

Installation and Alignment of Linear Axes

Correct installation and alignment are essential for the performance and lifetime of a linear axis. This page gives the unified procedure for mounting, aligning, coupling, lubricating, and commissioning a NILAB linear axis. For the axis-specific details, follow the links to the family pages.

1. Mounting the axis

- Mount the axis on a **rigid, flat** base (machine frame) — the base flatness and stiffness directly affect the guide lifetime and the achievable precision.
- Use the **flange** or **T-slot** mounting (ULCO: unified T-slots compatible with M5, M6, M8 nuts).
- Check the mounting surface for flatness and parallelism before fixing the axis.

2. Aligning the guide

- Align the **guide rails parallel** to the motion direction.
- Check the **straightness** and **parallelism** of the guide (straightness error and parallel offset of the two rails).
- Use the recommended alignment procedure from the axis documentation; for LM axes the guides are WON recirculating ball guides.

3. Coupling the load

- Attach the payload to the **carriage**.
- For an **off-axis** load, use a cross-carriage or the GDM module (available in a multi-carriage configuration).
- Keep the **moved mass low** and the **rigidity high** — see [Machine design](#) (mass reduction, stiffness, natural frequencies $\geq \sim 200$ Hz).

4. Lubrication

- WON recirculating ball guides are equipped with **LF seals** and use a porous resin lubricant — this gives a very long lubrication interval.
- **Do not use grease lubrication** in the GDM stage (grease is not optimal for high-speed linear motion).
- Follow the [Lubrication](#) page for the axis-specific requirements.

5. Cabling

- Use the **cable chain** for the LM axes (CH horizontal, CV vertical, CS side mounting) to protect and guide the cables.
- Route the cables without tension; use flying connectors or carriage-mounted connectors.
- Integrated motors (NLI, NLI-EtherCAT) reduce the cabling effort and support daisy-chain connection.

6. Protection

- Choose the **bellows** version (GDM) for dust or washdown environments. - Check the **IP rating** for the application environment (washdown, dust, food-grade).

7. First commissioning

- Perform a **homing / reference run**. - Check the encoder, the current, and the force during the first motion. - For integrated drives, use **NILAB Starter** (auto-teach, single and parallel motion, diagnostics).

Related pages

* [Linear axes selection](#) * [How a linear axis works](#) * [GDM Tubular Linear Stage](#) * [LM Linear Stage](#) * [Lubrication](#) * [Mounting examples](#) * [Cable chain](#) * [Machine design](#)

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