# SINUMERIK PAL-Seminar D - Robot and multi-Channel Programming

OEM: Siemens • Code: NC-PAL-D

## COURSE DESCRIPTION

Our PAL seminars teach the use of PAL CNC examination controls with a 3D machine room and machining simulation. The CNC training in DIN/ISO code is comprehensively covered.

Currently, three seminars are being offered, which build on each other at least partially. The seminars introduce the application of the software components of the training software TopCNC-Suite.

## AUDIENCE PROFILE

- Vocational school teachers
- Trainers in industry and trade

## PREREQUISITES

- SINUMERIK PAL-Seminar A
- SINUMERIK PAL-Seminar C (recommended)

**Note**

- Available as in-person seminar (in german language only), online seminar and on request as on-site training.

## COURSE OBJECTIVES

**By the end of this course, participants will be able to:**

- Overview to this seminar:
- Robot Programming (Handling)
- Multichannel Technology

## COURSE OUTLINE

### Module 1: Structure and function of the CNC manufacturing cell

**Module 2: Operation of a 6-axis articulated robot for workpiece handling**

**Module 3: Coordinate systems and axes of a 6-axis articulated robot**

**Module 4: Gripper systems and workpiece pallets in the simulator**

**Module 5: Horizontal and vertical gripping of workpieces**

**Module 6: Overview of basic M-commands for handling robot and machine tool**

**Module 7: Simplified programming through macro programs for robot positioning**

**Module 8: Parameter programming**

**Module 9: Mathematical calculations/functions for determining positions when gripping workpieces**

**Module 10: Multi-channel programming – interaction between robot and CNC machine**

**Module 11: Programming for synchronizing the control sequence between robot and CNC machine**

**Module 12: Collision consideration between robot and machine**