

# CNC Power Engineering

## Always on the move



## CNC and Drives

### Training catalogue 2023

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## Who has the best expertise in *your* area of business?

The answer is obvious and quite simple: **you are the expert in your field**. Similarly, no one other than NUM could claim to have the deepest expertise of our extended range of drives and CNCs. After all, this has been our business for fifty years. This is why **we** are your number one partner for the training of your teams.

Whether you are an end-user, an OEM, a maintenance specialist or a system builder; NUM has a large variety of all kinds of training sessions in its catalog dedicated to your applications and for all generations of NUM products that are running production on machines today.

Of course, each customer has their own requirements, and each machine and each application has its own special features; and that is why we can also offer customized training sessions that are tailored to focus on your particular and individual needs.

As a provider of CNC High End Applications, we have organized our training sessions by features and level of knowledge required, in order to help you acquire all the information you need to be successful. These sessions are conducted by training specialists and application engineers so you can be assured that you are receiving the most accurate and helpful answers, whatever your question or concern might be. Give us a chance to help you be successful and develop a cooperative relationship between our companies for the benefit of all.

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## Training with NUM: your advantages

- All technical data and information is up to date
- If you need to learn about a specific function, you will get in depth information
- Partnership development
- You will be in touch with the experts in every domain of NUM activity
- Whatever your area of expertise might be (Maintenance, Service, Programming, Setup...), you will find the courses you need
- Full range of products and software in one location

## Training Centers

All NUM technical centers are equipped to provide training. These sessions will take place either in our premises or in your facility.



Some training facilities



## Training Courses

The different training modules are linked in a way to provide a logical path for mastering our application solutions in your area of expertise.

	FX	TR	3	0	1
<b>Control Series</b>					
Generic	FX				
Flexium only	FL				
Flexium <sup>+</sup> only	FP				
<b>Training</b>					
<b>Type</b>					
Product Knowledge			1		
Operation and Diagnostics			2		
Maintenance			3		
Engineering and Integration			4		
<b>Modifier</b>					
<b>Expertise Level</b>					
Beginner					1
Advanced					2
Specialist					3

### Generic Training Sessions

FXTR 101	Flexium system description
FXTR 102	Flexium and Safety
FXTR 201	Operation and basic maintenance
FXTR 202	Advanced part programming
FXTR 213	Flexium 3D
FXTR 223	Dynamic operators in C
FXTR 233	High speed cutting – 5 axes functions
FXTR 301	Flexium system maintenance with Flexium Tools
FXTR 321	Flexium system maintenance without Flexium Tools
FXTR 433	Extended NCK Access (ENA)
FXTR 443	Flexium HMI personalization

## **Flexium-Specific Training Sessions**

FLTR 312	Flexium advanced maintenance
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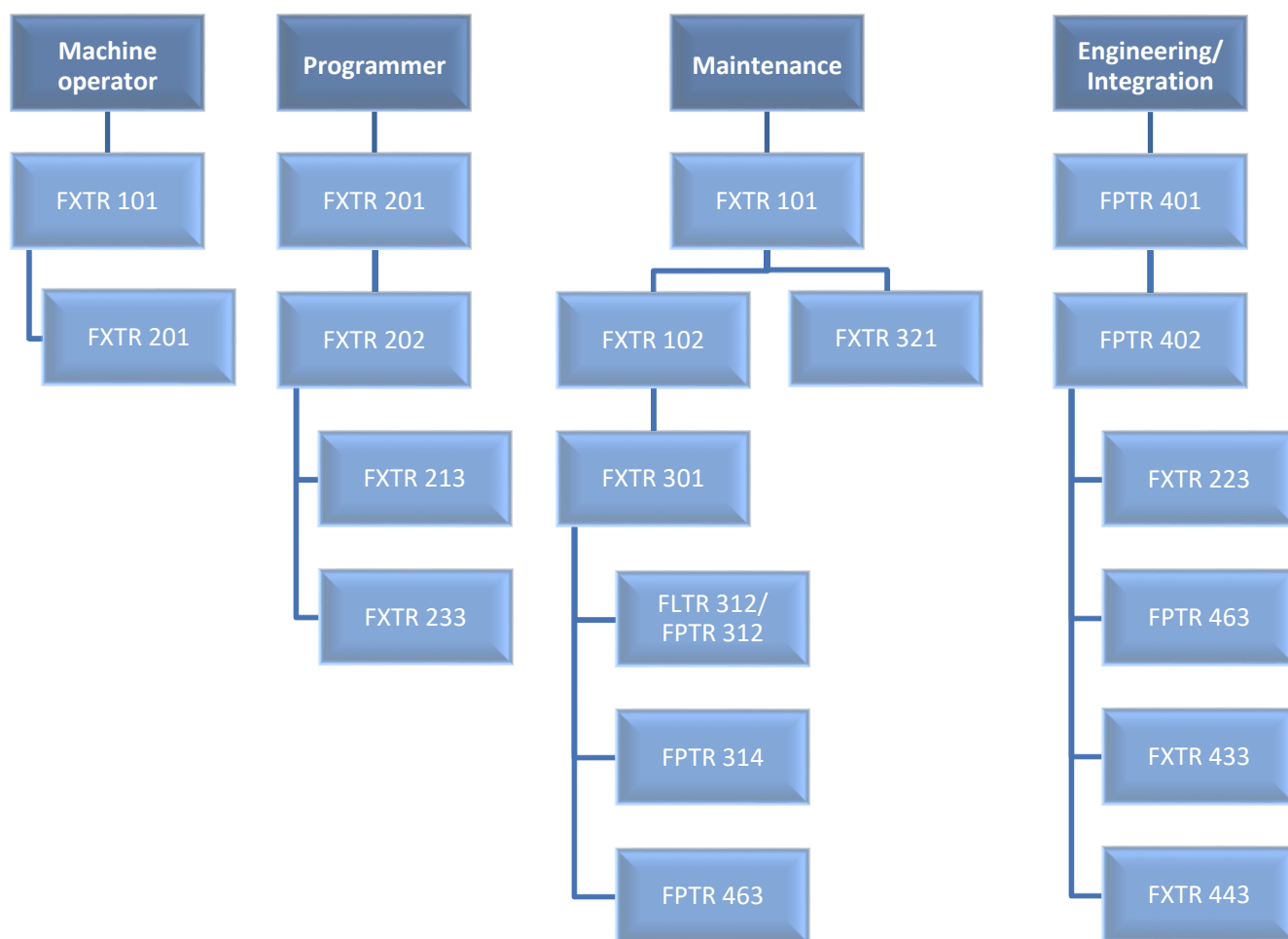
## **Flexium<sup>+</sup>-Specific Training Sessions**

FPTR 312	Flexium <sup>+</sup> system advanced maintenance
FPTR 314	NUMDrive X advanced maintenance
FPTR 401	Flexium <sup>+</sup> system initial setup
FPTR 402	Flexium <sup>+</sup> system advanced setup
FPTR 463	Safety including NUM-SAMX

## **Axium Power-Specific Training Session**

APTR 201	Axium Power system maintenance
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## Proposed Training Paths



## Course Schedule

CLASS	CLASS TYPE	SYSTEM	1 <sup>st</sup> QUARTER	2 <sup>nd</sup> QUARTER	3 <sup>rd</sup> QUARTER	4 <sup>th</sup> QUARTER
<b>FXTR 201 (2.5 days)</b>	Operations - Basic Programming	Flexium & Flexium <sup>+</sup>	1/23 to 1/25	4/24 to 4/26	7/24 to 7/26	10/23 to 10/25
<b>FXTR 202 (2.5 days)</b>	Adv. ISO Programming	Flexium & Flexium <sup>+</sup>	1/25 to 1/27	4/26 to 4/28	7/26 to 7/28	10/25 to 10/27
<b>FXTR 301 (2.5 days)</b>	System Maintenance	Flexium & Flexium <sup>+</sup>	1/30 to 2/1		7/31 to 8/2	
<b>FPTR 301 (2.5 days)</b>	System Maintenance	Flexium <sup>+</sup>		5/1 to 5/3		10/30 to 11/1
<b>FXTR 321 (2.5 days)</b>	System Maintenance	Flexium & Flexium <sup>+</sup>	2/6 to 2/8		8/7 to 8/9	
<b>FPTR 401 (5 days)</b>	Flexium <sup>+</sup> System Integration	Flexium <sup>+</sup> & MDLUX		5/15 to 5/19		11/27 to 12/1
<b>Seminar</b>	General	Flexium <sup>+</sup> & MDLUX		5/24 (Webinar)		11/8 (Webinar)

- 1- For course that are not listed in the schedule please contact NUM USA directly.  
2- Training for older NUM platform can be schedule as "Individual Training".

## Your training contacts

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# Course Descriptions

## Flexium system description

**FXTR 101**

Your area of interest	Prerequisite or Equivalent Knowledge
General knowledge	None
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Understanding the Flexium range structure (CNCs and Drives)</li> <li>✓ Understanding the main functions</li> <li>✓ Ability to define a configuration with the Flexium catalogue</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Individual components</li> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Flexium catalogue (on CD)</li> </ul>
Training Content	
<p>Flexium CNC presentation</p> <ul style="list-style-type: none"> <li>○ The different models of CNCs</li> <li>○ Hardware structure – Software functions</li> </ul> <p>The panels</p> <ul style="list-style-type: none"> <li>○ PC Panels</li> <li>○ Machine panels</li> </ul> <p>The PLC</p> <ul style="list-style-type: none"> <li>○ Structure</li> <li>○ Programming languages</li> <li>○ IOs</li> </ul> <p>NUMDrive C presentation</p> <ul style="list-style-type: none"> <li>○ Hardware structure</li> <li>○ Drives functions and performances</li> <li>○ Axes and spindle motors</li> </ul>	<p>NUMDrive X presentation</p> <ul style="list-style-type: none"> <li>○ Hardware structure</li> <li>○ Drives functions and performances</li> <li>○ Axes and spindle motors</li> </ul> <p>Tools</p> <ul style="list-style-type: none"> <li>○ PLC programming</li> <li>○ Web tools</li> </ul> <p>Applications</p> <ul style="list-style-type: none"> <li>○ From the single unit CNC to the multi CNC - multi panels configurations</li> </ul> <p>Questions and answers (1/2 hour)</p>
Duration	Date / Costs
1 day	Please consult your local training contact

# Flexium and Safety

**FXTR 102**

Your area of interest	Prerequisite or Equivalent Knowledge
General knowledge	FXTR101
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Understanding the Flexium and Flexium+ safety concepts</li> <li>✓ Understanding the various safety features</li> <li>✓ Ability to define the components and development required for a particular configuration</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Individual components</li> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Flexium catalogue (on CD)</li> </ul>
Training Content	
<p>Safety: What is it?</p> <ul style="list-style-type: none"> <li>○ Safety PLCs</li> <li>○ Safe motions</li> <li>○ Safety level</li> </ul> <p>General on EtherCAT and FSoE</p> <p>The Safe PLC</p> <ul style="list-style-type: none"> <li>○ Structure</li> <li>○ Programming languages</li> <li>○ I/Os</li> </ul>	<p>Safety and Motions</p> <ul style="list-style-type: none"> <li>○ SAM, STO and NUMDrive C</li> <li>○ SAMX, STOX and NUMDrive X</li> </ul> <p>Questions and answers (1/2 hour)</p>
Duration	Date / Costs
1 day	Please consult your local training contact

## Operation and Diagnostics

**FXTR 201**

Your area of interest	Prerequisite or Equivalent Knowledge
Machine operator – 1 <sup>st</sup> level maintenance	FXTR101 or equivalent
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Ability to run a machine equipped with Flexium system</li> <li>✓ Understanding and adjusting the coordinate systems and tools offsets</li> <li>✓ Understanding operators message and status indicators to perform a first level maintenance</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Individual components</li> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Programming manual (CD)</li> </ul>
Training Content	
<p>Operation</p> <ul style="list-style-type: none"> <li>○ Using the HMI</li> <li>○ Modes of operation</li> <li>○ ISO concepts (interpolation – feedrate – tools offsets – main canned cycles)</li> <li>○ Coordinate systems – programmable axes</li> <li>○ Work preparation, tools offsets, origin presets</li> <li>○ Basic of parametric programming</li> </ul> <p>Maintenance</p> <ul style="list-style-type: none"> <li>○ Status indicators</li> <li>○ Operators messages</li> <li>○ LED indications</li> <li>○ Backup of essential data</li> <li>○ Adding a system option</li> </ul>	<p>Tools</p> <ul style="list-style-type: none"> <li>○ Web tools</li> <li>○ Flexium license loader</li> </ul> <p>Questions and answers (2 hours)</p>
Duration	Date / Costs
2.5 days	Please consult your local training contact

## Advanced part programming

**FXTR 202**

Your area of interest	Prerequisite or Equivalent Knowledge
Advanced part programming – custom macros – special functions for OEM	FXTR201
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Mastering the advanced ISO functions of the system</li> <li>✓ Ability to create a custom macro (tool changer – milling head exchange – probing etc.)</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Individual components</li> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Programming and advanced programming manual (CD)</li> </ul>
Training Content	
<p>Advanced ISO functions</p> <ul style="list-style-type: none"> <li>○ Polar programming</li> <li>○ Probing management</li> <li>○ Pocket cycles</li> <li>○ Complements on parametric programming <ul style="list-style-type: none"> <li>▪ Detailed information on E parameters</li> <li>▪ Relation with the outside via the PLC</li> </ul> </li> <li>○ Structured programming</li> <li>○ Dynamic operators</li> <li>○ Customized G codes</li> </ul> <p>Exercises</p> <p>Questions and answers</p>	
Duration	Date / Costs
2.5 days	Please consult your local training contact

## Flexium 3D

**FXTR 213**

Your area of interest	Prerequisite or Equivalent Knowledge
Machine operation - Programming	FXTR202
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Using Flexium 3D to validate a part program</li> <li>✓ Interacting with Flexium HMI to correct possible programming faults</li> <li>✓ Optional : Customizing Flexium 3D for machine simulation</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> </ul>
Training Content	
<p>Flexium 3D presentation</p> <ul style="list-style-type: none"> <li>○ Principle of operation</li> <li>○ The different screens</li> </ul> <p>Running Flexium 3D</p> <ul style="list-style-type: none"> <li>○ Program configuration</li> <li>○ Defining the blank and the tools</li> <li>○ Off line and On line simulation</li> </ul> <p>Exercises</p> <p>Optional</p> <ul style="list-style-type: none"> <li>○ Designing a machine model</li> </ul> <p>Questions and answers (2 hours)</p>	
Duration	Date / Costs
1 day + 1 day optional	Please consult your local training contact

# Dynamic operators in C

**FXTR 223**

Your area of interest	Prerequisite or Equivalent Knowledge
General knowledge	FXTR202 and programming C language
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Develop an application using dynamic operators in C</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Individual components</li> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Flexium catalogue (on CD)</li> </ul>
Training Content	
<ul style="list-style-type: none"> <li>○ Principle of dynamic operators</li> <li>○ Short example using classic dynamic operators</li> <li>○ Review list of parameters</li> <li>○ The compiler</li> <li>○ Examples</li> <li>○ Trace and debug</li> </ul>	
Duration	Date / Costs
1 day	Please consult your local training contact

## High Speed Cutting – 5 axes functions

**FXTR 233**

Your area of interest	Prerequisite or Equivalent Knowledge
General knowledge	FXTR202 or FPTR 401
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Mastering 5 axes machining functions</li> <li>✓ RTCP (Rotating Tool Centre Point)</li> <li>✓ Inclined plane</li> <li>✓ High speed cutting</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Individual components</li> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Flexium catalogue (on CD)</li> </ul>
Training Content	
<ul style="list-style-type: none"> <li>○ NC 5 axes functions</li> <li>○ RTCP and inclined plane parameterization</li> <li>○ Application</li> <li>○ High speed machining functions</li> <li>○ Speed and acceleration controls</li> <li>○ Optimization of parameters</li> </ul>	<ul style="list-style-type: none"> <li>○ Axes adjustments</li> <li>○ Flexium tools instruments</li> <li>○ Practical case</li> </ul> <p>Questions and answers (1/2 hour)</p>
Duration	Date / Costs
2 days	Please consult your local training contact

## Flexium system maintenance with Flexium Tools

**FXTR 301**

Your area of interest	Prerequisite or Equivalent Knowledge
Maintenance	FXTR102
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Ability to detect and replace defective components in a short time</li> <li>✓ Predictive maintenance</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> </ul>
Training Content	
<p>Flexium system maintenance</p> <ul style="list-style-type: none"> <li>○ System structure</li> <li>○ Components</li> <li>○ System startup</li> <li>○ Diagnostics</li> <li>○ Software updates</li> <li>○ Service tool</li> <li>○ Safety</li> <li>○ Backup and Restore procedures</li> <li>○ Part replacement</li> </ul> <p>Drives maintenance</p> <ul style="list-style-type: none"> <li>○ Product knowledge</li> <li>○ Drives exchange procedure</li> </ul> <p>Questions and answers (1 hour)</p>	
Duration	Date / Costs
2.5 days	Please consult your local training contact



## Flexium system maintenance without Flexium Tools

**FXTR 321**

Your area of interest	Prerequisite or Equivalent Knowledge
Maintenance	FXTR102
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Ability to detect and replace defective components in a short time</li> <li>✓ Predictive maintenance</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> </ul>
Training Content	
<p>Flexium system maintenance</p> <ul style="list-style-type: none"> <li>○ System structure</li> <li>○ Components</li> <li>○ System startup</li> <li>○ Diagnostics</li> <li>○ Software updates</li> <li>○ Service tool</li> <li>○ Safety</li> <li>○ Backup and Restore procedures</li> <li>○ Part replacement</li> </ul> <p>Drives maintenance</p> <ul style="list-style-type: none"> <li>○ Product knowledge</li> <li>○ Drives exchange procedure</li> </ul> <p>Questions and answers (1 hour)</p>	
Duration	Date / Costs
2.5 days	Please consult your local training contact

## Flexium system advanced maintenance

FLTR 312

Your area of interest	Prerequisite or Equivalent Knowledge
Maintenance	FXTR301
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Ability to detect and replace defective components in a short time</li> <li>✓ Predictive maintenance</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> </ul>
Training Content	
<p>Flexium system maintenance</p> <ul style="list-style-type: none"> <li>○ Detailing the product structure</li> <li>○ Exchange zone</li> <li>○ Troubleshooting with Flexium HMI</li> <li>○ Flexium Tools</li> <li>○ Parameters modification</li> <li>○ Debugging with the PLC</li> <li>○ PLC program adjustments</li> <li>○ Backup and restore</li> </ul>	<p>NUMDrive C advanced maintenance</p> <ul style="list-style-type: none"> <li>○ Detailed analysis</li> <li>○ Drives instruments</li> <li>○ Drives exchange procedure</li> <li>○ Safety application maintenance</li> </ul> <p>Questions and answers (1 hour)</p>
Duration	Date / Costs
3 days	Please consult your local training contact

## Flexium<sup>+</sup> system advanced maintenance

**FPTR 312**

Your area of interest	Prerequisite or Equivalent Knowledge
Maintenance	FXTR301
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Ability to detect and replace defective components in a short time</li> <li>✓ Predictive maintenance</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> </ul>
Training Content	
<p>Flexium<sup>+</sup> system maintenance</p> <ul style="list-style-type: none"> <li>○ Detailing the product structure</li> <li>○ Exchange zone</li> <li>○ Troubleshooting with Flexium HMI</li> <li>○ Flexium Tools</li> <li>○ Parameters modification</li> <li>○ Debugging with the PLC</li> <li>○ PLC program adjustments</li> <li>○ Backup and restore</li> </ul>	<p>NUMDrive X drives advanced maintenance</p> <ul style="list-style-type: none"> <li>○ Detailed analysis</li> <li>○ Drives instruments</li> <li>○ Drives exchange procedure</li> <li>○ Safety application maintenance</li> </ul> <p>Questions and answers (1 hour)</p>
Duration	Date / Costs
3 days	Please consult your local training contact

## NUMDrive X advanced maintenance

**FPTR 314**

Your area of interest	Prerequisite or Equivalent Knowledge
Machine maintenance	FXTR301
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Ability to detect and replace components or adjust parameters</li> </ul>	Training materials <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> Deliveries <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> </ul>
Training Content	
Review <ul style="list-style-type: none"> <li>○ Range description</li> <li>○ Troubleshooting with Flexium HMI</li> </ul> Components connections <ul style="list-style-type: none"> <li>○ Structure of a NUMDrive X application</li> </ul> Adjustments <ul style="list-style-type: none"> <li>○ Using Flexium Tools for diagnostic</li> <li>○ Main drive parameters</li> <li>○ Adjustment and control</li> </ul> Questions and answers	
Duration	Date / Costs
2.5 days	Please consult your local training contact

# Flexium<sup>+</sup> system initial setup

**FPTR 401**

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	FXTR201
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Create a first Flexium application for a machine</li> <li>✓ Control basic functions – Run two axes and a spindle</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Installation manual – Commissioning manual – Flexium Tools (all on CD)</li> </ul>
Training Content	
<p>Understanding Flexium<sup>+</sup> structure</p> <p>Flexium Tools presentation</p> <ul style="list-style-type: none"> <li>○ Getting familiar with the package</li> <li>○ Languages</li> <li>○ Variables</li> <li>○ Structure of a project</li> </ul> <p>Practical exercise</p> <ul style="list-style-type: none"> <li>○ Creating the machine structure</li> <li>○ Integrating IOs (CANopen and Ethernet)</li> <li>○ Integrating a panel</li> <li>○ Handling modes, manual and automatic commands</li> <li>○ Operator messages</li> <li>○ Power on, security</li> <li>○ Integrating axes and spindle</li> <li>○ First level of parameterization</li> <li>○ Running a simple part program</li> <li>○ Introduction to the custom visualization</li> </ul>	Questions and answers
Duration	Date / Costs
5 days	Please consult your local training contact

## Flexium<sup>+</sup> system advanced setup

**FPTR 402**

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	FPTR 401
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Commissioning a Flexium system on any kind of machine</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Full set of Flexium manuals – Flexium Tools – Example project (all on CD)</li> </ul>
Training Content	
<p>Detailed analysis of exchange variables</p> <p>Flexium Tools complements</p> <ul style="list-style-type: none"> <li>○ Project simulation and debug</li> <li>○ Application control (Tasks – automated checks)</li> <li>○ Field bus control</li> <li>○ Advanced functions (Probing – tool wear – shutdown etc.)</li> <li>○ Custom screens complements</li> <li>○ Optional functions (multi NCK – multi panels etc.)</li> <li>○ Writing custom libraries</li> </ul>	<p>Questions and answers</p>
Duration	Date / Costs
5 days	Please consult your local training contact

## Extended NCK Access (ENA)

**FXTR 433**

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	FPTR402
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Exchange of additional data between NCK and PLC</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Flexium Tools – Example project</li> </ul>
Training Content	
<p>Structure of internal communication in Flexium systems</p> <p>ENA library</p> <ul style="list-style-type: none"> <li>○ Available parameters and functions</li> </ul> <p>Application</p> <ul style="list-style-type: none"> <li>○ Reading parameters</li> <li>○ Writing parameters</li> <li>○ Files management</li> </ul> <p>Questions and answers</p>	
Duration	Date / Costs
2 days	Please consult your local training contact

# Flexium HMI personalization

**FXTR 443**

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	<ul style="list-style-type: none"> <li>○ FXTR101</li> <li>○ Windows knowledge</li> <li>○ Programming knowledge of script languages</li> </ul>
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Creating Flexium HMI custom pages in HTML/JavaScript</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Software Development Kit access</li> <li>○ Example (on CD)</li> </ul>
Training Content	
<p>Introduction in the architecture of Flexium HMI</p> <p>Explanation of the Flexium HMI components</p> <ul style="list-style-type: none"> <li>○ FXBrowser</li> <li>○ FXServer</li> <li>○ FXLib</li> <li>○ FXLog</li> </ul> <p>Structure of configuration files</p> <ul style="list-style-type: none"> <li>○ FXServer.ini</li> <li>○ FXUser.ini</li> </ul> <p>Explanation of the FXServer architecture</p> <ul style="list-style-type: none"> <li>○ Event handling</li> <li>○ task management</li> <li>○ ...</li> </ul>	<p>Abstract of development tools</p> <p>Exercises related to practice using HTML and JavaScript</p> <ul style="list-style-type: none"> <li>○ Object instancing of the classes of the development components</li> <li>○ Using of the development components</li> <li>○ Characteristics of the array structure of event classes</li> <li>○ Programming examples</li> </ul> <p>Questions and answers</p>
Duration	Date / Costs
3 days	Please consult your local training contact



# Communication with Flexium

**FXTR 453**

<b>Your area of interest</b>	<b>Prerequisite or Equivalent Knowledge</b>
Engineering and Setup	<ul style="list-style-type: none"> <li>○ FXTR101</li> <li>○ Windows knowledge</li> <li>○ Knowledge of object oriented programming (OOP) and use of COM server</li> </ul>
<b>Objectives</b>	<b>Supports</b>
<ul style="list-style-type: none"> <li>✓ Using of FXServer for the communication with the different components of Flexium</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Software Development Kit access</li> <li>○ Programming examples in C# and C++ (on CD)</li> </ul>
<b>Training Content</b>	
<p>Introduction in the architecture of FXServer</p> <p>Explanation of the Flexium components (FXServer, FXLib, FXLog) and configuration file (FXServer.ini)</p> <p>Explanation of the FXServer architecture (Event handling, task management, ...)</p>	<p>Exercises related to practice using C#</p> <ul style="list-style-type: none"> <li>○ Object referencing and instancing of the classes of the development components</li> <li>○ Using of the development components</li> <li>○ Characteristics of the array structure of event classes</li> <li>○ Programming examples</li> </ul> <p>Questions and answers</p>
<b>Duration</b>	<b>Date / Costs</b>
3 days	Please consult your local training contact

## Safety including NUM-SAMX

**FPTR 463**

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	FXTR102 or FPTR402
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Understand concept.</li> <li>✓ Program and setup a safety application on a Flexium system</li> </ul>	<p>Training materials</p> <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> <p>Deliveries</p> <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Software Development Kit access</li> <li>○ Example (on CD)</li> </ul>
Training Content	
Hardware structure	
Safety functions	
Safety application concept	
Safe PLC programming	
Drive functions <ul style="list-style-type: none"> <li>○ NUM-STOX setup</li> <li>○ NUM-SAMX setup</li> </ul>	
Questions and answers	
Duration	Date / Costs
2 days	Please consult your local training contact

## Axiom Power system maintenance

APTR 201

Your area of interest	Prerequisite or Equivalent Knowledge
Maintenance	None
Objectives	Supports
<ul style="list-style-type: none"> <li>✓ Ability to detect and replace defective components in a short time</li> <li>✓ Predictive maintenance</li> </ul>	Training materials <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> Deliveries <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> </ul>
Training Content	
Axiom system maintenance <ul style="list-style-type: none"> <li>○ System structure</li> <li>○ Components</li> <li>○ System startup</li> <li>○ Diagnostics</li> <li>○ Software updates</li> <li>○ Service tool</li> <li>○ Safety</li> <li>○ Part replacement</li> </ul> Drives maintenance <ul style="list-style-type: none"> <li>○ Product knowledge</li> <li>○ Drives exchange procedure</li> </ul> Questions and answers (1 hour)	
Duration	Date / Costs
5 days	Please consult your local training contact

## Individual trainings

Your area of interest	Prerequisite or Equivalent Knowledge
Something around NUM controls	Depending on the training content
Objectives	Supports
✓ Will be defined with you	Training materials <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> Deliveries <ul style="list-style-type: none"> <li>○ Course presentation (printed and .pdf on CD)</li> <li>○ Example (on CD) if available</li> </ul>
Training Content	
Will be developed with you	
Duration	Date / Costs
To be defined	Please consult your local training contact

Individual trainings can happen at NUM locations or customer site.

## Seminar

Your area of interest	Prerequisite or Equivalent Knowledge
General	None
Objectives	Supplementary Items
<ul style="list-style-type: none"> <li>✓ Present NUM's newest innovations in CNC, servo motors and drive technology</li> </ul>	Training materials <ul style="list-style-type: none"> <li>○ Simulator</li> </ul> Media <ul style="list-style-type: none"> <li>○ Course presentation (.pdf on USB)</li> <li>○ Example (on USB) if available</li> </ul>
Training Content	
Topics include the newest innovations in CNC, servo motors and drive technology. Additional topics include NUM services, maintenance techniques and a range of innovative complete solutions for CNC and machine tool retrofits	
Duration	Date / Costs
0.5 days	<ul style="list-style-type: none"> <li>• Refer to Course Schedule</li> <li>• Free of charge</li> </ul>

## Organization

### Training Facilities United States

NUM USA	Phone	+1 630 505 7722
603 E. Diehl Road Suite 115	Fax	+1 630 505 7754
Naperville, IL 60563		sales.us@num.com

**Cost** Contact your local NUM office.

**Time** Classes begin at 08:30 a.m. and end at about 5:00 p.m., with 1-hour lunch break.

**Booking** All classes require a minimum of 3 persons. Insufficient enrollment 3 weeks prior to the class date will result in course cancellation.

Student cancellations will not be accepted within 3 weeks prior to the course start date. Student will be invoiced as if attending the course.

## Booking form

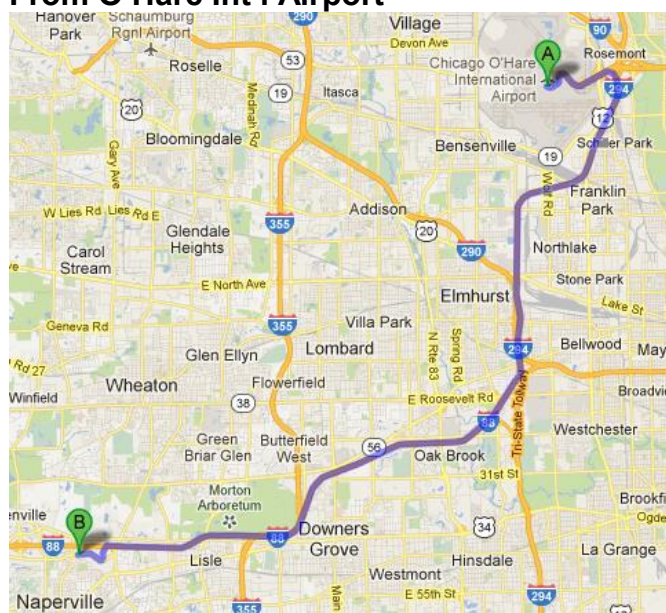
For booking of training, please send an e-mail to [sales.us@num.com](mailto:sales.us@num.com) with the following information:

- Company name
- Contact person
- Phone
- Address
- Purchase order number
- Training number
- Training date
- Training location
- Names of the participants

For other countries, please contact your local sales representative or NUM Switzerland ([sales.ch@num.com](mailto:sales.ch@num.com)).

## Journey to NUM USA

### From O'Hare Int'l Airport

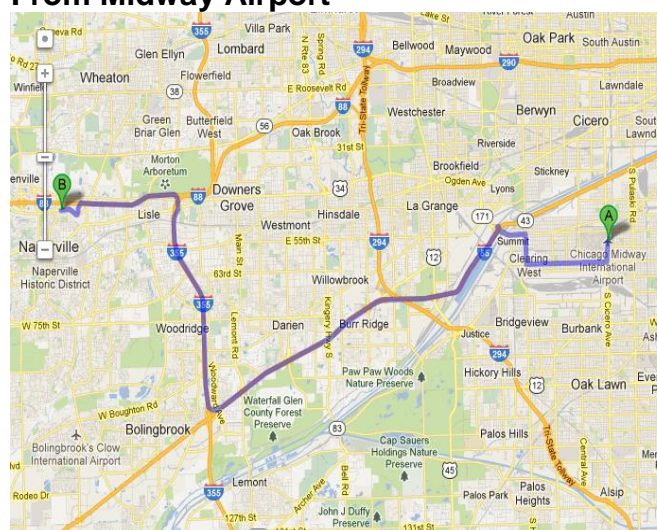


**Chicago O'Hare International Airport**  
10000 West O'Hare Avenue, Chicago, IL 60666

- Head southeast  
About 2 mins  
go 0.5 mi  
total 0.5 mi
- Take the ramp onto I-190 E  
About 3 mins  
go 1.5 mi  
total 2.1 mi
- Take exit 1D toward I-294 S/Indiana/S Tollway  
go 0.4 mi  
total 2.4 mi
- Merge onto I-294 S  
Partial toll road  
About 11 mins  
go 8.7 mi  
total 11.2 mi
- Take the Interstate 88 West E-W Tollway exit toward Aurora  
Toll road  
go 0.4 mi  
total 11.6 mi
- Merge onto I-88 W  
Toll road  
About 15 mins  
go 11.9 mi  
total 23.5 mi
- Take the exit toward Naperville Road  
About 1 min  
go 0.5 mi  
total 23.9 mi
- Turn left onto Freedom Dr  
About 1 min  
go 0.4 mi  
total 24.3 mi
- Turn right onto E Diehl Rd  
Destination will be on the left  
About 2 mins  
go 0.7 mi  
total 25.0 mi

**Num Corporation**  
603 E Diehl Rd, Naperville, IL 60563

### From Midway Airport



**Midway International Airport**  
5700 S Cicero Ave, Chicago, IL 60638

- Head south on S Cicero Ave  
About 1 min  
go 0.7 mi  
total 0.7 mi
- Turn right onto W 63rd St  
About 7 mins  
go 3.0 mi  
total 3.7 mi
- Turn right onto S Harlem Ave  
About 2 mins  
go 1.0 mi  
total 4.7 mi
- Turn left onto S Archer Ave  
About 2 mins  
go 0.7 mi  
total 5.4 mi
- Continue onto IL-171 N  
go 0.4 mi  
total 5.8 mi
- Take the I-55 S ramp to St Louis  
go 0.4 mi  
total 6.2 mi
- Keep left at the fork and merge onto I-55 S  
About 13 mins  
go 12.2 mi  
total 18.4 mi
- Take exit 269 for Interstate 355 Tollway N/Interstate 355 Tollway S toward Northwest Suburbs/Southwest Suburbs  
Toll road  
go 0.4 mi  
total 18.7 mi
- Keep right at the fork, follow signs for Interstate 355 N/Northwest Suburbs and merge onto I-355 N  
Toll road  
About 7 mins  
go 6.7 mi  
total 25.4 mi
- Take the exit toward Aurora  
Toll road  
About 2 mins  
go 1.5 mi  
total 27.0 mi
- Merge onto I-88 W  
Toll road  
About 3 mins  
go 2.6 mi  
total 29.6 mi
- Take the exit toward Naperville Road  
About 1 min  
go 0.5 mi  
total 30.0 mi
- Turn left onto Freedom Dr  
About 1 min  
go 0.4 mi  
total 30.4 mi
- Turn right onto E Diehl Rd  
Destination will be on the left  
About 2 mins  
go 0.7 mi  
total 31.2 mi

**Num Corporation**  
603 E Diehl Rd, Naperville, IL 60563

## Hotel with NUM discount

### Hampton Inn

1087 E. Diehl Road  
(630) 505-1400

Continental breakfast included. Area shuttle, exercise room and seasonal outdoor pool available.  
Ask for NUM USA rate to get a 25% discount.

### Hotel Indigo Naperville Riverwalk - Downtown

120 Water Street  
(630) 778 9676

Some customers prefer this downtown Riverwalk location with walking distance to shopping, restaurants, bars, etc... The Hotel has free wifi with full service restaurant serving breakfast, lunch, dinner, exercise room, free weights and cardio equipment. Complimentary shuttle service to and from NUM offices and within 5 mile radius of hotel - based upon availability.  
Ask for the NUM Corporation rate. 15-25% off. (Corp ID 786866549, IATA# 99502056)