Installation Guide: NexBot Drives 211-014 Robot Main Controller

SKU: NXB-GEN-211-014 | Revision: 1.0 | Category: Controllers & Software > Robot Controllers > Main Controllers

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

1. Required Tools & Materials

- Torque wrench (for mounting bolts and ground lug)
- M6 hex driver or socket set
- Wire stripper and crimping tool for power and I/O terminals
- Digital multimeter
- Flathead and Phillips head screwdrivers (insulated)
- Anti-static wrist strap
- Ethernet cable crimper and tester (for EtherCAT)
- Panel knockout punch for cable glands

2. Pre-Installation Checks

1. Verify package contents against the packing list, ensuring the NexBot Drives 211-014 controller (SKU: NXB-GEN-211-014) and required connectors are present.
2. Inspect the controller for any signs of shipping damage before mounting.
3. Ensure the installation environment is clean, dry, and free from excessive vibration, meeting the IP20 rating requirements by being inside a larger, sealed enclosure.
4. Confirm the mounting panel is flat, rigid, and capable of supporting the controller's weight of 7.5 kg.
5. Verify the main power supply is de-energized and locked out according to local safety regulations.
6. Check that the ambient temperature inside the cabinet will remain within the controller's specified operating range.

3. Installation Procedure

Step 1: Mounting the Controller

Secure the NexBot Drives 211-014 controller vertically inside the main control cabinet using four M6 bolts. Ensure a minimum clearance of 100 mm on the top and bottom for proper airflow and 50 mm on the sides for cable routing, respecting its 450 x 300 x 150 mm dimensions.

> **Warning:** The controller weighs 7.5 kg. Use proper lifting techniques or a two-person lift to prevent injury and dropping the unit.

Step 2: Connecting Protective Earth (PE) Ground

Connect a dedicated, low-impedance ground wire from the chassis ground terminal on the controller to the main cabinet's star grounding point. This is critical for operator safety and reducing electromagnetic interference.

> **Warning:** Failure to properly ground the controller can result in a serious electric shock hazard and unreliable operation.

Step 3: Connecting 24VDC Main Power

Connect the 24VDC power supply to the designated power input terminals (X1). Ensure correct polarity (+24V and 0V) is observed. Use appropriately sized wiring to handle the system's current draw.

> **Warning:** Reversing the power supply polarity will damage the controller's internal components and void the warranty.

Step 4: Connecting Robot Drive Cables

Connect the main multi-axis cables from the robot arm to the corresponding motor power and encoder feedback ports on the front of the controller. Ensure the connector housings are fully seated and latched to prevent intermittent connections during operation.

Step 5: Wiring Safety Circuits

Connect all safety-rated devices, such as emergency stop pushbuttons, safety gates, and light curtains, to the dedicated safety I/O terminals (X3). All safety circuits must be wired and validated in accordance with a comprehensive risk assessment.

> **Warning:** Improperly wired safety circuits can lead to unexpected robot motion and serious injury. This step must be performed by a qualified technician.

Step 6: Connecting EtherCAT Network

Connect the main EtherCAT network cable from the upstream PLC or master device to the EtherCAT IN port. If connecting downstream devices, use the EtherCAT OUT port to continue the network chain. Use shielded CAT5e or better cabling.

Step 7: Connecting Standard I/O

Wire any non-safety peripheral equipment, such as grippers, sensors, and actuators, to the general-purpose digital and analog I/O terminals (X4, X5). Ensure signal wires are routed separately from high-power motor cables.

4. Post-Installation Verification

1. Double-check all wiring terminations for tightness and correctness against the wiring diagram.
2. Verify continuity and low resistance on the main protective earth (PE) connection using a multimeter.
3. Ensure all connector latches and cable clamps are secure.
4. With the main robot drive power off, apply 24VDC control power and check for correct status LED indicators on the controller front panel.
5. Establish a network connection with a PC and verify that the NexBot Drives 211-014 is discoverable in the configuration software.
6. Confirm that the emergency stop circuit is functioning correctly by pressing an E-stop button and observing the safety status in the software.

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