



From 3D Model to Digital Twin in Record Time.

1. What is PLC-Lab 3D Studio?



A software tool that allows you to create digital twins from 3D models (created with the free software "Blender").



These twins are "PLC-ready," meaning they can be directly connected to and tested with a PLC (Programmable Logic Controller).



Students can now create a control program (PLC program) and check whether it can execute the virtual 3D model correctly.

2. Who is it for? (Target Groups)



Lecturers & Educational Institutions: For developing mechatronic teaching models and digital twins of training systems.



Training Providers: For providing high-quality 3D simulation models for training purposes.



Machine Builders: For the virtual commissioning of plants and machinery.

3. Key Advantages & Features (Why PLC-Lab 3D Studio?)



No CAD License Costs: Utilizes the free, open-source software Blender.



Custom Object Libraries: Save your own 3D objects and designs in a personal library.



Quick to Learn & Intuitive: A clearly structured user interface for a short learning curve.



Maximum Design Freedom: Not a rigid modular system. You can import your own designs or ready-made components.



Digitize Existing Hardware: Turn your physical mechatronic model into a digital twin.



Didactic Focus: Ideal for virtual learning factories, including the ability to insert faults for troubleshooting exercises.

4. The Process: In 5 Steps to a Digital Twin

1

Create a 3D model with Blender.

2

Prepare objects in Blender: Insert skills in objects. For example, a cylinder rod requires the skill {Drive-2-Point}.

3

Export the 3D model with the Blender-Plugin and import the file with PLC-Lab 3D Studio.

4

Configure Skills: Configure the settings of the skills.

5

Virtual Commissioning: Connect the 3D model to a PLC, write the PLC program and start testing.

5. Use Cases & Compatibility



Applications

Transporting, processing, sorting, and detecting workpieces, quality checks, pick-and-place tasks, level control systems.

Compatibility with different systems

- ✓ PLCSIM (TIA Portal & Simatic Manager)
- ✓ PLCSIM Advanced
- ✓ Grafcet-Studio

- ✓ Real S7 controllers (S7-300, S7-1200, S7-1500)
- ✓ CODESYS V3
- ✓ WinSPS-S7

- ✓ Allen Bradley (Micro800, ControlLogix, CompactLogix)
- ✓ Python (via MQTT)

6. System Requirements

- ✓ Operating System: Windows 10/11 (64-bit)
- ✓ PC: 6-core processor or better, RAM: 16 GB RAM or better, Graphics Card: Radeon Vega 8 (Zen 3 architecture) or better

