Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth Bosch Group

IndraMotion MLC

Simple, open, and flexible
- Integrated runtime system with motion, robot, and logic controls
- Comprehensive software libraries compliant with IEC 61131-3 and PLCopen
- Innovative motion function FlexProfile for complex motion sequences
- Intuitive engineering with the software framework IndraWorks
- Supports electrical, hydraulic and hybrid drives

The compact Rexroth IndraMotion MLC motion logic system gives you any freedom you wish for your consistent and modern machine automation. Innovative software and firmware functions, easy engineering and open system interfaces provide maximum flexibility in all motion applications.

By combining motion, robot and logic control with technology functions, you can synchronize multi-axis applications very easily freely scalable for central or decentralized solutions with a flexible control platform. Motion functions, such as master axes, electronic gears, electronic cams and the innovative FlexProfile for complex motion sequences, can be used quickly and transparently. Robot control provides full functionality for multi-axis path interpolation in space. Integrate hydraulic axes just as easily and quickly in your automation solution with the same tools and functionalities. The Indra-Works engineering framework with intuitive operation and the PLCopen-conforming software interface with standardized function blocks according to IEC 61131-3 facilitate integration in various machine designs.

Regardless whether you are using electric or hydraulic drive technology: The motion logic system IndraMotion MLC is the answer for all tasks demanding easy engineering, simple product adjustments, and cost-optimized automation.

Technical data

Controller		MLC L40 1G	MLC L65 1G	MLC L25	MLC L45	MLC L65
Runtime system	Integrated motion logic system	●	●	●	●	●
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	Function modules	4	4	2	4	4
	System events	●	●	●	●	●
Probe function, control		●	●	○	●	●
User memory	Total: code, data	24 MB	36 MB	12 MB	24 MB	36 MB
Remanent memory	Total: system, user	128KB	256KB			

On-board diagnosis and settings			MLC L40 1G	MLC L65 1G	MLC L25	MLC L45	MLC L65
Status display (boot, sercos, test)		Display	●	●	●	●	●
Errors, warnings, messages, system reset			●	●	●	●	●
Ethernet settings (IP address)			●	●	●	●	●
Voltage monitoring, watchdog			●	●	●	●	●
Relay output ready for operation			●	●	●	●	●
IndraMotion Service Tool		Web-based engineering	○	○	○	○	○
On-board communication interfaces							
Sercos III	Automation bus			●	●	●	●
Sercos II	Real-time motion bus		●	○	○	○	○
Motion-Control	Sercos III		○	○	○	○	○
	Sercos II		○	○	○	○	○
	Number of controls in control link		64	64	64	64	64
PROFIBUS	Master		●	●		●	●
	Slave		●			●	●
PROFINET IO	Controller (master)					○	○
	Device (slave)					○	○
EtherNet/IP	Scanner (master)					▼	▼
	Adapter (slave)					○	○
Ethernet TCP/IP			●	●	●	●	●
Control link	Ethernet TCP/UDP/IP		●	●	●	●	●
RS232	On-board		●				
Function module							
Number			4	4	2	4	4
PROFIBUS-Master/-Slave			○	○			
Realtime-Ethernet/PROFIBUS					○	○	○
DeviceNet-Master			○	○			
Realtime-Ethernet/DeviceNet					▼	▼	▼
sercos III/ master axis grouping			○	○	○	○	○
Sercos II/ master axis grouping			○	○	○	○	○
Programmable limit switch			○	○	○	○	○
SRAM			○	○	○	○	○
Fast I/O			○	○	○	○	○
HMI							
IndraControl VCP, VCH		Ethernet TCP/IP, OPC	○	○	○	○	○
IndraControl VEP, VEH			○	○	○	○	○
IndraControl VSP, VPP, VSB/VDP, VPB/VDP			○	○	○	○	○
Inputs/outputs							
On board	High-speed digital inputs	Interrupt capability, typ. 50 µs	8	8	0	8	8
	High-speed digital outputs	0.5 A, typ. 500 µs	8	8	0	8	8
Local	High-speed digital inputs (FAST I/O function module)	Interrupt capability, typ. 40 µs	○	○	○	○	○

On-board diagnosis and settings			MLC L40 1G	MLC L65 1G	MLC L25	MLC L45	MLC L65
	Inline (digital, analog, relay, technology)	64 Byte, max. 512E/A	○	○	○	○	○
Distributed via Inline (IP20)							
Sercos III	On-board/function module		-/○				
PROFIBUS	On-board/function module		○	○	○	○	○
DeviceNet	Function module		○	○			
Distributed via Fieldline (IP67)							
PROFIBUS	On-board/function module		-/○				
DeviceNet	Function module		○	○			
Distributed via IndraControl S67							
Sercos III	On-board/function module		-/○				
PROFIBUS	On-board/function module		-/○				
DeviceNet	On-board/function module		○	○			

Logic-Control

PLC runtime system						
IndraLogic 1G kernel	Conforming with IEC 61131-3	●	●	●	●	●
IndraLogic 2G kernel	Conforming with IEC 61131-3 with extensions			●	●	●
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 eventcontrolled	8	8	10	20	20
Cycle-synchronous processing of the I/O process image		●	●	●	●	●
Sercos III synchronous processing of the I/O process image				●	●	●
Min. PLC cycle time	Synchronous to the system cycle	1 ms	1 ms	2 ms	1 ms	1 ms
	Synchronous to the sercos cycle			1 ms	0.5 ms	0.25 ms
Min. motion cycle time	Setpoint generator	1 ms	1 ms	2 ms	1 ms	1 ms
PLC processing times						
Typical processing time for 1,000 instructions in µs	Command mix (real, integer, bool, etc.)	50	5	35	30	5
	Bool operations	50	5	20	30	5
	Word operations	50	5	20	30	5
Motion control						
Number of axes	Real, virtual, encoder, grouped	32	64	16	32	64
Control axis	Centrally controlled	0	0	4	8	32
Synchronization(ELS electronic line shaft)	Virtual axes(virtual masters)	●	●	●	●	●
	Encoder axes(real masters)	●	●	●	●	●
	Real axes(servo drives)	●	●	●	●	●
	Link axes(cross communication)	●	●	●	●	●
	Dynamic synchronization	●	●	●	●	●
	Master axis cascading	●	●	●	●	●
Positioning	Single-axis	●	●	●	●	●

			MLC L40 1G	MLC L65 1G	MLC L25	MLC L45	MLC L65
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. 16 segments)		2	2	2	2	2
	FlexProfile(in the control, master/timebased motion profiles with max. 16 segments)		4	4	4	4	4
Motion commands according to PLCopen (choice)		MC_MoveAbsolute	●	●	●	●	●
		MC_MoveRelative	●	●	●	●	●
		MC_MoveVelocity	●	●	●	●	●
		MC_Home	●	●	●	●	●
		MC_CamIn, MC_CamOut	●	●	●	●	●
		MC_GearIn, MC_GearOut	●	●	●	●	●
Extended motion commands (choice)		MB_ReadListParameter	●	●	●	●	●
		MB_WriteListParameter	●	●	●	●	●
		MB_GearInPos	●	●	●	●	●
		MB_PhasingSlave	●	●	●	●	●
		MB_ClearAxisError	●	●	●	●	●
		MB_ClearSystemError	●	●	●	●	●
Hydraulic functions							
Single-axis controller (best-in-class)					●	●	●
Synchronizer (active/passive)					●	●	●
Control transfer					●	●	●
Force ramps/curves					●	●	●
Travel-dependent deceleration					●	●	●
Sytronix controller					●	●	●
Sequential programming in ST code					●	●	●
Hydraulics template (GAT)					●	●	●
Robot control							
Number of axes per kinematic			16	16	16	16	16
Multi-axis kinematics	Incl. auxiliary axes		16	16	4	16	16
Kinematics transformations			●	●	●	●	●
Types of interpolation LINEAR, CIRCULAR, PTP			●	●	●	●	●
Configurable block transitions			●	●	●	●	●
Override			●	●	●	●	●
Teach-in function			●	●	●	●	●
Approximate positioning			●	●	●	●	●
Late blending			●	●	●	●	●
Belt synchronization			●	●	●	●	●
Jogging/single step					●	●	●
Speed limitation	For path and axes		●	●	●	●	●
Acceleration limitation	For path and axes		●	●	●	●	●
Safety zones					▼	▼	▼

Extended system functions (choice)		MLC L40 1G	MLC L65 1G	MLC L25	MLC L45	MLC L65
Programmable limit switch		●	●	●	●	●
Measuring wheel		●	●	●	●	●
Probe		●	●	●	●	●
Technology functions (choice)						
Crank kinematics		●	●	●	●	●
Cross cutters		●	●	●	●	●
Flying cutoff		●	●	●	●	●
Sag control		●	●	●	●	●
Tension control		●	●	●	●	●
Register control				●	●	●
Winders		●	●	●	●	●
Magic belt				●	●	●
Smart belt				●	●	●
Diagnosis						
Diagnosis(status, warning, error)	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

Electric axes		MLC L40 1G	MLC L65 1G	MLC L25	MLC L45	MLC L65
IndraDrive	BASIC and ADVANCED with MPB/MPH firmware	●	●	●	●	●
	Double-axis control units with MPD firmware	●	●	●	●	●
IndraDrive Mi	With MPB firmware	●	●	●	●	●
IndraDrive Cs		●	●	●	●	●
EcoDrive Cs		●	●	●	●	●
Sercos ack-Profile		●	●	●	●	●
Control communication	Sercos III	●	●	●	●	●
Control communication	Sercos II	●	●	●	●	●
Min. Sercos III – cycle time		1 ms	1 ms	1 ms	0.5 ms	0.25 ms
Hydraulic axes						
HNC 100…3x/S(Sercos)	Distributed axis control (IP20)			●	●	●
IAC Multi Ethernet	Valve-integrated axis controller (distributed)			●	●	●
Inline block I/O	Control-integrated axis control (central)			●	●	●
Hybrid axes						
Sytronix FcP				●	●	●

Electric axes		MLC L40 1G	MLC L65 1G	MLC L25	MLC L45	MLC L65
Sytronix DFEn				●	●	●
Sytronix SvP				●	●	●
Engineering and operation						
IndraWorks		○	○	○	○	○
IndraMotion Service Tool	Web-based engineering	○	○	○	○	○
Compatible with all IndraLogic XLC systems		●	●	●	●	●

Components

Engineering and operation

Description	Page
Engineering	Software tools

Control hardware and interfaces

Description	Page
Control hardware	IndraControl L25
Control hardware	IndraControl L40
Control hardware	IndraControl L45
Control hardware	IndraControl L65

HMI

Description	Page	Details
HMI/industrial PC	Manual operator panels	IndraControl VCH
HMI/industrial PC		IndraControl VCP
HMI/industrial PC	Embedded PC	IndraControl VEP
Industrial PC	Panel PC	IndraControl VPP the PC solution for high-end industrial requirements

I/O

Description	Page	Details
IP 20	Inline	
I/O	IP 67	Fieldline, IndraControl S67

Electrohydraulic components

Description	Page	
I/O	IndraControl S20 (IP20)	
Block I/O modules	Sercos III analog, axis module	R-ILB S3 AI12 AO4 SSI-IN4

Ordering information

Type code	Description	Material number
FWA-CML25*-MLC-12VRS-D0	Firmware IndraControl L25	R911334607
FWA-CML402-MLC-04VRS-D0	Firmware IndraControl L40 (based on 1st generation PLC kernel)	R911320567
FWA-CML45*-MLC-12VRS-D0	Firmware IndraControl L45	R911334609
FWA-CML65*-MLC-04VRS-D0	Firmware IndraControl L65 (based on 1st generation PLC kernel)	R911320568
FWA-CML65*-MLC-12VRS-D0	Firmware IndraControl L65	R911334611

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