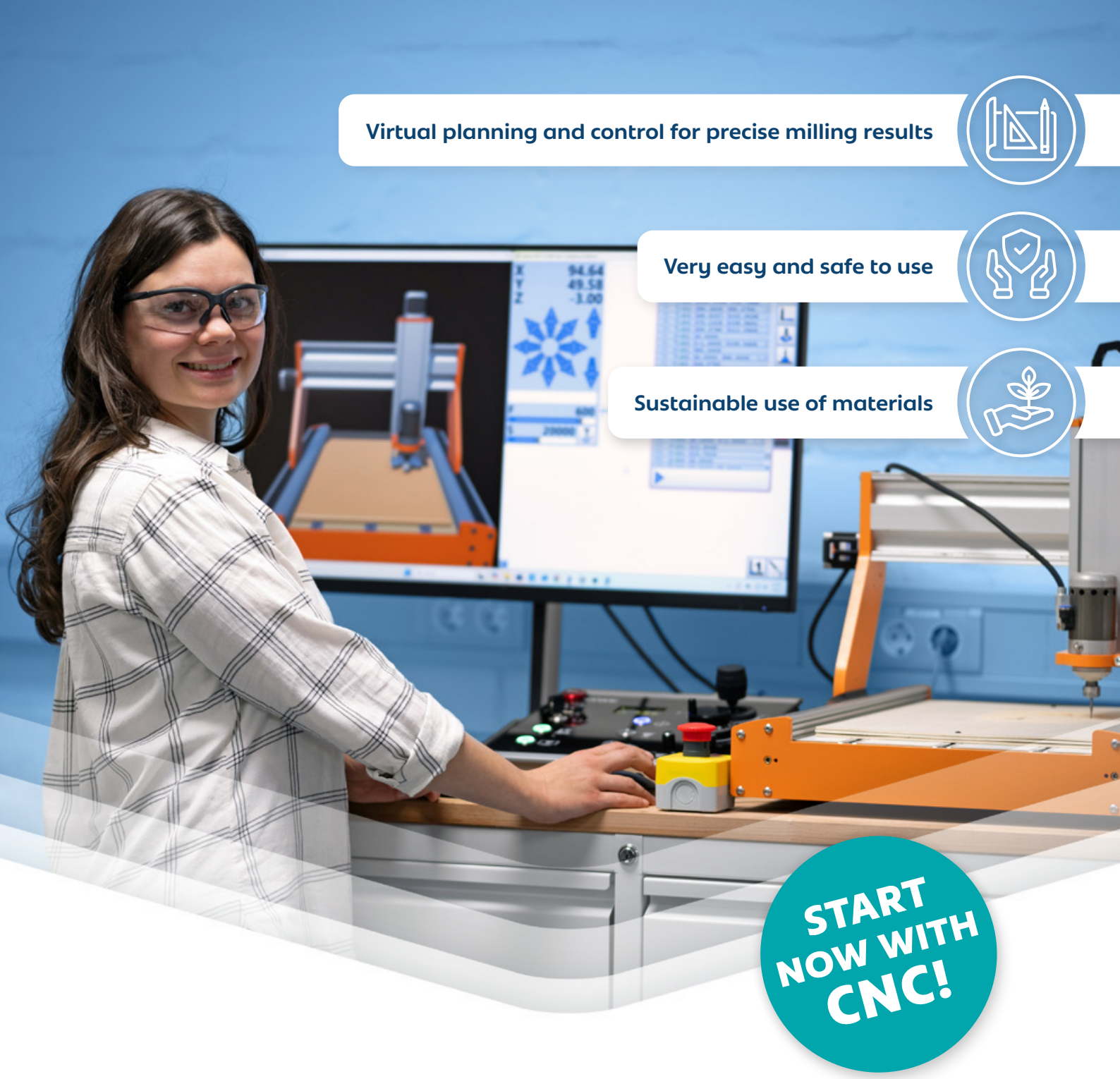


CNC-TRAINER

Virtual and Mechanical CNC Milling in the Classroom

PHYWE

Milling as a Future Technology

Virtual Planning and Safe Use for Learning

Whether for precision manufacturing or for individualized, graphic design, computer-aided milling is rapidly gaining importance in numerous professional and technical applications. In school education, it is therefore vital to familiarize students with this digital production technology at an early stage and thus prepare them ideally for their professional future.

The CNC-Trainer opens exciting new possibilities for your teaching concepts in the subjects of crafts, art and STEM (science, technology, engineering and mathematics) as well as in vocational training. It is possible to virtually plan, check and evaluate workpieces in advance as part of the work process[1] even before material is consumed during actual production, thanks to the digital twin[2] of the milling machine.

This permits a more sustainable use of materials. Simplified operation specifically for educational purposes also offers increased safety for use in younger school classes.

CNC-Trainer | PHYWE

1 Model of the Complete Work Action

Today, modern vocational training teaches complex work and production processes in six simple steps:

1. **Informing** about the project requirements
2. **Planning** an implementation strategy
3. **Deciding** on an approach
4. **Carrying** out the work steps
5. **Checking** proper execution
6. **Evaluating** for improvements

2 Digital Twin

The digital twin is a precise virtual model of the CNC milling machine that makes it possible to digitally simulate the machining process in advance. This allows errors to be detected and checking proper execution at an early stage before real production starts.

From a Drawing to the Real Milled Part

The included learning courses convey all the basic CNC manufacturing steps:

Technical Drawing

Create digital shape contours from a sketch

2D Drawing (CAD)

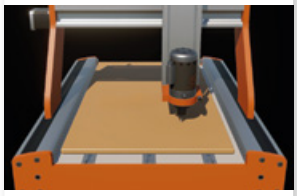
Setting the Milling Parameters

Defining milling paths, material and tools

2.5D Milling Paths (CAM)

Simulation of Results

Check the virtual milling part in advance using the digital twin



Simulation

Real Milling Process

The milled part is produced mechanically

Real Milled Part

Multifunctional Control Panel as Central Controller

CNC-Trainer's control panel is the interface between the CAD/CAM program, digital twin and CNC milling machine. It enables the virtual or real milling process to be started and stopped, the axes to be moved manually using the joystick and rotary wheel and the axis of rotation motor to be configured.

The integrated display provides an overview of the current coordinates of the milling head as well as its current feed and axis of rotation speed. The milling process can be stopped immediately and safely at any time using the emergency stop switch.

CNC-Trainer (Article No.: 14000-99)

Product Features

- Innovative control panel for controlling and monitoring the virtual and real milling process
- Realistic digital twin with versatile setting options and variable camera positions
- Modular and easy to understand learning courses
- Easy connection to the computer via USB interface
- Standard support of the Stepcraft D420 CNC milling machine (not part of the scope of delivery, support for other CNC milling machines on request)
- Support for Estlcam software for CAM and CNC control
- **System requirements:**

  Windows 10/11, 64-bit CPU with 2 GHz, 4 GB RAM, screen resolution 1280 × 720 pixels

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