165°	120° / s	
Max. / Nominal Payload	3kg at Half / 1kg at Full			Half / Full : Reach and Speed
Repeatability	0.05mm			
Material	Alunimum, Plastic, Steel			
Weight	10kg			Without Adapter
Mouting	Floor			
Operating Environment	Operating Temperature: 0–40°C			Indoor use only
Input Power	24V DC / 8A			Dedicated Adapter (100~ 240VAC)
Service Interface	1 x XT30 / 1 x RJ45 Cat5e			For Gripper
Software Specificaion				
Control Interface	Network (TCP/IP)			Dedicate python lib is provided
Operating Mode	Auto / Manual (by teaching pendant software)			Conventional method in FA
	Remote (by network API)			Easy to integrate with Vision
	Realtime server (by network packet)			Easy to integrate with AI
Special Features	Collision detection and servo off			NVIDIA IsaacSim
	Hand teaching (free drive mode)			
	Singularity avoidance			
	Simulation integration			

Dimensions & Workspace



Mounting

