

Installation Guide: NexBot Vision 643-011 Linear Rail Track (3m)

SKU: NXB-GEN-643-011 | Revision: 1.0 | Category: Safety Systems > Robot Mounts & Bases > Linear Rails & Tracks

DANGER: Disconnect all power sources before beginning installation. Follow lockout/tagout (LOTO) procedures per OSHA 1910.147.

1. Required Tools & Materials

- Heavy-duty crane or forklift with a minimum 500 kg lift capacity
- Certified lifting straps and spreader bar
- Industrial laser level and precision shims
- Calibrated industrial torque wrench with M20 sockets
- High-strength, non-shrink epoxy grout or anchoring compound
- Hammer drill with masonry bits for M20 anchor bolts
- Digital multimeter for 480VAC verification
- EtherCAT network cable tester

2. Pre-Installation Checks

1. Verify concrete foundation is fully cured, level, and meets the load requirements for the 450 kg track plus the full robot and payload mass.
2. Unpack and inspect the NexBot Vision 643-011 track assembly for any damage sustained during shipping. Cross-reference components with the packing list.
3. Ensure the installation area is clean, clear of obstructions, and cordoned off for safety during heavy lifting operations.
4. Confirm the designated 480VAC 3-phase power source is de-energized and locked out according to standard safety procedures (LOTO).
5. Check that the floor layout provides adequate clearance for the full 3000 mm travel path, including cable carrier movement and service access.
6. Confirm the robot controller's location allows for proper EtherCAT and power cable routing without exceeding maximum cable lengths.

3. Installation Procedure

Step 1: Positioning and Initial Placement

Using a certified crane and appropriate lifting gear, carefully lift the 450 kg track assembly. Slowly lower it into position on the prepared foundation, aligning it with the pre-surveyed floor markings.

Warning: Never stand under a suspended load. Use guide ropes to control the track's position from a safe distance.

Step 2: Precision Leveling

Place a laser level along the rail's primary axis. Use leveling bolts and precision shims to adjust the track until it is perfectly level across its entire 3000 mm length. This step is critical to achieving the specified ± 0.05 mm repeatability.

Step 3: Foundation Anchoring

Drill holes into the concrete foundation through the designated mounting points on the track's structural steel base. Secure the track using M20 anchor bolts and the specified epoxy grout, following the grout manufacturer's curing instructions.

Warning: Wear appropriate PPE, including safety glasses and dust mask, when drilling into concrete.

Step 4: Torque Anchor Bolts

Once the anchoring grout has fully cured, use a calibrated torque wrench to tighten all M20 anchor bolts to the specification listed in the main engineering drawings. Follow a star or cross pattern to ensure even pressure.

Step 5: Mounting Robot Carriage and Robot

Install the robot transport carriage onto the linear rail's bearing blocks. Securely mount the compatible NexBot robot to the carriage, ensuring all fasteners are torqued to the robot-specific installation values.

Warning: Ensure the robot is properly supported during mounting to prevent tipping or sudden movement.

Step 6: Cable Management Installation

Route all robot and track cables (power, EtherCAT, I/O) through the flexible cable carrier (e-chain). Ensure there is sufficient slack and a proper service loop to allow for unrestricted movement across the entire travel range without pinching or straining cables.

Step 7: Electrical and Network Connection

Connect the main 480VAC power lines to the track's primary control box. Connect the EtherCAT IN/OUT cables between the robot controller and the track, ensuring the network topology is correct.

Warning: All electrical work must be performed by a qualified electrician in compliance with local codes.

4. Post-Installation Verification

1. With the system energized, verify correct voltage at the track's control box and confirm that power status LEDs are active.
2. Establish communication between the robot controller and the linear track. Ensure the track appears as a configured external axis in the controller software.
3. Perform a slow-speed manual jog of the axis across its full travel range to check for smooth motion, absence of binding, and any unusual noises.
4. Execute the axis homing procedure to establish a zero-reference point. Verify the home position is accurate and repeatable.
5. Test all hardware limit switches and software travel limits to ensure they function correctly and prevent physical crashes.
6. Run a test program with coordinated robot and track motion to confirm proper system integration and performance.

Note: For technical support, contact your authorized service provider or visit <https://robotics.barca.group/support>.

