

IndraMotion MLD – drive-based automation solution for single-axis and multi-axis applications

The integrated IndraMotion MLD automation solution is based on the scalable IndraDrive platform. High-performance motion control and PLC functions are joined to form a complete automation system for modern machine concepts. Higher-level controls are no longer necessary. This provides a clear and fast solution for complex control and motion tasks.

The drive-based solution is scalable as a single-axis control for simple applications as well as a multi-axis control for applications with a maximum of 10 axes. Ready-to-use function libraries simplify the use of intelligent drive functions of IndraDrive. In addition, function blocks according to PLCopen provide access to standardized motion control functions. The open technology and communication interfaces simplify integration of IndraMotion MLD in the automation design.

Your benefits

- ▶ Compact system for modular distributed architectures
- ▶ Scalable as single-axis or multi-axis control
- ▶ Electronic synchronization of up to 10 servo-axes
- ▶ Ready-to-use function libraries according to PLCopen
- ▶ Integrated intelligent drive functions
- ▶ Optional interfaces for communication, safety and additional encoder
- ▶ Drive-integrated motion control and PLC according to IEC 61131-3
- ▶ Certified safety technology according to EN ISO 13849-1, category 3 PL d and EN 62061 SIL 2
- ▶ Intuitive engineering framework IndraWorks for project development, programming, visualization and diagnostics
- ▶ Software options with technology packages and turnkey solutions



IndraMotion MLD from Rexroth helps you to integrate your valuable know-how directly in the drive, thus ensuring your competitive edge.



Compact, intelligent and economic

- ▶ Very cost-effective solution for single-axis and multi-axis applications without any additional hardware
- ▶ Minimized engineering through conformity with IEC and PLCopen
- ▶ Faster implementation of your system solution through predefined technology packages



As a sub-system, IndraMotion MLD can be flexibly integrated in the most varied machines and systems and ensures the highest productivity and efficiency in many applications:

- ▶ Machine tools
- ▶ Production machines
- ▶ Process systems
- ▶ Heavy load handling
- ▶ Automotive
- ▶ Renewable energies
- ▶ Cellulose and paper
- ▶ Solar technology



IndraMotion MLD controls drive-based compact systems, as well as modules in a complex system, that demand extremely precise and fast drive synchronization in the following areas:

- ▶ Packaging technology
- ▶ Printing presses and processing machines
- ▶ Forming machines and simple machine tools
- ▶ Bending and drawing machines, spinning lathes
- ▶ Press automation
- ▶ Nibbling and punching
- ▶ Wood processing
- ▶ Assembly and handling
- ▶ Transfer and transport
- ▶ Warehouses and storage





IndraMotion MLD – technical data

		MLD-M IndraDrive Cs	MLD-M IndraDrive C/M	MLD-S IndraDrive Cs	MLD-S IndraDrive C/M	MLD-S IndraDrive Mi
Control						
Runtime system	Integrated motion logic systems	●	●	●	●	●
Multitasking		●	●	●	●	●
Data management	Code, data, retentive data, user data	●	●	●	●	●
Storage	Boot project	●	●	●	●	●
	PLC project as packed archive file	●	●	●	●	●
	User data to the internal memory and a removable storage medium	●	●	●	●	●
Support	System events	●	●	●	●	●
Probe function, control		○	○	○	○	○
User memory	Total: code, data	4 MB	4 MB	512 kB	512 kB	512 kB
Retentive memory	Total: system, user	32 kB	32 kB	32 kB	32 kB	32 kB
On-board diagnosis and settings						
Status display (boot, sercos, test)	Display	●	●	●	●	–
Errors, warnings, messages, system reset	Display, keys	●	●	●	●	–
Ethernet settings (IP address)	Display, keys	●	●	●	●	–
Voltage monitoring, watchdog		●	●	●	●	●
Relay output ready for operation		●	●	●	●	●
IndraMotion service tool		▼	▼	–	–	–
On-board communication interfaces						
sercos III	Automation bus (master)	●	●	○	○	▼
	Automation bus (slave)	○	○	○	○	▼
Multi-Ethernet		●	●	●	○	▼
sercos II	Real-time motion bus	○	○	○	○	○
PROFIBUS	Slave	○	○	○	○	–
PROFINET IO	Device (slave)	○	○	○	○	▼
EtherNet/IP	Adapter (slave)	○	○	○	○	▼
DeviceNet	Slave	–	○	–	○	–
EtherCAT	Slave	○	○	○	○	▼
Ethernet TCP/IP		●	●	●	○	▼
ModbusTCP	Server (slave)	○	○	○	○	▼
CANopen	Slave	▼	○	▼	○	–
RS232	On-board	–	●	–	●	–

● Default ▼ In preparation ○ Optional – Not available

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		MLD-M IndraDrive Cs	MLD-M IndraDrive C/M	MLD-S IndraDrive Cs	MLD-S IndraDrive C/M	MLD-S IndraDrive Mi
Options						
Encoder	Number	Max. 2	Max. 2	Max. 2	Max. 2	Max. 1
Encoder emulation	Number	–	Max. 1	–	Max. 1	–
HMI						
IndraControl VCP, VCH	Ethernet TCP/IP, OPC	○	○	○	○	○
IndraControl VEP, VEH	Ethernet TCP/IP, OPC	○	○	○	○	○
IndraControl VSP, VPP, VSB/VDP, VPB/VDP	Ethernet TCP/IP, OPC	○	○	○	○	○
Inputs/outputs						
On-board						
Digital inputs	Number	5	3	5	4	5
Digital inputs/outputs (any adjustment)	Number	1	4	1	3	1
High-speed digital inputs (probe)	Number/sampling time	2/500 μs	2/41 μs	2/500 μs	1/83 μs	2/500 μs
Analog inputs/outputs		1 / –	1 / 2	1 / –	Max. 2/–	–
Local						
Analog inputs/outputs		–	Max. 2/2	–	Max. 2/2	–
Digital inputs/outputs		–	Max. 16/16	–	Max. 16/16	–
Distributed via Inline (IP20)						
sercos III	On-board	●	●	○	○	▼
Logic control						
PLC runtime system						
IndraLogic 1G kernel	Conf. with IEC 61131-3	●	●	●	●	●
Program organization	According to IEC 61131-3	●	●	●	●	●
Loading and executing IEC-61131-3 applications		●	●	●	●	●
Task management						
Freely configurable tasks (priority 0-20)	Cyclic, free-running, event-controlled, externally event-controlled	4	4	4	4	4
Task-synchronous processing of the I/O process image		●	●	●	●	●
sercos III-synchronous processing of the I/O process image		●	●	●	●	●
Min. PLC cycle time	Synch. with system cycle	1 ms	1 ms	1 ms	1 ms	1 ms
	Synch. with sercos cycle	1 ms	1 ms	1 ms	1 ms	1 ms
Min. motion cycle time	Set value generator	0.25 ms	0.25 ms	1 ms	1 ms	1 ms
PLC processing times						
Typical processing time for 1,000 instructions/μs	Command mix (real, integer, bool, etc.)	50	50	100	260	260
	Bool operations	50	50	100	270	270
	Word operations	45	45	90	240	240

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Motion control						
Number of axes	Real/virtual/encoder/grouped	1 / 10 / 2 / 1	1 / 10 / 2 / 1	1 / 1 / 2 / 0	1 / 1 / 2 / 0	1 / 1 / 2 / 0
Synchronization (ELS – electronic line shaft)	Real axes (servo drives)	●	●	●	●	●
	Virtual axes (virtual masters)	●	●	●	●	●
	Encoder axes (real masters)	●	●	●	●	●
	Grouped axes (cross communication)	●	●	–	–	–
	Dynamic synchronization	●	●	●	●	●
	Master axis cascading	●	●	–	–	–
Positioning	Single-axis	●	●	●	●	●
Electronic gears		●	●	●	●	●
Electronic cams	Intermediate point tables (in the drive, max. 1,024 intermediate points)	4	4	4	4	4
	Electronic motion profile (in the control, motion profiles with max. 8 segments)	2	2	2	2	2
Torque control		●	●	●	●	●
Velocity control		●	●	●	●	●
Motion commands according to PLCopen (choice)	MC_MoveAbsolute	●	●	●	●	●
	MC_MoveRelative	●	●	●	●	●
	MC_MoveVelocity	●	●	●	●	●
	MC_CamIn, MC_CamOut	●	●	●	●	●
	MC_GearIn, MC_GearOut	●	●	●	●	●
Extended motion commands (choice)	MB_ReadListParameter	●	●	●	●	●
	MB_WriteListParameter	●	●	●	●	●
	MB_GearInPos	●	●	●	●	●
	MB_PhasingSlave	●	●	●	●	●
	MB_Home	●	●	●	●	●
	MB_ClearAllError	●	●	●	●	●
Extended system functions (choice)						
Programmable limit switches		○	○	○	○	○
Encoder		○	○	○	○	○
Fault tolerance for failure of connected devices		●	●	○	○	○
	I/O	●	●	○	○	○
Ring healing and redundancy	Drives	●	●	–	–	–
		●	●	○	○	○

● Default ▼ In preparation ○ Optional – Not available



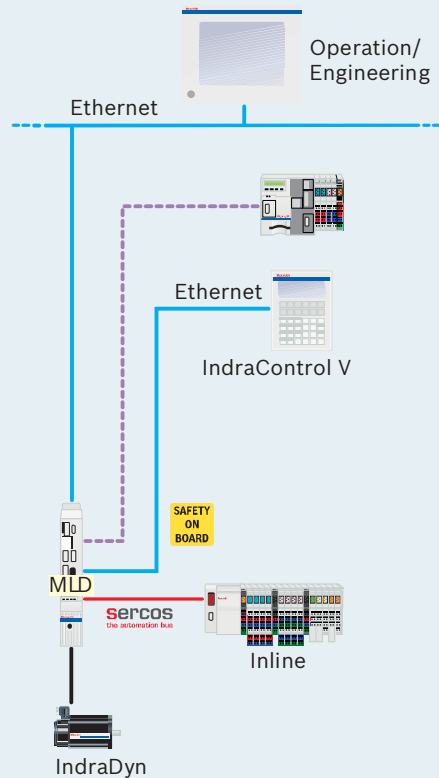
		MLD-M IndraDrive Cs	MLD-M IndraDrive C/M	MLD-S IndraDrive Cs	MLD-S IndraDrive C/M	MLD-S IndraDrive Mi
Technology functions (choice)						
Crank kinematics		○	○	○	○	○
Cross cutter		○	○	–	–	–
Flying cut-off		○	○	○	○	○
Tension control		○	○	–	–	–
Register control		○	○	○	○	○
Winder		○	○	○	○	○
Smart belt		○	○	○	○	○
Diagnosis						
Diagnosis (status, warnings, errors)	Function blocks (software)	●	●	●	●	●
	Parameter access to diagnosis memory (software)	●	●	●	●	●
	Locally via display (control hardware)	●	●	●	●	●
	Axis monitoring (e.g. capacity, encoders, limit values)	●	●	●	●	●
	Diagnosis memory (64 kB, max. 999 messages)	●	●	●	●	●
Debugging monitor for IEC applications		●	●	●	●	●
Drive systems						
IndraDrive		●	●	–	–	–
IndraDrive Mi	MPB firmware	▼	▼	–	–	–
IndraDrive Cs		●	●	–	–	–
Master communication	sercos III	●	●	●	●	●
Min. sercos III cycle time		0.25 ms	0.25 ms	1 ms	1 ms	1 ms
Engineering and operation						
IndraWorks		○	○	○	○	○
IndraMotion service tool		▼	▼	–	–	–

● Default ▼ In preparation ○ Optional – Not available



IndraMotion MLD – system configuration

Example configuration



System configuration

Software		Page(s)
Engineering framework	IndraWorks	60 – 79
HMI		
Manual operator panel	IndraControl VxH	90f/98f
Compact operator panel	IndraControl VCP	84 – 89
Embedded PC	IndraControl VEP	92 – 97
Panel PC	IndraControl VPP	100 – 103
Standard interfaces	Ethernet TCP/IP	–
I/O modules		
Local and distributed input/output modules in IP20	Inline	140 – 175
Standard interfaces	sercos III	–
Drives and motors		
Control/drive system	IndraDrive and IndraDyn	See "Drive System Rexroth IndraDrive"
Standard interfaces	sercos III	–



IndraMotion MLD – ordering data

Ordering data for firmware	
Description	Type code
Firmware IndraDrive BASIC with option TF (with PLC capable for technology functions)	FWA-INDRV*-MPB-xxVRS-xx-x-xxx-TF
Firmware IndraDrive ADVANCED with option ML (with PLC capable for technology functions)	FWA-INDRV*-MPH-xxVRS-xx-x-xxx-ML
Firmware IndraDrive ADVANCED with option MA (with PLC capable for extensive technology functions)	FWA-INDRV*-MPH-xxVRS-D5-1-ALL-MA
Technology function Rollfeed Standard for IndraMotion MLD-S, based on IndraDrive ADVANCED	FWS-MLDTFA-RFS-xxVRS-D0
Technology function Rollfeed Standard for IndraMotion MLD-S, based on IndraDrive BASIC	FWS-MLDTFB-RFS-xxVRS-D0
Technology function Rollfeed Extended for IndraMotion MLD-S, based on IndraDrive ADVANCED	FWS-MLDTFA-RFE-xxVRS-D0
Technology function Flying Shear for IndraMotion MLD-S, based on IndraDrive ADVANCED	FWS-MLDTFA-SPF-xxVRS-D0
Technology function Sequential Motion Control for IndraMotion MLD-S, based on IndraDrive ADVANCED	FWS-MLDTFA-SMC-xxVRS-D0
Ordering data for software	
Description	Type code
Software DVD, Engineering framework IndraWorks for IndraDrive drives (parameterization)	SWA-IWORKS-D*-xxVRS-D0-DVD**-COPY
Software DVD, Engineering framework IndraWorks for IndraDrive drives (service tool)	SWA-IWORKS-DS*-xxVRS-D0-DVD**-COPY
Software DVD, Engineering framework IndraWorks for IndraMotion MLD	SWA-IWORKS-MLD-xxVRS-D0-DVD**-COPY
Single license, for IndraWorks tool CamBuilder	SWS-IWORKS-CAM-xxVRS-D0
Software CD technology functions for IndraMotion MLD	SWA-IM*MLD-LTE-xxVRS-D0-CD650-COPY
Software CD technology functions for IndraMotion for Handling	SWA-IM*ML*-LHA-xxVRS-D0-CD650-COPY
Ordering data for hardware	
Description	Type code
Control and drive platform	See product catalog "Drive System Rexroth IndraDrive"

xx = IndraDrive configuration or software/firmware version

Current documentation can be found in the Internet at www.boschrexroth.com/mediadirectory.