



TRAINING CENTER

COURSE PROGRAM





KERN Training Center – Course program

Table of Contents

HEIDENHAIN CONTROL

Beginners

TNC 640 conversational programming: basic skills (200023250)	4
Laser tool measurement (200023251)	5
Touch probe systems/Touch probe cycles (200023252)	6

Advanced

TNC 640 conversational programming: progressive skills (200023253)	7
--	---

Professionals

TNC 640 5-axis machining (200023254)	8
--------------------------------------	---

KERN MACHINE OPERATION

Machine operation with a focus on Heidenhain (200023255)	10
Machine operation (200023256)	11
Operation of the workpiece changer (200023257)	12
Troubleshooting (200023258)	13

TECHNICAL TRAINING

Repairs and maintenance (200023259)	14
Maintenance training (200023260)	15

CUSTOMIZED TRAINING

μ-View operation (200023262)	16
Customized training (200023261)	17
Process optimization (200023263)	18

COURSE FEES AND CONTACT INFORMATION

Course fees	20
Contact and recommendations	21
Terms and conditions of participation	22



“ We turn your requirements into reality - together we can use all the potential of your technology. ”

Thomas Mauer and Christoph Weinmann
KERN Training Center

BEGINNERS

TNC 640 conversational programming: basic skills

TARGET GROUP Programmers and operators of Kern CNC milling machines

REQUIREMENTS You are familiar with milling based on drawings

CONTENTS

- Basic principles
- Cartesian contours
- Polar contours
- Cycles for holes, pockets, pins and grooves
- Programming techniques
- Pattern definitions
- SL cycles
- Cycles for coordinate conversion
- Functions in the various machine operating modes
- DXF converter (option #42)

LEARNING GOALS Participants will be able to create and test programs in the HEIDENHAIN conversational dialog based on workpiece drawings

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
4	8	4.5	Please bring safety shoes

BEGINNERS

Laser tool measurement

TARGET GROUP Programmers and operators of Kern CNC milling machines

REQUIREMENTS You already participated in our basic course or have equivalent knowledge about programming and operation of control and machine

CONTENTS

- Calibration of the laser measuring system
- Length measurement of centric tools
- Tool adjustment for length, radius and runout
- Tool inspection
- Cutting edge inspection

LEARNING GOALS Participants will be able to apply the measuring cycles in manual and automatic mode

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
4	8	1	Please bring safety shoes

BEGINNERS

Touch probe systems Touch probe cycles

TARGET GROUP Programmers and operators of Kern CNC milling machines

REQUIREMENTS You already participated in our basic course or have equivalent knowledge about programming and operation of TNC controls

CONTENTS

- Working with touch probes
- Centering of touch probes
- Calibration of touch probes
- Editing the touch probe table
- Editing the preset table
- Compensation of workpiece misalignment
- Setting the workpiece reference point
- Touch probe cycles for automatic workpiece measurement
- Plane alignment
- Checking and setting the machine kinematics

LEARNING GOALS Participants can apply the touch probe cycles in manual and automatic mode and log the readings

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
4	8	3	Please bring safety shoes

USERS

TNC 640 conversational programming: progressive skills

TARGET GROUP Programmers and operators of Kern CNC milling machines

REQUIREMENTS You already participated in our basic course or have equivalent knowledge about programming and operation of TNC controls

CONTENTS

- Q-parameter programming
- Polar coordinates and point tables for the creation of patterns
- CAD import
- SL cycles
- Free contour programming
- Multipass milling of chamfers and radii
- Tilted machining
- Engraving consecutive serial numbers

LEARNING GOALS Participants will expand and deepen their knowledge of the individual subject areas within programming via the HEIDENHAIN onversational dialog

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
4	8	4.5	Please bring safety shoes

PROFESSIONALS

TNC 640 5-axis machining

TARGET GROUP	Programmers and operators of Kern CNC milling machines
REQUIREMENTS	You already participated in our basic course or have equivalent knowledge about programing and operation of the control
CONTENTS	<ul style="list-style-type: none"> Machine Kinematic Setting reference point and probing in a tilted or non-tilted system Tilting the machining plane, preferably via the PLANE function Coordinate conversions Resetting the tilt Aligning the workpiece
LEARNING GOALS	<p>Participants know know to tilt the working plane when working with swivel heads or swivel tables.</p> <p>Participants know how to work with rotary axis and spatial angels.</p>

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
4	8	4.5	Please bring safety shoes



HEIDENHAIN

AUTORISIERUNG

KERN Microtechnik GmbH
 Olympiastraße 2
 82438 Eschenlohe

ist seit 2018

**Autorisierter Schulungspartner
 für TNC-Programmierschulungen der
 DR. JOHANNES HEIDENHAIN GmbH**


 Dr. Jan Braasch
 Leiter Marketing


 i.V. Udo Nowak
 Leiter Technische Schulungen

Machine operation with a focus on Heidenhain

TARGET GROUP	Operators of Kern CNC milling machines
REQUIREMENTS	Basic CNC knowledge
CONTENTS	<p>A combination of our courses for operators working with Kern CNC milling machines</p> <p>Heidenhain conversational programming (including some content from basic course)</p> <p>Competent and safe operation of the machine</p> <p>Basic procedures for setup mode, automatic mode and interruptions</p> <p>Operation of additional machine accessories and equipment</p> <p>Tool setup</p> <p>Features of and how to work with the service mode</p> <p>Kern M functions</p> <p>Calibration of the machine</p> <p>Troubleshooting</p> <p>Maintenance schedule and lubricants, operating fluids</p>
LEARNING GOALS	<p>Participants operate and set up the Kern CNC milling machine independently.</p> <p>Participants can reset the machine to its home position after interruption, for example after a power shortage.</p>

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
1	3	4.5	Please bring safety shoes

Machine operation

TARGET GROUP	Operators of Kern CNC milling machines with basic knowledge of Heidenhain conversational programming
REQUIREMENTS	Basic CNC knowledge
CONTENTS	<p>Competent and safe operation of the machine</p> <p>Basic procedures for setup mode, automatic mode and interruptions</p> <p>Operation of additional machine accessories and equipment</p> <p>Tool setup</p> <p>Features of and how to work with the service mode</p> <p>Kern M functions</p> <p>Calibration of the machine</p> <p>Troubleshooting</p> <p>Maintenance schedule and lubricants, operating fluids</p>
LEARNING GOALS	<p>Participants operate and set up the Kern CNC milling machines independently.</p> <p>Participants can reset the machine to its home position after interruption, for example after a power shortage.</p>

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
1	3	3	Please bring safety shoes

Operation of the workpiece changer

TARGET GROUP	Operators of Kern CNC milling machines with workpiece changing systems
REQUIREMENTS	Safe and independent handling of a Kern CNC milling machine
CONTENTS	<ul style="list-style-type: none"> General handling of a workpiece changer Movement of the axes in manual mode Pallet setup Setup for automatic mode Creating a pallet program Repositioning after an interruption Efficient use of the pallet changer
LEARNING GOALS	Participants can setup and work efficiently with a work piece changer

PARTICIPANTS	
MIN	MAX
1	3

DURATION
DAYS
1

NOTICE
Please bring safety shoes

Troubleshooting

TARGET GROUP	Operators of Kern CNC milling machines
REQUIREMENTS	Basic operation of the machine
CONTENTS	<ul style="list-style-type: none"> Machine operation during and after interruptions Features and use of the machine service menu Checking inputs and outputs Checking axis properties Use of the internal oscilloscope Working with the the pneumatic unit Axis and spindle lubrication system
LEARNING GOALS	Participants can analyze machine errors and can repair many occurring errors

PARTICIPANTS	
MIN	MAX
1	3

DURATION
DAYS
1.5

NOTICE
Please bring safety shoes

Repairs and maintenance

TARGET GROUP	Operators and maintenance personal of Kern CNC milling machines
REQUIREMENTS	You are familiar with mechanical systems and know how to work with a CNC machine. Electrical background is advantageous.
CONTENTS	<p>Machine operation during and after interruptions Feature and use of the machine service mode Checking inputs and outputs Checking axis properties Use of the internal oscilloscope Use of TNC Scope Working with the pneumatic unit Axis and spindle lubrication system Replacement of mechanical components Checking accuracy of the axes Optimizing axis parameters Spindle diagnostics</p> <p><u>Optional:</u></p> <ul style="list-style-type: none"> Analyzing and trouble shooting of electronic errors Replacement of electronic components
LEARNING GOALS	Participants can analyze and repair machine errors and replace and setup electronic components. Optional - trouble shooting and working on electrical system

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
1	3	3	Please bring safety shoes

Maintenance training

TARGET GROUP	Maintenance personal of Kern CNC milling machines
REQUIREMENTS	Basic mechanical training
CONTENTS	<p>Performing machine maintenance as per Kern's standards Changing filters Checking the axis Checking the spindle Refilling for machine lubricants Checking the pneumatic units Checking the pressurized systems</p>
LEARNING GOALS	Participants can maintain Kern machines according to Kern's standards

PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	
1	3	2	Please bring safety shoes

μ-View operation

TARGET GROUP People working with the Kern μ-View on a regular basis

REQUIREMENTS No prior knowledge necessary

CONTENTS

- Basic operation of the μ-View
- Analysis of tools after milling
- Determining tool wear
- Creating tool reports
- Using the measurement option

LEARNING GOALS Participants can operate and use the benefits of the μ-View

PARTICIPANTS	
MIN	MAX
1	5

DURATION
DAYS
1

NOTICE
Please bring safety shoes

Customized training

TARGET GROUP Customers with Kern CNC milling machines

REQUIREMENTS Basic training in the corresponding field

CONTENTS

In case our standard training does not meet your expectations and needs we provide customized courses according to your demands.

Scope, definition of the topic and duration of the course will be defined together with you once we have the necessary information.

For training at the customer's site, a machine must be taken out of production and be made available for the entire training period.

LEARNING GOALS Participants can cover all the defined topics

PARTICIPANTS	
MIN	MAX
1	3

DURATION
DAYS
Upon agreement

NOTICE
Please bring safety shoes

Process optimization

TARGET GROUP Customers who want to exploit the full potential of their Kern CNC milling machine

REQUIREMENTS An existing process and a specific goal

POSSIBLE CONTENTS

Choice of:

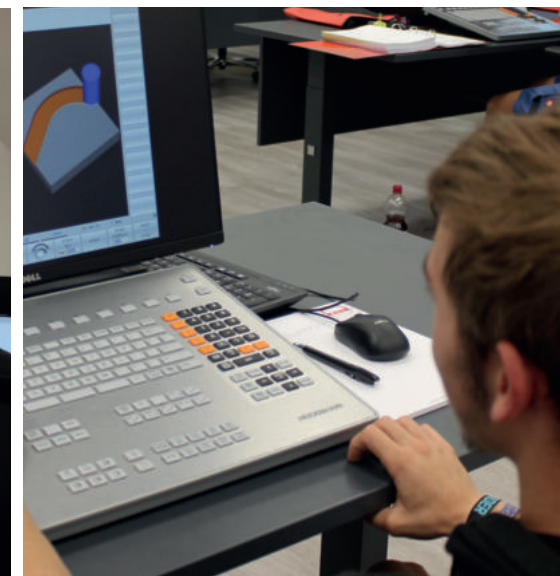
- Tool and workpiece clamping technology
- Tools or cutting materials
- Cooling lubricants

Process strategies for:

- Extend tool life
- Increase parts accuracy
- Improve surface quality
- Reduce cycle time

Integration of the machining center into a fully automated environment

LEARNING GOALS Participants can improve existing CNC programs and benefit from all advantages a Kern CNC machine offers



PARTICIPANTS		DURATION	NOTICE
MIN	MAX	DAYS	Please bring safety shoes
1	5	by arrangement	

Course fees

GROUP SIZE

In case we do reach the required number of participants, we reserve the right to cancel the training no later than two weeks before the start. The course fee will be completely refunded or, if requested by the participant, the course will be re-scheduled.

FEES

For a quotation for our training please send an e-mail to **trainingcenter@kern-microtechnik.com**. Please provide information about the course and the date you are interested in and the number of participants.

All course fees include:

- Training
- Equipment
- Lunch
- Drinks and snacks

The course fees do not include:

Arrival, accommodation, car rental, breakfast

SPECIALIZED TRAINING

Please send requests for customized training to **trainingcenter@kern-microtechnik.com** stating the requested course contents, number of participants and date. We will contact you to discuss further details.

WITHDRAWAL

If participants cannot attend the course and no replacements are nominated, a cancellation fee will be charged per person:

6 to 2 weeks before the start of the course:

30% of the respective fee plus VAT

2 weeks to 1 day before the start of the course:

50 % of the respective fee plus VAT

Non-attendance without notice: entire course fee

Contact and recommendations

CONTACT

Kern Microtechnik GmbH

Olympiastrasse 2
82438 Eschenlohe
Germany

✉ trainingcenter@kern-microtechnik.com

☎ +49 (0) 8824 9101 203

RECOMMENDED ACCOMMODATION

Griesbräu Murnau

www.griesbraeu.de

Angerbräu Murnau

www.angerbraeu.de

Tonihof Eschenlohe

www.tonihof-eschenlohe.de

Alpenhotel Ohlstadt

www.alpenhotel-ohlstadt.de

Terms and conditions of participation

Registration

In order to arrange a suitable date and to register to attend the training courses please send an email to trainingcenter@kern-microtechnik.com.

By registering, the participant accepts the terms and conditions of participation as well as our general terms and conditions. Registrations will be processed on a first-come-first-served basis. The participants will receive written confirmation of their registration. Participation is only possible after receipt of this confirmation.

Number of participants

Courses only take place with the required number of participants. In case the required number of participants is not met, we reserve the right to cancel the course up to two weeks before the start date. In this case, you will be notified about the cancellation of the course in writing or by phone.

Terms of payment

Each participant will receive an invoice for payment of the course fee. When wiring the fee please state the full invoice number and the participant's name, otherwise it will not be possible to process your payment.

Cancellation / refunds / course cancellation

Even after successful confirmation of your registration, KERN reserves the right to cancel this contract due to required number of participants, absence of a trainer, or for other reasons for which it is not responsible. In this case all received payments will be completely refunded.

Bookings made by course participants are binding. Participants who fail to attend the entire or parts of the course are still obliged to pay the full amount. In case of illness or absence of the participant for other reasons a different participant may be nominated. If participants are withdrawn shortly before the start of the course and no replacements are nominated, a cancellation fee will be charged per person: 6 to 2 weeks before the start of the course: 30% of the respective fee plus VAT // 2 weeks to 1 day before the start of the course: 50% of the respective fee plus VAT. // Non-attendance without notice: entire course fee.



Kern Microtechnik GmbH | Olympiastraße 2 | DE 82438 Eschenlohe
Tel: +49 (0) 8824 9101-0 | info@kern-microtechnik.com



CNC Machines Contract Production Manufacturing Processes Automation

www.kern-microtechnik.com

