User Manual: NexBot Robotics 213-010 8-Axis EtherCAT Motion Controller

SKU: NXB-CTL-213-010 | Version: 1.0 | Brand: NexBot Robotics

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1. Safety Information

READ ALL SAFETY INSTRUCTIONS BEFORE OPERATION. Failure to follow safety procedures may result in serious injury or equipment damage.

DANGER: Isolate all hazardous energy before servicing NexBot Robotics 213-010 8-Axis EtherCAT Motion Controller; stored electrical or mechanical energy may remain present after shutdown.

WARNING: Operate NXB-CTL-213-010 only within its intended Controllers & Software > Robot Controllers > Motion Controllers duty profile and published specification limits.

CAUTION: Use only approved tools, mating parts, and installation hardware to prevent premature wear or unsafe operation.

NOTICE: Protect the product from contamination, impact, and environmental exposure beyond IP20 during installation and service.

2. Product Overview

The NexBot Robotics 213-010 Motion Controller is an advanced control unit designed to orchestrate complex, multi-axis motion for industrial automation applications. This controller serves as the central processing hub for compatible NexBot robot arms, executing trajectory planning, kinematic calculations, and I/O logic with high precision and reliability. Its core function is to translate program commands into the precise, coordinated movements required for demanding tasks. The primary feature of the 213-010 is its capacity to manage up to 8 axes simultaneously, providing the flexibility to control a standard 6-axis articulated robot plus two external axes, such as a linear track or a workpiece positioner. This expanded capability allows for the creation of more sophisticated and efficient work cells. This high-speed communication is critical for applications requiring smooth, continuous-path motion, such as arc welding or sealing. Powered by a multi-core processor, the controller delivers the computational performance needed for real-time inverse kinematics and dynamic compensation, resulting in superior path accuracy and reduced cycle times. It is equipped with a comprehensive set of digital and analog I/O points for seamless integration with PLCs, safety systems, and other factory equipment. Typical applications include high-speed pick-and-place, complex assembly, material handling, and automated dispensing. The unit is designed for easy installation in a control cabinet via a standard DIN rail mount, and features front-panel status LEDs for rapid diagnostics during setup and maintenance.

3. Getting Started

1. Confirm product identity

Verify the installed item is NexBot Robotics 213-010 8-Axis EtherCAT Motion Controller with SKU NXB-CTL-213-010. Cross-check the unit against project documentation before applying power or connecting it to the host system.

2. Review operating context

Understand how the product is used within the Controllers & Software > Robot Controllers > Motion Controllers workflow, including any upstream and downstream dependencies, service intervals, and operator responsibilities.

3. Complete initial startup

Power up the unit under controlled conditions, observe indicator states, and verify the product initializes cleanly with the expected 24VDC operating setup.

4. Operation

Normal operation

Run NexBot Robotics 213-010 8-Axis EtherCAT Motion Controller within the documented workload, environmental, and service conditions. Track alarms, unusual noise, heat, or vibration so corrective action can be scheduled before unplanned downtime occurs.

Interface and controls

Use the supported electrical and control interfaces to commission, monitor, and troubleshoot the device. Validate all signal mappings and control behavior after maintenance or part replacement, especially where EtherCAT communication is required.

> **Tip:** Capture a baseline of healthy status indicators after commissioning so later diagnostics can be compared quickly.

Load and application limits

Keep the product within the published ratings for speed, force, load, and environmental exposure. Where applicable, confirm mounting, routing, and attached tooling do not compromise access, cooling, or serviceability.

Change management

Whenever hardware, firmware, wiring, or connected tooling changes, repeat the relevant verification and commissioning checks before returning the equipment to production service.

> **Tip:** Update maintenance records immediately after any wiring, parameter, or parts change.

5. Maintenance Schedule

Interval	Task	Notes
Daily	Inspect NexBot Robotics 213-010 8-Axis EtherCAT Motion Controller for visible wear, damage, contamination, loose hardware, and abnormal status indicators.	Record any abnormalities before the next production cycle begins.
Monthly	Verify mounting integrity, connector condition, and cable routing or strain relief points.	Retorque or reseat hardware only to the documented service specification.
Quarterly	Review diagnostic logs, event history, and operational trends for early signs of degradation.	Escalate recurring warnings before they develop into hard faults.
Annually	Perform a full service inspection covering mechanical condition, electrical connections, and functional verification.	Coordinate annual service with planned downtime to minimize production disruption.

6. Troubleshooting

Symptom	Possible Cause	Solution
Unit does not initialize or remain ready	Incoming supply, controls wiring, or commissioning parameters do not match the documented 24VDC configuration.	Verify power quality, wiring continuity, protective devices, and startup parameters before restarting the unit.
Intermittent communication or status loss	Loose connectors, damaged cabling, or	Inspect physical connections, confirm interface settings, and

Symptom	Possible Cause	Solution
	interface mismatch on EtherCAT.	replace damaged cables or connectors as needed.
Unexpected wear, vibration, or overheating	Mechanical loading, contamination, misalignment, or duty cycle exceeds the intended application conditions.	Inspect the installation, restore proper alignment and cooling, and verify the product is being used within its published operating limits.
Connected equipment performance is inconsistent	The installed product is not configured correctly for the host system or compatible robot series (R-50, R-100, C-10).	Validate the configuration, confirm compatibility, and rerun the functional verification procedure after any corrections.

7. Technical Specifications

Parameter	Value	Unit
Weight	2.8	kg
Material	Anodized Aluminum	
Voltage	24VDC	
IP Rating	IP20	
Country of Origin	JP	
Protocol	EtherCAT	
Dimensions	220 x 150 x 55 mm	