

User Manual: NexBot Drives CLR032-002 SCARA Robot 5kg Payload

SKU: NXB-ROB-CLR032-002 | 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: ELECTRICAL SHOCK HAZARD. Disconnect and lock out all power sources before opening any panels or performing service. Stored energy may be present.

WARNING: The robot can move unexpectedly and at high speed, causing serious injury or death. All personnel must remain outside of the robot's work envelope while it is in automatic mode.

WARNING: Do not exceed the maximum payload of 5 kg. Overloading the robot can lead to premature component failure, inaccurate motion, and unpredictable behavior.

CAUTION: During continuous operation, motor housings and other surfaces may become hot enough to cause burns. Avoid direct skin contact with the robot arm after extended use.

NOTICE: The NexBot CLR032-002 is rated IP54 for protection against dust and splashing water. Do not expose the robot to high-pressure jets or submerge it in any liquid.

2. Product Overview

NexBot Drives CLR032-002 SCARA Robot 5kg Payload (NXB-ROB-CLR032-002) is an industrial robot platform built for automated handling, machine tending, and repeatable production motion in manufacturing cells. Its product profile emphasizes the characteristics buyers expect from a robot rather than from a component: payload capacity, reach, axis coordination, motion repeatability, and controller-level integration into line equipment. The platform is suited to continuous-duty factory environments where predictable cycle performance, maintenance access, and installation planning all matter to engineering teams. It fits robotics programs that need a complete robot arm for deployment, expansion, or replacement within an existing automation footprint.

3. Getting Started

1. System Power-Up Sequence

To start the system, first apply power to the main robot controller. Once the controller has fully booted, enable the arm power via the software interface or teach pendant. This two-stage process ensures the controller has full command before the arm is energized.

2. Establishing a Software Connection

Connect a PC running the NexBot programming environment to the same network as the robot controller. Use the software's connection manager to discover the CLR032-002 robot via its EtherCAT network address and establish a programming session.

3. Homing the Robot

Before any programmed motion can occur, the robot must be homed. This procedure moves each of the 4 axes to a known reference position, calibrating its coordinate system. The homing routine should be executed after every power cycle.

4. Operation

Manual Jogging

Manual jogging allows for direct control of the robot's position using the teach pendant. You can move the robot in different coordinate systems, such as JOINT for individual axis movement or CARTESIAN for linear X, Y, Z motion, which is useful for teaching points precisely.

Tip: When teaching points near other equipment, always use a slow jog speed to prevent accidental collisions.

Defining Tool and Payload Data

Accurate motion requires defining the properties of the installed End-of-Arm Tooling (EOAT). In the software, configure the Tool Center Point (TCP) and the payload mass (up to 5 kg) and its center of gravity. This data allows the controller to calculate precise, efficient motion paths.

Creating a Motion Program

A program consists of a sequence of recorded points and motion commands. Move the robot to a desired position using manual jogging, then record the point. Define the motion type (e.g., linear, joint) to move to the next point, and build the sequence to complete a task.

Tip: Use JOINT moves for large, non-linear transitions and LINEAR moves for precise approaches to pick or place locations.

Running in Automatic Mode

To run a production cycle, select the desired program, switch the system to Automatic Mode, and clear any active faults. Ensure all safety guards are in place, then initiate the cycle from the control panel or a PLC command. The robot will then execute the program loop continuously.

5. Maintenance Schedule

Interval	Task	Notes
Daily	Visually inspect the robot arm, cables, and connectors for any signs of wear, damage, or loose fittings. Ensure the work area is clean and free of debris.	This is a pre-operational check to be performed by the machine operator.
Weekly	Wipe down the robot's cleanroom-grade coated aluminum surfaces with an approved, non-abrasive cleaning agent to maintain cleanliness standards.	Use lint-free cloths to avoid contaminating the operating environment.
Quarterly	Test the functionality of all emergency stop buttons and safety interlocks (e.g., light curtains, door switches) to ensure they correctly halt robot motion.	Document the results of each safety check in a maintenance log.
Annually	Check and re-torque the base mounting bolts and the end-of-arm tooling mounting bolts to their specified values.	Vibration from normal operation can cause fasteners to loosen over time.

Interval	Task	Notes
Annually	Create a complete backup of all robot programs, configuration settings, and system parameters.	Store the backup file in a secure, off-controller location.
Every 20,000 Hours	Perform a major service including the replacement of grease in all axis gearboxes and inspection of internal wiring harnesses. This should only be performed by NexBot certified technicians.	Contact NexBot Robotics to schedule preventative maintenance service.

6. Troubleshooting

Symptom	Possible Cause	Solution
Robot fails to power on; no lights on controller.	No incoming AC power or main breaker is tripped.	Verify the 200-240VAC power source is live. Check the facility circuit breaker and the main power switch on the robot controller.
Controller shows 'Emergency Stop' alarm.	An E-Stop button on the teach pendant or control panel has been activated.	Locate the activated E-Stop button, twist it to release, and then reset the alarm on the controller interface.
Robot loses EtherCAT communication with the master.	Network cable is disconnected, damaged, or there is a network configuration issue.	Check that the EtherCAT cable is securely plugged in at both the robot and the master. Inspect the cable for damage. Verify network settings.
Positioning is not accurate or repeatable (outside ± 0.01 mm spec).	Incorrect payload data, loose EOAT, or mechanical wear.	Ensure the payload settings in the software match the installed tool. Check for and tighten any loose bolts on the EOAT or robot base. If the issue persists, contact service.
An 'Overtravel Limit' error occurs.	A programmed point is outside the robot's physical range of motion.	Manually jog the robot away from the physical limit. Edit the program to adjust the target point to be within the valid work envelope.

Symptom	Possible Cause	Solution
A 'Singularity' error occurs during a linear move.	The robot's wrist axes (J3 and J4) are aligning, making a straight-line path mathematically impossible.	Slightly adjust the start or end point of the linear move, or change the motion type to a JOINT move for that segment.
Robot motion seems jerky or vibrates excessively.	Payload settings are incorrect, or acceleration/ deceleration values are too high for the load.	Verify the payload mass and center of gravity are correctly entered in the controller. Try reducing the programmed acceleration values.

7. Technical Specifications

Parameter	Value	Unit
Weight	25.0	kg
Material	Cleanroom-grade coated aluminum	
Voltage	200-240VAC Single Phase	
IP Rating	IP54	
Country of Origin	KR	
Protocol	EtherCAT	
Dimensions	210 x 210 mm (Base Footprint)	
Reach	450 mm	
Payload	5 kg	
Axes	4	
Repeatability	±0.01 mm	