

CNC Power Engineering

Always on the move



CNC and Drives

Training catalogue 2021

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.

Content list

Who has the best expertise in <i>your</i> area of business?	1
Content list.....	3
Training with NUM: your advantages	4
Training Centers	4
Training Courses.....	5
Generic Training Sessions.....	5
Flexium-Specific Training Sessions	6
Flexium ⁺ -Specific Training Sessions	6
Proposed Training Paths	7
Course Schedule	8
Your training contacts	8
*Switzerland:	8
USA:.....	8
Course Descriptions.....	9
Flexium system description FXTR 101	9
Flexium and Safety FXTR 102	10
Operation and Diagnostics FXTR 201	11
Advanced part programming FXTR 202	12
Flexium 3D FXTR 213.....	13
Dynamic operators in C FXTR 223.....	14
High Speed Cutting – 5 axes functions FXTR 233.....	15
Flexium system maintenance with Flexium Tools FXTR 301.....	16
Flexium system maintenance without Flexium Tools FXTR 321	17
Flexium system advanced maintenance FLTR 312	18
Flexium ⁺ system advanced maintenance FPTR 312	19
NUMDrive C advanced maintenance FLTR 314.....	20
NUMDrive X advanced maintenance FPTR 314.....	21
Flexium system initial setup FXTR 401	22
Flexium system advanced setup FLTR 402.....	23
Flexium ⁺ system advanced setup FPTR 402.....	24
Extended NCK Access (ENA) FXTR 433	25
Flexium HMI personalization FXTR 443	26
Communication with Flexium FXTR 453	27
Safety including SAM FLTR 463	28
Safety including NUM-SAMX FPTR 463	29
Axiom system maintenance APTR 201	30
Individual trainings	31
Seminar	32
Organization	33
Booking form	33
Journey to NUM USA	34
From O'Hare Int'l Airport.....	34
From Midway Airport	34
Hotel with NUM discount	34

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
Control Series					
Generic	FX				
Flexium only	FL				
Flexium ⁺ only	FP				
Training					
Type					
Product Knowledge			1		
Operation and Diagnostics			2		
Maintenance			3		
Engineering and Integration			4		
Modifier					
Expertise Level					
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 401	Flexium system initial setup
FXTR 433	Extended NCK Access (ENA)
FXTR 443	Flexium HMI personalization

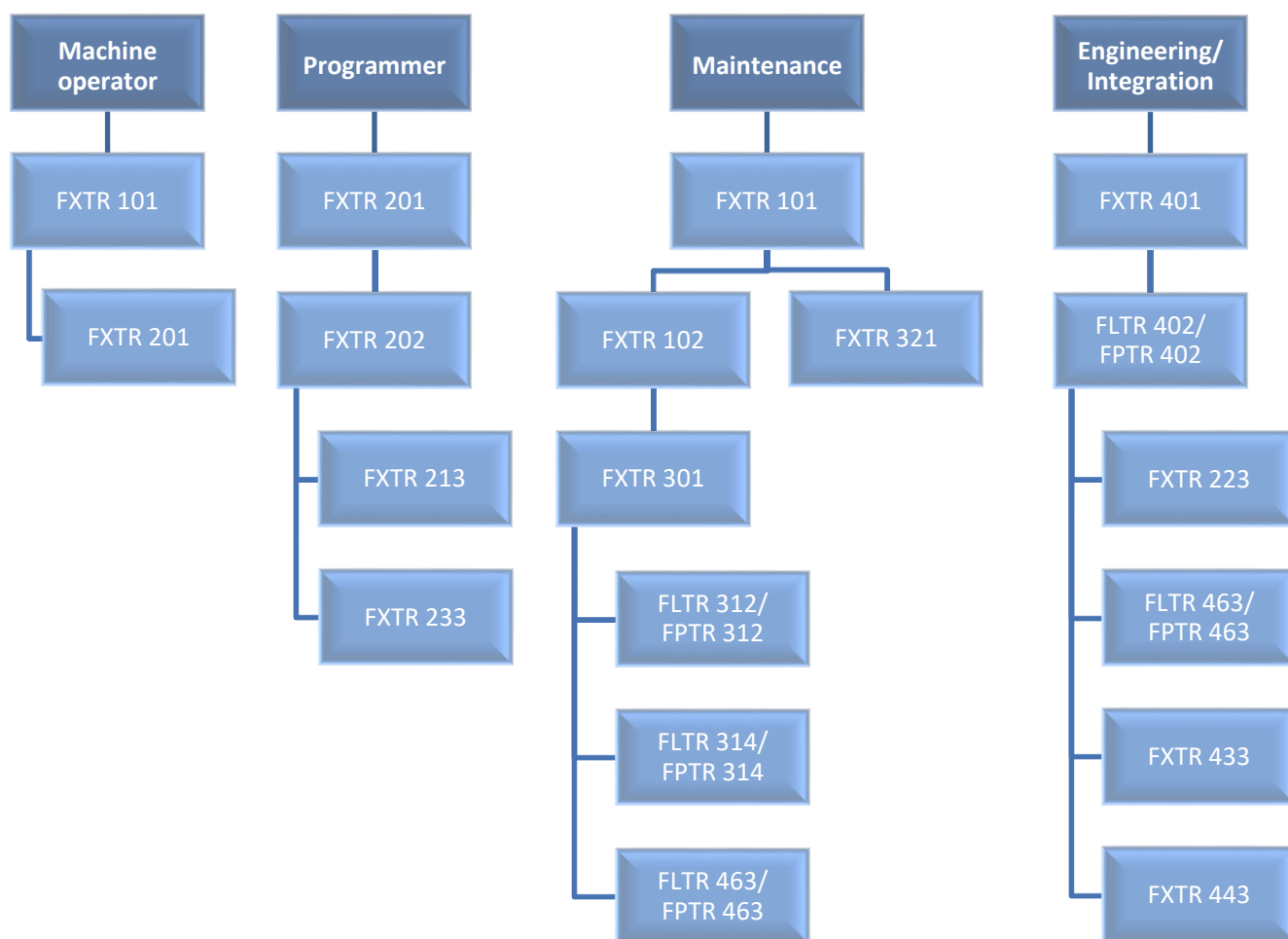
Flexium-Specific Training Sessions

FLTR 312	Flexium advanced maintenance
FLTR 314	NUMDrive C advanced maintenance
FLTR 402	Flexium system advanced setup
FLTR 463	Safety including SAM

Flexium⁺-Specific Training Sessions

FPTR 312	Flexium ⁺ system advanced maintenance
FPTR 314	NUMDrive X advanced maintenance
FPTR 402	Flexium ⁺ system advanced setup
FPTR 463	Safety including NUM-SAMX

Proposed Training Paths



Course Schedule

CLASS	CLASS TYPE	SYSTEM	1 st QUARTER	2 nd QUARTER	3 rd QUARTER	4 th QUARTER
FXTR201	Operations - Basic Programming	Flexium & Flexium ⁺	1/25 to 1/27	4/26 to 4/28	7/26 to 7/28	10/25 to 10/27
FXTR202	Adv. ISO Programming	Flexium & Flexium ⁺	1/27 to 1/29	4/28 to 4/30	7/28 to 7/30	10/27 to 10/29
FXTR301	System Maintenance	Flexium & Flexium ⁺	2/1 to 2/3		8/2 to 8/4	
FPTR301	System Maintenance	Flexium ⁺		5/3 to 5/5		11/1 to 11/3
FXTR321	System Maintenance	Flexium & Flexium ⁺	2/8 to 2/10		8/9 to 8/11	
FXTR401	System Startup	Flexium & Flexium ⁺	2/15 to 2/19	5/10 to 5/14	8/16 to 8/20	11/8 to 11/10
FPTR402	Adv. Flexium Tools Config.	Flexium ⁺ & MDLUX		5/17 to 5/21		11/15 to 11/19
Seminar	General	Flexium ⁺ & MDLUX		5/26 (Webinar)		11/22 (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

USA:

Engineering Department

Phone: +1 630 505 7722

Fax: +1 630 505 7754

sales.us@num.com

*Switzerland:

Irma Roth

Phone: +41 71 335 04 11

Fax: +41 71 333 35 87

sales.ch@num.com

*For other countries, please contact your local sales representative or NUM Switzerland.

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"> ✓ Understanding the Flexium range structure (CNCs and Drives) ✓ Understanding the main functions ✓ Ability to define a configuration with the Flexium catalogue 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Individual components ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Flexium catalogue (on CD)
Training Content	
<p>Flexium CNC presentation</p> <ul style="list-style-type: none"> ○ The different models of CNCs ○ Hardware structure – Software functions <p>The panels</p> <ul style="list-style-type: none"> ○ PC Panels ○ Machine panels <p>The PLC</p> <ul style="list-style-type: none"> ○ Structure ○ Programming languages ○ IOs <p>NUMDrive C presentation</p> <ul style="list-style-type: none"> ○ Hardware structure ○ Drives functions and performances ○ Axes and spindle motors 	<p>NUMDrive X presentation</p> <ul style="list-style-type: none"> ○ Hardware structure ○ Drives functions and performances ○ Axes and spindle motors <p>Tools</p> <ul style="list-style-type: none"> ○ PLC programming ○ Web tools <p>Applications</p> <ul style="list-style-type: none"> ○ From the single unit CNC to the multi CNC - multi panels configurations <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"> ✓ Understanding the Flexium and Flexium+ safety concepts ✓ Understanding the various safety features ✓ Ability to define the components and development required for a particular configuration 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Individual components ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Flexium catalogue (on CD)
Training Content	
<p>Safety: What is it?</p> <ul style="list-style-type: none"> ○ Safety PLCs ○ Safe motions ○ Safety level <p>General on EtherCAT and FSoE</p> <p>The Safe PLC</p> <ul style="list-style-type: none"> ○ Structure ○ Programming languages ○ I/Os 	<p>Safety and Motions</p> <ul style="list-style-type: none"> ○ SAM, STO and NUMDrive C ○ SAMX, STOX and NUMDrive X <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 st level maintenance	FXTR101 or equivalent
Objectives	Supports
<ul style="list-style-type: none"> ✓ Ability to run a machine equipped with Flexium system ✓ Understanding and adjusting the coordinate systems and tools offsets ✓ Understanding operators message and status indicators to perform a first level maintenance 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Individual components ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Programming manual (CD)
Training Content	
<p>Operation</p> <ul style="list-style-type: none"> ○ Using the HMI ○ Modes of operation ○ ISO concepts (interpolation – feedrate – tools offsets – main canned cycles) ○ Coordinate systems – programmable axes ○ Work preparation, tools offsets, origin presets ○ Basic of parametric programming <p>Maintenance</p> <ul style="list-style-type: none"> ○ Status indicators ○ Operators messages ○ LED indications ○ Backup of essential data ○ Adding a system option 	<p>Tools</p> <ul style="list-style-type: none"> ○ Web tools ○ Flexium license loader <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"> ✓ Mastering the advanced ISO functions of the system ✓ Ability to create a custom macro (tool changer – milling head exchange – probing etc.) 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Individual components ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Programming and advanced programming manual (CD)
Training Content	
<p>Advanced ISO functions</p> <ul style="list-style-type: none"> ○ Polar programming ○ Probing management ○ Pocket cycles ○ Complements on parametric programming <ul style="list-style-type: none"> ▪ Detailed information on E parameters ▪ Relation with the outside via the PLC ○ Structured programming ○ Dynamic operators ○ Customized G codes <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"> ✓ Using Flexium 3D to validate a part program ✓ Interacting with Flexium HMI to correct possible programming faults ✓ Optional : Customizing Flexium 3D for machine simulation 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD)
Training Content	
<p>Flexium 3D presentation</p> <ul style="list-style-type: none"> ○ Principle of operation ○ The different screens <p>Running Flexium 3D</p> <ul style="list-style-type: none"> ○ Program configuration ○ Defining the blank and the tools ○ Off line and On line simulation <p>Exercises</p> <p>Optional</p> <ul style="list-style-type: none"> ○ Designing a machine model <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"> ✓ Develop an application using dynamic operators in C 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Individual components ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Flexium catalogue (on CD)
Training Content	
<ul style="list-style-type: none"> ○ Principle of dynamic operators ○ Short example using classic dynamic operators ○ Review list of parameters ○ The compiler ○ Examples ○ Trace and debug 	
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 FXTR 401
Objectives	Supports
<ul style="list-style-type: none"> ✓ Mastering 5 axes machining functions ✓ RTCP (Rotating Tool Centre Point) ✓ Inclined plane ✓ High speed cutting 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Individual components ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Flexium catalogue (on CD)
Training Content	
<ul style="list-style-type: none"> ○ NC 5 axes functions ○ RTCP and inclined plane parameterization ○ Application ○ High speed machining functions ○ Speed and acceleration controls ○ Optimization of parameters 	<ul style="list-style-type: none"> ○ Axes adjustments ○ Flexium tools instruments ○ Practical case <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"> ✓ Ability to detect and replace defective components in a short time ✓ Predictive maintenance 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD)
Training Content	
<p>Flexium system maintenance</p> <ul style="list-style-type: none"> ○ System structure ○ Components ○ System startup ○ Diagnostics ○ Software updates ○ Service tool ○ Safety ○ Backup and Restore procedures ○ Part replacement <p>Drives maintenance</p> <ul style="list-style-type: none"> ○ Product knowledge ○ Drives exchange procedure <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"> ✓ Ability to detect and replace defective components in a short time ✓ Predictive maintenance 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD)
Training Content	
<p>Flexium system maintenance</p> <ul style="list-style-type: none"> ○ System structure ○ Components ○ System startup ○ Diagnostics ○ Software updates ○ Service tool ○ Safety ○ Backup and Restore procedures ○ Part replacement <p>Drives maintenance</p> <ul style="list-style-type: none"> ○ Product knowledge ○ Drives exchange procedure <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"> ✓ Ability to detect and replace defective components in a short time ✓ Predictive maintenance 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD)
Training Content	
<p>Flexium system maintenance</p> <ul style="list-style-type: none"> ○ Detailing the product structure ○ Exchange zone ○ Troubleshooting with Flexium HMI ○ Flexium Tools ○ Parameters modification ○ Debugging with the PLC ○ PLC program adjustments ○ Backup and restore 	<p>NUMDrive C advanced maintenance</p> <ul style="list-style-type: none"> ○ Detailed analysis ○ Drives instruments ○ Drives exchange procedure ○ Safety application maintenance <p>Questions and answers (1 hour)</p>
Duration	Date / Costs
3 days	Please consult your local training contact

Flexium⁺ system advanced maintenance

FPTR 312

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

NUMDrive C advanced maintenance

FLTR 314

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

Flexium system initial setup

FXTR 401

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

Flexium system advanced setup

FLTR 402

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	FXTR401
Objectives	Supports
<ul style="list-style-type: none"> ✓ Commissioning a Flexium system on any kind of machine 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Full set of Flexium manuals – Flexium Tools – Example project (all on CD)
Training Content	
<p>Detailed analysis of exchange variables</p> <p>Flexium Tools complements</p> <ul style="list-style-type: none"> ○ Project simulation and debug ○ Application control (Tasks – automated checks) ○ Field bus control ○ Advanced functions (Probing – tool wear – shutdown etc.) ○ Custom screens complements ○ Optional functions (multi NCK – multi panels etc.) ○ Writing custom libraries 	<p>Questions and answers</p>
Duration	Date / Costs
5 days	Please consult your local training contact

Flexium⁺ system advanced setup

FPTR 402

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	FXTR401
Objectives	Supports
<ul style="list-style-type: none"> ✓ Commissioning a Flexium system on any kind of machine 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Full set of Flexium manuals – Flexium Tools – Example project (all on CD)
Training Content	
<p>Detailed analysis of exchange variables</p> <p>Flexium Tools complements</p> <ul style="list-style-type: none"> ○ Project simulation and debug ○ Application control (Tasks – automated checks) ○ Field bus control ○ Advanced functions (Probing – tool wear – shutdown etc.) ○ Custom screens complements ○ Optional functions (multi NCK – multi panels etc.) ○ Writing custom libraries 	<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	FLTR402 or FPTR402
Objectives	Supports
<ul style="list-style-type: none"> ✓ Exchange of additional data between NCK and PLC 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Flexium Tools – Example project
Training Content	
<p>Structure of internal communication in Flexium systems</p> <p>ENA library</p> <ul style="list-style-type: none"> ○ Available parameters and functions <p>Application</p> <ul style="list-style-type: none"> ○ Reading parameters ○ Writing parameters ○ Files management <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"> ○ FXTR101 ○ Windows knowledge ○ Programming knowledge of script languages
Objectives	Supports
<ul style="list-style-type: none"> ✓ Creating Flexium HMI custom pages in HTML/JavaScript 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Software Development Kit access ○ Example (on CD)
Training Content	
Introduction in the architecture of Flexium HMI	Abstract of development tools
<p>Explanation of the Flexium HMI components</p> <ul style="list-style-type: none"> ○ FXBrowser ○ FXServer ○ FXLib ○ FXLog <p>Structure of configuration files</p> <ul style="list-style-type: none"> ○ FXServer.ini ○ FXUser.ini <p>Explanation of the FXServer architecture</p> <ul style="list-style-type: none"> ○ Event handling ○ task management ○ ... 	<p>Exercises related to practice using HTML and JavaScript</p> <ul style="list-style-type: none"> ○ Object instancing of the classes of the development components ○ Using of the development components ○ Characteristics of the array structure of event classes ○ Programming examples <p>Questions and answers</p>
Duration	Date / Costs
3 days	Please consult your local training contact

Communication with Flexium

FXTR 453

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

Safety including SAM

FLTR 463

Your area of interest	Prerequisite or Equivalent Knowledge
Engineering and Setup	FXTR102 or FLTR402
Objectives	Supports
<ul style="list-style-type: none"> ✓ Understand concept. ✓ Program and Set-Up a safety application on a Flexium system 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Software Development Kit access ○ Example (on CD)
Training Content	
Hardware structure	
Safety functions	
Safety application concept	
Safe PLC programming	
Drive functions <ul style="list-style-type: none"> ○ STO setup ○ SAM setup 	
Questions and answers	
Duration	Date / Costs
1 day	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"> ✓ Understand concept. ✓ Program and setup a safety application on a Flexium system 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Software Development Kit access ○ Example (on CD)
Training Content	
Hardware structure	
Safety functions	
Safety application concept	
Safe PLC programming	
Drive functions	
<ul style="list-style-type: none"> ○ NUM-STOX setup ○ NUM-SAMX setup 	
Questions and answers	
Duration	Date / Costs
2 days	Please consult your local training contact

Axium system maintenance

APTR 201

Your area of interest	Prerequisite or Equivalent Knowledge
Maintenance	None
Objectives	Supports
<ul style="list-style-type: none"> ✓ Ability to detect and replace defective components in a short time ✓ Predictive maintenance 	<p>Training materials</p> <ul style="list-style-type: none"> ○ Simulator <p>Deliveries</p> <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD)
Training Content	
<p>Axium system maintenance</p> <ul style="list-style-type: none"> ○ System structure ○ Components ○ System startup ○ Diagnostics ○ Software updates ○ Service tool ○ Safety ○ Part replacement <p>Drives maintenance</p> <ul style="list-style-type: none"> ○ Product knowledge ○ Drives exchange procedure <p>Questions and answers (1 hour)</p>	
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"> ○ Simulator Deliveries <ul style="list-style-type: none"> ○ Course presentation (printed and .pdf on CD) ○ Example (on CD) if available
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"> ✓ Present NUM's newest innovations in CNC, servo motors and drive technology 	Training materials <ul style="list-style-type: none"> ○ Simulator Media <ul style="list-style-type: none"> ○ Course presentation (.pdf on USB) ○ Example (on USB) if available
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"> • Refer to Course Schedule • Free of charge

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

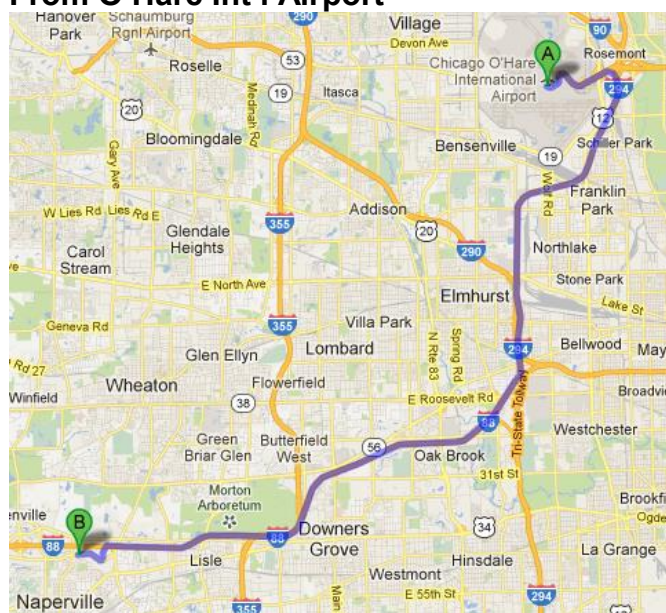
For booking of training, please send an e-mail to sales.us@num.com with the following information:

- 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).

Journey to NUM USA

From O'Hare Int'l Airport

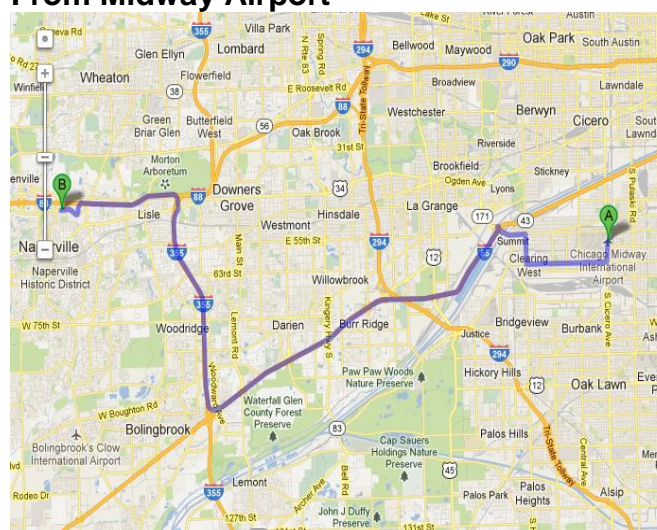


Chicago O'Hare International Airport
10000 West O'Hare Avenue, Chicago, IL 60666

- 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)