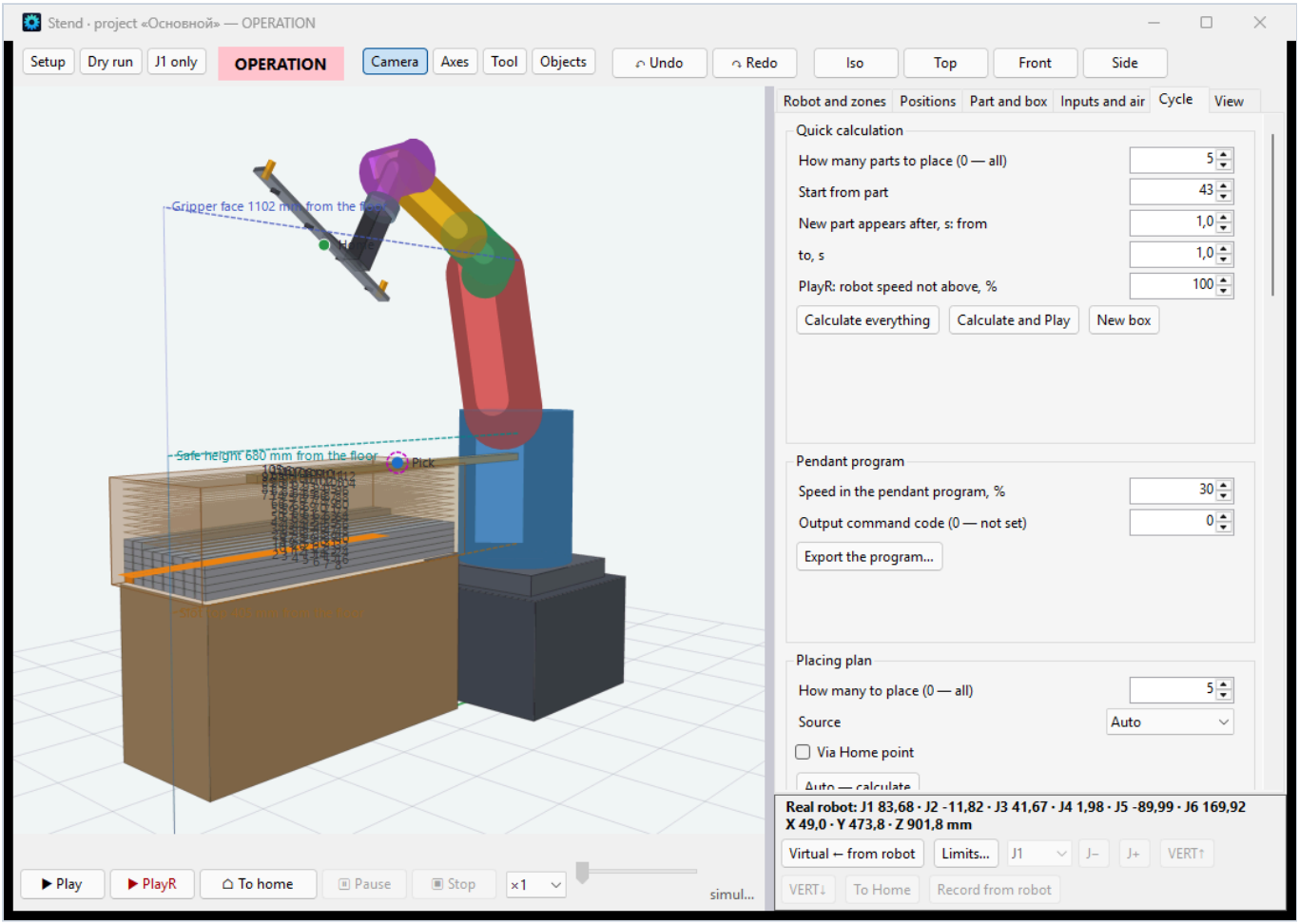
Robot1 – the Stend module

Installation of DIN rails using the BORUNTE BRTIRUS0707A robot · brief description

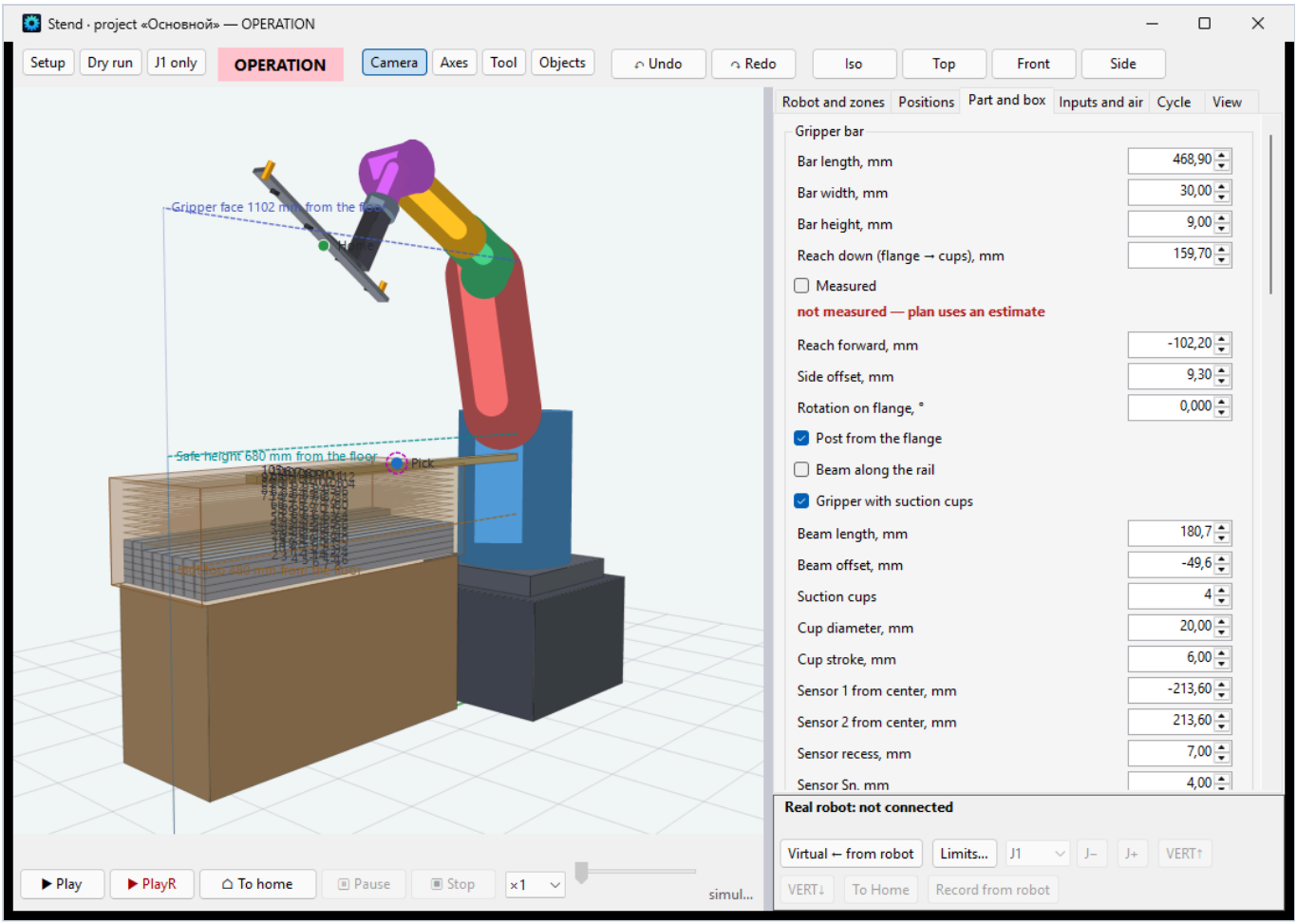
Stend is a three-dimensional stand for configuring grippers and laying DIN rails without risking damage to the metal. The robot on the pedestal, the box, the pick station, and the part itself are all manipulated with the mouse; the gripper on the J6 axis is assembled from the support, beam, and rail directly on the model. The program automatically calculates reach, layout plan (98–112 slots), and shows the entire cycle with simulated inputs and air – even before the real robot moves.



Window Stend: on the left, a scene with a robot, a box, and stacked beams; on the right, a cycle calculation.

What is adjustable with the mouse?

- **Robot, box, pick station, and part** – moved by dragging on the floor; height and orientation – adjusted using Shift and Ctrl.
- **gripper on J6** – This refers to the stand, beam, and rail: Shift changes the size, Ctrl moves the component, and Alt removes and restores the component.
- **Robot axes** – controlled by clicking on the bell; Ctrl allows you to enter multiple axes, and the right-click rotates the camera.



"Part and Box" tab: dimensions of the guide, box, and gripper unit on J6 – stand, beam, suction cups, and sensors.

Cycle calculation with one button

Tab "**Cycle**", group "**Quick Calculation**": specify how many parts to place and how many seconds it takes for the next one to appear, then click "**Calculate All**". The program will record the gripper's position relative to the current part, take the starting point from the virtual robot, activate the simulation, and calculate the plan.

A summary will appear below the buttons: **how many parts can be processed from the given set, within what time, and the average time per part, as well as the amount of time spent waiting for a new part**. If the axis speeds have not yet been measured, it is clearly stated that the time is approximate. The button **"Calculate and Play"** immediately starts the process.

Field	What it defines
How many parts to place	How many guides to place per cycle. 0 – fill the box to the end.
Which part to start with	Slots up to this number are considered occupied – the cycle continues after stopping.
A new part appears after	The interval between the appearance of the next guide, for example, 3...7 seconds.
PlayR: The robot's speed is not higher than	The maximum speed of any movement on the current robot.

From model to real robot

The main principle: everything is initially configured and tested on the model, and then gradually implemented on the hardware.

1. **Play** – a performance on stage: the robot remains stationary.
2. **dry run** – the same steps are written in the log, and no commands are sent to the robot.
3. **Only J1** – the robot rotates one axis at a speed not exceeding 5%.
4. **PlayR** – a complete cycle on a robot with point verification and speed limit.

> **Can be stopped at any time.** The "Stop" button smoothly halts the robot and clears the command queue. While the Stend cycle is running, the robot is not controlled by other sources.

> **Continuing with the correct rail.** After each piece is laid, the "Which piece to start with" field automatically displays the next one. We stopped in the middle of the box – we pressed "Start" and continued with the same rail, without damaging the pieces already laid. The "New box" button resets the count.

Software for the robot's teach pendant

The same pre-calculated cycle is downloaded as files within the teach pendant program: the section ``**"Teach Pendant Program"** on the "Cycle" tab creates .act files and associated files, which are transferred to the robot via a USB drive. The robot then carries out the stacking process independently; the computer is only needed for setup and calculation.
