



ROBOCATA

An Open Global Standard for Cataloging Robots

Complete Field Reference (V1)

Version 1.0 - March 2026

RoboCata defines a structured, machine-readable taxonomy and specification framework for cataloging robots across domains, industries, and applications.

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Abstract

The RoboCata Standard defines a structured, machine-readable classification and specification framework for cataloging robots across industrial, professional, and consumer domains.

The standard establishes:

- A unified taxonomy of domains, categories, and robot types
- A canonical set of technical specification fields
- Defined coded option values for structured comparison
- A unique robot identification code format
- Conformance requirements for interoperable implementations

The purpose of the RoboCata Standard is to enable comparability, interoperability, and structured aggregation of robot data across manufacturers, researchers, integrators, and digital platforms.

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This document defines Version 1.0 (March 2026).

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Introduction

The robotics industry is experiencing unprecedented growth. Thousands of robots are now commercially available across dozens of categories — from industrial arms and autonomous mobile platforms to surgical systems, delivery drones, and home companions. There is currently no universally adopted standard governing how robots are described, classified, and compared.

Today, every manufacturer uses its own terminology, its own specification format, and its own categorization. A buyer comparing robots from three manufacturers must navigate three entirely different data structures. Researchers aggregating market data must manually reconcile incompatible schemas. Integrators evaluating robots for a project have no common framework to work from.

The RoboCata Standard defines a comprehensive, open classification standard that provides a common language for the entire robotics ecosystem.

What This Standard Defines

- **Classification:** A unified taxonomy consisting of 3 Domains, 29 Categories, and 15 Type codes that systematically classify robot form factors and application sectors.
- **Specifications:** A structured schema of 267 technical specification fields organized into 24 sections, from physical dimensions to AI capabilities
- **Identification:** A unique identification code for every robot (e.g., RBC-AR-PD-IRB1400) that encodes its type, category, and identity in a single string
- **Media:** Standard requirements for product imagery, primary image selection, and video content to ensure consistent visual representation
- **Standardized Options:** Coded option values for 72 fields with predefined valid codes, ensuring data consistency across all contributors and sources

Why a Standard Matters

- **Comparability:** Buyers and integrators can compare robots across manufacturers using the same fields and codes.
- **Data Quality:** Market researchers and analysts can aggregate data across the industry without manual reconciliation.
- **Discoverability:** Manufacturers that adopt the standard make their products more discoverable and easier to evaluate.
- **Future-Proofing:** As new robot types emerge, the taxonomy can grow while maintaining backward compatibility.

Current Scope

The RoboCata Standard has been developed through practical classification of real-world robots across industrial, professional, and consumer domains.

The RoboCata catalog at <https://robocata.com> is one implementation of this standard and has been used to validate and refine its structure. Other independent implementations are permitted.

This document defines the normative field structure and taxonomy independent of any specific database, website, or commercial platform. It is intended for robot manufacturers, data partners, researchers, system integrators, and other stakeholders seeking a consistent framework for robot data.

1. Identification & Description

Core fields that identify a robot and provide textual descriptions.

Field	Label	Type	Description
robot_code *	Robot Code	Text	Unique RoboCata identifier (format: RBC-TT-CC-XXXXXXX)
info_name *	Robot Name	Text	Full product name (e.g., "IRB 1400", "Spot Enterprise")
manufacturer_text *	Manufacturer	Text	Company name (e.g., "ABB", "Boston Dynamics")
type*	Type	Single code	Physical form factor classification (e.g., "Robotic Arm", "Mobile Platform")
domain *	Domain	Single code	Application domain — PRO (Professional & Services), HOME (Home & Consumer), IND (Industrial & Manufacturing)
category *	Category	Single code	Primary application category (e.g., "Medical & Healthcare", "Production & Assembly")
info_model	Model	Text	Model designation, if different from the product name
info_model_number	Model Number	Text	Alphanumeric model number for the specific variant
info_id	Product ID	Text	Manufacturer's unique product identifier or SKU
info_productline	Product Line	Text	Product line or family name (e.g., "GoFa")
short_description	Short Description	Text	Catalog summary for listings (40–100 words)
description_detailed	Detailed Description	Text	Full description covering capabilities, applications, features (80–200 words)
description_long	Long Description	Text	Extended narrative description (2–5 sentences) for SEO and detail pages
current_version	Version	Text	Current software or hardware version number
product_url	Product URL	URL	Link to the manufacturer's official product page
github_url	GitHub URL	URL	Link to open-source repository if available
github_repos	GitHub Repos	Number	Number of GitHub repositories related to this robot
meta_tags	Meta Tags	Text	Keywords and tags for search optimization
info_status	Product availability status.	Single code	Availability status (e.g. In Production, Pre-order, Coming Soon, Prototype).
info_release_year	Release Year	Number	Year the robot was first released or announced
info_status_since_date	Status Date	Date	Date when the status became effective

* Required fields – see next pages for details.

Type

Physical form and morphology. Field: type

Code	RBC Code	Name	Description
ARM	AR	Robotic Arm	Fixed-base manipulator arm
MOBI	MO	Mobile Platform	Wheeled or tracked ground robot
BIPD	BI	Biped	Bipedal/humanoid walking robot
QUAD	QU	Quadruped	Four-legged walking robot
HEXA	HE	Hexapod+	Six or more legged robot
AERI	AE	Aerial	Flying robot (drone, VTOL, fixed-wing)
AQUA	AQ	Aquatic	Underwater/surface water robot
SERP	SE	Serpentine	Snake-like, limbless robot
SPHR	SP	Spherical	Ball or rolling form factor
SOFT	SO	Soft Robot	Soft-bodied, flexible material robot
WEAR	WE	Wearable	Body-worn, exoskeleton, prosthetic
VEHI	VE	Vehicle	Autonomous vehicle platform
APPL	AP	Appliance	Robot built into appliance
SWRM	SW	Swarm Unit	Designed for swarm operations
HYBR	HY	Hybrid	Hybrid or multi-modal form factor

Domain

High-level market segmentation. Each robot belongs to exactly one domain. Field: domain

Code	RBC Code	Name	Description
IND	-	Industrial & Manufacturing	Factory floors, production lines, heavy industry
PRO	-	Professional & Services	Commercial, professional, and institutional use
HOME	-	Home & Consumer	Residential and personal use

Category

Primary application sector. 29 categories grouped by domain. Field: category

Industrial (5)

Code	RBC Code	Name	Description
QC	QC	Quality Control	Inspection, testing, measurement
PROD	PR	Production & Assembly	Manufacturing, assembly lines
WELD	WL	Welding & Fabrication	Welding, cutting, metal work
HEAVY	HV	Heavy Industry	Mining, steel, foundry
PACK	PK	Packaging & Logistics	Palletizing, sorting, warehouse

Professional (15)

Code	RBC Code	Name	Description
MED	MD	Medical & Healthcare	Surgery, rehabilitation, patient care
AGR	AG	Agricultural	Farming, harvesting, crop management
CONST	CN	Construction & Building	Building, demolition, site work
TRANS	TR	Transportation & Delivery	Delivery, logistics, last-mile

LAB	LB	Laboratory & Research	Scientific research, lab automation
HOSP	HS	Hospitality & Food Service	Hotels, restaurants, food service
RET	RT	Retail & Commerce	Store operations, customer service
EDU	ED	Educational	Teaching, training, STEM
INFRA	IF	Infrastructure & Utilities	Power, water, telecom maintenance
LAND	LD	Landscaping & Grounds	Commercial landscaping
CLEAN	CL	Commercial Cleaning	Office, industrial, public space
SQP	SQ	Security (Professional)	Commercial/industrial security
SPORTP	ST	Sports (Professional)	Professional sports, training
OFF	OF	Office & Business	Office automation, telepresence
VET	VT	Veterinary & Animal Care	Animal healthcare, livestock

Home & Consumer (9)

Code	RBC Code	Name	Description
HCLEAN	HC	Home Cleaning	Residential cleaning (vacuuming, mopping)
YARD	YD	Yard & Garden	Lawn care, garden maintenance
COOK	CK	Kitchen & Cooking	Food preparation, cooking
ENT	EN	Entertainment & Gaming	Fun, games, recreation
COMP	CM	Companion	Social, emotional companionship
CARE	CR	Personal Care	Health monitoring, personal assistance
SQH	SH	Home Security	Residential security, patrol
SPORTH	SF	Sports & Fitness (Home)	Home fitness, personal training
CHILD	CH	Childcare & Education	Child supervision, home education

Conformance Definition (Normative)

A robot record shall be considered conformant with RoboCata Standard V1.0 (March 2026) if:

- It contains all required fields:
 - robot_code
 - info_name
 - manufacturer_text
 - type
 - domain
 - category
- All coded fields use only values defined in Appendix E.
- All numeric fields follow Appendix B unit conventions.
- Field names match exactly the canonical field identifiers.
- A conformant implementation may omit non-required fields, but must not redefine or alter field semantics.

2. Media Requirements

Visual and video media are recommended for standard. Every robot should have one image designated as the primary image. It is used as the main display image, thumbnail in listings, Open Graph image for social sharing, and representative image in comparisons. Choose a clean, front-facing or three-quarter product shot.

Image Fields

Field	Label	Type	Description
media_primaryimage	Primary Image	URL	URL of the primary product image (used for thumbnails, OG tags, listings)
images	Image Gallery	JSON Array	Array of image URLs for the robot gallery

Image Requirements

Requirement	Specification	Notes
Formats	PNG or JPG (JPEG)	PNG preferred for transparency; JPG for photos
Min Resolution	800 × 600 px	Higher resolution preferred
Max File Size	5 MB per image	Optimize for web
Background	Clean / white preferred	Product shots on white; in-situ also accepted
Minimum	1 per robot	At least one clear product photo required
Recommended	3–5 per robot	Front, side, in-application, detail shots

Video Fields

Field	Label	Type	Description
media_video_url	Video URL	URL	Primary product video (YouTube/Vimeo link or MP4)
media_demovideo_url	Demo Video	URL	Demonstration video showing the robot in operation
media_360view_url	360° View	URL	Interactive 360-degree view URL

Video Requirements

Requirement	Specification	Notes
Formats	MP4 (H.264) or YouTube/Vimeo URL	Hosted links preferred
Min Resolution	720p	1080p preferred; 4K accepted
Duration	30–90 seconds recommended	Max 5 minutes
Content	Robot in operation	Movement, manipulation, navigation, or task execution

Document Fields

Field	Label	Type	Description
media_brochure_url	Brochure URL	URL	Link to marketing brochure PDF. Documents should be provided in PDF format unless otherwise specified.
media_datasheet_url	Datasheet URL	URL	Link to technical datasheet PDF. Documents should be provided in PDF format unless otherwise specified.

3. Physical Dimensions & Weight

Dimensions, weight, payload, and physical characteristics.

Field	Display Label	Unit/Type	Description
dimensions_weight_kg	Weight	kg	Total robot weight without payload
dimensions_height_mm	Height	mm	Overall height
dimensions_width_mm	Width	mm	Overall width
dimensions_depth_mm	Depth/Length	mm	Overall depth or length
length_mm	Length	mm	Additional length measurement (if depth != length)
reach_mm	Reach	mm	Maximum operational reach distance
reach_max_mm	Max Reach	mm	Maximum reach distance (extended arm)
payload_max_kg	Max Payload	kg	Maximum payload capacity
payload_rated_kg	Rated Payload	kg	Rated (nominal) payload capacity
wrist_payload_kg	Wrist Payload	kg	Wrist/end-effector payload capacity
payload_capacity_kg	Weight with Payload	kg	Total weight including max payload
working_envelope	Working Envelope	Text	Description of reachable workspace geometry
footprint_area	Footprint	Text	Floor space required (e.g., "600×600 mm")
material_construction	Material	Text	Primary construction material (aluminum, steel, carbon fiber)
mounting_options	Mounting	Text	Mounting configurations (floor, ceiling, wall, rail)

4. Motion & Kinematics

Movement capabilities, kinematic specifications, and joint details.

Field	Display Label	Unit/Type	Description
mobility_primary	Primary Mobility	Single code	Primary locomotion type (see Mobility codes)
mobility_secondary_list	Secondary Mobility	List of codes	Secondary/alternative mobility modes
tech_maxspeedvalue	Max Speed Value	Number	Maximum speed as raw numeric value
speed_mobile_ms	Speed	m/s	Maximum movement speed in meters per second
speed_class	Speed Class	Text	Speed classification category
tech_speedunit	Speed Unit	Single code	Unit for speed measurement (m/s, mm/s, cm/s, RPM)
degrees_freedom	Degrees of Freedom (DoF)	Single code	Number of degrees of freedom (joints/axes)
sys_kinematic	Kinematics	Single code	Kinematic structure (articulated, SCARA, delta, cartesian)
joint_specs	Joint Specs	Text	Detailed joint specifications
joint_speeds	Joint Speeds	Text	Individual joint rotation speeds (°/s per axis)
joint_rotation_range	Joint Range	Text	Joint rotation range (±degrees per axis)
joint_torque_max	Max Joint Torque	Text	Maximum torque per joint (Nm)
repeatability_position_mm	Repeatability	±mm	Position repeatability accuracy
acceleration_max	Max Acceleration	Text	Maximum acceleration specification
dynamic_model	Dynamic Model	Single code	Available dynamic model format (URDF, STEP, CAD)
moment_of_inertia	Moment of Inertia	Text	Moment of inertia at wrist flange
backlash_arcmin	Backlash	arcmin	Backlash in arc minutes

5. Navigation & Localization

Navigation systems, path planning, and obstacle handling.

Field	Display Label	Unit/Type	Description
navigation_list	Navigation Methods	List of codes	All navigation systems (SLAM, GPS, VSLAM, LiDAR, wire-guided)
navigation_system	Navigation System	Text	Primary navigation system description
path_planning	Path Planning	Text	Path planning algorithm (A*, RRT, potential fields)
mapping_capability	Mapping	Text	Mapping capability (SLAM, pre-mapped, dynamic)
localization_method	Localization	Text	Localization method (LiDAR, visual, UWB, GPS)
obstacle_avoidance	Obstacle Avoidance	Text	Obstacle avoidance method (reactive, predictive, 3D)
obstacle	Obstacle Detection	Single code	Obstacle detection capability (None, Limited, Extensive)
multifloor	Multi-Floor	Single code	Multi-floor capability (None, Single, Multi)

6. Power & Energy

Power supply, consumption, battery, and charging specifications.

Field	Display Label	Unit/Type	Description
powersource	Power Source	Single code	Primary power type (AC Mains, Battery, Pneumatic, Solar)
powersource_secondary_list	Secondary Power	List of codes	Secondary/backup power sources
power_voltage_min	Voltage (min)	V	Minimum operating voltage
power_voltage_max	Voltage (max)	V	Maximum operating voltage
power_phases	Power Phases	Number	Number of power phases (1/3)
power_frequency_hz	Power Frequency	Hz	Power frequency (50/60 Hz)
power_consumption_normaluse_w	Power (Normal)	W	Typical power consumption during normal use
power_consumption_peakuse_w	Power (Peak)	W	Peak power consumption
power_consumption_standby_w	Power (Standby)	W	Standby power consumption
power_consumption_max_w	Power (Max)	W	Maximum power consumption
power_batterycap_kwh	Battery Capacity	kWh	Total battery energy capacity
battery_life_hours	Battery Life	hrs	Runtime on full charge under normal use
power_battchargetime_minutes	Charge Time	min	Time to fully recharge battery
power_detachablebattery	Detachable Battery	Yes/No	Whether battery can be swapped
bat_type	Battery Type	Single code	Battery chemistry (Li-Ion, LiPo, LiFePO4, NiMH)
charger_type	Charger Type	Text	Charger specifications and type
energy_rating	Energy Rating	Single code	Energy efficiency rating (A+++ to D)
cons_usd_month	Operating Cost	USD/mo	Estimated monthly operating/energy cost

7. Performance & Throughput

Operational performance, cycle times, and reliability metrics.

Field	Display Label	Unit/Type	Description
cycle_time_typical	Cycle Time	Text	Typical time to complete one operational cycle
duty_cycle	Duty Cycle	Text	Operating duty cycle (continuous, intermittent, %)
throughput_capacity	Throughput Desc.	Text	Throughput capacity description
throughput_amount_min	Throughput (Min)	Number	Minimum throughput quantity
throughput_amount_def	Throughput (Default)	Number	Default/typical throughput quantity
throughput_amount_max	Throughput (Max)	Number	Maximum throughput quantity
throughput_units	Throughput Unit	Single code	Throughput measurement unit (units/hr, cycles/min, kg/hr)
mtbf_hours	MTBF	hrs	Mean time between failures
uptime_pct	Uptime	%	Expected operational uptime
control_frequency_hz	Control Frequency	Hz	Control loop frequency

8. Environment & Operating Conditions

Temperature, humidity, IP rating, and environmental specifications.

Field	Display Label	Unit/Type	Description
tech_min_temp_celsius	Min Temp (Op)	°C	Minimum operating temperature (temperature of robot)
tech_max_temp_celsius	Max Temp (Op)	°C	Maximum operating temperature (temperature of robot)
environment_temp_min_c	Min Temp (Env)	°C	Minimum environmental temperature
environment_temp_max_c	Max Temp (Env)	°C	Maximum environmental temperature
storage_temp_min_c	Min Temp (Storage)	°C	Minimum storage temperature
storage_temp_max_c	Max Temp (Storage)	°C	Maximum storage temperature
operating_temperature_range	Temp Range	Text	Full operating temperature range description
environment_humidity_min	Min Humidity	%	Minimum relative humidity
environment_humidity_max	Max Humidity	%	Maximum relative humidity
operating_altitude_max	Max Altitude	m	Maximum operating altitude above sea level
ip_rating	IP Rating	Single code	Ingress Protection rating (e.g., IP54, IP67, IP69K)
ip_rating_text	IP Rating Detail	Text	IP rating description and what it means
noise_level_db	Noise Level	dB	Acoustic noise output during operation
environment	Environment	Text	General environment description
environment_type_list	Environment Types	List of codes	Suitable environments (Indoor, Outdoor, Cleanroom, Hazardous)
explosion_proof	Explosion Proof	Yes/No	Certified for explosive atmospheres (ATEX/IECEX)
ex_rating	EX Rating	Text	Explosion protection rating details
washdown_capability	Washdown	Yes/No	Can be cleaned with pressurized water

9. Safety & Certifications

Safety features, certifications, and compliance standards (robot-level).

Field	Display Label	Unit/Type	Description
safety_feat_list	Safety Features	List of codes	Safety features (E-stop, PFL, collision detection, safe zones)
safety_compliance_list	Compliance	List of codes	Compliance certification and standards (CE, FDA, ISO, HACCP, ATEX, MIL-STD)
safety_compliance_text	Compliance Details	Text	Detailed compliance information
safety_category	Safety Category	Text	Safety category classification (PLd, PLe, SIL2, SIL3)
functional_safety	Functional Safety	Text	Functional safety level per ISO 13849
collision_detection	Collision Detection	Text	Collision detection method and sensitivity
emergency_stop	Emergency Stop	Text	E-stop configuration (Cat 0/1/2, circuits)
force_feedback	Force Feedback	Text	Force feedback capability and sensitivity
child_safe	Child Safe	Single code	Child safety rating (Yes/No/With Supervision)
pet_safe	Pet Safe	Single code	Pet safety rating (Yes/No/With Precautions)
dust_resistance	Dust Resistance	Text	Dust resistance level and testing
vibration_resistance	Vibration Resist.	Text	Vibration resistance level and testing
cleanroom_rating	Cleanroom Rating	Text	Cleanroom compatibility class (ISO 3/5/7)

10. Connectivity & Communication

Communication protocols, interfaces, and IoT capabilities.

Field	Display Label	Unit/Type	Description
connectivity	Protocols	Text	Industrial protocols (EtherNet/IP, PROFINET, EtherCAT)
connectivity_list	Connectivity List	List of codes	All connectivity options with codes
wireless_protocols	Wireless	Text	Wireless protocols (WiFi, Bluetooth, 5G, LoRa, Zigbee)
ethernet_ports	Ethernet Ports	Number	Number and type of Ethernet ports
usb_ports	USB Ports	Number	Number and type of USB ports
io_digital	Digital I/O	Text	Number of digital input/output channels
io_analog	Analog I/O	Text	Number of analog input/output channels
control_interface	Control Interface	Text	Primary control interface type
control_interface_list	Interface List	List of codes	All control interfaces (teach pendant, mobile app, web, API)
communication_protocol_details	Protocol Details	Text	Detailed protocol specs and versions
iot_integration	IoT Integration	Text	IoT platform integration capability
cloud_connectivity	Cloud	Text	Cloud platform (AWS IoT, Azure IoT, proprietary)
remote_monitoring	Remote Monitoring	Text	Remote monitoring and diagnostics capability
smart_home_list	Smart Home	List of codes	Smart home integrations (Alexa, Google, HomeKit, IFTTT)

11. Control & Programming

Controller, programming languages, and control architecture.

Field	Display Label	Unit/Type	Description
control_architecture	Architecture	Single code	Control architecture (centralized, distributed, hybrid, cloud)
controller_model	Controller Model	Text	Robot controller model (IRC5, KRC5, CB5)
control_programming_list	Programming Methods	List of codes	Programming methods (Python, C++, Blockly, teach mode)
programming_languages	Languages	Text	Supported programming languages
programming_difficulty	Difficulty	Text	Programming difficulty level
teach_pendant	Teach Pendant	Text	Teach pendant model and features
simulation_tools	Simulation	Text	Supported simulation tools (RobotStudio, Gazebo)
collaboration	Collaboration Mode	Single code	Collaborative mode (Power/Force Limited, Hand Guiding, etc.)
interaction	Interaction Level	Single code	Required human interaction time per day
adaptive_control	Adaptive Control	Text	Adaptive control capability
predictive_maintenance	Predictive Maint.	Text	Predictive maintenance features
tech_sdk	SDK Available	Single code	SDK availability (Open Source, Free, Paid, Limited)

12. Software & Operating Systems

Operating systems, ROS support, and software ecosystem.

Field	Display Label	Unit/Type	Description
software_platform	Software Platform	Single code	Primary software/OS (ROS2, Ubuntu, Windows, Proprietary)
operating_system_list	Operating Systems	List of codes	Supported operating systems
ros_package_list	ROS Packages	List of codes	ROS/ROS2 packages and compatibility (MoveIt, Nav2, Gazebo)
sys_lang_list	UI Languages	List of codes	Available user interface languages

13. Sensors & Perception

Sensor systems, cameras, LiDAR, and perception capabilities.

Field	Display Label	Unit/Type	Description
sensor_list	Sensor List	List of codes	All sensor types (camera, LiDAR, IMU, ultrasonic, force/torque)
sensors	Sensors Description	Text	Free-text sensor description
vision_system	Vision System	Text	Vision system type and description
vision_system_list	Vision Capabilities	List of codes	Vision capabilities (face detection, object recognition, SLAM)
camera_specs	Camera Specs	Text	Camera specifications (resolution, FPS, FOV)
lidar_specs	LiDAR Specs	Text	LiDAR specifications (range, points/sec, channels)
force_torque_sensor	Force/Torque Sensor	Text	Force-torque sensor specs (6-axis, sensitivity)
form_factor	Form Factor	Text	Physical form factor description

14. AI & Autonomy

Artificial intelligence capabilities and autonomous behavior.

Field	Display Label	Unit/Type	Description
autonomy	Autonomy Level	Single code	Autonomy level L0–L5 (see codes in Section 1)
autonomy_level_text	Autonomy Description	Text	Detailed autonomy level explanation
ai_capabilities	AI Capabilities	Text	Free-text AI capability description
ai_capabilities_list	AI Capabilities List	List of codes	AI features (computer vision, ML, NLP, SLAM, path optimization)
machine_learning_enabled	ML Enabled	Yes/No	Uses machine learning on-device or in-cloud
edge_computing	Edge Computing	Text	On-board compute (NVIDIA Jetson, Intel NUC)
learning_curve	Learning Curve	Single code	Time to learn operation (<1hr, 1 day, 1–2 weeks, etc.)
skill_level_required	Skill Level	Single code	Required operator skill (None, Basic, Expert, Certified)
training_available	Training Available	Text	Available training programs and certification

15. Hardware & Actuators

Processors, actuators, end effectors, and mechanical components.

Field	Display Label	Unit/Type	Description
processor_list	Processors	List of codes	Processor types (Intel, ARM, NVIDIA Jetson, FPGA)
actuator_type_list	Actuators	List of codes	Actuator types (servo, stepper, linear, pneumatic, hydraulic)
motor_specs	Motor Specs	Text	Motor specifications (type, torque, RPM)
gripper_type	Gripper Type	Text	Gripper type (parallel, vacuum, magnetic, soft)
end_effector_type	End Effector	Text	Tool/end effector type (welding torch, spray gun)
end_effector_compatibility	EE Compatibility	Text	Compatible end effectors and interfaces
tool_interface	Tool Interface	Text	Mechanical tool interface standard (ISO 9409)
drive_type	Drive Type	Text	Drive mechanism (direct drive, harmonic, belt)

16. Features & Capabilities

Key features, unique capabilities, and design characteristics.

Field	Display Label	Unit/Type	Description
best_features	Best Features	Text	Top features highlighted by manufacturer
unique_features	Unique Features	Text	Distinctive/unique features
innovation_highlights	Innovation	Text	Key innovation highlights
collaborative_features	Collaborative	Text	Collaborative features for human-robot interaction
modular_design	Modular Design	Text	Modular design capability and reconfigurability
customization_options	Customization	Text	Available customization options
upgrade_options	Upgrade Options	Text	Available hardware/software upgrades
interoperability	Interoperability	Text	Interoperability with other systems and robots

17. Installation & Space

Installation requirements, space needs, and setup.

Field	Display Label	Unit/Type	Description
installation_type_list	Installation Types	List of codes	Mounting/installation methods (floor, ceiling, wall, cart, rail)
space_required_class	Space Required	Single code	Minimum space needed (Desktop, <1m ² , 1–4m ² , Room, Outdoor)
setup_time	Setup Time	Single code	Time to set up (<30min, 2hrs, 1–3 days, Professional)
cable_management	Cable Management	Text	Cable management system description
mod_friendly	Mod Friendly	Single code	Modification friendliness (Open, Encouraged, Limited, Locked)

18. Commercial & Pricing

Pricing, warranty, ROI, and availability information.

Field	Display Label	Unit/Type	Description
price_amount_usd	Price	USD	Unit price
price_range_min_usd	Price Range (Min)	USD	Minimum price range
price_range_max_usd	Price Range (Max)	USD	Maximum price range
pricetier_text	Price Tier (Text)	Text	Price tier classification in words
pricetier	Price Tier (Code)	Single code	Coded price tier (T1=<\$100 to T12=>\$1M)
warranty_months	Warranty	Single code	Warranty period (3/6/12/24/36/48/60 months, Lifetime)
roi	ROI Estimate	Single code	Return on investment estimate (<6mo to >5yr)
lead_time	Lead Time	Single code	Delivery lead time (In Stock to >12 months)
availability	Availability	Text	General availability status and regions
available_regions_text	Available Regions	Text	Regions/countries where available
leasing_available	Leasing	Yes/No	Whether leasing/rental options exist
robot_as_a_service	RaaS	Yes/No	Available as Robot-as-a-Service subscription

19. Support & Maintenance

Maintenance, spare parts, training, and support services.

Field	Display Label	Unit/Type	Description
maintenance_interval	Maint. Interval	Single code	Recommended interval (Monthly, Quarterly, Annual, None)
calibration_interval	Calibration	Text	How often calibration is needed
maintenance_requirements	Maint. Requirements	Text	Required maintenance tasks (lubrication, belts, calibration)
consum_req_list	Consumables	List of codes	Required consumables (filters, brushes, lubricants, belts)
spare_parts_avail	Spare Parts	Single code	Spare parts availability (Readily Available, OEM Only, Limited)
spare_parts_availability	Spare Parts Detail (Text)	Text	Detailed spare parts availability info
support_types_list	Support Types	List of codes	Support options (email, phone, on-site, 24/7, SLA)
service_option_list	Service Options	List of codes	Service plans (preventative, premium, extended warranty)
training_list	Training Programs	List of codes	Available training (on-site, online, certification, VR)
demo_avail_list	Demo Availability	List of codes	Demo options (showroom, video, free trial, rental)
manual_avail	Manual Available	Single code	User manual availability (Free Download, Registration, Physical)

20. Applications & Use Cases

Target applications, industries, advantages, and limitations.

Field	Display Label	Unit/Type	Description
typical_use_cases	Use Cases	Text	Primary applications (palletizing, welding, floor cleaning)
application_examples	Examples	Text	Specific application examples with context
industries	Industries	Text	Target industries (automotive, food & beverage, logistics)
user_demographic_list	User Demographics	List of codes	Target users (Enterprise, SMB, Home, Research, Education)
competitive_advantages	Advantages	Text	Competitive advantages over alternatives
limitations	Limitations	Text	Known limitations or constraints
documentation_language	Doc Languages	Text	Languages documentation is available in

21. Certifications & Standards

Quality, environmental, and industry-specific certifications (manufacturer level).

Field	Display Label	Unit/Type	Description
certifications	Certifications	Text	General certifications held
quality_certifications	Quality Certs	Text	Quality certifications (ISO 9001, etc.)
standards_compliance	Standards	Text	Standards compliance (ISO, IEC, ANSI)
environmental_certifications	Environmental Certs	Text	Environmental certifications (RoHS, WEEE)
precision_class	Precision Class	Text	Precision classification standard

22. Ratings & Metrics

Subjective ratings and evaluation metrics.

Field	Display Label	Unit/Type	Description
ease_of_use_rating	Ease of Use	Number	Ease of use rating (1–10 scale)
flexibility_rating	Flexibility	Number	Flexibility rating (1–10 scale)
productivity_rating	Productivity	Number	Productivity rating (1–10 scale)
integration_complexity	Integration	Number	Integration complexity rating (1–10 scale)

23. Manufacturer & Origin

Manufacturer identification and location.

Field	Display Label	Unit/Type	Description
manufacturer_location	Mfr Location	Text	Manufacturer headquarters/factory location
manufacturer_id	Manufacturer ID	Text	Internal manufacturer identifier
expected_lifetime	Expected Lifetime	Text	Expected service lifetime (years)
technology_generation	Tech Generation	Text	Technology generation number or name
future_roadmap	Future Roadmap	Text	Future development plans and roadmap

24. Research & Popularity

Research activity, popularity metrics, and metadata.

Field	Display Label	Unit/Type	Description
research_papers_count	Research Papers	Number	Number of academic papers citing this robot
research_collaborations	Collaborations	Text	Research collaborations and partnerships
patent_technologies	Patents	Text	Patented technologies used in this robot

Appendix A: Data Types

Type	Format	Examples
Text	Free-form string	"ABB IRB 1400", "Aluminum alloy"
Number	Numeric value	25.5, 1200, 6
URL	Full URL	"https://manufacturer.com/product"
Boolean	true/false	yes/no
Code	Predefined code string	"PRO", "ARM", "L3"
List	Array of strings or codes	["WiFi", "Bluetooth", "5G"]
Yes/No	Text boolean	"Yes", "No"
JSON Array	JSON array of objects	[{"url": "...", "primary": true}]
Date	ISO date or year	2024, 2025-01-15
Image Object	JSON object	{ "url": "https://example.com/robot-front.jpg", "primary": true, "caption": "Front view of robot", "source": "Manufacturer", "resolution": "1920x1080" }
Images Array	Array of Image Objects	[{ "url": "https://example.com/front.jpg", "primary": true }, { "url": "https://example.com/side.jpg" }]
Video Object	JSON object	{ "url": "https://youtube.com/watch?v=xyz", "type": "demo", "duration_seconds": 85, "platform": "YouTube" }
Videos Array	Array of Video Objects	[{ "url": "https://youtube.com/watch?v=xyz", "type": "demo" }]

Appendix B: Unit Conventions

Measurement	Unit	Field Suffix	Notes
Weight	Kilograms	_kg	Always metric
Length/Distance	Millimeters	_mm	Reach, dimensions, repeatability
Speed	Meters/second	_ms	Mobile speed
Power	Watts	_w	Consumption
Energy	Kilowatt-hours	_kwh	Battery capacity
Time	Hours or minutes	_hours, _minutes	Battery life, charge time
Temperature	Celsius	_celsius, _c	Operating range
Noise	Decibels	_db	Acoustic output
Price	US Dollars	_usd	Commercial pricing
Frequency	Hertz	_hz	Control and power frequency
Altitude	Meters	N/A	Operating altitude
Precision	Arc minutes	_arcmin	Backlash measurement

Appendix C: RoboCata Code Format

Each robot receives a unique identification code:

RBC - TT - CC - XXXXXXXX

Part	Name	Description
RBC	Prefix	Robot Catalog identifier
TT	Type	Physical form/morphology code (2 letters)
CC	Category	Application sector code (2 letters)
XXXXXX	Robot ID	Unique robot identifier (alphanumeric)

Examples:

Robot	Code	Breakdown
ABB IRB 1400	RBC-AR-PD-IRB1400	Arm + Production
Boston Dynamics Spot	RBC-QU-IF-SPOTDOG	Quadruped + Infrastructure
iRobot Roomba i7	RBC-MO-HC-ROOMBI7	Mobile + Home Cleaning
DJI Agras T30	RBC-AE-AG-AGRAST30	Aerial + Agricultural

Appendix D: Coded Option Fields Summary

The following fields use predefined option codes. Each code maps to a human-readable label. For the full list of valid codes per field, read Appendix E within this document. When both a *_list coded field and a free-text descriptive field exist, the coded field shall be considered authoritative for structured comparison. The text field may provide supplemental explanation but shall not introduce contradictory classification.

Field	Type	Options	Description
actuator_type_list	List of codes	14	Actuator types (SERVO, BLDC, LINEAR, etc.)
ai_capabilities_list	List of codes	26	AI capabilities (CV, ML, NLP, etc.)
mobility_primary	Single code	12	Mobility types (WHEEL, STAT, AERIAL, etc.)
api_doc	Single code	7	API documentation level
autonomy	Single code	6	Autonomy level L0–L5
bat_type	Single code	20	Battery chemistry types
category	Single code	29	Application category codes
child_safe	Single code	5	Child safety rating
collaboration	Single code	6	Collaboration mode
connectivity_list	List of codes	25	Connectivity protocols
consum_req_list	List of codes	17	Required consumables
control_architecture	Single code	8	Control architecture type
control_interface_list	List of codes	18	Control interfaces
control_programming_list	List of codes	19	Programming methods
degrees_freedom	Single code	9	Degrees of freedom (1–7+)
demo_avail_list	List of codes	19	Demo availability options
domain	Single code	3	Market domain (IND/PRO/HOME)
dynamic_model	Single code	5	Dynamic model format
energy_rating	Single code	8	Energy efficiency (A+++ to D)
environment_type_list	List of codes	24	Environment suitability
info_status	Single code	6	Product status
installation_type_list	List of codes	21	Installation methods
interaction	Single code	6	Required interaction level
ip_rating	Single code	13	IP protection rating
lead_time	Single code	8	Delivery lead time
learning_curve	Single code	7	Time to learn operation
maintenance_interval	Single code	7	Maintenance frequency
manual_avail	Single code	5	Manual availability
mod_friendly	Single code	5	Modification friendliness
multifloor	Single code	3	Multi-floor capability
navigation_list	List of codes	22	Navigation methods
obstacle	Single code	3	Obstacle detection
operating_system_list	List of codes	17	Operating systems
pet_safe	Single code	4	Pet safety rating

powersource	Single code	13	Primary power source
pricetier	Single code	14	Price tier code
processor_list	List of codes	21	Processor types
roi	Single code	8	ROI estimate timeframe
ros_package_list	List of codes	30	ROS packages & compatibility
safety_compliance_list	List of codes	16	Safety compliance standards
safety_feat_list	List of codes	21	Safety features
scale	Single code	13	Physical size scale
sensor_list	List of codes	36	Sensor types
service_option_list	List of codes	19	Service plan options
setup_time	Single code	7	Setup time required
skill_level_required	Single code	6	Required operator skill
smart_home_list	List of codes	18	Smart home integrations
software_platform	Single code	16	Software platform/OS
space_required_class	Single code	9	Space requirement
spare_parts_avail	Single code	6	Spare parts availability
support_types_list	List of codes	17	Support types available
sys_kinematic	Single code	13	Kinematic structure
sys_lang_list	List of codes	30	UI languages
tech_sdk	Single code	6	SDK availability
tech_speedunit	Single code	8	Speed unit type
throughput_units	Single code	8	Throughput measurement unit
training_list	List of codes	20	Training programs
type	Single code	15	Robot type/morphology
user_demographic_list	List of codes	22	Target user demographics
vision_system_list	List of codes	23	Vision system capabilities
warranty_months	Single code	9	Warranty period

Appendix E: Complete Option Code Reference

This appendix lists every valid code and its human-readable label for all 70 coded option fields in the RoboCata V1 schema. These are the values that should be used when populating the corresponding fields.

actuator_type_list (14 options)

Code	Label	Description
AC	AC Motor	Industrial grade, high power applications
BLDC	Brushless DC Motor	High efficiency, low maintenance, good for continuous operation
DC	DC Motor	Simple brushed DC motor, basic speed control
DIRECT_DRIVE	Direct Drive Motor	No gearbox, motor directly coupled to load
HARMONIC	Harmonic Drive	High gear reduction with zero backlash
HYDRAULIC	Hydraulic Actuator	High force output using pressurized fluid, heavy-duty applications
LINEAR	Linear Actuator	Direct linear motion without rotation conversion
NONE	Not Applicable	No actuators present or not specified
PIEZO	Piezoelectric Actuator	Ultra-precise nano-positioning using piezoelectric effect
PNEUMATIC	Pneumatic Actuator	Compressed air driven, fast and clean for light loads
SERVO	Servo Motor	High precision position control with feedback, common in robotics
SMA	Shape Memory Alloy	Temperature-activated shape change for compact actuation
STEPPER	Stepper Motor	Precise incremental movement without feedback, cost-effective
VOICE_COIL	Voice Coil Motor	Fast, precise linear motion for small displacements

ai_capabilities_list (26 options)

Code	Label	Description
ADAPTIVE	Adaptive Behavior	Adapt to changing conditions
ANOMALY_AI	Anomaly Detection	AI-based anomaly identification
CLOUD_AI	Cloud AI	Cloud-based AI processing
CV	Computer Vision	AI-powered visual processing
DECISION_TREE	Decision Trees	Rule-based decision making
DL	Deep Learning	Deep neural network capabilities
EDGE_AI	Edge AI	On-device AI processing
EMOTION_AI	Emotion Recognition	Detect and respond to emotions
EXPERT_SYS	Expert System	Knowledge-based expert system
FEDERATED	Federated Learning	Distributed learning across devices
FUZZY_LOGIC	Fuzzy Logic	Fuzzy logic control systems
GENERATIVE	Generative AI	Generate new content or solutions
ML	Machine Learning	General machine learning algorithms
NONE	Not Applicable	No AI/ML capabilities

NEURAL_NET	Neural Networks	Artificial neural network processing
NLP	Natural Language Processing	Understanding and generating natural language
PATH_OPT	Path Optimization	Optimize navigation and motion paths
PERCEPTION	Perception AI	Advanced sensory perception
PLANNING	AI Planning	Automated planning and scheduling
PRED_MAINT	Predictive Maintenance	Predict maintenance needs from data
REASONING	Reasoning	Logical reasoning capabilities
RL	Reinforcement Learning	Learn from trial and error
SWARM_AI	Swarm Intelligence	Collective behavior algorithms
TRANSFER_LEARN	Transfer Learning	Apply pre-trained models
VOICE_RECOG	Voice Recognition	Speech to text conversion
VOICE_SYNT	Voice Synthesis	Text to speech generation

api_doc (7 options)

Code	Label	Description
BASIC	Basic API	Simple command API with limited functionality
EXCEL	Excellent Documentation	Well-documented API with examples and support
GRAPH	GraphQL API	GraphQL API interface available
LTD	Limited Documentation	API exists but documentation is minimal
NONE	No API	No API available for this robot
REST	REST API	RESTful web service API available
SDK	SDK - Multiple Languages	Comprehensive SDK supporting multiple programming languages

autonomy (6 options)

Code	Label	Description
L0	0 - Manual control only	Requires constant human control with no autonomous features
L1	1 - Assisted operation	Basic assistance features but requires human operation
L2	2 - Partial autonomy	Can perform some tasks autonomously but needs human oversight
L3	3 - Conditional autonomy	Autonomous in specific conditions or environments
L4	4 - High autonomy	Mostly autonomous, human intervention only in edge cases
L5	5 - Full autonomy	Completely autonomous operation without human intervention

bat_type (20 options)

Code	Label	Description
AC_POWERED	AC Powered	Mains power only, no battery
AGM	AGM	Absorbed glass mat battery
ALKALINE	Alkaline	Standard alkaline batteries
CUSTOM_PACK	Custom Pack	Proprietary battery design

EXTERNAL	External Power	External power source only
FUEL_CELL	Fuel Cell	Hydrogen fuel cell
GEL	Gel Battery	Gel cell battery
HYBRID_BATT	Hybrid Battery	Combination battery system
LEAD_ACID	Lead Acid	Traditional lead-acid battery
LIFEPO4	LiFePO4	Lithium iron phosphate battery
LIPO	LiPo	Lithium polymer battery
LION	Lithium-ion	Standard lithium-ion battery
NONE	Not Applicable	No battery system
NICD	NiCd	Nickel-cadmium battery
NIMH	NiMH	Nickel-metal hydride battery
POE_POWERED	PoE Powered	Power over Ethernet only
SOLID_STATE	Solid State	Solid state battery technology
SUPER_CAP	Supercapacitor	Supercapacitor energy storage
SWAPPABLE	Swappable Pack	Hot-swappable battery pack
ZINC_AIR	Zinc-Air	Zinc-air battery

category (29 options)

Code	Name	Description
AGR	Agricultural	Farming, harvesting, crop management
CARE	Personal Care	Health monitoring, personal assistance
CHILD	Childcare & Education	Child supervision, home education
CLEAN	Commercial Cleaning	Office, industrial, public space
COMP	Companion	Social, emotional companionship
CONST	Construction & Building	Building, demolition, site work
COOK	Kitchen & Cooking	Food preparation, cooking
EDU	Educational	Teaching, training, STEM
ENT	Entertainment & Gaming	Fun, games, recreation
HCLEAN	Home Cleaning	Residential cleaning (vacuuming, mopping)
HEAVY	Heavy Industry	Mining, steel, foundry
HOSP	Hospitality & Food Service	Hotels, restaurants, food service
INFRA	Infrastructure & Utilities	Power, water, telecom maintenance
LAB	Laboratory & Research	Scientific research, lab automation
LAND	Landscaping & Grounds	Commercial landscaping
MED	Medical & Healthcare	Surgery, rehabilitation, patient care
OFF	Office & Business	Office automation, telepresence
PACK	Packaging & Logistics	Palletizing, sorting, warehouse
PROD	Production & Assembly	Manufacturing, assembly lines
QC	Quality Control	Inspection, testing, measurement
RET	Retail & Commerce	Store operations, customer service
SPORTH	Sports & Fitness (Home)	Home fitness, personal training
SPORTP	Sports (Professional)	Professional sports, training
SQH	Home Security	Residential security, patrol

SQP	Security (Professional)	Commercial/industrial security
TRANS	Transportation & Delivery	Delivery, logistics, last-mile
VET	Veterinary & Animal Care	Animal healthcare, livestock
WELD	Welding & Fabrication	Welding, cutting, metal work
YARD	Yard & Garden	Lawn care, garden maintenance

child_safe (5 options)

Code	Label	Description
CHILD	Yes - Designed for Children	Specifically designed as safe for children
NONE	Not Applicable	Not applicable (industrial/commercial use)
NOT	Not Safe for Children	Not safe for children
SUP	With Supervision	Requires adult supervision around children
YES	Yes – Safe	Safe design suitable for children

collaboration (6 options)

Code	Label	Description
FULL	Full Collaborative	Designed for direct human collaboration
HAND	Hand Guiding	Can be physically guided by human hands
NONE	Not Collaborative	Requires safety barriers, cannot work near humans
POWER	Power & Force Limited	Inherently safe through limited force
SPEED	Speed & Separation	Adjusts speed based on human proximity
STOP	Safety Monitored Stop	Stops when humans enter workspace

connectivity_list (25 options)

Code	Label	Description
4G_LTE	4G/LTE	Cellular 4G/LTE connectivity
5G	5G	5G cellular connectivity
BT	Bluetooth	Bluetooth wireless connection
BT_LE	Bluetooth LE	Bluetooth Low Energy for power efficiency
CAN	CAN Bus	Controller Area Network bus
DEVICENET	DeviceNet	Industrial network protocol
ETH	Ethernet	Wired Ethernet connection (RJ45)
ETHERCAT	EtherCAT	Real-time Ethernet fieldbus
IR	Infrared	Infrared communication
LORA	LoRa/LoRaWAN	Long-range low-power wireless
MODBUS	Modbus	Modbus RTU or TCP protocol
MQTT	MQTT	Message Queuing Telemetry Transport protocol
NONE	Not Connected	No connectivity options
NFC	NFC	Near Field Communication
OPCUA	OPC UA	Open Platform Communications Unified Architecture
PROFIBUS	PROFIBUS	Process field bus standard
PROFINET	PROFINET	Industrial Ethernet standard by Siemens
RS232	RS-232	Serial RS-232 communication

RS485	RS-485	Industrial RS-485 serial bus
USB	USB	USB connection for data and/or power
USB_C	USB-C	USB Type-C connection
WIFI	WiFi	Wireless WiFi connectivity (802.11)
WIFI6	WiFi 6	Latest WiFi 6/6E standard support
WIFI7	WiFi 7	Latest WiFi 7 standard support
ZIGBEE	Zigbee	Low-power mesh network protocol

consum_req_list (17 options)

Code	Label	Description
BAGS	Collection Bags	Dust or waste collection bags
BATTERIES	Batteries	Replaceable battery packs
BEARINGS	Bearings	Ball or roller bearings
BELTS	Belts	Drive belts require periodic replacement
BRUSHES	Brushes	Cleaning brushes wear and need replacement
CABLES	Cables	Wear cables that need replacement
CLEANING_SOL	Cleaning Solution	Liquid cleaning products
CUTTING	Cutting Tools	Blades, bits, cutting implements
FILTERS	Filters	Air, HEPA, or other filters need replacement
GRIPPER_TIPS	Gripper Tips	End effector consumable parts
LUBRICANTS	Lubricants	Oils, greases for maintenance
NONE	Not Applicable	No consumables required
PADS	Pads/Mops	Cleaning pads or mop heads
SEALS	Seals/Gaskets	Rubber seals and gaskets
SENSORS	Sensor Elements	Consumable sensor components
WEAR_PARTS	Wear Parts	General wear components
WELDING	Welding Supplies	Wire, tips, gas for welding robots

control_architecture (8 options)

Code	Label	Description
BEHAV	Behavior-based	Behavior-based robotics architecture
CENT	Centralized	Single central controller manages all functions
CLOUD	Cloud-based	Processing primarily in cloud servers
DIST	Distributed	Multiple controllers work together
EDGE	Edge Computing	Local AI processing at the edge
HIER	Hierarchical	Layered control with multiple levels
HYBRID	Hybrid	Combination of control architectures
UNK	Unknown	Control architecture not documented

control_interface_list (18 options)

Code	Label	Description
API	API Only	Programmatic control through API only
AR	AR Interface	Augmented reality control overlay

BLUETOOTH_CTL	Bluetooth Controller	Generic Bluetooth control device
CLI	Command Line	Command line interface for terminal control
GESTURE	Gesture Control	Hand gesture or body movement recognition
HMI_PANEL	HMI Panel	Industrial human-machine interface touchscreen
JOYSTICK	Joystick	Physical joystick or gamepad controller
MOBILE_ANDROID	Android App	Android mobile application
MOBILE_IOS	iOS App	Apple iOS mobile application
NONE	Not Applicable	No direct control interface
PC_SW	PC Software	Desktop computer software interface
PHYSICAL_BTN	Physical Buttons	On-device buttons and switches
REMOTE_RC	RC Remote	Traditional radio control remote
TEACH_PENDANT	Teach Pendant	Handheld programming device with physical controls
TOUCHSCREEN	Touchscreen	On-device touchscreen interface
VOICE	Voice Control	Speech recognition and voice commands
VR	VR Controller	Virtual reality interface for immersive control
WEB_IF	Web Interface	Browser-based control interface

control_programming_list (19 options)

Code	Label	Description
API_ONLY	API Only	Programming through API calls only
BLOCKLY	Blockly	Google Blockly visual programming
C	C Language	C programming language support
CPP	C++	C++ programming language support
CSHARP	C#	C# programming language support
GRAPHICAL	Graphical/Block	Visual programming with blocks or flowcharts
JAVA	Java	Java programming language support
LABVIEW	LabVIEW	National Instruments LabVIEW
LADDER	Ladder Logic	PLC-style ladder logic programming
MATLAB	MATLAB	MATLAB/Simulink programming
NONE	Not Programmable	Device is not user-programmable
NODE_RED	Node-RED	Flow-based development tool
PROPRIETARY	Proprietary	Manufacturer's custom programming method
PYTHON	Python	Python programming language support
ROS_PKG	ROS Package	ROS package and node development
SCRATCH	Scratch	MIT Scratch programming environment
SCRIPT	Script Language	Proprietary scripting language
SDK	SDK Available	Software development kit provided
TEACH_MODE	Teach Mode	Physical guidance programming by demonstration

degrees_freedom (9 options)

Code	Label	Description
NONE	Not Applicable	Not applicable, typically for mobile robots without arms
8P	8+	Eight or more axes, typically humanoid or snake robots

1	1	Single axis of movement, typically linear or rotational
2	2	Two independent axes of movement
3	3	Three axes, common in simple positioning systems
4	4	Four axes, often SCARA robots or simple arms
5	5	Five axes, less common but used in specific applications
6	6	Six axes, standard for full 3D positioning and orientation
7	7	Seven axes, adds redundancy for obstacle avoidance

demo_avail_list (19 options)

Code	Label	Description
CUSTOM_DEMO	Custom Demo	Customized demonstration
DEMO_UNIT	Demo Unit	Dedicated demo unit available
DIGITAL_TWIN	Digital Twin	Digital twin for virtual testing
FREE_TRIAL	Free Trial	Free trial period
LAB_VISIT	Lab Visit	Visit to demonstration lab
LIVE_DEMO	Live Demo	Live online demonstration
NONE	No Demo	No demonstration available
ONSITE_DEMO	On-site Demo	Demonstration at customer site
PILOT_PROGRAM	Pilot Program	Extended pilot deployment
POC	Proof of Concept	POC project available
RENTAL	Rental Program	Short-term rental for evaluation
SANDBOX	Sandbox Environment	Online sandbox for testing
SHOWROOM	Showroom Demo	Demo at vendor showroom
SIMULATION	Simulation Available	Software simulation for testing
TRADE_SHOW	Trade Show	Demo at trade shows/exhibitions
TRIAL	Money-back Trial	Purchase with return option
VIDEO_DEMO	Video Demo	Pre-recorded demonstration videos
VIRTUAL_DEMO	Virtual Demo	Interactive virtual demonstration
WEBINAR_DEMO	Webinar Demo	Demo during webinar sessions

domain (3 options)

Code	Label	Description
HOME	Home & Consumer	Robots for personal/household use by individual consumers
IND	Industrial & Manufacturing	Robots for production, assembly, heavy industry, warehousing
PRO	Professional & Services	Robots for business services, healthcare, agriculture, education, research

dynamic_model (5 options)

Code	Label	Description
CAD	Yes - STEP/CAD	CAD models in STEP or similar format available
NONE	Not available	No simulation model available

PROP	Yes - Proprietary	Proprietary format simulation model available
REQ	On Request	Model available upon request to manufacturer
URDF	Yes - URDF	Universal Robot Description Format model available

energy_rating (8 options)

Code	Label	Description
AX	A	Good energy efficiency
APX	A+	High energy efficiency
APPX	A++	Very high energy efficiency
APPPX	A+++	Highest energy efficiency rating
B	B	Above average energy efficiency
C	C	Average energy efficiency
D	D	Below average energy efficiency
NR	Not Rated	No official energy efficiency rating

environment_type_list (24 options)

Code	Label	Description
ALL_WEATHER	All Weather	Any weather conditions
CHEMICAL	Chemical	Chemical exposure environments
CLEANROOM	Clean Room	Cleanroom compatible
CORROSIVE	Corrosive	Corrosive chemical exposure
DUSTY	Dusty	Dusty or particulate environments
EXPLOSIVE	Explosive Atmosphere	Potentially explosive environments
EXTREME_TEMP	Extreme Temperature	Very high or low temperatures
FOOD_SAFE	Food Safe	Food processing environments
HAZARDOUS	Hazardous	Dangerous or hazardous areas
HIGH_TEMP	High Temperature	High temperature operation
INDOOR	Indoor	Standard indoor environments
LOW_TEMP	Low Temperature	Cold/freezer environments
MAGNETIC	Magnetic Field	Strong magnetic field areas
MARINE	Marine	Maritime/saltwater environments
OFFICE	Office	Standard office environment
OUTDOOR	Outdoor	Outdoor operation capable
PHARMA	Pharmaceutical	Pharmaceutical production areas
RADIATION	Radiation	Radiation exposure areas
SPACE	Space/Vacuum	Space or vacuum operation
STERILE	Sterile	Sterile medical/lab environments
UNDERGROUND	Underground	Mines, tunnels, underground
UNDERWATER	Underwater	Submersible operation
VIBRATION	High Vibration	High vibration environments
WET_HUMID	Wet/Humid	High moisture environments

info_status (6 options)

Code	Label	Description
DISC	Discontinued	Robot is no longer in production but may still be available as remaining stock or used
LIMITED	Limited Availability	Robot is produced in small quantities or only available to specific customers or regions
PREORD	Pre-order	Robot has been announced and can be ordered but is not yet shipping to customers
PROD	In Production	Robot is currently being manufactured and is available for purchase through normal channels
PROTO	Prototype	Robot exists as a working prototype or demonstration unit but is not yet commercially available
SOON	Coming Soon	Robot has been officially announced with planned release but cannot yet be ordered

installation_type_list (21 options)

Code	Label	Description
CART_MOUNT	Cart Mounted	Mounted on mobile cart
CEILING_MOUNT	Ceiling-mounted	Suspended from ceiling
CLAMP_MOUNT	Clamp Mount	Clamped to existing structure
CRANE_MOUNT	Crane Mounted	Mounted on crane or boom
CUSTOM_FOUND	Custom Foundation	Requires custom foundation
FLOOR_MOUNT	Floor-mounted	Bolted or fixed to floor
FREE_STAND	Free-standing	Self-supporting, no mounting required
GANTRY	Gantry Mounted	Mounted on gantry system
INTEGRATED	Integrated	Built into larger system
MAGNETIC	Magnetic Mount	Magnetic mounting system
MOBILE	Mobile/Portable	Wheeled or easily portable
MODULAR	Modular System	Modular mounting system
NONE	No Mounting	No mounting required
PEDESTAL	Pedestal Mount	Mounted on pedestal or column
POLE_MOUNT	Pole Mounted	Mounted on pole or mast
RACK_MOUNT	Rack Mounted	Standard rack mounting
RAIL_SYSTEM	Rail System	Mounted on rail or track system
SUSPENDED	Suspended	Hanging or suspended mounting
TABLE_MOUNT	Table/Bench	Mounted on table or workbench
VEHICLE_MOUNT	Vehicle Mounted	Mounted on vehicle
WALL_MOUNT	Wall-mounted	Mounted on wall surface

interaction (6 options)

Code	Label	Description
2HR	1-2 hours/day	Needs 1 to 2 hours of daily operation
30MIN	5-30 minutes/day	Needs 5 to 30 minutes of daily interaction
5MIN	<5 minutes/day	Requires less than 5 minutes daily attention
60MIN	30-60 minutes/day	Requires 30 to 60 minutes daily

AUTO	Fully Autonomous	Operates independently without daily interaction
CONST	Constant Monitoring	Requires continuous human supervision

ip_rating (13 options)

Code	Label	Description
IP20	IP20	Protected against solid objects >12.5mm, no water protection
IP30	IP30	Protected against solid objects >2.5mm, no water protection
IP40	IP40	Protected against solid objects >1mm, no water protection
IP42	IP42	Protected against objects >1mm, dripping water at 15°
IP44	IP44	Protected against objects >1mm, splashing water
IP54	IP54	Dust protected, splash protected
IP55	IP55	Dust protected, water jet protected
IP65	IP65	Dust tight, protected against water jets
IP66	IP66	Dust tight, protected against powerful water jets
IP67	IP67	Dust tight, protected against temporary immersion
IP68	IP68	Dust tight, protected against continuous immersion
IP69K	IP69K	Dust tight, protected against high pressure/temperature water
NR	Not Rated	No IP rating assigned or tested

lead_time (8 options)

Code	Label	Description
12M	6-12 months	Delivery within 6-12 months
2MX	1-2 months	Delivery within 1-2 months
2WX	1-2 weeks	Delivery within 1-2 weeks
3MX	2-3 months	Delivery within 2-3 months
4WX	2-4 weeks	Delivery within 2-4 weeks
6MX	3-6 months	Delivery within 3-6 months
12P	>12 months	Delivery takes more than 12 months
STOCK	In Stock	Available immediately from inventory

learning_curve (7 options)

Code	Label	Description
1D	1 day	Takes about a day to learn
1H	<1 hour	Can be learned in less than an hour
1M	>1 month	Takes more than a month to become proficient
2W	1-2 weeks	Takes one to two weeks to master
4H	1-4 hours	Requires a few hours of learning
4W	2-4 weeks	Requires two to four weeks of practice
5D	2-5 days	Requires several days of training

maintenance_interval (7 options)

Code	Label	Description
2YR	Every 2 Years	Maintenance every two years
ANN	Annual	Needs yearly maintenance
MON	Monthly	Requires monthly maintenance
NEED	As Needed	Condition-based maintenance when required
NONE	None Required	Maintenance-free operation
QTR	Quarterly	Needs maintenance every 3 months
SEMI	Semi-Annual	Requires maintenance twice per year

manual_avail (5 options)

Code	Label	Description
FREE	Free Download	Manual freely available for download without registration
NONE	Not Available	No manual or documentation available
PHYS	Included Physical	Physical manual included with product
PURCH	Purchase Only	Manual must be purchased separately
REG	Registration Required	Must register account to access manual

mobility_primary and mobility_secondary_list (12 options)

Code	Label	Description
AERIAL	Aerial/Flying	Robot flies through the air
AQUA	Aquatic/Swimming	Robot moves through water
BIPED	Legged (Bipedal)	Robot walks on two legs like humans
GANTRY	Gantry	Robot moves on overhead gantry system
HEX	Legged (Hexapod)	Robot walks on six legs
HYBRID	Hybrid	Robot combines multiple mobility methods
LEGGED	Legged (Other)	Robot walks on legs but not 2, 4, or 6
QUAD	Legged (Quadruped)	Robot walks on four legs
RAIL	Rail-mounted	Robot moves along fixed rails or tracks
STAT	Stationary/Fixed	Robot is permanently fixed in one location
TRACK	Tracked	Robot moves on continuous tracks like a tank
WHEEL	Wheeled	Robot moves using wheels

mod_friendly (5 options)

Code	Label	Description
ENC	Encouraged	Manufacturer encourages modifications and customization
LOCK	Locked/Proprietary	Closed system, modifications void warranty or impossible
LTD	Limited Modifications	Some modifications possible but restricted
MOD	Moderate - Warranty Void	Modifications possible but void warranty
OPEN	Open Hardware	Fully open hardware design with published schematics

multifloor (3 options)

Code	Label	Description
NONE	Not applicable	Not applicable for this robot type
SINGLE	Single Floor	Limited to single floor operation
MULTI	Multi Floor	Can navigate between floors independently

navigation_list (22 options)

Code	Label	Description
BLUETOOTH	Bluetooth Beacons	Indoor navigation using Bluetooth beacons
DGPS	Differential GPS	Enhanced GPS with ground-based corrections
GPS	GPS Navigation	Global positioning system for outdoor navigation
HYBRID	Hybrid Navigation	Combination of multiple navigation methods
IMU	IMU-Based	Inertial measurement unit for orientation and movement
LIDAR_2D	2D LiDAR	Navigation using 2D laser scanning
LIDAR_3D	3D LiDAR	Navigation using 3D point cloud from LiDAR
LINE_FOLLOW	Line Following	Following painted or magnetic lines on floor
MANUAL	Manual Control	Human-operated without autonomous navigation
MARKER	Marker-Based	Navigation using fiducial markers or QR codes
NONE	Not Applicable	Navigation not relevant for this robot type
ODOMETRY	Wheel Odometry	Dead reckoning using wheel encoder data
RAIL	Rail-Guided	Movement constrained to physical rails or tracks
RTK_GPS	RTK GPS	Real-time kinematic GPS for centimeter accuracy
SLAM_2D	2D SLAM	Simultaneous localization and mapping in 2D plane
SLAM_3D	3D SLAM	Full 3D simultaneous localization and mapping
TEACH_PLAYBACK	Teach & Playback	Recorded and repeated path navigation
UWB	Ultra-Wideband	Indoor positioning using UWB beacons
VISION	Vision-Based	Computer vision for feature-based navigation
VSLAM	Visual SLAM	SLAM using camera vision as primary sensor
WIFI	WiFi Positioning	Location estimation using WiFi signal strength
WIRE	Wire-Guided	Following buried wire with electromagnetic signal

obstacle (3 options)

Code	Label	Description
LTD	Limited obstacle detection	Basic obstacle detection or works only in certain conditions
NONE	No obstacle detection	No obstacle detection or avoidance features
EXT	Extensive obstacle detection	Full obstacle detection and avoidance capabilities

operating_system_list (17 options)

Code	Label	Description
ANDROID	Android	Android OS for mobile robot platforms
BARE_METAL	Bare Metal	No OS, direct hardware programming
FREERTOS	FreeRTOS	Real-time OS for microcontrollers and embedded systems

IOS	iOS	Apple iOS for robot control interfaces
LINUX_RT	Linux Real-Time	Real-time Linux kernel for deterministic control
NONE	Not Applicable	OS not specified or not relevant
PROPRIETARY	Proprietary OS	Manufacturer's custom operating system
QNX	QNX	Real-time Unix-like OS for embedded systems
RASPBIAN	Raspbian	Raspberry Pi optimized Debian Linux
ROS1	ROS 1	Robot Operating System version 1, widely adopted middleware
ROS2	ROS 2	Robot Operating System version 2, improved real-time and security
UBUNTU	Ubuntu Linux	Standard Ubuntu distribution, common base for ROS
VXWORKS	VxWorks	Commercial RTOS for safety-critical applications
WINDOWS	Windows	Microsoft Windows OS, typically for user interfaces
WINDOWS_IOT	Windows IoT	Windows IoT Core for embedded systems
YOCTO	Yocto Linux	Custom embedded Linux built with Yocto Project
OTHER	Other	Other

pet_safe (4 options)

Code	Label	Description
NONE	Not Applicable	Not applicable
NOT	Not Pet Safe	Not safe for pets
PREC	With Precautions	Safe with proper precautions and supervision
YES	Pet Safe	Designed to be safe around pets

powersource and powersource_secondary_list (13 options)

Code	Label	Description
AC110	AC Mains (110V)	Powered by 110V AC electrical outlet (North America standard)
AC220	AC Mains (220V/230V)	Powered by 220V/230V AC electrical outlet (Europe/Asia standard)
AC380	AC Mains (380V/3-phase)	Industrial 3-phase power supply
DC	DC Power Supply	Direct current power supply
FUEL	Fuel Cell	Hydrogen or other fuel cell technology
HYBRID	Hybrid	Combination of multiple power sources
HYDR	Hydraulic	Hydraulic fluid powered
LEAD	Battery (Lead-acid)	Lead-acid rechargeable battery
LION	Battery (Li-ion)	Lithium-ion rechargeable battery
LIPO	Battery (Li-Po)	Lithium-polymer rechargeable battery
NIMH	Battery (NiMH)	Nickel-metal hydride rechargeable battery
PNEUM	Pneumatic	Compressed air powered
SOLAR	Solar	Solar panels for power generation

pricetier (14 options)

Code	Label	Description
NONE	Not applicable	Not applicable (for instance, prototype
QUOTE	Quote Only	Price only available upon request
T1X	<\$100	Under 100 US dollars
T10	\$250K-500K	Between 250,000 and 500,000 dollars
T11	\$500K-1M	Between 500,000 and 1 million dollars
T12	>\$1M	Over 1 million dollars
T2X	\$100-500	Between 100 and 500 dollars
T3X	\$500-1K	Between 500 and 1,000 dollars
T4X	\$1K-5K	Between 1,000 and 5,000 dollars
T5X	\$5K-10K	Between 5,000 and 10,000 dollars
T6X	\$10K-25K	Between 10,000 and 25,000 dollars
T7X	\$25K-50K	Between 25,000 and 50,000 dollars
T8X	\$50K-100K	Between 50,000 and 100,000 dollars
T9X	\$100K-250K	Between 100,000 and 250,000 dollars

processor_list (21 options)

Code	Label	Description
ARM_A53	ARM Cortex-A53	Efficient 64-bit ARM processor for embedded systems
ARM_A57	ARM Cortex-A57	Performance-oriented 64-bit ARM processor
ARM_A72	ARM Cortex-A72	High-performance 64-bit ARM processor
ARM_M4	ARM Cortex-M4	Microcontroller with DSP capabilities for real-time control
ARM_M7	ARM Cortex-M7	High-performance microcontroller for embedded systems
DSP	DSP Processor	Digital signal processor for real-time signal processing
ESP32	ESP32	Espressif dual-core processor with WiFi/Bluetooth
FPGA	FPGA	Field-programmable gate array for custom logic
INTEL_ATOM	Intel Atom	Low-power Intel processor for embedded applications
INTEL_I3	Intel Core i3	Entry-level Intel processor for basic computing needs
INTEL_I5	Intel Core i5	Mid-range Intel processor, good balance of power and efficiency
INTEL_I7	Intel Core i7	High-performance Intel processor for complex computing
INTEL_XEON	Intel Xeon	Server-grade processor for heavy computational loads
NONE	Not Applicable	Processor type not specified or not relevant
NVIDIA_JETSON	NVIDIA Jetson	GPU-accelerated ARM processor for AI applications
NVIDIA_ORIN	NVIDIA Orin	Latest generation AI processor for robotics
NVIDIA_XAVIER	NVIDIA Xavier	Advanced AI computing platform for autonomous machines
PROPRIETARY	Proprietary CPU	Custom or undisclosed processor architecture
RPI4	Raspberry Pi 4	Broadcom BCM2711, popular for hobby and education
RPI5	Raspberry Pi 5	Broadcom BCM2712, latest Raspberry Pi processor
STM32	STM32	STMicroelectronics ARM-based microcontroller family

roi (8 options)

Code	Label	Description
12M	6-12 months	ROI achieved in 6 to 12 months
18M	12-18 months	Payback period of 12 to 18 months
24M	18-24 months	ROI in 18 to 24 months
3YR	2-3 years	Return on investment in 2 to 3 years
5YR	3-5 years	ROI achieved in 3 to 5 years
6M	<6 months	Return on investment in less than 6 months
NONE	Not applicable	ROI not applicable for this product type
OVER	>5 years	Payback period exceeds 5 years

ros_package_list (30 options)

Code	Label	Description
CONTROL	ROS Control	ros_control framework
CUSTOM_PKG	Custom Packages	Proprietary ROS packages
DIAGNOSTICS	Diagnostics	ROS diagnostics support
DRIVERS	ROS Drivers	Hardware driver packages
GAZEBO	Gazebo Models	Gazebo simulation models
IGNITION	Ignition Gazebo	Ignition Gazebo support
INDUSTRIAL	ROS Industrial	ROS-Industrial packages
MOVEIT	Movelit Compatible	Movelit motion planning framework
MOVEIT2	Movelit2 Compatible	Movelit2 for ROS2
NONE	No ROS Support	Not compatible with ROS
NAV_STACK	Navigation Stack	ROS navigation stack compatible
NAV2	Nav2	ROS2 Navigation stack
PERCEPTION	Perception Stack	ROS perception packages
ROS1_KINETIC	ROS1 Kinetic	ROS1 Kinetic Kame support
ROS1_MELODIC	ROS1 Melodic	ROS1 Melodic Morenia support
ROS1_NOETIC	ROS1 Noetic	ROS1 Noetic Ninjemys support
ROS2_CONTROL	ROS2 Control	ros2_control framework
ROS2_DASHING	ROS2 Dashing	ROS2 Dashing Diademata support
ROS2_ELOQUENT	ROS2 Eloquent	ROS2 Eloquent Elusor support
ROS2_FOXY	ROS2 Foxy	ROS2 Foxy Fitzroy support
ROS2_GALACTIC	ROS2 Galactic	ROS2 Galactic Geochelone support
ROS2_HUMBLE	ROS2 Humble	ROS2 Humble Hawksbill support
ROS2_IRON	ROS2 Iron	ROS2 Iron Irwini support
ROS2_JAZZY	ROS2 Jazzy	ROS2 Jazzy Jalisco support
RVIZ	RViz Compatible	RViz visualization support
RVIZ2	RViz2 Compatible	RViz2 for ROS2
SLAM_TOOLBOX	SLAM Toolbox	SLAM toolbox integration
TF	TF/TF2	Transform library support
URDF	URDF Available	URDF robot description
XACRO	Xacro Files	Xacro macro files

safety_compliance_list (16 options)

Code	Label	Description
AEC_Q100	AEC-Q100	Automotive electronics quality standard
ATEX	ATEX	Explosive atmospheres directive compliant
FDA	FDA Approved	US Food and Drug Administration approved
FOOD_EU	Food Grade (EU)	EU food contact regulation compliant
FOOD_FDA	Food Grade (FDA)	FDA food contact compliant materials
GMP	GMP	Good Manufacturing Practice compliant
HACCP	HACCP	Hazard Analysis Critical Control Points
ISO1	Cleanroom ISO 1	ISO 14644-1 Class 1 cleanroom compatible
ISO3	Cleanroom ISO 3	ISO 14644-1 Class 3 cleanroom compatible
ISO5	Cleanroom ISO 5	ISO 14644-1 Class 5 cleanroom compatible
ISO7	Cleanroom ISO 7	ISO 14644-1 Class 7 cleanroom compatible
MDC_I	Medical Device Class I	FDA Class I medical device
MDC_II	Medical Device Class II	FDA Class II medical device
MDC_III	Medical Device Class III	FDA Class III medical device
MIL_STD	MIL-STD	Military standard specification compliant
NONE	Not Applicable	No specific industry compliance

safety_feat_list (21 options)

Code	Label	Description
AUDIO_WARN	Audio Warning	Audible alerts and warnings
BRAKE	Safety Brake	Fail-safe braking system
COLLISION_DET	Collision Detection	Automatic collision detection and response
DUAL_CHANNEL	Dual Channel	Redundant safety control channels
ENABLING_DEV	Enabling Device	Three-position enabling device required
ESTOP	Emergency Stop	Emergency stop button for immediate shutdown
HAND_GUIDE	Hand Guiding	Safe hand-guided operation mode
INTERLOCK	Safety Interlock	Mechanical or electrical interlocks
LASER_SCANNER	Laser Scanner	Area laser scanner for presence detection
LIGHT_CURTAIN	Light Curtain	Optical safety barrier detection
NONE	Not Applicable	No specific safety features
PFL	Power Force Limiting	Limits force/torque to safe levels
PROTECTIVE_STOP	Protective Stop	Monitored stop for safety functions
SAFE_SPEED	Safe Speed	Safe limited speed operation
SAFE_STOP	Safe Stop	Multiple safe stop categories (SS1, SS2)
SAFE_TORQUE	Safe Torque Off	Safe torque off function (STO)
SAFE_ZONES	Safety Zones	Configurable safety zones and boundaries
SKIN_SENSOR	Sensitive Skin	Tactile/pressure sensitive skin
SRMS	Speed & Sep Monitor	Speed and separation monitoring for collaboration
VISION_SAFETY	Vision Safety	Camera-based safety monitoring
VISUAL_WARN	Visual Warning	LED indicators and warning lights

scale (13 options)

Code	Name	Description
DS	Desk	Desktop-sized
HU	Human	Human-scale
IF	Infra	Infrastructure-scale
MD	Medium	Medium-sized (waist height)
MG	Mega	Very large industrial
MI	Micro	Microscopic scale
ML	Milli	Millimeter scale
MN	Mini	Small portable robot
NN	Nano	Nanoscale
OV	Oversized	Larger than a vehicle
PM	Palm	Fits in one hand
SM	Small	Small floor robot
VH	Vehicle	Vehicle-sized

sensor_list (36 options)

Code	Label	Description
ACCELEROMETER	Accelerometer	Linear acceleration sensor
BUMPER	Bumper/Contact	Physical contact detection
CAM_2D	2D Camera	Standard RGB camera for 2D imaging
CAM_3D	3D Camera/Depth	Depth camera for 3D perception
CLIFF	Cliff Detection	Drop-off or stair detection
CURRENT	Current Sensor	Electrical current monitoring
ENCODER	Encoder	Rotary or linear position encoder
FLOW	Flow Sensor	Fluid or air flow measurement
FORCE_TORQUE	Force/Torque	Multi-axis force and torque sensor
GAS	Gas/Chemical	Gas or chemical detection sensor
GPS	GPS	Global positioning system receiver
HALL_EFFECT	Hall Effect	Magnetic field detection
HUMIDITY	Humidity	Humidity sensor
IMU	IMU/Gyroscope	Inertial measurement unit
INFRARED	Infrared	IR proximity or distance sensor
LIDAR_2D	LIDAR 2D	2D laser scanning sensor
LIDAR_3D	LIDAR 3D	3D LIDAR for point cloud generation
LIGHT	Light Sensor	Ambient light detection
LOAD_CELL	Load Cell	Weight or force measurement
MAGNETOMETER	Magnetometer	Magnetic field sensor/compass
MICROPHONE	Microphone	Audio input sensor
MMWAVE	mmWave Radar	Millimeter wave radar sensor
NONE	No sensors	No sensors equipped
PIR	PIR Motion	Passive infrared motion detector

POTENTIOMETER	Potentiometer	Analog position sensor
PRESSURE	Pressure	Pressure sensor
PROXIMITY	Proximity	Near-field proximity sensor
RADAR	Radar	Radio detection and ranging sensor
RAIN	Rain Sensor	Moisture/rain detection
RGBD	RGB-D Camera	Combined color and depth camera
STEREO	Stereo Vision	Dual camera stereo vision system
TACTILE	Tactile	Touch or pressure sensitive
TEMPERATURE	Temperature	Temperature measurement sensor
THERMAL	Thermal Camera	Infrared thermal imaging
ULTRASONIC	Ultrasonic	Ultrasonic distance sensor
VOLTAGE	Voltage Sensor	Voltage monitoring sensor

service_option_list (19 options)

Code	Label	Description
ANNUAL	Annual Contract	Annual service contract
BASIC	Basic Support	Basic support package
CALIBRATION	Calibration	Calibration and validation services
EXT_WARRANTY	Extended Warranty	Extended warranty beyond standard
INSPECTION	Inspection Service	Regular inspection services
LABOR_ONLY	Labor Only	Labor coverage, parts extra
LEASE	Lease Option	Equipment leasing programs
NONE	Not Applicable	No service options available
PARTS_LABOR	Parts & Labor	Coverage for parts and labor
PARTS_ONLY	Parts Only	Parts coverage, labor extra
PER_INCIDENT	Per Incident	Pay-per-incident service calls
PREMIUM	Premium Support	Premium tier support package
PREVENTATIVE	Preventative Maintenance	Scheduled preventative maintenance program
REFURB	Refurbishment	Refurbishment services available
RENTAL	Rental Option	Equipment rental programs available
SUBSCRIPTION	Subscription	Monthly/annual subscription service
TRADE_IN	Trade-in Program	Trade-in for newer models
TRAINING_SVC	Training Service	Professional training services
UPGRADE	Upgrade Service	Hardware/software upgrade services

setup_time (7 options)

Code	Label	Description
2HR	30min - 2 hours	Setup takes between 30 minutes and 2 hours
30MIN	<30 minutes	Can be set up in less than 30 minutes
3DAY	1-3 days	Setup takes 1 to 3 days
7DAY	3-7 days	Installation requires 3 to 7 days
8HR	2-8 hours	Installation requires 2 to 8 hours
PROF	Professional Required	Must be installed by certified professional

WEEK	>1 week	Setup takes more than one week
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skill_level_required (6 options)

Code	Label	Description
ADV	Advanced	Requires significant expertise and training
BASIC	Basic User	Requires basic training or manual reading
CERT	Certified Only	Requires specific certification or license
EXPERT	Expert/Engineer	Requires engineering degree or extensive expertise
INTER	Intermediate	Requires technical knowledge and experience
NONE	No Experience	Anyone can use without training

smart_home_list (18 options)

Code	Label	Description
ALEXA	Amazon Alexa	Compatible with Amazon Alexa ecosystem
GOOGLE	Google Home	Works with Google Assistant/Home
HOME_ASSISTANT	Home Assistant	Home Assistant integration available
HOMEKIT	Apple HomeKit	Apple HomeKit certified
HUBITAT	Hubitat	Hubitat Elevation compatible
IFTTT	IFTTT	If This Then That automation platform
MATTER	Matter	Matter/Thread protocol support
MQTT_BROKER	MQTT Broker	Connects to MQTT brokers
NONE	Not Applicable	No smart home integration
OPENHAB	openHAB	openHAB smart home platform
PROPRIETARY	Proprietary Hub	Requires proprietary smart hub
REST_API	REST API	RESTful API for integration
SIRI	Siri Shortcuts	Supports Apple Siri Shortcuts
SMARTTHINGS	SmartThings	Samsung SmartThings compatible
TUYA	Tuya Smart	Tuya Smart Life platform
WEBHOOKS	Webhooks	Supports webhook integrations
ZIGBEE_HUB	Zigbee Hub	Works with Zigbee hubs
ZWAVE	Z-Wave	Z-Wave protocol support

software_platform (16 options)

Code	Label	Description
ANDROID	Android	Android OS for mobile robot platforms
BARE_METAL	Bare Metal	No OS, direct hardware programming
FREERTOS	FreeRTOS	Real-time OS for microcontrollers and embedded systems
IOS	iOS	Apple iOS for robot control interfaces
LINUX_RT	Linux Real-Time	Real-time Linux kernel for deterministic control
NONE	Not Applicable	OS not specified or not relevant
PROPRIETARY	Proprietary OS	Manufacturer's custom operating system
QNX	QNX	Real-time Unix-like OS for embedded systems
RASPBIAN	Raspbian	Raspberry Pi optimized Debian Linux

ROS1	ROS 1	Robot Operating System version 1, widely adopted middleware
ROS2	ROS 2	Robot Operating System version 2, improved real-time and security
UBUNTU	Ubuntu Linux	Standard Ubuntu distribution, common base for ROS
VXWORKS	VxWorks	Commercial RTOS for safety-critical applications
WINDOWS	Windows	Microsoft Windows OS, typically for user interfaces
WINDOWS_IOT	Windows IoT	Windows IoT Core for embedded systems
YOCTO	Yocto Linux	Custom embedded Linux built with Yocto Project

space_required_class (9 options)

Code	Label	Description
100M2	25-100m ²	Requires 25 to 100 square meters
10M2	4-10m ²	Requires 4 to 10 square meters
1M2	<1m ²	Requires less than 1 square meter
25M2	10-25m ²	Needs 10 to 25 square meters
4M2	1-4m ²	Needs 1 to 4 square meters
DESK	Desktop/Tabletop	Fits on a desk or table
LARGE	>100m ²	Needs more than 100 square meters
OUT	Outdoor Only	Only operates outdoors
ROOM	Entire Room	Requires dedicated room

spare_parts_avail (6 options)

Code	Label	Description
LONG	Available - Long Lead	Parts available but with extended delivery time
LTD	Limited Availability	Parts scarce or difficult to obtain
NONE	Not Available	Replacement parts no longer available
OEM	OEM Only	Parts only available from original manufacturer
READY	Readily Available	Parts available off-the-shelf from multiple sources
THIRD	Third Party Available	Compatible parts available from third-party suppliers

support_types_list (17 options)

Code	Label	Description
24_7	24/7 Support	Round-the-clock support availability
CERTIFICATION	Certification	User certification programs offered
CHAT	Live Chat	Real-time chat support
EMAIL	Email Support	Email-based technical support
FORUM	Community Forum	User community forum support
KNOWLEDGE_BASE	Knowledge Base	Searchable knowledge base articles
NONE	No support	No formal support provided
ONLINE_DOCS	Online Documentation	Web-based documentation and manuals
ONSITE	On-site Service	Technician visits customer location
PARTNER_NET	Partner Network	Authorized partner support network
PHONE	Phone Support	Telephone technical support

REMOTE	Remote Access	Remote diagnostic and support access
SLA	SLA Available	Service level ement options
SPARE_PARTS	Spare Parts	Spare parts availability and support
TRAINING	Training Programs	Formal training courses available
VIDEO_TUT	Video Tutorials	Video training and tutorial content
WARRANTY	Warranty Support	Standard warranty coverage

sys_kinematic (13 options)

Code	Label	Description
ART6	Articulated (6-axis)	Six-axis articulated arm robot
ART7	Articulated (7-axis)	Seven-axis articulated arm with redundancy
CART	Cartesian/Gantry	Linear X-Y-Z movement system
CYL	Cylindrical	Cylindrical coordinate system robot
DELTA	Delta/Parallel	Parallel link delta robot configuration
HUMAN	Humanoid	Human-like kinematic structure
MACK	Mobile Ackermann	Car-like Ackermann steering geometry
MDIFF	Mobile Differential Drive	Two-wheel differential drive mobile base
MOMNI	Mobile Omnidirectional	Omnidirectional mobile base (mecanum/omni wheels)
NONE	Not applicable	Kinematic configuration not applicable
OTHER	Other	Non-standard kinematic configuration
POLAR	Polar/Spherical	Spherical coordinate system robot
SCARA	SCARA	Selective Compliance Articulated Robot Arm

sys_lang_list (30 options)

Code	Label	Description
ar	Arabic	
bg	Bulgarian	
bn	Bengali	
cs	Czech	
da	Danish	
de	German	
el	Greek	
en	English	
es	Spanish	
fa	Persian	
fi	Finnish	
fr	French	
gu	Gujarati	
he	Hebrew	
hi	Hindi	
hr	Croatian	

hu	Hungarian	
id	Indonesian	
it	Italian	
ja	Japanese	
jav	Javanese	
km	Khmer	
ko	Korean	
mr	Marathi	
ms	Malay	
my	Burmese	
nl	Dutch	
no	Norwegian	
pa	Punjabi	
pl	Polish	
pt	Portuguese	
ro	Romanian	
ru	Russian	
sk	Slovak	
sr	Serbian	
sv	Swedish	
ta	Tamil	
te	Telugu	
th	Thai	
tl	Filipino/Tagalog	
tr	Turkish	
uk	Ukrainian	
ur	Urdu	
vi	Vietnamese	
zh	Chinese (Mandarin)	

tech_sdk (6 options)

Code	Label	Description
FREE	Yes - Free	SDK available free but not open source
LTD	Limited	Limited SDK with restricted functionality
NONE	Not available	No SDK available
OPEN	Yes - Open Source	SDK available as open source software
PAID	Yes - Paid	SDK available for purchase
SOON	Coming Soon	SDK announced but not yet available

tech_speedunit (8 options)

Code	Label	Description
CM_S	cm/s	Centimeters per sec for moderate speed measurements
CYCLE	cycles/min	Complete cycles per minute for repetitive tasks
M_S	m/s	Meters per second for faster linear movements
M2H	m ² /hour	Square meters covered per hour, typically for cleaning robots
MM_S	mm/s	Millimeters per second for precise linear movements
NONE	Not Applicable	Speed measurement not applicable to this robot type
RPM	RPM	Revolutions per minute for rotating components
UPH	units/hour	Production units completed per hour

throughput_units (8 options)

Code	Label	Description
UPH	units/hour	Number of units processed per hour
CPM	cycles/minute	Number of complete cycles per minute
KGH	kg/hour	Kilograms processed per hour
PPH	pieces/hour	Number of pieces handled per hour
M2H	m ² /hour	Square meters covered per hour
CUST	custom	Custom measurement specific to application
NONE	Not applicable	Throughput measurement not applicable
UPD	units/day	Number of units processed per day

training_list (20 options)

Code	Label	Description
AR Training	AR Training	Augmented reality guided training
Bootcamp	Bootcamp	Intensive multi-day training
Certification Program	Certification Program	Formal certification with testing
Custom Training	Custom Training	Tailored training programs
Documentation Only	Documentation Only	Training through documentation
In-person Training	In-person Training	Classroom training at provider location
Live Online	Live Online	Real-time online instructor-led training
Mentorship	Mentorship	One-on-one mentoring program
NONE	No Training	No training provided
On-site Training	On-site Training	Training at customer location
Online Course	Online Course	Structured online learning course
Online Videos	Online Videos	Pre-recorded video tutorials
Quick Start Session	Quick Start Session	Brief introductory training
Refresher Course	Refresher Course	Periodic update training
Self-paced Learning	Self-paced Learning	Self-directed learning materials
Simulation Software	Simulation Software	Training via simulation software
Train the Trainer	Train the Trainer	Training for internal trainers

VR Training	VR Training	Virtual reality training environment
Webinars	Webinars	Live or recorded webinar sessions
Workshops	Workshops	Hands-on workshop sessions

type (15 options)

Physical form and morphology. Field: type

Code	Name	Description
ARM	Robotic Arm	Fixed-base manipulator arm
MOBI	Mobile Platform	Wheeled or tracked ground robot
BIPD	Biped	Bipedal/humanoid walking robot
QUAD	Quadruped	Four-legged walking robot
HEXA	Hexapod+	Six or more legged robot
AERI	Aerial	Flying robot (drone, VTOL, fixed-wing)
AQUA	Aquatic	Underwater/surface water robot
SERP	Serpentine	Snake-like, limbless robot
SPHR	Spherical	Ball or rolling form factor
SOFT	Soft Robot	Soft-bodied, flexible material robot
WEAR	Wearable	Body-worn, exoskeleton, prosthetic
VEHI	Vehicle	Autonomous vehicle platform
APPL	Appliance	Robot built into appliance
SWRM	Swarm Unit	Designed for swarm operations
HYBR	Hybrid	Hybrid or multi-modal form factor

user_demographic_list (22 options)

Code	Label	Description
AGRICULTURE	Farm/Agriculture	Agricultural and farming operations
CONSTRUCTION	Construction	Construction and building sites
CONSUMER	General Consumer	General consumer market
EDUCATION	School/University	Educational institutions K-12 and higher
ENERGY	Energy/Utilities	Power plants, utilities, energy sector
ENTERPRISE	Enterprise	Large corporations and enterprises
GOVERNMENT	Government/Military	Government agencies and military
HEALTHCARE	Hospital/Healthcare	Hospitals, clinics, care facilities
HOBBYIST	Hobbyist/Maker	Hobbyists and maker community
HOME	Home User	Individual consumers for personal/home use
HOSPITALITY	Hospitality	Hotels, restaurants, entertainment venues
INDUSTRIAL	Factory/Industrial	Manufacturing and industrial facilities
LOGISTICS	Warehouse/Logistics	Warehouses, distribution centers, logistics
MARINE	Marine/Maritime	Ports, ships, maritime operations
MINING	Mining	Mining and extraction operations
PROFESSIONAL	Professional	Professional service providers
RESEARCH	Research Lab	Research laboratories and institutions
RETAIL	Retail	Retail stores and shopping centers

SERVICE	Service Provider	Service companies using robots for clients
SMB	Small Business	Small to medium-sized businesses
SPACE	Space/Aerospace	Space exploration and aerospace
TRANSPORT	Transportation	Airports, stations, transport hubs

vision_system_list (23 options)

Code	Label	Description
3D_RECON	3D Reconstruction	Build 3D models from visual data
ANOMALY_DET	Anomaly Detection	Detect visual anomalies or defects
BLOB_DETECT	Blob Detection	Detect and analyze blob shapes
COLOR_DET	Color Detection	Identify and differentiate colors
DEPTH_EST	Depth Estimation	Estimate depth from visual information
FACE_DETECT	Face Detection	Detect presence of faces without identification
FACE_RECOG	Face Recognition	Detect and identify human faces
FEATURE_TRACK	Feature Tracking	Track specific visual features over time
GESTURE	Gesture Recognition	Recognize hand gestures and body movements
INSTANCE_SEG	Instance Segmentation	Individual object instance identification
LINE_DETECT	Line Detection	Detect lines and edges for navigation
MOTION_DET	Motion Detection	Detect movement in the visual field
NONE	Not Applicable	No vision system capabilities
OBJ_RECOG	Object Recognition	Identify and classify objects in images
OCR	Text/OCR	Optical character recognition for reading text
OPTICAL_FLOW	Optical Flow	Analyze pattern of motion between frames
PEOPLE_TRACK	People Tracking	Track and follow human subjects
POSE_EST	Pose Estimation	Estimate object or human pose/orientation
QR_BARCODE	QR/Barcode Reading	Read QR codes and various barcode formats
SCENE_UNDER	Scene Understanding	High-level scene interpretation
SEMANTIC_SEG	Semantic Segmentation	Pixel-level scene understanding
TEMPLATE_MATCH	Template Matching	Match predefined visual templates
VISUAL_SLAM	Visual SLAM	Visual simultaneous localization and mapping

warranty_months (9 options)

Code	Label	Description
LIFE	Lifetime	Lifetime warranty
WOX	No Warranty	Product sold without warranty
W12	12 months	One year warranty
W24	24 months	Two year warranty
W3X	3 months	Three month warranty period
W36	36 months	Three year warranty
W48	48 months	Four year warranty
W6X	6 months	Six month warranty period
W60	60 months	Five year warranty

Version History

Version	Date	Changes
1.0	March 2026	Initial release and publication

RoboCata Standard – Terms of Use & Governance

1. Status of the RoboCata Standard

The RoboCata Standard (“Standard”) is an open, publicly documented classification and field reference framework for describing robots.

- Current version: **Version 1.0 (March 2026)**
- Document title: *RoboCata – Complete Field Reference*
- Maintained by: Martin Smit (standards@robocata.org)
- Standards website: <https://robocata.org> or <https://github.com/robocata/robocata-standard>

The Standard is published to enable interoperability, comparability, and structured robot data exchange across the robotics ecosystem.

The Standard is distinct from the RoboCata catalog database hosted at robocata.com.

2. Open Standard License

You may:

- Use the RoboCata field structure and taxonomy
- Implement the schema in your own systems
- Build APIs compatible with the RoboCata Standard
- Reference and cite the Standard
- Create derivative schemas or extensions

Provided that:

- You clearly reference the version used (e.g., “RoboCata Standard v1.0”)
- You do not imply endorsement by RoboCata unless formally agreed
- You do not misrepresent modified versions as the official Standard

The RoboCata Standard text and schema are licensed under Creative Commons Attribution 4.0 (CC BY 4.0).

The RoboCata Standard is free to implement. Commercial use is permitted. Redistribution of modified versions must clearly indicate deviations from the official specification.

3. Intellectual Property

The RoboCata name and logo are proprietary. The Standard itself (field names, structures, codes) is open for implementation under the terms above.

4. Versioning & Governance

Versioning Model

- V1.x → backward-compatible updates
- V2.0 → structural or breaking changes
- Minor updates (typos, clarifications) do not change V1
- Minor updates (V1.x) may introduce new optional fields but shall not alter or remove existing field semantics. Field deletions or major field updates require major version increment
- Each official version is date-stamped
- Archived versions remain publicly accessible

Change Process

Changes to the RoboCata Standard may be proposed by any stakeholder. Proposed changes are reviewed by the Editor and, where appropriate, incorporated into minor or major version updates. Minor updates shall maintain backward compatibility. Major version updates may introduce structural changes with documented migration guidance.

Proposals must include:

- Field impact
- Backward compatibility assessment
- Rationale
- Example implementation

The maintainer retains final authority over acceptance into official versions. Future governance models (e.g., advisory board or community review panel) may be introduced as adoption grows.

5. Conformance & Claims

Organizations may state: “Compatible with RoboCata Standard v1.0” provided that:

- Required fields are implemented
- Code fields and united use enumerations and conventions as per this standard

RoboCata may publish optional conformance validation tools in the future. False or misleading claims of compliance may result in public clarification.

6. Separation from RoboCata Catalog

The RoboCata Standard is a specification framework and is independent of any specific database, website, or commercial implementation. The RoboCata catalog available at <https://robocata.com> is one implementation of the RoboCata Standard. Other organizations may implement the standard independently without affiliation, permission, or partnership with the RoboCata catalog platform.

The RoboCata Standard is open and licensed under Creative Commons Attribution 4.0 (CC BY 4.0).

The RoboCata catalog dataset at robocata.com is proprietary unless explicitly licensed otherwise.

Use of the RoboCata Standard does not grant any rights to access, scrape, replicate, redistribute, or commercially exploit the RoboCata catalog dataset.

Conformance to the RoboCata Standard does not require use of the RoboCata website, database, infrastructure, or services.

7. Limitation of Liability

The Standard is provided “as is”. RoboCata makes no guarantees regarding:

- Completeness
- Suitability for specific applications
- Regulatory compliance
- Safety certification interpretation

Implementers are responsible for validating data before operational use.

8. Future Development

The Standard is intended to evolve alongside robotics innovation.

Possible future directions:

- API specification (OpenAPI format)
- JSON Schema publication
- Machine-readable code registries
- Validation tools

9. Contact & Feedback

Feedback and proposals may be submitted via <https://robocata.org> or the Official GitHub repository at <https://github.com/robocata/robocata-standard>