Installation Guide: NexBot Robotics INC142-001 Incremental Encoder 1024 PPR

SKU: NXB-SNS-INC142-001 | Revision: 1.0 | Category: Drive Systems > Encoders > Incremental Encoders

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

1. Required Tools & Materials

- Hex key set (metric)
- Torque wrench (low range, Nm)
- Digital multimeter
- Wire stripper and crimping tool
- Precision flathead screwdriver (2.5mm)
- PROFINET M12 D-coded connector tool
- Mounting screws (size appropriate for application)
- Shaft coupling

2. Pre-Installation Checks

1. Verify the product SKU is NXB-SNS-INC142-001 and visually inspect the encoder for any shipping damage.
2. Confirm the machine's drive shaft diameter is compatible with the encoder's shaft and the selected coupling.
3. Ensure the system's power supply output is stable and within the 5-24VDC operating range of the encoder.
4. Review the control system's wiring diagram and ensure all necessary cables are available.
5. Power down and lock out all related machinery and control panels before beginning installation.
6. Confirm the target PROFINET network is operational and a valid IP address is available for the device.

3. Installation Procedure

Step 1: Power Down System

Ensure all power to the target machine and control cabinet is completely shut off. Follow standard lock-out/tag-out (LOTO) procedures to prevent accidental startup.

> **Warning:** Failure to de-energize equipment can result in severe electrical shock, equipment damage, and unintended machine motion.

Step 2: Mechanical Mounting

Securely mount the encoder's 58 x 58 mm anodized aluminum body to a rigid, flat surface using the provided mounting holes. Ensure the encoder is positioned to allow for proper shaft alignment.

Step 3: Shaft Coupling

Attach a suitable flexible coupling to the motor or machine shaft, then connect it to the encoder shaft. Ensure there is no axial or radial preload on the encoder shaft to prevent premature bearing wear.

> **Warning:** Misalignment can cause inaccurate readings and damage the encoder's internal bearings. Use a dial indicator for high-precision applications.

Step 4: Power and Ground Wiring

Connect the DC power supply wires to the appropriate terminals as specified in the product's wiring diagram. Connect the ground (GND) wire to a clean chassis ground point to ensure signal integrity.

> **Warning:** Applying voltage outside the 5-24VDC range or with incorrect polarity will permanently damage the encoder.

Step 5: Signal Wiring

Connect the A, B, and Z channel signal wires to the corresponding inputs on your PLC, drive, or controller. Ensure connections are secure and polarity is correct.

Step 6: PROFINET Network Connection

Connect a shielded PROFINET cable with an M12 D-coded connector to the encoder's network port. Ensure the connector is fully seated and tightened to maintain the IP67 rating.

> **Warning:** Use of unshielded or improperly terminated cables can lead to communication errors and network instability.

Step 7: Cable Routing and Strain Relief

Route all cables away from high-voltage lines or sources of electromagnetic interference (EMI). Secure the cables using appropriate clamps to provide strain relief and prevent damage from vibration or snagging.

Step 8: Configure PROFINET Device

Using your engineering software (e.g., TIA Portal), add the INC142-001 encoder to your hardware configuration using the provided GSDML file. Assign a unique device name and IP address.

4. Post-Installation Verification

1. Double-check all wiring against the official NexBot Robotics wiring diagram for the INC142-001.
2. Verify that all mechanical mounting hardware and shaft couplings are tightened to their specified torque values.
3. Remove all tools from the work area and re-install any safety guards that were removed.
4. After removing LOTO, power on the control system and verify the encoder receives the correct voltage (5-24VDC).

5. Check the diagnostic LEDs on the encoder and the PROFINET network switch to confirm a valid network link.
6. Slowly rotate the drive shaft by hand and confirm that the controller is receiving changing position counts.

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