The Drive & Control Company

Rexroth
Bosch Group

IndraMotion MTX
The CNC system solution for perfect cutting and forming

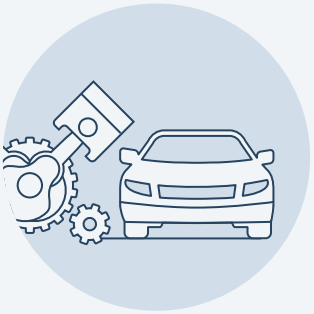
IndraMotion MTX – high-speed CNC machining

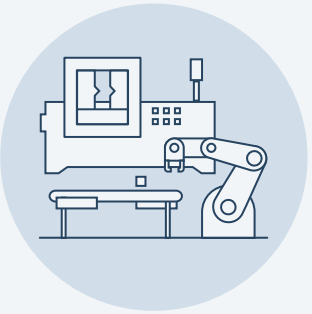
The market for CNC machine tools is diverse and requires control and drive solutions that can be scaled to meet the needs of the application – from job shops to connected production lines in the Industry 4.0 environment. Rexroth has created one of the most scalable modern CNC platform: IndraMotion MTX, which completely covers this wide range of applications.

50 Years CNC Technology

Medical equipment
- **Implants**
- **Instruments**
- **Joints**

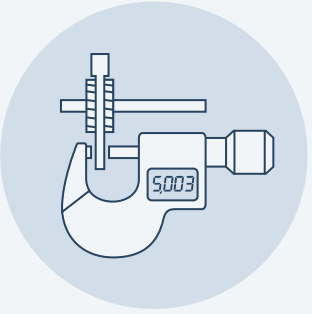
Automotive engineering
- **Powertrain and assembly**
- **Fuel systems**
- **Power steering/ suspension systems**
- **Transmission components**





Mechanical engineering
- **Tool making**
- **Construction and farming equipment**
- **Mold/die production**
- **Profile/pipe processing**
- **Furniture production**

Aerospace engineering
- **Profiles**
- **Cubic 5-axis parts**
- **Integral components**
- **Blades, blisks and impellers**



Precision technology
- **Optical lenses**
- **Jewelry**
- **Electrical and electronic components**

No matter whether you want to automate a series machine for cutting or forming or control a connected system for high production – with IndraMotion MTX you have a tailor-made CNC machine control solution at your disposal.

Multipurpose use
An innovative CNC core, extensive libraries and technology packages allow flexibility – from standard machines to fully automated production systems.

Simple handling
Convenient CNC control software, a consistent engineering framework, as well as built-in web technologies simplify the programming, unify the operation and facilitate the diagnosis.

Outstanding performance
The shortest CNC cycle times and minimum PLC processing times allow for fast, dynamic processing, reduce downtime and enable a significant increase in productivity.

Precise processing
CPUs with excellent performance, coupled with the intelligence of the IndraDrive drivetrain from Rexroth, provide manufacturing accuracy in all applications – down to the nanometer range.

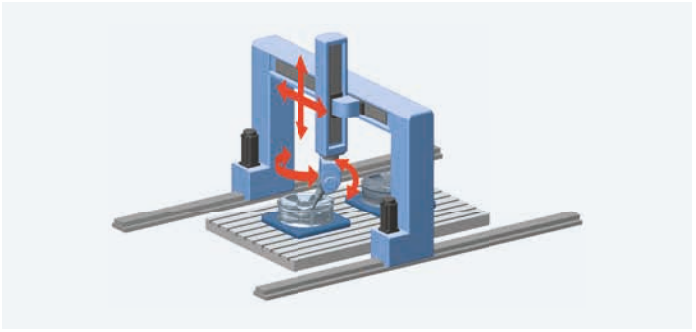
Open architecture
Differentiation from the competition is becoming increasingly important. IndraMotion MTX offers OEMs many opportunities to integrate specific functions – from integrating your own control functions to the implementation of your own HMI control software and even the implementation of your own algorithms and functions in the CNC core.

Ready for Industry 4.0
The integrated OPC UA server provides access to the control data – all in real time. Thus, the control unit can be combined with MES systems, a data analytics server, or cloud solutions with little effort.

Safe production
The realization of safer machine solutions is possible thanks to SafeMotion, the drive-based safety solution, and the safe logic functions from SafeLogic. The solutions are scalable in terms of both function and performance and integrate homogeneously into machine automation.

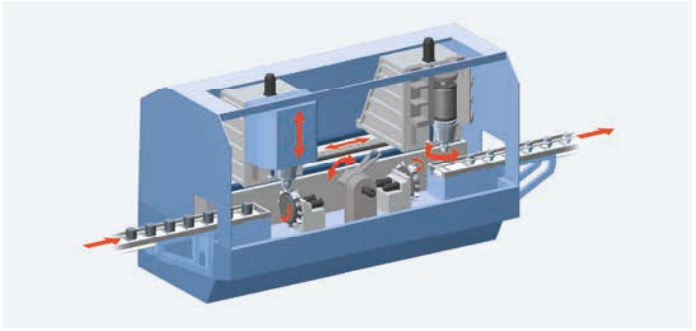
The multi-technology CNC

Comprehensive technology functions and outstanding performance data in up to 60 independent CNC channels open up new horizons for turning, milling, drilling, grinding, bending, punching/nibbling, shape cutting and handling. Due to the modular design of the hardware and software, IndraMotion MTX can be integrated optimally into different machine designs.



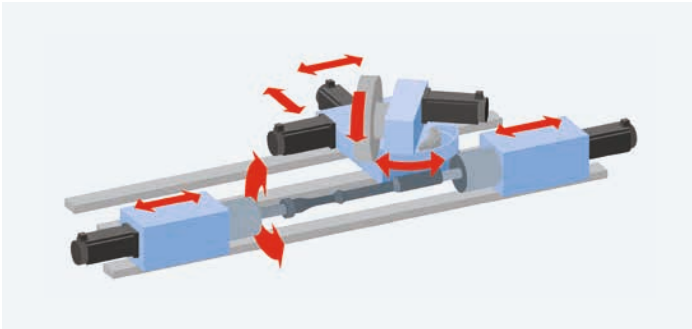
Milling – fast and precise

The CNC functions, which have a proven track record in practical application, cover the entire spectrum ranging from standard milling machines and high-speed cutting to free-form machining. Very large part programs can also be executed easily and without delay via hard disk or network access. The open system architecture allows CAD/CAM and customized software packages to be seamlessly integrated for creating part programs.

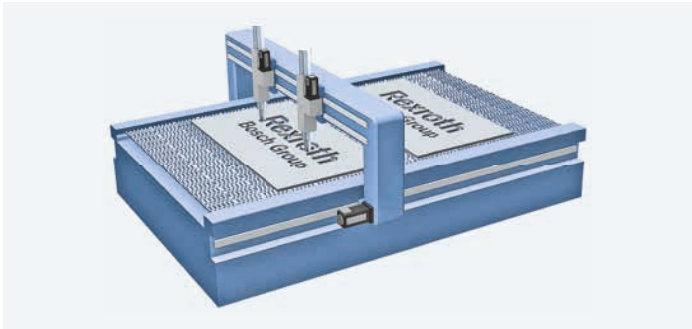


Turning – complete, precision lathe operations

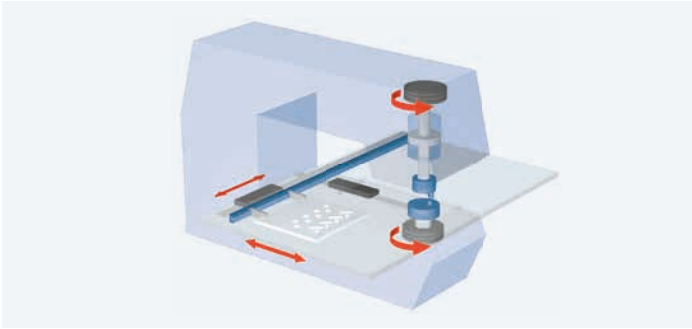
Modern turning centers combine turning, drilling, milling, cutting and more in one process, in one operation, efficiently and precisely. For all this, IndraMotion MTX offers you all the functions from dynamic turning to cross-technology, multi-axis machining. Multi-channel capability and axis transfer between the channels allow you to perform machining on the reverse side with workpiece transfer on multi-spindle lathe centers.



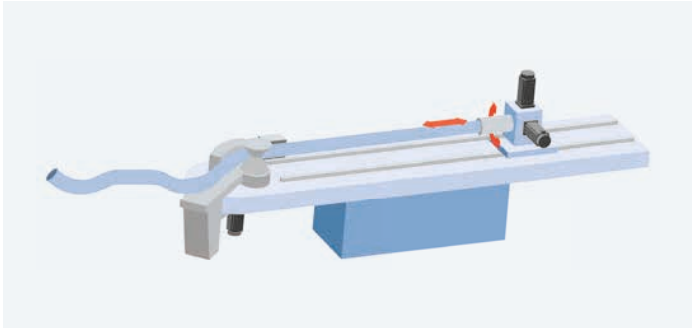
Grinding – high dynamics with nano precision
IndraMotion MTX with intelligent IndraDrive digital drives and IndraDyn motors are the ideal solution for your demanding grinding applications, offering precision in the nanometer range. The individually scalable CNC platform with integrated PLC ensures ultra-fast response to process events and minimizes downtime.



Laser, waterjet and plasma cutting – fast and accurate
IndraMotion MTX optimally controls plasma, laser and water-jet cutting machines thanks to ultra-fast response times and superior speed guidance. Programming becomes easy and efficient – even for difficult tasks – with the process-optimized control functions.

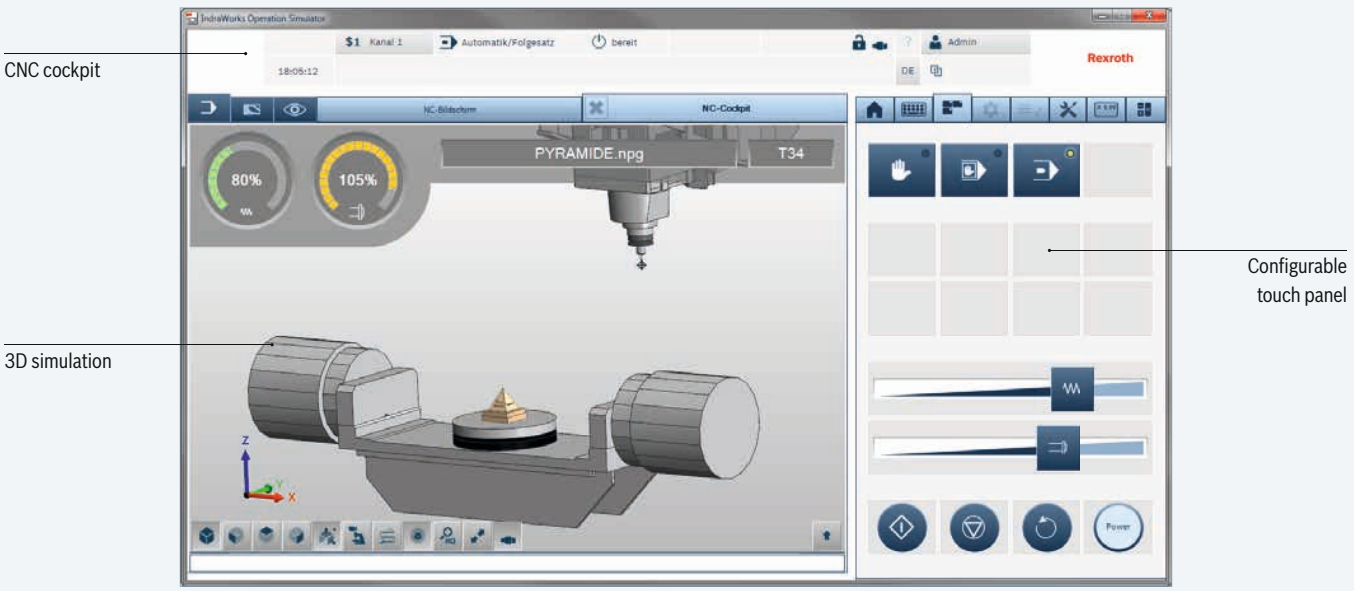


Nibbling and punching – fast and accurate
IndraMotion MTX and IndraDrive digital drives allow you to maximize the stroke rate of your machine and improve productivity. A process-optimized operating interface and special punching and nibbling functions of the CNC core facilitate programming and keep machine downtime to a minimum.



Bending – coordination and high precision
The IndraMotion MTX consistently bends sheet metal, pipe, profiles or wire with a high degree of geometrical precision. You can use axis interpolation with up to 8 axes on one CNC channel to achieve perfect operations such as 3D bending. Rexroth hydraulic and electro-mechanical CNC axes can be connected on one common Sercos Ethernet for best process control.

Intuitive operation and visualization



Intuitive machine operation
IndraWorks Operation Desktop is the ready-to-use, but flexible solution for intuitive machine operation now and in the future. The multi-touch HMI software automatically adapts to the operator and the machine status. Custom touch operator panels, gesture control and 3D online simulation provide for intuitive use, just like a smartphone. 3D offline simulation and collision detection help avoid expensive downtime.

Apps for simulation, manual operation, tool management, program editing and diagnostics are all integrated. OEMs can integrate their own applications with full access to the control unit via the OPC UA interface.

IndraWorks Operation Desktop runs on Windows-based devices such as PCs and tablets. 3rd party software packages, for example CAD/CAM systems, can be seamlessly integrated.

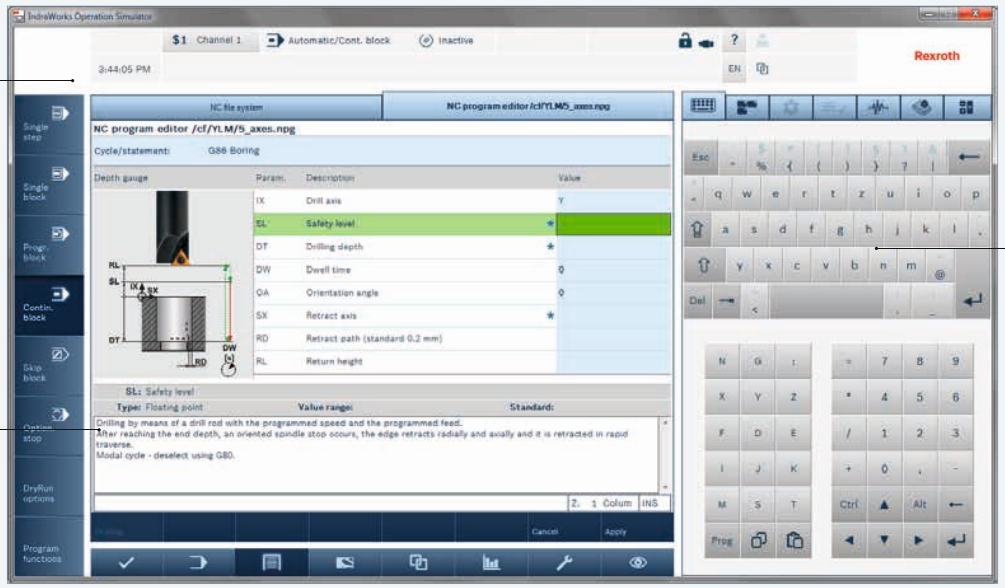
Advantages

- Intuitive machine operation with multi touch
- 3D simulation and collision detection
- Flexible configuration
- Integration of user software (apps) written in C#, C++
- Integration of 3rd party software via (e.g. CAD/CAM)
- Runs on standard PCs and tablets
- Windows OS-based platform

User panel variants:

- **Multi-touch control panels with 15" and 21" screen diagonal**
- **Both horizontal and vertical positioning**
- **Optional emergency stop, override switch and control buttons integrated in the control panels**

Efficient programming

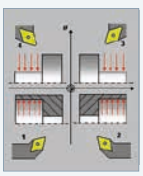


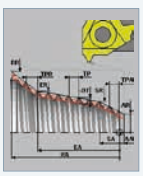
Technology-cycles library

IndraMotion MTX has a comprehensive technology-cycle library for standard machining. The intuitive user guidance facilitates selecting a cycle, entering parameters and clearly arranged dialogs. Complex machining tasks are easy to carry out, which improves efficiency and helps to avoid errors.

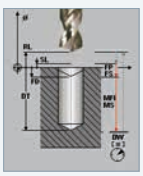
Cycle examples

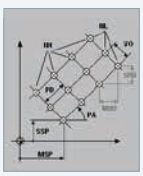
Turning



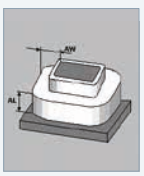


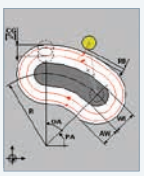
Drilling



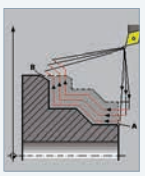


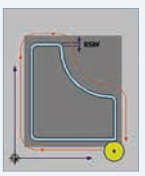
Milling



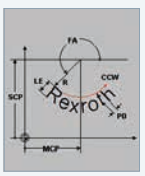


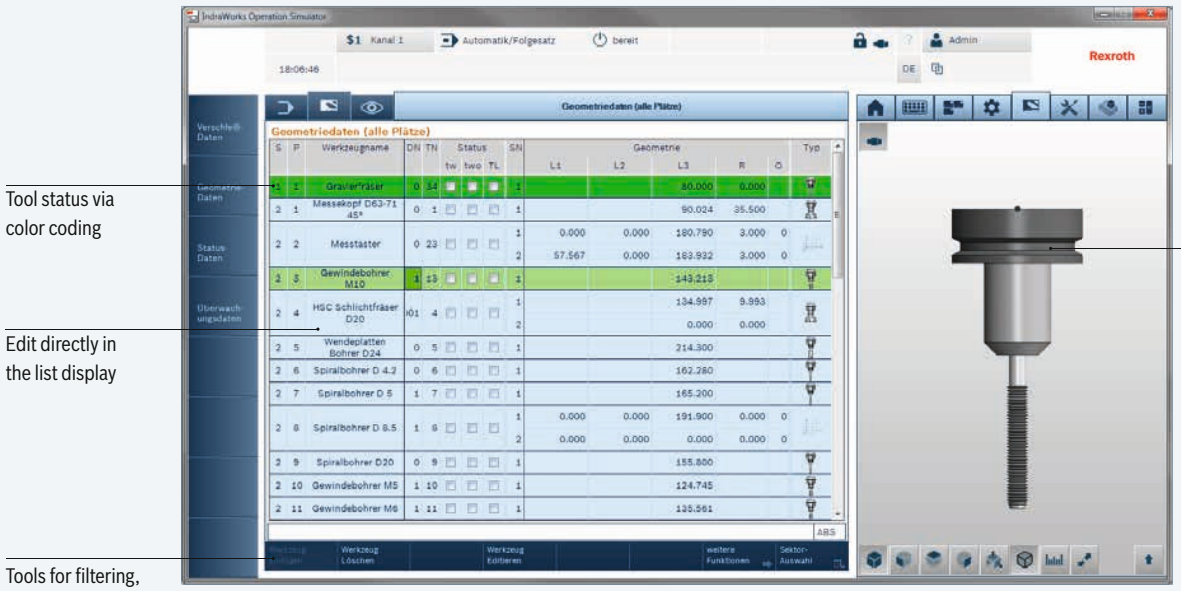
Contouring





Engraving

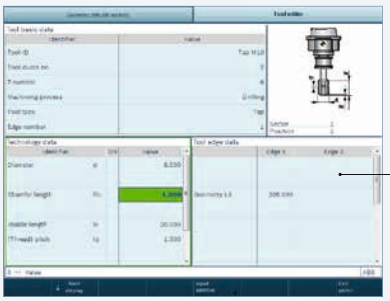


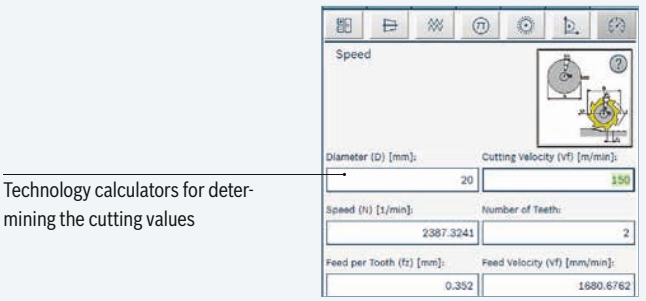


Tool management

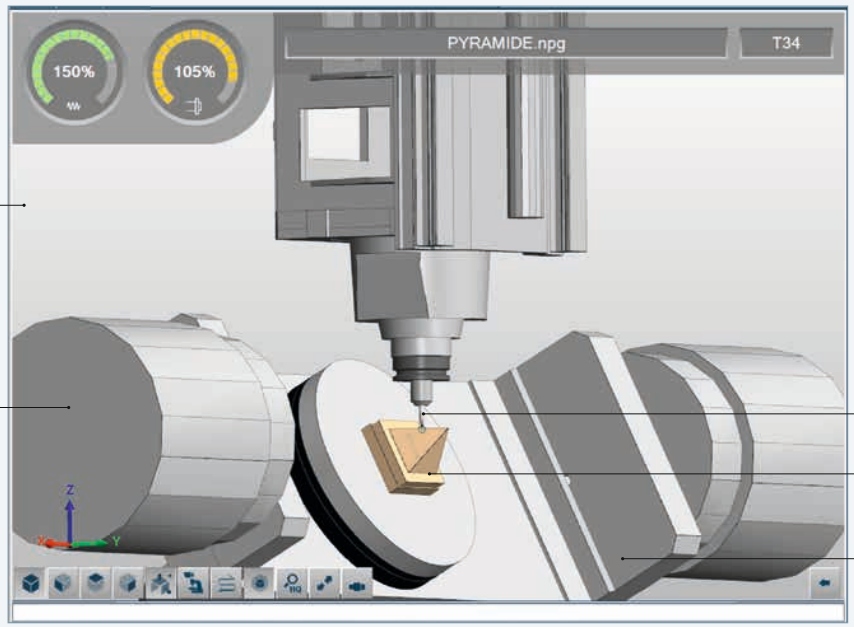
The tool management dialogs are easy to use and can be adapted to different types of machines and magazines. Screens for entering tooling data and providing overviews of tool lists with wear status, for example, are part of the standard screens. Color coding and filtering capabilities ensure clarity even in large warehouses.

- Up to 999 tools, 16 cutting edges per tool
- Geometry and wear corrections
- Tool life management
- Radius correction, tool edge correction
- Angle head tools
- Fixed-place coding/variable coding
- Alternate tools
- Configurable tool database





Perfect 3D simulation



Mechanical engineering and machining simulation in real time

Import of complex models for machine, work pieces and tools

3D tool models

3D workpiece models for raw and finished products

3D machine models

Functionality

The 3D simulation of the machine, tool and workpiece with removal simulation and collision detection, definition of raw parts and tools directly by means of the CNC program and tool data. The optional import of 3D models for the machine, tools, workpieces and fixtures as an STP file.

Customer benefits

- Simulation (digital twin) as a standard feature
- Avoid expensive downtime thanks to collision avoidance
- Can be used as a virtual machine in connection with IndraMotion MTX Workstation

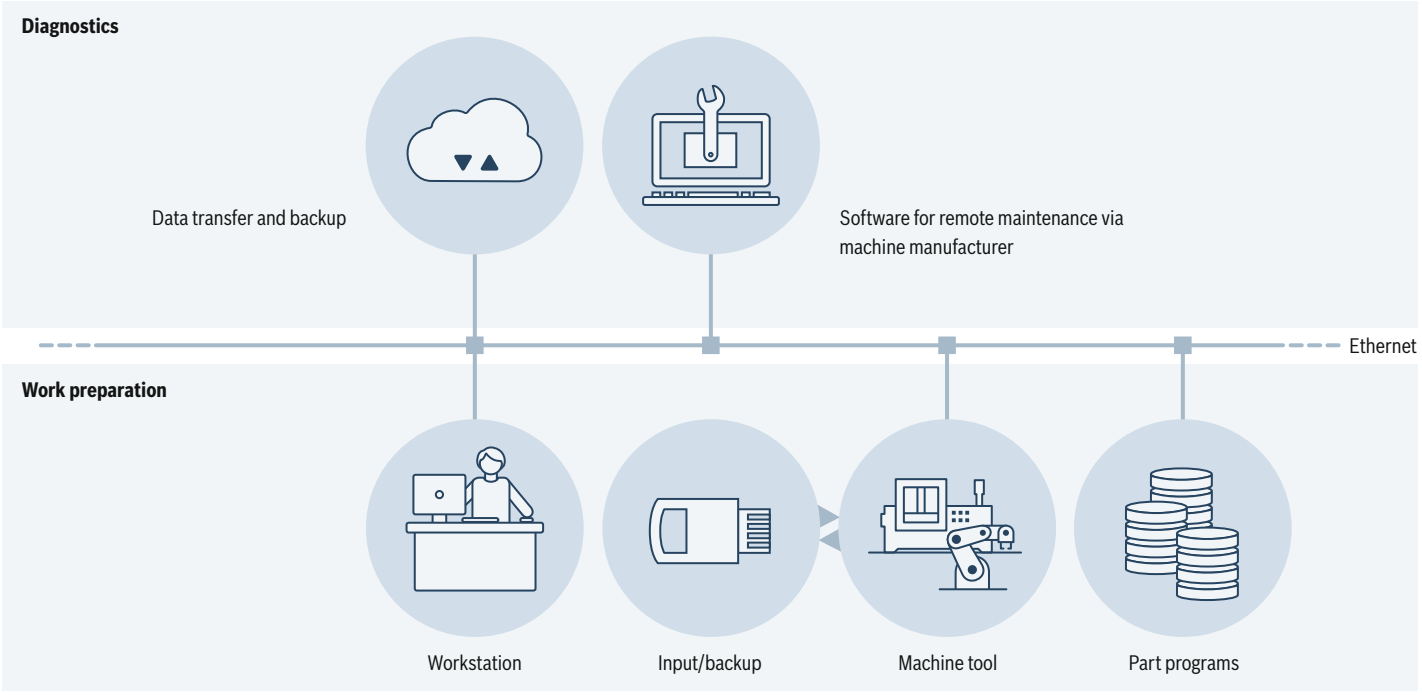
Removal simulation (standard)

- The 3D model of the tool is generated directly from the database
- Definition of the 3D workpiece model in the CNC program
- Collision monitoring for the tool and workpiece

Machine simulation (optional)

- Import of complex 3D models for machine, workpiece and tool
- Simulation of kinematics and machine movements
- Collision monitoring for the machine, tool and workpiece

Direct communication



Program processing via networks

- Easy integration of IndraMotion MTX in existing network infrastructures via Ethernet and TCP/IP
- Almost unlimited storage space for CNC programs and data
- Seamless integration of external CNC data in the IndraMotion MTX file system via network drives

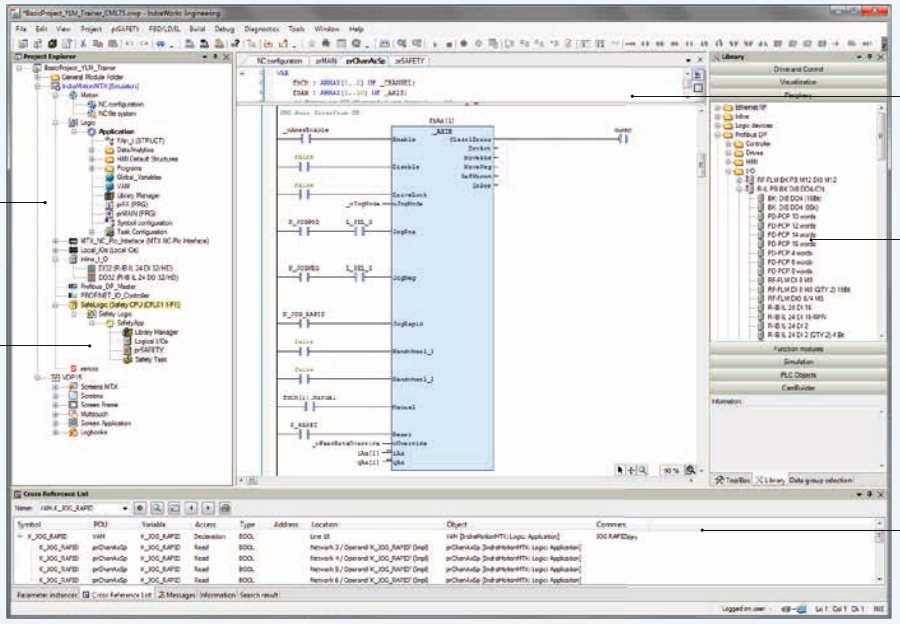
Remote maintenance and diagnostics

- TCP/IP communication allows a connection to be made to an office PC and CNC control system. This, in turn, makes it possible to carry out diagnostics from a control station or perform remote maintenance via the Internet

Program processing via external storage media

- Integration of external storage media, for example a USB flash drive, in the file system of the control enables direct selection of CNC programs – with no copying necessary

Efficient engineering

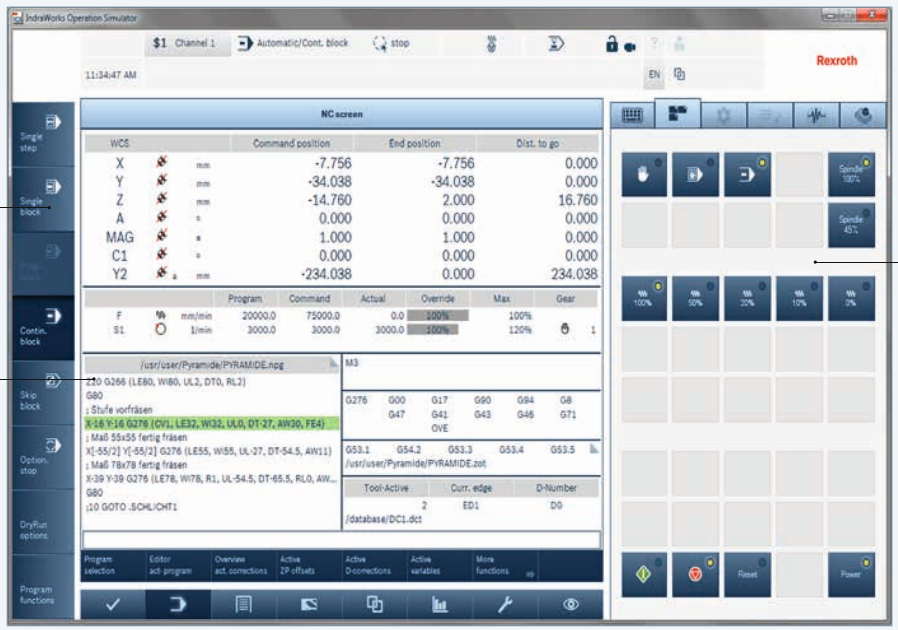


The engineering tool IndraWorks carries you confidently through all the steps involved in project planning, programming, parameterization, operation and diagnosis.

All tools for commissioning and diagnostics on board
The IndraWorks Engineering Framework provides all the tools for configuration, commissioning and diagnosis of HMI, CNC, PLC, safety logic, drives and peripherals. System-wide diagnosis for service purpose is offered by a multi-channel oscilloscope, logic analyzer and debugger for PLC and CNC Logic. Project management with central data management for device configuration, HMI data, PLC and CNC programming, as well as user data ensure that your data is transparent and consistent.

PLC programming with open standards
Depending on the programming task, you can use the IEC 61131-3-compatible editors for Instruction List (IL) and Structured Text (ST), or the graphical editors Ladder Diagram (LD), Function Block Diagram (FBD), Sequential Function Chart (SFC) and Continuous Function Chart (CFC). Object-oriented extensions facilitate the modularization and maintainability of the user programs.

Interfaces for optimized workflows
The Automation Interface for scripts provides direct access to IndraWorks functions for automation of recurring engineering tasks. Projects can be linked directly to Subversion, the free version control platform. Field devices from different manufacturers are directly involved via the FDT/DTM interface. The ECAD data interface enables easy data exchange with EPLAN Electric P8.



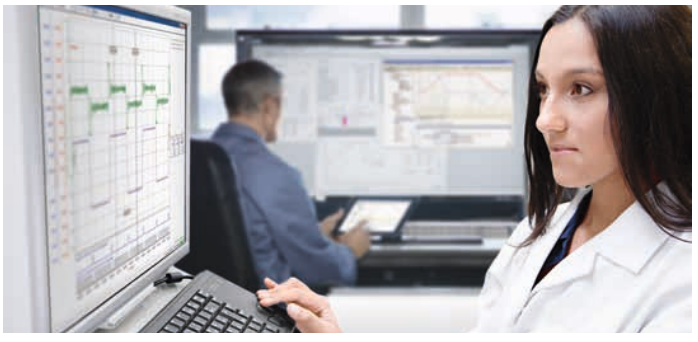
IndraMotion MTX Workstation

The engineering package IndraMotion MTX Workstation lets you simulate the IndraMotion MTX CNC controller on a PC. Thus, it is possible to perform the parameterization of the CNC and the drives, the PLC programming and the HMI interface without hardware.

In conjunction with 3D machine simulation, IndraMotion MTX Workstation serves as a virtual machine. The representation of the control panel and HMI user interface just like on the machine allows for real life control and CNC programming.

Advantages

- Simulation of CNC, PLC and axes on a PC
- Virtual machine with 3D machine simulation
- Ability to commission IndraMotion MTX without hardware
- Real life operation and CNC programming
- Easy to learn how to operate and program
- Identical CNC programming for all controls



Optimized processes – with IndraMotion MTX efficiency workbench

IndraMotion MTX efficiency workbench is the platform for versatile tools that improve machine and system efficiency. The universal efficiency tools can be used to optimize the productivity and energy efficiency for machine tools.

Cycle time analysis tool IndraMotion MTX cta

IndraMotion MTX cta makes it easy to understand complex machine tool processes. The optimization potential of CNC programs and process variables is quickly and easily identified, cycle times are minimized and productivity improved.

Advantages

- Process optimization and elimination of bottleneck situations thanks to synchronized recording of CNC, PLC and drive signal data down to the millisecond
- Easy handling of data via table-based and graphical depiction of measurement results
- Optimization of sub-systems such as material feeders or tools changers for production machines or of machining programs for mass production

IndraMotion MTX ega energy analysis tool

The energy consumption of machine tools is influenced by many factors, including process sequence, tool wear and raw material tolerances. With IndraMotion MTX ega and the integrated energy monitor, an overview of the machine's energy consumption is available at the push of a button.

Advantages

- Transparency of energy requirements as the basis for improved energy efficiency for all CNC processing technologies
- Differentiation between machine modules
- Simultaneous analysis of cycle time and energy requirements

Higher availability and lower costs – with the Data Analytics Server

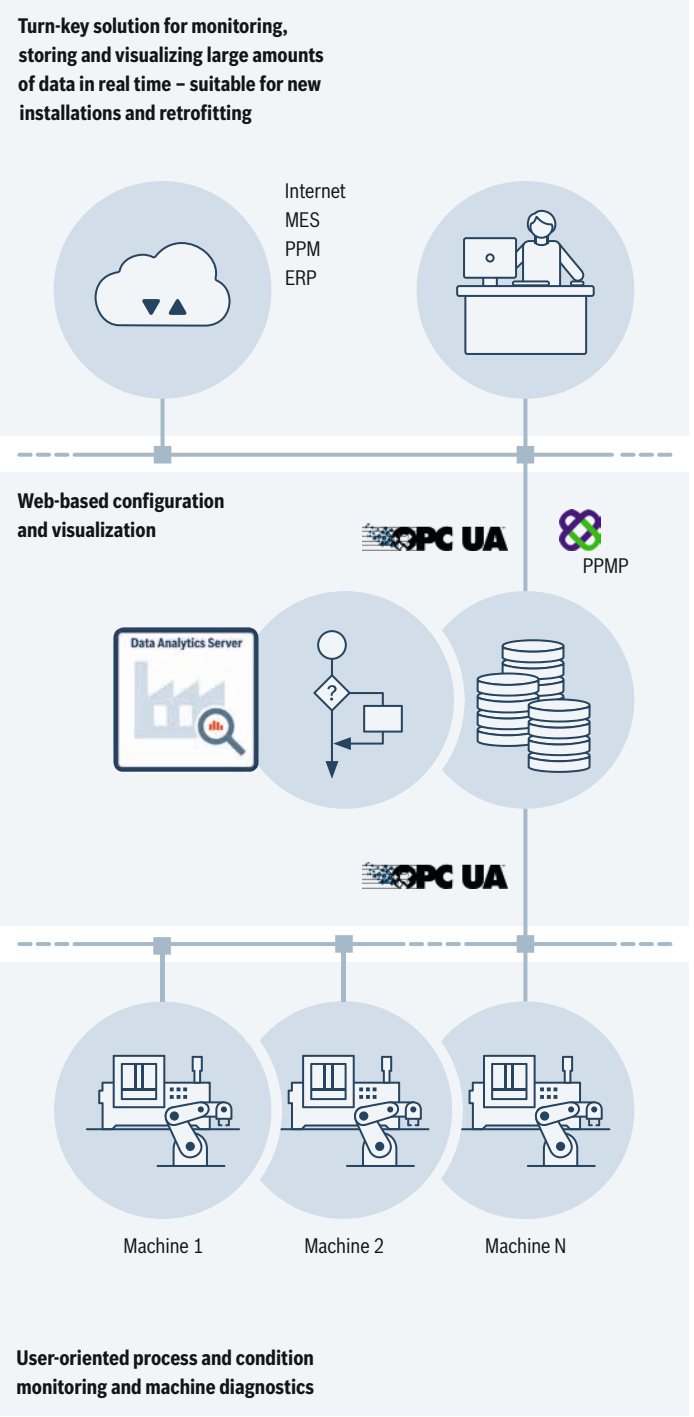
Analyzing the status of the machine and the use of the machine is possible with the Data Analytics Server, a powerful database solution. The easy-to-use, browser-based configuration and visualization allows the user to concentrate on the essentials - optimizing the process.

Functionality

- Monitoring of the control, drive and sensor data in real time using the OPC UA standard
- Powerful database to store large amounts of data
- Workflow system to analyze, optimize and resolve manufacturing problems
- Long-term diagnostics logbook with integrated TOP10 error analysis
- Deployment of pre-processed data for other IT systems like MES, PPM, and Data Analytics via the OPC UA standard

Advantages

- Predictable maintenance and repair schedule for the machinery
- Optimized process quality and stability
- Increased machine availability
- Minimized production costs



IndraMotion MTX – custom scalability

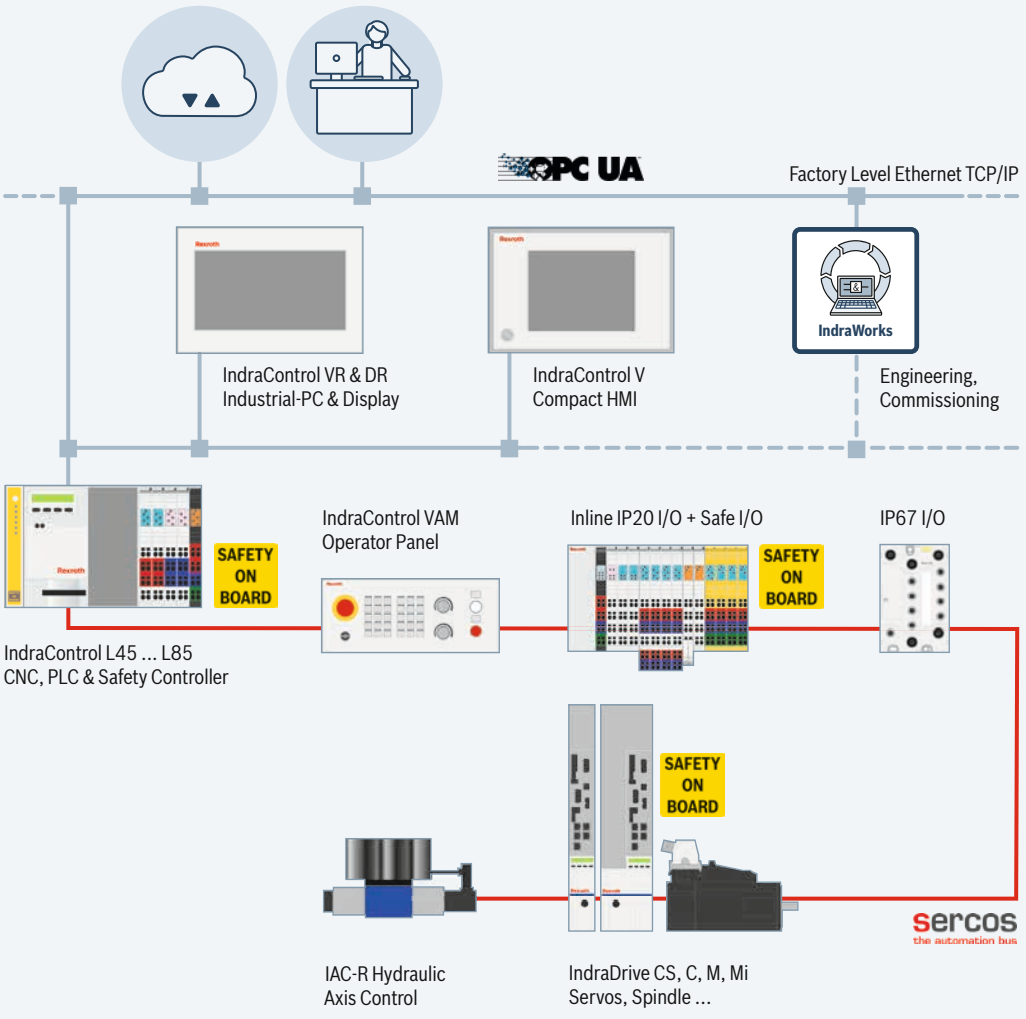
IndraMotion MTX incorporates a modular system design, open controller structure and standard international interfaces. This helps you solve all of your machining tasks in the field of CNC technology with the highest level of dynamics and precision.

IT level
Communicate with IT systems via standard protocols such as Ethernet TCP/IP and OPC UA

HMI level
PC based control devices with Windows OS ensure easy data exchange with IT systems and 3rd party software packages

I/O level
Rexroth uses global standards such as Sercos, PROFIBUS, PROFINET and EtherNet/IP for communicating at the sensor/actuator level

Drive level
The internationally standardized Sercos automation bus is used to achieve the highest level of dynamics and precision with data rates of up to 100 MBaud



IndraMotion MTX standard – the universal CNC control system

This controller is characterized by a complete CNC with integrated PLC for rail mounting. This basic version offers excellent performance in 2 independent CNC channels with 12 axes, whereby 4 are available for spindle functions. The control system is combined with the panels of the IndraControl V product family for operation and visualization.

IndraMotion MTX performance – the high-performance CNC control system

IndraMotion MTX performance is the system solution for demanding machine tools used in rough industrial environments. The control delivers excellent performance and offers a wide range of technology functions for special requirements. In 12 independent CNC channels, it can control up to 64 axes, of which 32 can have a spindle function.
A whole series of functions is available in addition for performing complex interpolation, axis coupling, special kinematics and fast I/O coupling.

IndraMotion MTX advanced – CNC Control System for the Highest of Demands

Exceptional computing power through the use of state-of-the-art multi-core processors, plenty of memory and the combination of high-performance, compact industrial PCs make IndraMotion MTX advanced the ideal system solution for particularly demanding applications. 60 independent CNC channels can handle up to 250 axes, of which 60 can have a spindle function. Multi-core CPUs deliver minimal PLC and CNC processing times for outstanding productivity and precision.

Scalable system components for flexible automation

A controller-based control platform with exceptional performance, intelligent drive technology and performance visualization devices with a wide variety of accessories available ensure ultra-high production accuracy in all applications.

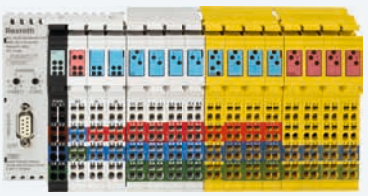
IndraControl V

IndraControl VAM

IndraControl L

IndraDrive and IndraDyn

Inline



IndraControl S67

- **IndraControl L** – the controller-based control platform
- **IndraControl VAM** – convenient machine control panels
- **IndraControl V** – high-power visualization devices
- **IndraDrive and IndraDyn** – intelligent drive technology and servomotors
- **IndraControl S67** – I/O modules in IP67: strong and reliable
- **Inline** – I/O modules in IP20: space-saving I/O technology

IndraMotion MTX – the CNC system solution for perfect cutting and forming: www.boschrexroth.com/mtx

Technology and service under one roof

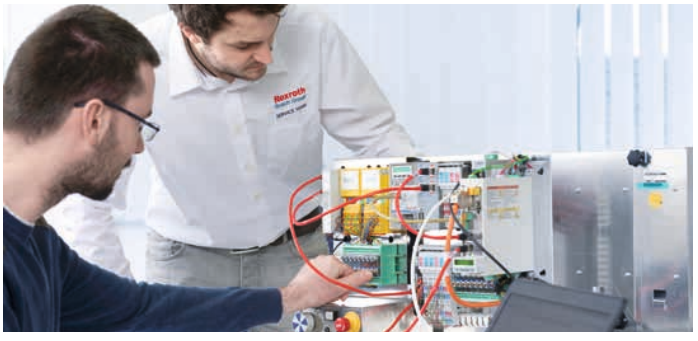
We offer a complete range of drive and control solutions backed up by in-depth consultancy expertise and an ideal service portfolio ranging from conceptual development and commissioning to modernization. We help you maximize the efficiency of your machines' lifecycle.

Project planning and application support
Both in the planning,design and build phase our experts are here to offer you support and advice:

- Selection of automation components (hardware and software) for your application
- Detailed description of drive & control components, interfaces and data management
- Development of sample applications
- Active involvement in initial applications at your site
- Support to help you develop systematic, compliant safety strategies

Service
Our service team supports you throughout the planning, installation, commissioning, operation and extended life phases:

- Technical support/help desk
- Field service
- Repair service
- Spare parts service
- Retrofitting and modernization
- Training



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Technical specifications

1	Machining technologies	MTX standard		MTX performance		MTX advanced	
1.1	Turning		●		●		●
1.2	Milling		●		●		●
1.3	Drilling		●		●		●
1.4	Grinding		●		●		●
1.5	Nibbling, shape cutting		●		●		●
1.6	CNC forming		●		●		●
1.7	Shappe cutting		○		○		○
2	**Axis control**						
2.1	Default number of axes	8	●	8	●	8	●
2.2	Max. number of axes	12	○	64	○	250	○
2.3	Thereof max. number of spindles	4	●	32	○	60	○
2.4	Default number of independent channels	2	●	3	●	3	●
2.5	Max. number of independent channels	2	●	12	○	60	○
2.6	Default number of interpolating axes per channel	4	●	4	●	4	●
2.7	Max. number of interpolating axes per channel	5*	○	8*	○	8*	○
2.8	Linear axes		●		●		●
2.9	Rotary axes		●		●		●
2.10	Endlessly rotating rotary axis		●		●		●
2.11	Hirth axes		●		●		●
2.12	Spindle/C-axis switching		●		●		●
2.13	Max. number of gantry groups per channel	4 ② ③ ⑤	○	8 ② ③ ⑤	○	8 ② ③ ⑤	○
2.14	Channel-crossing axis transfer		●		●		●
2.15	Electronic cam		●		●		●
2.16	Spindle coupling via electronic transmission	⑥	○	⑥	○	⑥	○
2.17	Software limits		●		●		●
2.18	Main spindle synchronization	① ②	○	① ② ③	○	① ② ③	○
2.19	Axis-specific jerk limitation		●		●		●
2.20	Integrated safety function compliant with EN 13849-1 and EN 62061 (Safe Stop and Safe Motion)		□		□		□

● Standard
○ Option
■ Option in connection with PC
□ Option with IndraDrive

① Technology package "Turning 1"
② Technology package "Milling 1"
③ Technology package "Milling 2"
④ CNC simulation "Virtual machine"
⑤ Technology package "Shape cutting"
⑥ Technology package "Electronic transmission"

* Option subject to export approval according to Part I C of the Export List (EC Regulation) position 2D002

3	Interpolation functions	MTX standard		MTX performance		MTX advanced	
3.1	Linear interpolation		●		●		●
3.2	Straight line interpolation with/without exact stop		●		●		●
3.3	Circular interpolation with radius and center-point programming, helical interpolation		●		●		●
3.4	Circular interpolation with tangential inlet		●		●		●
3.5	Rigid tapping cycle		●		●		●
3.6	Thread cutting		●		●		●
3.7	Cylinder surface transformation	① ⑤	○	① ⑤	○	① ⑤	○
3.8	C-axis transformation	①	○	①	○	①	○
3.9	NC block preview, look-ahead	max 1,000 blocks	●	max 1,000 blocks	●	max 1,000 blocks	●
3.10	5/6-axis transformation with TCP programming		○	③	○	③	○
3.11	Jogging with active transformation		○	③	○	③	○
3.12	Spline interpolation C1 + C2 continuous, cubic splines B-splines, NURBS	① ② ③ ⑤	○	① ② ③ ⑤	○	① ② ③ ⑤	○
3.13	Nanometer resolution		●		●		●
4	**Feed functions**						
4.1	Feed in mm/min or inch/min		●		●		●
4.2	Time programming		●		●		●
4.3	Feedrate per revolution		●		●		●
4.4	Constant cutting speed	①	○	①	○	①	○
4.5	Feed on positive stop		●		●		●
4.6	Torque reduction		●		●		●
5	**Shifts and compensations**						
5.1	Mirroring, scaling, rotating		●		●		●
5.2	Zero point offset		●		●		●
5.3	Compensations and zero offsets programmable through CPL		●		●		●
5.4	Placements (FRAMES)	② ③ ⑤	○	② ③ ⑤	○	② ③ ⑤	○
5.5	2D compensation		●		●		●
5.6	3D cutter radius compensation	③	○	③	○	③	○
5.7	Compensation with plane switching		●		●		●
5.8	Tangential tool guidance		●		●		●
6	**Tool management**						
6.1	Integrated, flexible tool management		●		●		●
6.2	Configurable tool database		●		●		●
6.3	Freely definable tool compensation (length, radius, cutting position compensation, user data)		●		●		●
6.4	Additive tool compensations (D compensations)		●		●		●
6.5	Access to tool data from the PLC		●		●		●
6.6	Access to tool data from the CNC		●		●		●
6.7	Access to tool data via OPC UA and HMI		●		●		●

For detailed description of the individual functions, please see the technical documentation "IndraMotion MTX Functional Description" at www.boschrexroth.com

7	CNC Programming	MTX standard		MTX performance		MTX advanced	
7.1	Part program generation	DIN ISO 66025/ RS 274D	●	DIN ISO 66025/ RS 274D	●	DIN ISO 66025/ RS 274D	●
7.2	High-level programming, CPL (customer programming language)		●		●		●
7.3	3D machine simulation	④	○	④	○	④	○
7.4	CNC memory	256 MB		1 GB		1 GB	
7.5	Static memory	8 MB		16 MB		16 MB	
7.6	Max. size of parts program	PC hard disk (network file system) •	●	PC hard disk (network file system) •	●	PC hard disk (network file system) •	●
8	**Technology cycles**						
8.1	Drilling		●		●		●
8.2	Turning		●		●		●
8.3	Milling		●		●		●
8.4	Measuring cycles		●		●		●
9	**Functions**						
9.1	Dwell time in seconds		●		●		●
9.2	Acceleration programming, loop gain programming		●		●		●
9.3	Homing through NC program		●		●		●
9.4	Absolute dimension, relative dimension		●		●		●
9.5	Switching between inch and mm		●		●		●
9.6	Probe, static/on-the-fly measurement		●		●		●
9.7	Read process and drive data through Sercos		●		●		●
9.8	Roundings and chamfers		●		●		●
9.9	Corner rounding with splines		●		●		●
9.10	Laser power control		●		●		●
9.11	Digitizing		●		●		●
9.12	NC block defined by PLC		●		●		●
10	**Support for control elements**						
10.1	Configurable operator screens		■		■		■
10.2	Cycle header/input support, OEM cycles		■		■		■
10.3	NC program restart/block search		●		●		●
10.4	Dry run		●		●		●
10.5	Retracting from and returning to the contour		●		●		●
10.6	Retrace function: reversing over the contour	⑤	○	⑤	○	⑤	○
10.7	Return to interuption point		●		●		●
10.8	Restart at label		●		●		●
11	**PLC programming**						
11.1	Integrated PLC: IndraLogic		●		●		●
11.2	Programming languages according to IEC 61131-3 (IL, LD, FBD, ST, SFC, CFC)		●		●		●
11.3	PLC program memory	8 MB		16 MB		16 MB	
11.4	Number of high-speed inputs/outputs	8/8	●	8/8	●	8/8	●
11.5	Number of fieldbus inputs/outputs in bytes	8,192/8,192		8,192/8,192		8,192/8,192	
11.6	Multitasking		●		●		●
11.7	Max. number of PLC tasks	16		16		16	

12	Diagnostic and start up tools	MTX standard	MTX performance	MTX advanced
12.1	Integrated, system-crossing engineering framework IndraWorks	●	●	●
12.2	Status and error messages in plain text	●	●	●
12.3	Integrated drive setup tools	●	●	●
12.4	Drive oscilloscope	●	●	●
12.5	Integrated PLC setup tools	●	●	●
12.6	Logic analyzer	●	●	●
12.7	Circle form test	●	●	●
12.8	NC analyzer	●	●	●
12.9	IndraMotion MTX acr action recorder	○	○	○
12.10	IndraMotion MTX cta cycle time analyzer	○	○	○
12.11	IndraMotion MTX ega energy analyzer	○	○	○
13	**Open architecture**			
13.1	Configurable standard user interface with all standard functions	●	●	●
13.2	User-specific operator graphics	●	●	●
13.3	Adaptation and integration via standardized interfaces (OPC/OPC UA, XML, ActiveX, .NET)	●	●	●
14	**Controller hardware and interfaces**			
14.1	Controller hardware	IndraControl L45	IndraControl L75	IndraControl L85
14.2	Sercos automation bus	100 MBaud ●	100 MBaud ●	100 MBaud ●
14.3	PROFIBUS master/slave	12 MBaud ●	12 MBaud ●	12 MBaud ●
14.4	Ethernet TCP/IP	10/100 MBaud ●	10/100 MBaud ●	10/100 MBaud ●
14.5	EtherNet/IP (scanner/adapter)	●	●	●
14.6	PROFINET IO (Controller/Device)	●	●	●

● Standard
○ Option

④ CNC simulation "Turning"
⑤ Technology package "Shape cutting"

* For details please refer to the product catalog

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