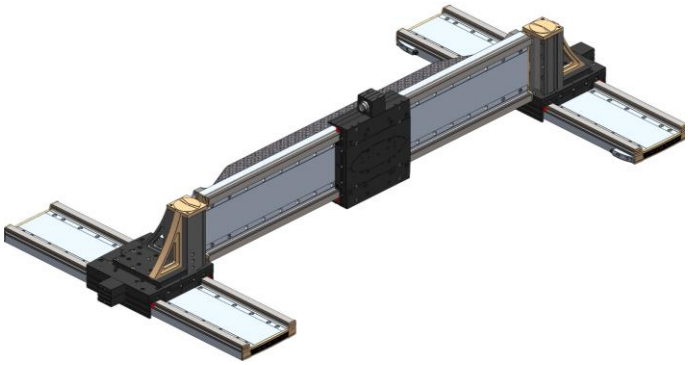
Assembly GANTRY LINAX® with joints Lxs

Edition 08. January 2024

GANTRY Lxs F60/F120®



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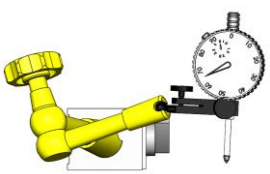
1 Required Instruments and Pre-assembly

1.1 Required Instruments



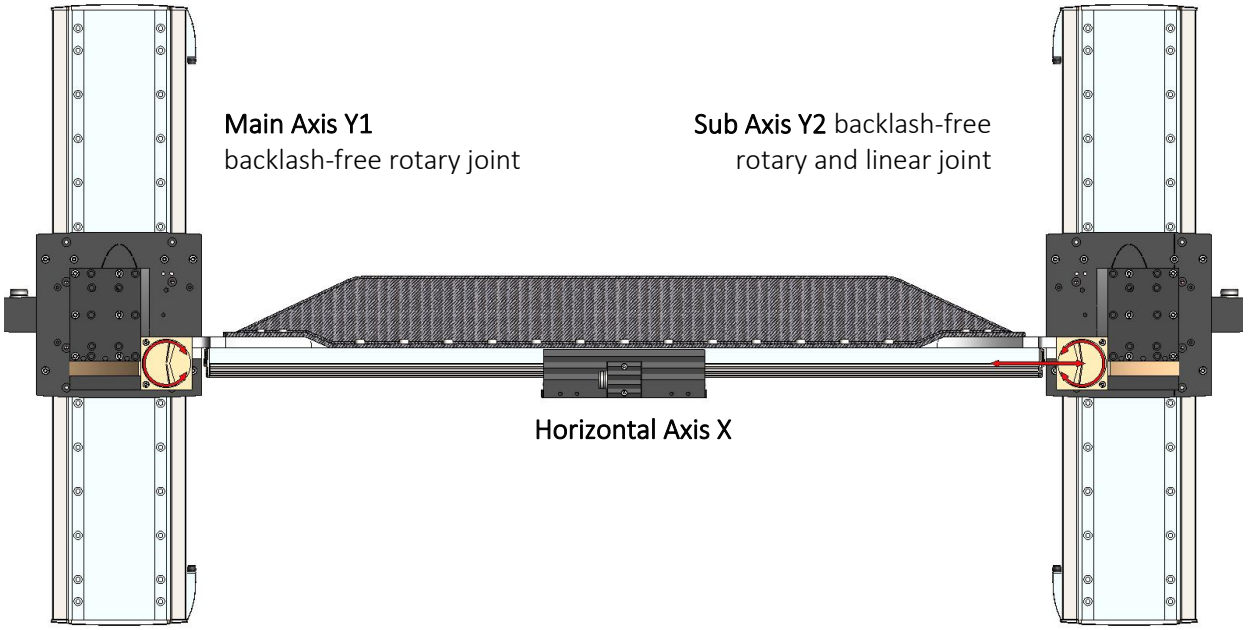
- Solid, precise measuring angle, ideally made of granite with side lengths of at least 200 x 200 mm
- Dial gauge stand and dial gauge, preferred resolution 0.001 mm.
- Note: Available fixation points on the X-Axis for the dial gauge stand are M3 and M4 threads. For magnetic stands, a ferromagnetic adapter plate is needed.
- - Please observe the installation instructions in chapter 9 of the DATASHEET_LINAX®Lxx, especially with regard to the flatness of the ground plate of at least 0.01 mm.

1.2 Pre-assembly Y-Axes

- Mount the main axis Y1 on the prepared ground plate by starting with the screws in the centre and working your way from screw position to screw position alternately on both sides.
- Note: The adjustment of the main axis Y1 is the reference system for the complete gantry unit.
- Mount the sub-axis Y2 parallel to the main axis Y1, typically also with the connector housing to the outside.
- Start with two screws the centre of the Y2 axis to allow an adjustment of angle orientation.

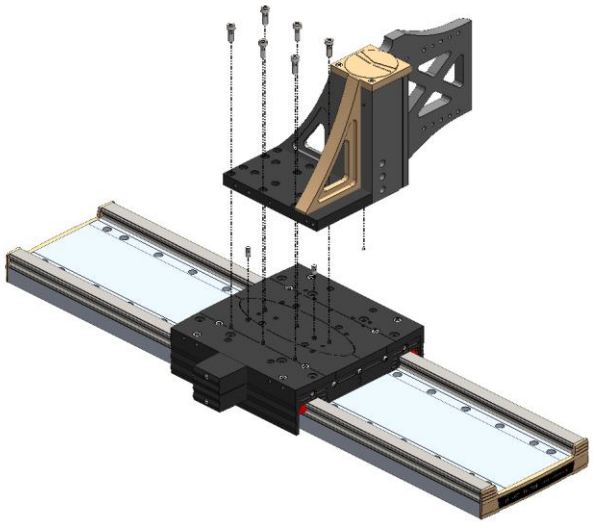
2 Installation of the GANTRY axes

The gantry main axis Y1 with the backlash-free rotary joint is the reference guideline for the horizontal position of the X axis. The main axle is always where the backlash-free rotary joint is mounted. With gantry support at the bottom and view of the carriage of the X-axis, the main axis is arranged on the left as default.
Art. No. Lxs F60, 135.12.34 / Lxs F120, 135.12.35



3 Assembly of joints

3.1 Rotary joint on gantry main axis Y1



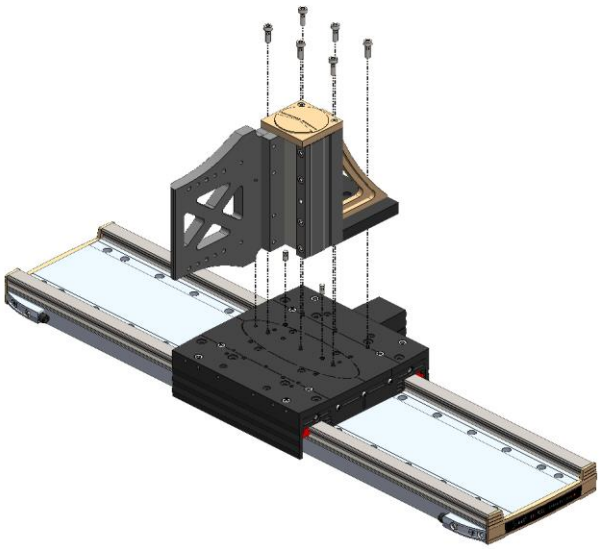
Lxs F120

- Insert 2 x centring pins Ø4 x 8 on the slide.
- Put on the rotary joint Gantry Main and fix the 6 hexagon socket round screws M4 x 12 with 2.9Nm.

Lxs F60

- Insert 2 x centring pins Ø4 x 8 on the slide.
- Put on the rotary joint Gantry Main and fix the 4 hexagon socket round screws M4 x 12 with 2.9Nm.

3.2 Rotary-linear joint on gantry sub axis Y2



Lxs F120

- Insert 2 x centring pins Ø4 x 8 on the slide.
- Put on the rotary-linear joint Gantry Sub and fix the 6 hexagon socket screws M4 x 12 with 2.9Nm

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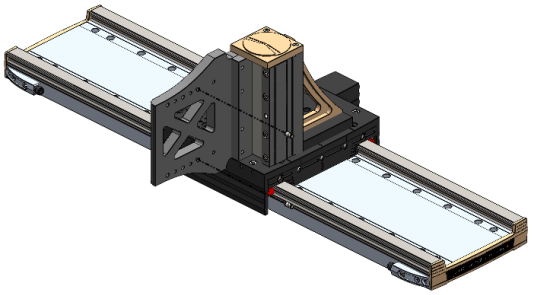
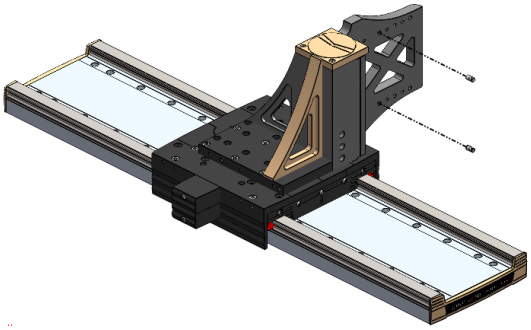
Lxs F60

- Insert 2 x centring pins Ø4 x 8 on the slide.
- Put on the rotary-linear joint Gantry Sub and fix the 4 hexagon socket screws M4 x 12 with 2.9Nm

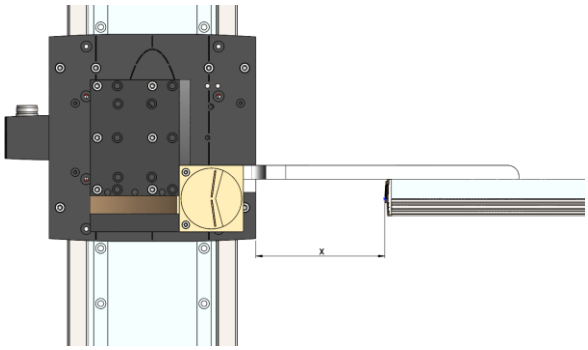
3.3 Insert the centring pins into the adapter plates

- Insert 2 centring pins Ø4 x 8 for each





- Notice:
  An adapter plate
  with flexible distance X can be inserted



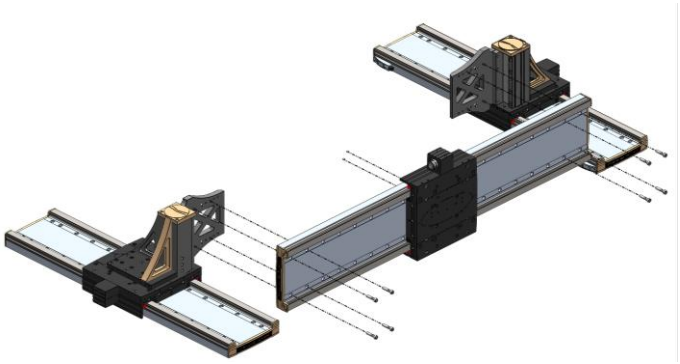
4 Assembly X-Axis horizontal

Lxs F120

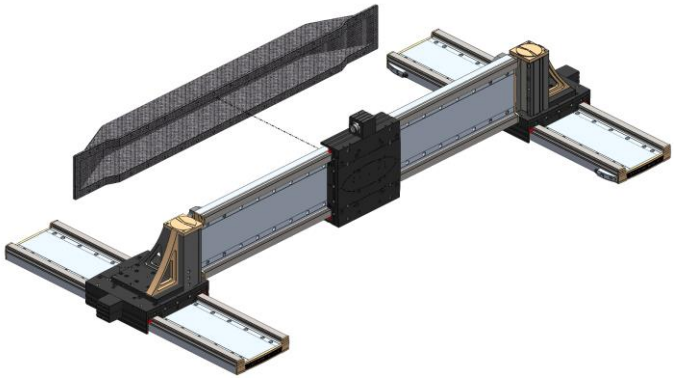
- Align the horizontal axis X with the centring pins and insert it in place. Then fix it on both sides with 4 hexagon socket screws M4 x 20 each with a torque of 2.9Nm.

Lxs F60

- Align the horizontal axis X with the centring pins and insert it in place. Then fix it on both sides with 4 hexagon socket screws M4 x 25 each with a torque of 2.9Nm.



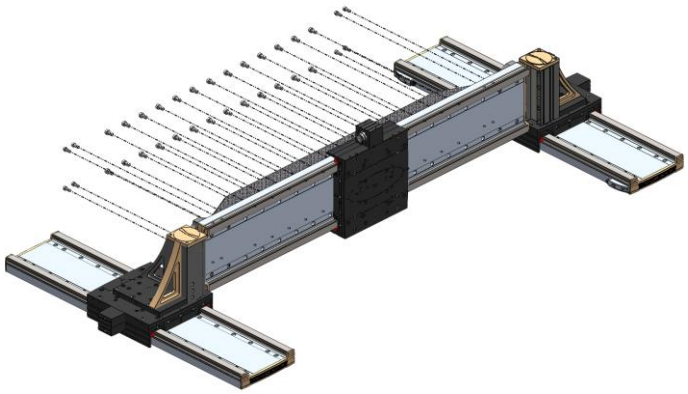
4.1 Putting the stiffening bracket in place



4.2 Fixing the stiffening bracket with screws

- The bracket is fixed with 4 x hexagon socket screws M4 x 10 at the rotary joint Gantry Main and at the rotary linear joint Gantry Sub with a torque of 2.9Nm

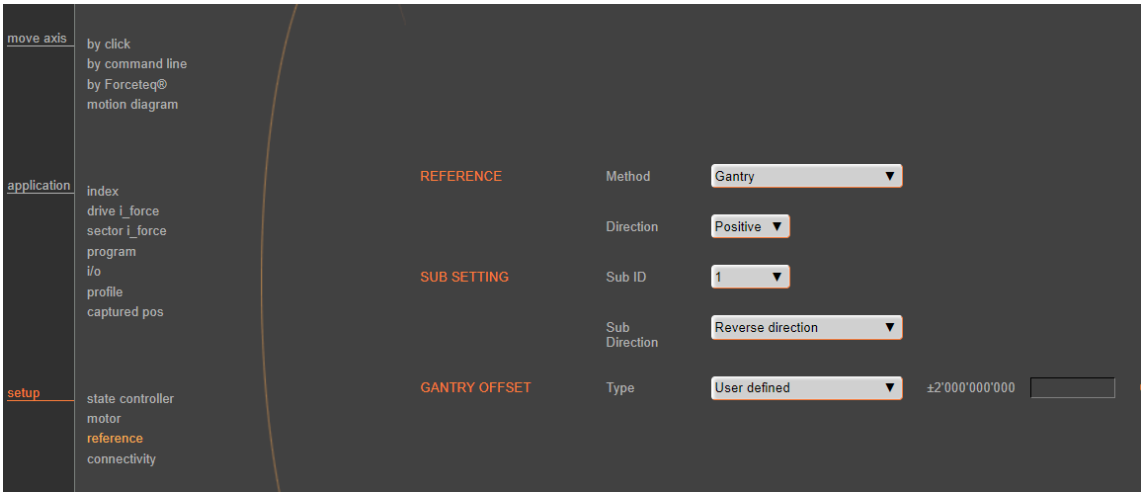
- And then fix the bracket over the whole length with the M5 x 10 screws and a torque of 2.9Nm



5 Precise adjustment

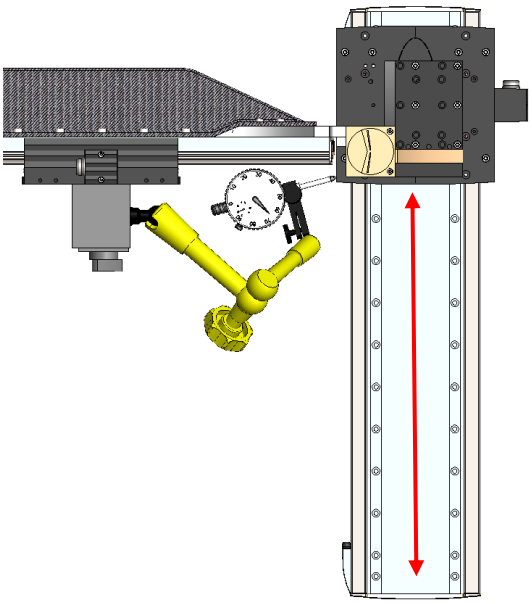
5.1 Preparations for adjustments

- Tighten the Y-Main axis on the machine at the desired position, the contact surface must be plane
- Set the REFERENCE Method to “Gantry”
- Typically, the “Sub Direction” is “Reverse direction” when the cable connectors are on the outside of the two Y-axes
- GANTR OFFSET “User defined”
  When the two Y-axes are centred in length, then set the initial value of offset to 0.
  If the two Y-axes are mounted off-centre in length, then the corresponding shift dimension must be initial entered to the offset parameter



5.2 Parallelism of the two Y-axes

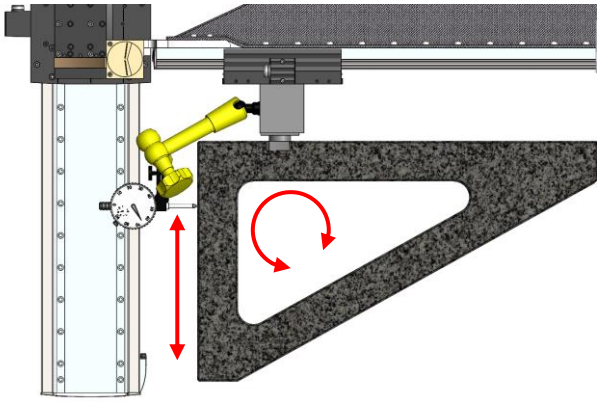
The Y master axis is fixed in the correct position. The dial gauge can now be used to measure the distance from the carriage of the X-axis to the carriage of the Y-sub axis. By moving the referenced Y-axes back and forth, the parallelism of the two Y-axes can be measured. If necessary, this can be corrected by adjusting the Y-sub axis. Start in the centre and work your way alternately from screw position to screw position on both sides. Therefore, the counterforce of the linear joint on gantry sub axis should remain minimal.
Error estimation: $Error = \sqrt[2]{Stroke^2 + \Delta Measurements^2} - Stroke$.
A deviation of 0.2mm over 500mm results in a error of under 40nm.



5.3 Align angle gauge towards Y-axis

A heavy angle gauge in granite material is useful for aligning the rectangularity. Place this angle gauge in the working area of the gantry system.

The first step is **to align the angle gauge on one side parallel to the Y-axis**. The X-axis is held in position and the Y-axis is moved back and forth along the angle measure using the dial indicator. Align the angle gauge so that the parallelism is guaranteed within a few micrometres.



5.4 Rectangularity of Y-Axis main to X-Axis Align

Then place the dial gauge on the other side of the measuring angle. Ensure that the aligned measuring angle is not readjusted.
Now move for- and backward with the X-axis controlled by WebMotion®. Set the "Offset" parameter in WebMotion® so, that there are only a few micro-metres of deviation results over this movement. depending on the measuring system resolution, the setting can be made with a resolution of +/-1µm or +/-100nm. Theoretical offset correction = $Axis\ length/meassuring\ distance * \Delta measuremen\ deviation.$