SIGMATEK

SERVO DRIVES
MDD 2000

EN

HIGHLY COMPACT, MODULAR, FLEXIBLE

DIAS DRIVE MDD 2000

The high power density of the multi-axis MDD 2000 servo system, combined with the modular configuration, enables customized and very flexible drive designs. With single-cable technology, many safety functions and simple handling, the servo drives are the perfect solution for various applications.

MAXIMUM POWER DENSITY

The highest power density combined with modern controller performance in one highly compact housing: The DIAS Drive MDD 2000 series is designed for dynamic multi-axis applications. For customized drive solutions, the combined supply/axis modules (MDP) with 1 or 3 integrated axes can be used as stand-alone compact drives or combined with any number of axis-expansion modules (MDD) into a multi-axis network. The compact modules differ only by 75 mm in width per size (75/150/225 mm), the height (242 mm) and depth (219 mm) remain the same.

FLEXIBLE COMPLETE SYSTEM

Supply, power filter, brake resistor and DC link, as well as numerous safety functions are integrated into the drive. The flexible servo system is operated in single or three phase with 200/240 V AC or 380/480 V AC. The position settings are made in the control and then sent to the drive via the real-time VARAN bus. With controller cycle times of only 62.5 µs and jitter under 1 µs, the MDD 2000 DIAS Drives are ideal for fast and high precise positioning tasks.

HIGH PERFORMANCE IN THREE SIZES

Two sizes are currently available. MDP 2100, the combined supply/axis module in size 1, provides 3x 5 A of rated power and 15 A of peak current. In size 2, the MDP 2200 is available with 3x 10 A of rated current and 30 A of peak current. In these two sizes, axis expansion modules are already available. Size 3 follows as MDP 2300 with combined supply/axis modules with 1x 30 A of rated current and a peak current of 90 A as well as 2x 22 A rated current and a peak current of 66 A*. All series provide an overload factor of up to 300 percent. With modularity by design, the MDD-2000 system is tailored to meet any application's needs, the system however particularly distinguishing itself in environments with varying loading times.

*in preparation

MDD 2000 AT A GLANCE

PRECISE MOTOR CONTROL

- Minimal controller cycle times of only 62.5 µs
- Real-time Ethernet VARAN
- High overload capacity: 300 %

MODULAR CONFIGURATION

- Combined supply/axis module (MDP), as well as expansion axis modules (MDD) for up to 3 axes
- Connection technology without backplane: No optional modules are required

HIPERFACE DSL© SINGLE-CABLE SOLUTION

- Minimizes wiring
- Optional: universal interface for resolver, EnDat 2.1©, Hiperface©, Sin/Cos, TTL, BiSS-C as well as Tamagawa encoder types

READY TO USE

- Comfortable configuration in the all-in-one engineering tool LASAL
- Seamless integration into the SIGMATEK automation system

NUMEROUS SAFETY FUNCTIONS

- Safe Torque Off (STO), Safe Operating Stop (SOS), Safe Stop 1 (SS1), Safe Stop 2 (SS2)
- Safe Brake Control (SBC)
- Safely Limited Speed (SLS), Safe Speed Monitor (SSM), Safe Maximum Speed (SMS)
- Safe Maximum Acceleration (SMA), Safely Limited Acceleration (SLA)
- Safely Limited Position (SLP), Safely Limited Increment (SLI), Safe CAM (SCA)
- Safe Direction (SDI)

up to SIL 3, PL e, Cat. 4, TÜV certified

COMFORTABLE

- Fast, tool-free module connection

MDD 2000

FEATURES THAT CONVINCE

The MDD 2000 servo drives are designed for dynamic multi-axis applications. With short cycletimes of 62.5 µs and jitter below 1 µs, the drives are ideally suited for fast and highly precise positioning tasks.

FLEXIBLE MULTI-AXIS SERVO SYSTEM

The combined supply and axis modules from the MDP 2000 series for up three axes can be used as stand-alone compact drives or expanded into a multi-axis network with different MDD 2000 axis modules of both sizes.

CLEVER CONNECTION MECHANICS

The multi-axis network is toollessly expanded with DCB "DC Connection Block" and BCB "Bus Connection Block". This eliminates costly individual wiring for current, DC-Link coupling and real-time Ethernet communication with VARAN bus.

MANY SAFETY FUNCTIONS

Numerous safety functions are integrated in the DIAS Drives MDD 2000 – up to SIL 3, PL e, Cat. 4 and TÜV certified: safe stop, brake, speed, acceleration, position and rotating direction functions.

LESS WIRING

With the MDD 2000 series, the Hiperface DSL digital motor feedback interface is a standard feature. The single-cable solution for power and feedback signals minimizes wiring.

DYNAMIC, PRECISE, ECONOMIC

FULLY INTEGRATED

The drive technology at SIGMATEK is seamlessly integrated into the automation system. Motion and sequence control, safety and visualization are combined on one platform. This simplifies programming and ensures clearly structured application software.

Energy-efficient servo motors can be precisely controlled with the modular multi-axis units of the MDD-2000-series. You can flexibly adapt or scale your drive concept to the required number of axes.

SIMPLE HANDLING

Since all parameter and configuration data of the servo amplifiers are stored centrally in the control, initial start-up and service are simple. When exchanging the drives, the parameters and configuration data are automatically reloaded.

ECONOMIC

The functions of the DIAS Drives 2000 were intentionally reduced. With current, speed and position control, they concentrate on their actual tasks while the control takes over the application tasks. Redundant functions and expensive electronics in the drive are therewith eliminated. An intermediate circuit in the DIAS Drives ensures energy efficiency.

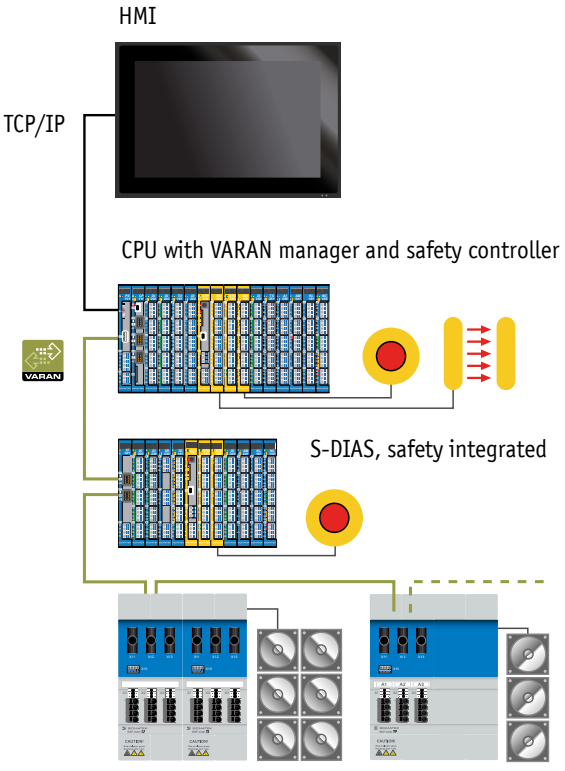
INTEGRATED SAFETY

All MDD 2000 drives have many safety functions in accordance up to SIL 3 as per EN IEC 62061 and PL e as per EN ISO 13849-1/-2 and are TÜV certified. This guarantees easy integration into the safety concept of the machine.

REAL-TIME ETHERNET

The modern system structure is enabled by the hard real-time capable Ethernet bus VARAN, which is used for communication between the drive and control. The precision of the motion is also increased. The short access times and high synchronicity reached with VARAN makes implementing controls for complex tracked profiles with multiple axes in combination with a primary PLC is simple and economic.

In addition, a significantly deeper integration of the drive into the control is achieved with the VARAN bus. Through the high data transfer rate and broad bandwidth of the real-time Ethernet communication, it is possible to activate more drives in a shorter time.



MDD 2000

SPECIFICATIONS

AVAILABLE MODULES

BRIEF DESCRIPTION	ART	SAFETY	UNIVERSAL ENCODERS	UL CERTIFIED	ARTICLE NUMBER
MDP2102-DDD-03	Power/axis module with 3 x 7/15 A (230 V)	yes	yes	designed acc. to UL	09-83-102-DDD-03
MDP2100-DDD-00	Power/axis module with 3 x 5/15 A	yes	no	cULus	09-83-100-DDD-00
MDP2100-DDD-03	Power/axis module with 3 x 5/15 A	yes	yes	cULus	09-83-100-DDD-03
MDD2100-DDD-00	Axis module with 3 x 5/15 A	yes	no	cULus	09-84-100-DDD-00
MDD2100-DDD-03	Axis module with 3 x 5/15 A	yes	yes	cULus	09-84-100-DDD-03
MDP2200-L-01	Power/axis module with 1 x 20/60 A	yes	yes	designed acc. to UL	09-83-200-L-01
MDP2200-HHH-00	Power/axis module with 3 x 10/30 A	yes	no	cULus	09-83-200-HHH-00
MDP2200-HHH-03	Power/axis module with 3 x 10/30 A	yes	yes	cULus	09-83-200-HHH-03
MDD2200-HHH-00 (auf Anfrage)	Axis module with 3 x 10/30 A	yes	no	cULus	09-84-200-HHH-00
MDD2200-HHH-03	Axis module with 3 x 10/30 A	yes	yes	cULus	09-84-200-HHH-03

DC-LINK CIRCUIT

MODULE	MDP 2102		MDP/MDD 2100		MDP/MDD 2200		MDP/MDD 2300*	
Effective rated power	1.3 kW	2.6 kW for 10 s	4 kW	8 kW for 10 s	9 kW	18 kW for 10 s	18 kW	36 kW for 10 s
DC-link voltage	325 V		565 V					
Maximum DC-link voltage	430 V		850 V					
DC-link capacitance	1320 µF		330 µF (MDP)/495 µF (MDD)		660 µF		1155 µF	
Maximum nominal DC-link current	4 A		7.1 A		16 A		t.b.d.	

AXIS/MOTOR CONNECTION

MODULE	MDP/MDD 210X	MDP/MDD 2200	MDP 2200-L-01	MDP/MDD 2300*
Maximum number	3			
Switching frequency	8 kHz			
Derating	2.5 %/°C over 45 °C (affects axis current and DC-link power)			
Continuous/peak current for 1 s per axis	5/15 A 7/15 A (230 V)	10/30 A	20/60 A	Version 1: 1x 30/90 A Version 2: 2x 22/66 A
Maximum total current	15 A	30 A	20 A	45 A
Maximum output frequency	599 Hz			
Maximum cable length	30 m			

*in preparation

SAFE / CAPTURE INPUTS

ART	SAFE INPUT (INPUT 1-4)	CAPTURE INPUT (INPUT 5-6)
Number	6	
Rated input voltage	+24 V	
Input voltage range	+18-30 V	
Signal level	low: ≤ +5 V	low: ≤ +5 V, high ≥ +15 V
Switching threshold	typically +11 V	
Input current	typically 3.6 mA at +24 V	
Input delay	typically 0.5 ms at +24 V	typically 3 µs at +24 V

CROSS-CIRCUIT DETECTION SIGNAL OUTPUTS

MODULE	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Number	1x signal A per module 1x signal B per module		
Rated output voltage	+24 V		
Output voltage range	+22-30 V		
Output current	maximum 100 mA		
Short-circuit proof	yes		

ENCODER INTERFACE

MODULE		MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
On-board	Maximum amount	3		
	Type	Hiperface DSL		
	Connection type	Single cable solution		
	Power supply	12 V		
Optional	Maximum amount	3		
	Type	Resolver/Sin-Cos/TTL/Hiperface/EnDAT 2.1/Tamagawa/BiSS-C		
	Voltages	5 V (with Remote Sensing)/9 V		
	Maximum cable length	30 m		

POWER SUPPLY

MODULE	MDP 2102	MDP 2100	MDP 2200	MDP 2300*
Rated supply voltage	1x 230 V AC	3x 400 V AC		
Supply voltage range	1x 230 V AC ±10 %	3x 380-480 V AC ±10 %		
Overvoltage category	III			
Power supply frequency	45-65 Hz			
Rated connection load	2.8 kVA	8.5 kVA	17.25 kVA	27.6 kVA
Supply input current	12 A	12 A	25 A	40 A
Inrush current	maximum 15 A	maximum 35 A		maximum 45 A
Neutral point	grounded			
Maximum permissible short circuit current	5 kA			
Power supply	TN-S, TN-C-S (with grounded neutral point)			
	IT (on request)			
Integrated power filter according to 61800-3, Category C3	yes			
Maximum fuse	Line protection: 13 A Type C		Line protection: 25 A Type C	Line protection: 40 A Type C
	Operating class gG (gL): 13 A		Operating class gG (gL): 25 A	Operating class gG (gL): 40 A

*in preparation

BALLAST RESISTANCE

MODULE	MDP 2102	MDP 2100	MDP 2200	MDP 2300*
Internal regen resistor provided	yes (25 Ω)			yes (20 Ω)
Continuous power int./ext.	50 W/500 W		200 W/1000 W	400 W/2000 W
Peak power int./ext.	7.4 kW/12.3 kW	28.9 kW/28.9 kW	28.9 kW/36.1 kW	37 kW/48.1 kW
Minimum permissible regen resistance (ext.)	15 Ω	25 Ω	20 Ω	15 Ω
Overload protection	yes			
Short circuit protection	yes			
Ground fault protection	no			
Maximum cable length	3 m			

COMMUNICATION

MODULE	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Bus	VARAN		

MOTOR HOLDING BRAKE

MODULE	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Maximum continuous current	1.5 A		
Overload and short-circuit protection	yes		
Overvoltage monitor	yes		
Cable break monitor	yes		
Brake voltage reduction	yes (12-24 V)		

MECHANICS

MODULE	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Cooling	air		
Backplane	none required		
Mounting position	vertical hanging		
Clearance above and below	at least 3 cm		
Fan	yes, exchangeable (lifespan circa 70,000 h)		
Dimensions (W x H x D)	75 x 242 x 219 mm	150 x 242 x 219 mm	225 x 242 x 219 mm
Weight	3 kg	5.2 kg	7.2 kg

ENVIRONMENTAL CONDITIONS

MODULE	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Storage temperature	-25 ... +70 °C		
Rated ambient temperature	0 ... +45 °C		
Ambient temperature max.	0 ... +55 °C (with derating 2.5 %/°C over 45 °C)		
Humidity	maximum relative humidity 85 %, non-condensing		
Altitude	up to 1000 m above NN at rated values 1000-3000 m over NN with reduction by 1.5 % / 100 m (affects rated output current and rated input power)		
Operating conditions	pollution degree 2		
Vibration resistance	frequency: 5-150 Hz acceleration: 1 g amplitude: 0.075 mm (0.15 mm pp)		
Shock resistance	acceleration: 15 g		
Protection Type	IP20		

MISCELLANEOUS

MODULE	MDP/MDD 210X	MDP/MDD 2200	MDP/MDD 2300*
Standard	UL: see Available Models		
Approvals	CE, TÜV-Austria EG-type-examined		

* in preparation

TECHNICAL DATA

DSM5 SERVO MOTORS

Our compact synchronous servo motors of the DSM5 series are equipped with the newest generation of magnet technology. The brushless three-phase motors are ideal for positioning tasks with high demands on dynamics and stability. They contain permanent magnets in the rotor made of neodymium magnet material. Through the low inertial torque, the motors are highly dynamic and have very low cogging. The robust, compact motors with high power density are available in 7 sizes and fine graduations, whereby customization is possible.

DSM LOW VOLTAGE

For our S-DIAS DIN rail motion modules, DSM low-voltage servo motors are available for the 24 V and 48 V ranges. Additional information on request.

STANDARD FEATURES

- IP65 protection
- Rotatable angled connector
- Sensors in the stator windings for temperature monitoring
- UL-conforming configuration

MOTOR		MOTOR - DATA											BRAKE - DATA			DRIVES	
	Winding code	Motor standstill torque	Rated torque	Peak torque	Nominal rotation speed	Nominal power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Weight standard	Stop torque at 120 °C	Inertial torque	Brake weight	Rated voltage 230 V	Rated voltage 400 V
		M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_N (A)	I_{max} (A)	KT (Nm/A)	J ($kgcm^2$)	m (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	m_{br} (kg)		
DSM5-0																	
DSM504	1	0.19	0.15	0.6	8000	0.126	0.78	0.60	3.1	0.24	0.037	0.53	0.4	0.019	0.2	X	
DSM505	1	0.38	0.29	1.3	8000	0.243	1.21	0.09	4.8	0.31	0.061	0.68	0.4	0.019	0.2	X	
DSM5-2																	
DSM521	1	0.7	0.58	2.4	6200	0.38	1.57	1.29	6.4	0.45	0.13	1.2	2	0.045	0.2	X	
DSM521	2	0.7	0.65	2.4	3600	0.25	0.96	0.89	3.9	0.73	0.13	1.2	2	0.045	0.2	X	
DSM521	1	0.7	0.52	2.4	8000	0.44	1.57	1.16	6.4	0.45	0.13	1.2	2	0.045	0.2		X
DSM521	2	0.7	0.6	2.4	6000	0.38	0.96	0.82	3.9	0.73	0.13	1.2	2	0.045	0.2		X
DSM522	1	1.4	0.9	4.6	6300	0.59	2.8	1.80	11	0.5	0.23	1.7	2	0.045	0.2	X	
DSM522	2	1.4	1.1	4.6	3900	0.45	1.73	1.34	6.6	0.81	0.23	1.7	2	0.045	0.2	X	
DSM522	1	1.4	0.8	4.6	8000	0.67	2.8	1.60	11	0.5	0.23	1.7	2	0.045	0.2		X
DSM522	2	1.4	1	4.6	6000	0.63	1.73	1.22	6.6	0.81	0.23	1.7	2	0.045	0.2		X
DSM5-3																	
DSM531	1	1.5	1.22	5.1	3100	0.4	1.65	1.34	6.6	0.91	0.92	2.4	11	1.06	0.6	X	
DSM531	2	1.5	1.38	4.8	1800	0.26	1.1	0.97	4	1.42	0.92	2.4	11	1.06	0.6	X	
DSM531	3	1.5	1.11	6.4	5000	0.58	2.6	1.91	13	0.58	0.92	2.4	11	1.06	0.6	X	
DSM531	1	1.5	1.1	5.1	6000	0.69	1.65	1.21	6.6	0.91	0.92	2.4	11	1.06	0.6		X
DSM531	2	1.5	1.3	4.8	3500	0.48	1.1	0.92	4	1.42	0.92	2.4	11	1.06	0.6		X
DSM531	3	1.5	1.8	6.4	6500	0.74	2.6	1.86	13	0.58	0.92	2.4	11	1.06	0.6		X
DSM532	1	2.9	2.31	10	3200	0.77	3.2	2.54	12.8	0.91	1.72	3.5	11	1.06	0.6	X	
DSM532	2	2.9	2.5	10	1900	0.5	2	1.72	8	1.46	1.72	3.5	11	1.06	0.6	X	
DSM532	8	2.9	2.05	10	5400	1.16	5.2	3.66	21	0.56	1.72	3.5	11	1.06	0.6	X	
DSM532	1	2.9	1.95	10	6000	1.23	3.2	2.14	12.8	0.91	1.72	3.5	11	1.06	0.6		X
DSM532	2	2.9	2.3	10	3500	0.84	2	1.59	8	1.46	1.72	3.5	11	1.06	0.6		X
DSM532	8	2.9	1.89	10	6500	1.29	5.2	3.38	21	0.56	1.72	3.5	11	1.06	0.6		X
DSM533	1	4.2	3.22	14	3300	1.113	4.6	3.54	18	0.91	2.53	4.6	11	1.06	0.6	X	
DSM533	2	4.2	3.6	14	2000	0.75	2.9	2.48	11	1.46	2.53	4.6	11	1.06	0.6	X	
DSM533	4	4.2	2.38	14	5200	1.54	7.1	4.80	28	0.6	2.53	4.6	11	1.06	0.6	X	
DSM533	1	4.2	2.65	14	6000	1.665	4.6	2.91	18	0.91	2.53	4.6	11	1.06	0.6		X
DSM533	2	4.2	3.35	14	3500	1.228	2.9	2.31	11	1.46	2.53	4.6	11	1.06	0.6		X
DSM533	4	4.2	2.53	14	6500	1.722	7.1	4.29	28	0.6	2.53	4.6	11	1.06	0.6		X
DSM534	1	5.3	4	18	3300	1.38	5.8	4.40	23	0.91	3.33	5.7	11	1.06	0.6	X	
DSM534	2	5.3	4.4	18	1900	0.88	3.4	2.86	14	1.54	3.33	5.7	11	1.06	0.6	X	
DSM534	4	5.3	3.56	18	4700	1.75	8	5.39	32	0.66	3.33	5.7	11	1.06	0.6	X	
DSM534	1	5.3	3.6	18	5000	1.885	5.8	3.96	23	0.91	3.33	5.7	11	1.06	0.6		X
DSM534	2	5.3	4.1	18	3000	1.288	3.4	2.66	14	1.54	3.33	5.7	11	1.06	0.6		X
DSM534	4	5.3	3.08	18	5000	1.613	8	4.67	32	0.66	3.33	5.7	11	1.06	0.6		X
DSM5-4																	
DSM541	1	4	3.21	14	3200	1.08	4.4	3.53	18	0.91	5	5.6	22	3.6	1.1	X	
DSM541	2	4	3.46	14	1800	0.65	2.5	2.18	10	1.59	5	5.6	22	3.6	1.1	X	
DSM541	3	4	3.17	14	4100	1.36	5.4	4.34	23	0.73	5	5.6	22	3.6	1.1	X	

MOTOR		MOTOR - DATA											BRAKE - DATA			DRIVES	
	Winding code	Motor standstill torque	Rated torque	Peak torque	Nominal rotation speed	Nominal power	Standstill current	Rated current	Peak current	Torque constant	Rotor inertial torque	Weight standard	Stop torque at 120 °C	Inertial torque	Brake weight	Rated voltage 230 V	Rated voltage 400 V
		M_0 (Nm)	M_n (Nm)	M_{0max} (Nm)	n_n (min^{-1})	P_n (kW)	I_0 (A)	I_N (A)	I_{max} (A)	KT (Nm/A)	J ($kgcm^2$)	m (kg)	M_{br} (Nm)	J_{br} ($Kgcm^2$)	m_{br} (kg)		
DSM541	1	4	2.7	14	6000	1.7	4.4	2.97	18	0.91	5	5.6	22	3.6	1.1		X
DSM541	2	4	3.35	14	3000	1.05	2.5	2.11	10	1.59	5	5.6	22	3.6	1.1		X
DSM541	3	4	2.77	14	6000	1.74	5.4	3.79	23	0.73	5	5.6	22	3.6	1.1		X
DSM542	1	7.6	5.84	26	3200	1.69	7.8	5.96	32	0.98	9.6	8.5	22	3.6	1.1	X	
DSM542	2	7.6	6.43	26	1800	1.21	4.7	3.97	19	1.62	9.6	8.5	22	3.6	1.1	X	
DSM542	4	7.6	6.72	26	1000	0.70	2.8	2.46	11	2.73	9.6	8.5	22	3.6	1.1	X	
DSM542	1	7.6	5	26	5000	2.62	7.8	5.10	32	0.98	9.6	8.5	22	3.6	1.1		X
DSM542	2	7.6	6	26	3000	1.89	4.7	3.70	19	1.62	9.6	8.5	22	3.6	1.1		X
DSM542	4	7.6	6.38	26	1900	1.27	2.8	2.34	11	2.73	9.6	8.5	22	3.6	1.1		X
DSM543	1	11.3	8.56	40	3300	2.96	12	8.73	48	0.98	14	11.4	22	3.6	1.1	X	
DSM543	2	11.3	9.54	39	1800	1.80	7	5.89	29	1.62	14	11.4	22	3.6	1.1	X	
DSM543	3	11.3	7.29	39	4800	3.66	17	10.72	68	0.68	14	11.4	22	3.6	1.1	X	
DSM543	1	11.3	7.5	40	5000	3.927	12	7.65	48	0.98	14	11.4	22	3.6	1.1		X
DSM543	2	11.3	8.8	39	3000	2.764	7	5.43	29	1.62	14	11.4	22	3.6	1.1		X
DSM543	3	11.3	6.27	39	6000	3.94	17	9.22	68	0.68	14	11.4	22	3.6	1.1		X
DSM5-5																	
DSM551	1	10	8.1	35	3000	2.54	9.8	7.94	41	1.03	22	11	40	9.5	1.4		X
DSM551	2	10	8.1	35	1900	1.61	6.5	5.26	27	1.54	22	11	40	9.5	1.4		X
DSM551	3	10	7.47	35	3800	2.97	12	9.22	51	0.81	22	11	40	9.5	1.4		X
DSM551	1	10	7	35	5000	3.67	9.8	6.86	41	1.03	22	11	40	9.5	1.4	X	
DSM551	2	10	7.8	35	3000	2.45	6.5	5.06	27	1.54	22	11	40	9.5	1.4	X	
DSM551	3	10	6	35	6000	3.77	12	7.41	51	0.81	22	11	40	9.5	1.4	X	
DSM552	1	19	10	64	4000	4.1	16	8.3	64	1.19	43	16	40	9.5	1.4		X
DSM552	2	19	15.2	64	3000	4.8	12	9.87	50	1.54	43	16	40	9.5	1.4		X
DSM552	3	19	10.2	64	4000	4.27	21	10.97	82	0.93	43	16	40	9.5	1.4		X
DSM553	1	27	16	94	3000	5	21	12.30	84	1.29	65	21	40	9.5	1.4	X	
DSM553	2	27	15.4	94	3000	4.8	15	8.80	62	1.75	65	21	40	9.5	1.4	X	
DSM553	3	27	10	94	4000	4.19	25	9.09	104	1.09	65	21	40	9.5	1.4	X	
DSM553	4	27	21.4	118	1900	4.26	9.6	7.64	42	2.81	65	21	40	9.5	1.4		X
DSM554	1	35	20.8	118	2500	5.4	25	14.80	100	1.41	87	26	40	9.5	1.4		X
DSM554	2	35	20.8	118	2500	5.4	20	12.00	80	1.75	87	26	40	9.5	1.4		X
DSM5-6																	
DSM561	1	15	8.50	40	2000	1.78	11	6.44	37	1.31	54	17	80	31.8	4.1		X
DSM561	2	15	8.00	40	2000	1.68	9.1	4.82	27	1.65	54	17	80	31.8	4.1		X
DSM562	1	28	15.8	72	2000	3.3	24	13.50	72	1.17	91	23	80	31.8	4.1		X
DSM562	2	28	15.8	72	2000	3.3	13	7.10	38	2.22	91	23	80	31.8	4.1		X
DSM563	2	50	27.4	130	2000	5.74	18	9.79	55	2.8	177	36	80	31.8	4.1		X
DSM563	3	50	43.2	177	500	2.26	5	4.35	16	9.92	177	36	80	31.8	4.1		X
DSM564	3	70	58	180	350	2.1	5	4.36	16	13.2	264	50	80	31.8	4.1		X
DSM5-7																	
DSM571	2	76	44.3	200	1800	8.35	25	14.7	73	3.03	484	50	120	57.5	6		X

DSM522 . 2 0 9 6 . 26 62 66

- **Product:** DSM5 Synchronous motor self-cooling
- **Motor size:** Size 0-7
- **Motor length:** Length 1-4
- **Voltage configuration:** Winding Code 1-8
- **Brake:**
  - 0 without brake
  - 1 with brake 24 VDC

Mechanical Dimensions at www.sigmatek-automation.com

- **Options:**
  - 26 Smooth shaft
  - 62 Thin shaft 9x20 flange 40/63 (motor size 2 only)
  - 66 Shaft seal

  Multi-response possible

  If 26 is not specified, the default shaft version with key is provided.
  If 62 is not specified, the default shaft diameter (11x23 with size 2) is provided.
- **Connector type:**
  - 6 M23 motor connector, M23 Encoder/Resolver
  - 9 M40 motor connector, M23 Encoder/Resolver
  - J ytec M15 round connector with size 0 ytec possible only

  If DSL encoders are used (W, Y), variant 6 with a single M23 round connector and variant 9 with a single M40 round connector are provided (single-cable solution).
  M40 motor connectors should be used for a continuous current larger than 20 A. Motors with an M40 connector are longer.
  ytec round connectors are available up to size 2 (continous current < 10 A).
- **Encoder system:**
  - 9 Resolver size 15 2p 7V 10kHz
  - W Sick encoder EKS36 17bit NO SIL, DSL
  - Y Sick encoder EKM36 18bit Multi-turn NO SIL, DSL
  - Z Sick encoder SKM36 Hiperface 128i PPT Multi-turn

  Motors with resolvers (9) have a different length than motors with encoders (W, Y, Z).
  The DSL variants (W, Y) are for single-cable solutions.
  The encoder system W, Y and Z are available by request with SIL2/SIL3 safety class.

TECHNICAL DATA PLANETARY GEARS

PEII-SERIE

The servomotors can be combined into compact coaxially constructed drive units using the economic planetary gears from the PEII series. The housing of the low-backlash PEII gears is made of powder-coated steel, the drive shaft with parallel key is also made of steel and drive flange and motor adapter plate are made of anodized aluminum. Versatile combination possibilities and precision translation stages enable the optimal adaptation to your specific application.

Additional series are available by request - such as stainless steel, angled gears, high drive torque, smaller backlash classes and grease lubrication.

STANDARD FEATURES

- Straight toothing
- Geometric 50/70/90/120/155 flange size
- Backlash up to < 10 angular minutes
- IP65
- High torsional stiffness and low running noise
- Efficiency ≥ 94 – 97 %
- Life-time lubrication

	Gear translation	Stages	Rated torque	Emergency stop Torque	Max. acceleration torque allowed	Backlash	Torsional stiffness	Rated rotation speed	Max. drive rotation speed	Operating noise	Mass inertial torque	Weight	Shaft diameter
	i		T_{2N} (Nm)	T_{2NOT} (Nm)	T_{2B} (Nm)	Δφ2 (arcmin)	C2 (Nm/arc-min)	n_{1N} (rpm)	n_{1B} (rpm)	LPA (dB)	J (kg.cm²)	kg	Ø(A) (mm)
PEII 050													
	3	1	16	48	28.8	≤ 8	0.9	4500	8000	≤ 60	0.1 – 0.2	0.7	8 – 14
	4	1	16	48	28.8	≤ 8	0.9	4500	8000	≤ 60	0.1 – 0.2	0.7	8 – 14
	5	1	15	45	27	≤ 8	0.9	4500	8000	≤ 60	0.1 – 0.2	0.7	8 – 14
	7	1	12	36	21.6	≤ 8	0.9	4500	8000	≤ 60	0.1 – 0.2	0.7	8 – 14
	10	1	10	30	18	≤ 8	0.9	4500	8000	≤ 60	0.1 – 0.2	0.7	8 – 14
	15	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	16	2	16	48	28.8	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	20	2	16	48	28.8	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	25	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	30	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	35	2	12	36	21.6	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	40	2	16	48	28.8	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	50	2	15	45	27	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	70	2	12	36	21.6	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14
	100	2	10	30	18	≤ 10	0.9	4500	8000	≤ 60	0.1 – 0.2	0.9	8 – 14

	Gears Transmission	Stages	Rated torque	Emergency stop Torque	Max. acceleration torque allowed	Backlash	Torsional stiffness	Rated rotation speed	Max. drive rotation speed	Operating noise	Mass inertial torque	Weight	Shaft diameter
	i		T_{2N} (Nm)	T_{2NOT} (Nm)	T_{2B} (Nm)	$\Delta\varphi 2$ (arcmin)	C2 (Nm/arc-min)	n_{1N} (rpm)	n_{1B} (rpm)	LPA (dB)	J (kg.cm^2)	kg	Ø$^{(A)}$ (mm)
PEII 070													
	3	1	42	126	75.6	≤ 7	2.2	4000	6000	≤ 62	0.1 – 1.53	1.9	8 – 19
	4	1	42	126	75.6	≤ 7	2.2	4000	6000	≤ 62	0.1 – 1.53	1.9	8 – 19
	5	1	40	120	72	≤ 7	2.2	4000	6000	≤ 62	0.1 – 1.53	1.9	8 – 19
	7	1	35	105	63	≤ 7	2.2	4000	6000	≤ 62	0.1 – 1.53	1.9	8 – 19
	10	1	27	81	48.6	≤ 7	2.2	4000	6000	≤ 62	0.1 – 1.53	1.9	8 – 19
	15	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	16	2	42	126	75.6	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	20	2	42	126	75.6	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	25	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	30	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	35	2	35	105	63	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	40	2	43	129	77.4	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	50	2	40	120	72	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	70	2	35	105	63	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
	100	2	27	81	48.6	≤ 9	2.2	4000	6000	≤ 62	0.1 – 1.53	2.3	8 – 19
PEII 090													
	3	1	110	330	198	≤ 6	8	3600	6000	≤ 64	0.2 – 2.68	3.4	14 – 28
	4	1	113	339	203.4	≤ 6	8	3600	6000	≤ 64	0.2 – 2.68	3.4	14 – 28
	5	1	118	354	212.4	≤ 6	8	3600	6000	≤ 64	0.2 – 2.68	3.4	14 – 28
	7	1	96	288	172.8	≤ 6	8	3600	6000	≤ 64	0.2 – 2.68	3.4	14 – 28
	10	1	68	204	122.4	≤ 6	8	3600	6000	≤ 64	0.2 – 2.68	3.4	14 – 28
	15	2	109	327	196.2	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	16	2	116	348	208.8	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	20	2	116	348	208.8	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	25	2	123	369	221.4	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	30	2	108	324	194.4	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	35	2	100	300	180	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	40	2	117	351	210.6	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	50	2	123	369	221.4	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	70	2	100	300	180	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28
	100	2	70	210	126	≤ 8	8	3600	6000	≤ 64	0.2 – 2.68	4.3	14 – 28

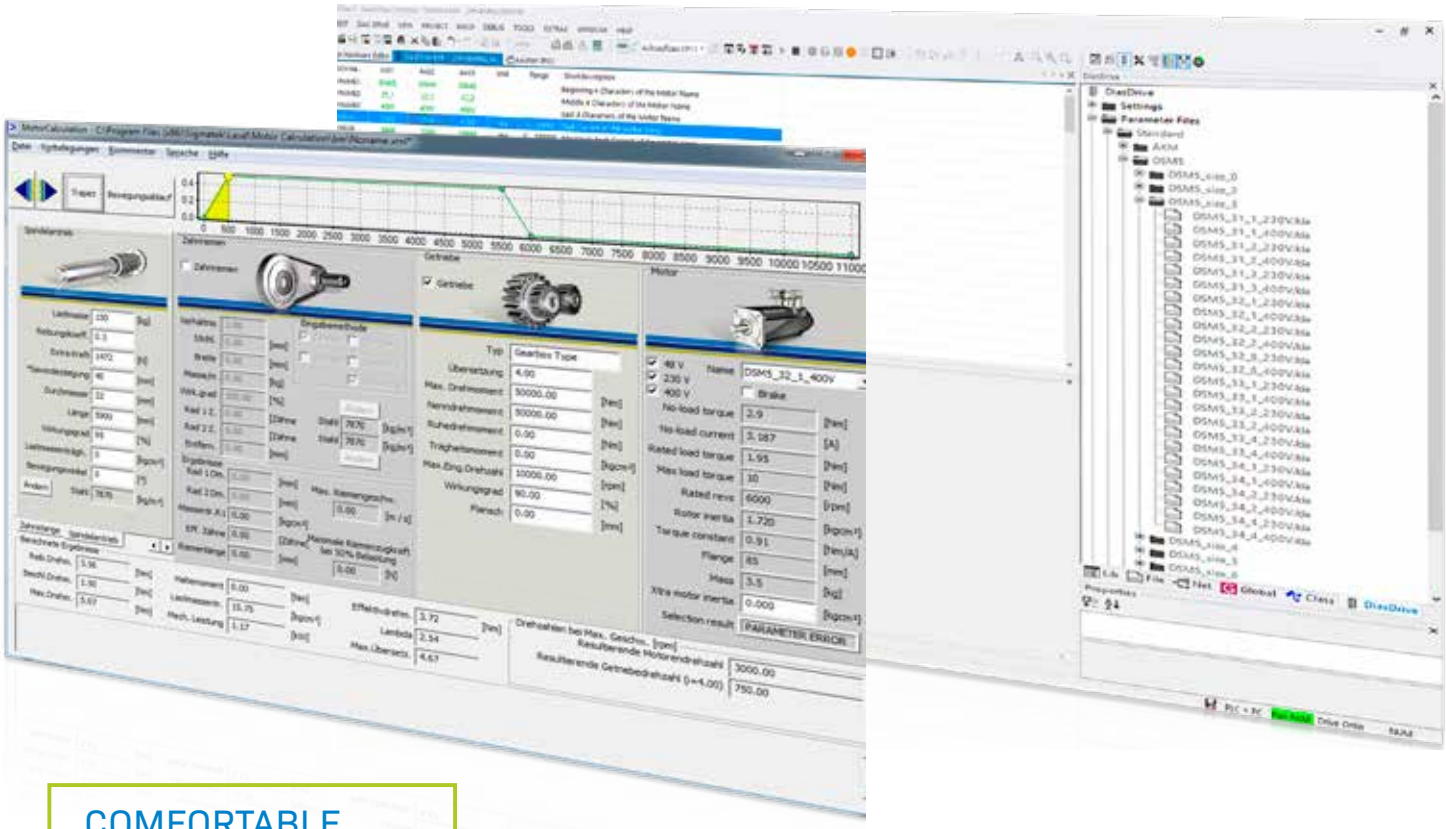
	Gears Transmission	Stages	Rated torque	Emergency stop Torque	Max. acceleration torque allowed	Backlash	Torsional stiffness	Rated rotation speed	Max. drive rotation speed	Operating noise	Mass inertial torque	Weight	Shaft diameter
	i		T_{2N} (Nm)	T_{2NOT} (Nm)	T_{2B} (Nm)	Δφ2 (arcmin)	C2 (Nm/arc-min)	n_{1N} (rpm)	n_{1B} (rpm)	LPA (dB)	J (kg.cm^2)	kg	Ø$^{(A)}$ (mm)
PEII 120													
	3	1	217	651	390.6	≤ 6	12	3600	4800	≤ 66	1.6 – 14	11.8	19 – 38
	4	1	223	669	401.4	≤ 6	12	3600	4800	≤ 66	1.6 – 14	11.8	19 – 38
	5	1	220	660	396	≤ 6	12	3600	4800	≤ 66	1.6 – 14	11.8	19 – 38
	7	1	198	594	356.4	≤ 6	12	3600	4800	≤ 66	1.6 – 14	11.8	19 – 38
	10	1	155	465	279	≤ 6	12	3600	4800	≤ 66	1.6 – 14	11.8	19 – 38
	15	2	213	639	383.4	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	16	2	228	684	410.4	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	20	2	230	690	414	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	25	2	228	684	410.4	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	30	2	212	636	381.6	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	35	2	206	618	370.8	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	40	2	232	696	417.6	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	50	2	228	684	410.4	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	70	2	206	618	370.8	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
	100	2	162	486	291.6	≤ 8	12	3600	4800	≤ 66	1.6 – 14	13.8	19 – 38
PEII 155													
	3	1	430	1290	774	≤ 6	16	2500	3600	≤ 68	2.23 – 24.5	16.5	24 – 42
	4	1	440	1320	792	≤ 6	16	2500	3600	≤ 68	2.23 – 24.5	16.5	24 – 42
	5	1	435	1305	783	≤ 6	16	2500	3600	≤ 68	2.23 – 24.5	16.5	24 – 42
	7	1	366	1098	658.8	≤ 6	16	2500	3600	≤ 68	2.23 – 24.5	16.5	24 – 42
	10	1	295	885	531	≤ 6	16	2500	3600	≤ 68	2.23 – 24.5	16.5	24 – 42
	15	2	424	1272	763.2	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	16	2	452	1356	813.6	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	20	2	454	1362	817.2	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	25	2	450	1350	810	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	30	2	422	1266	759.6	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	35	2	382	1146	687.6	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	40	2	459	1377	826.2	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	50	2	450	1350	810	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	70	2	382	1146	687.6	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38
	100	2	308	924	554.4	≤ 8	16	2500	3600	≤ 68	1.69 – 14.2	20.1	19 – 38

Mechanical Dimensions at www.sigmatek-automation.com

SIMPLE INTEGRATION OF DRIVE TECHNOLOGY

LASAL AND LASAL MOTION

LASAL is the all-in-one engineering tool from SIGMATEK and makes a significant contribution to the fast and easy integration into the control system. The initial start-up or parameterizing software for the DIAS Drives is completely integrated into LASAL; no additional software is needed.



COMFORTABLE

With the LASAL Motor Calculation software the right drive components can be easily determined.

LASAL MOTOR CALCULATION

For any application: With an optimized drive concept, the efficiency of the machine and the energy efficiency in particular, can be increased.

Important thereby, is the need-based dimensioning and the professional configuration of drives, motors and gears. The all-in-one engineering tool LASAL supports you in the configuration with the comfortable "LASAL Motor Calculation software".

Based on user-definable speed profiles (speed, acceleration, distance or motion time) and mechanical data (weight, diameter, mass, ratios), the optimal drive can be specified for the respective application.

PARAMETER SETS FOR SIGMATEK MOTORS

Parameter sets for SIGMATEK motors are already available. You simply have to adjust the system-specific data and do not have to worry about the motor parameters. All the parameters can be stored in the control, which guarantees that the drive always has the correct data. An exchange of the drive is therewith easily possible without a software tool. Alternatively, user-defined parameters can be stored. These can naturally be based on the available SIGMATEK parameter sets and therefore comfortably tailored to your needs.

INTERNAL DATA ANALYZER

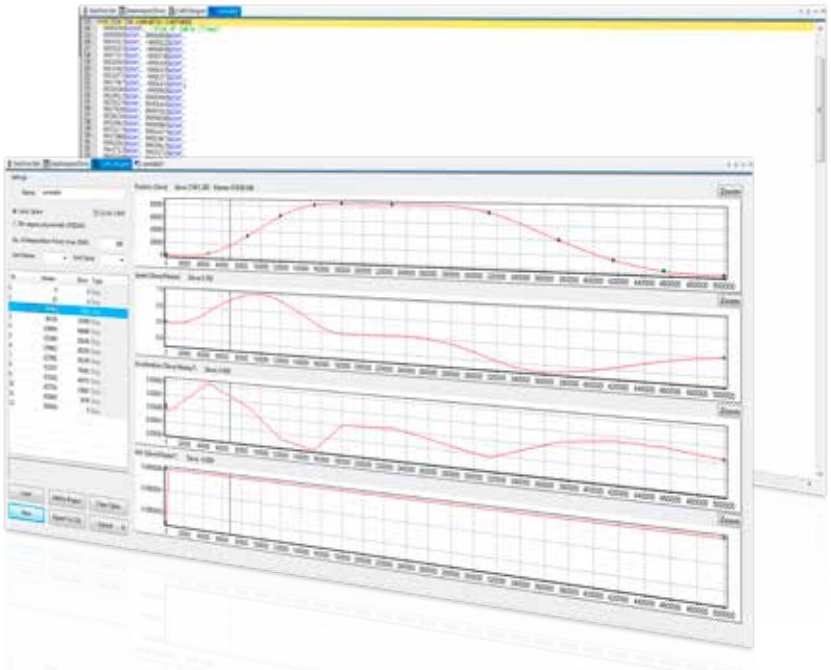
The DIAS Drives have an internal data analyzer that can record data with a scan rate of 62.5 µs. This data is recorded in the converter in real-time and then displayed through the software tool. Optimizing the controllers and displaying the data analyzer can be done in the same screen view.

GRAPHIC REPRESENTATION INITIAL CONTROLLER START

Current, rotation speed and position control are graphically displayed in the software, which ensures a clear overview at any time. All respective control parameters are visible at a glance and can be set individually.

CAM-DESIGNER: COUPLE CAM DISCS

With the CAM Designer cam disc couplings can be easily calculated and displayed. Interpolation points are defined for calculations. Based on this, position, speed, acceleration and jerk curves can be displayed. The selection of various interpolation types enables an exact adaptation to the requirements of the specific application.



FLEXIBLE MOTION DESIGN

The LASAL MOTION package simplifies all drive technology tasks. Complex axis control and regulation tasks can also be comfortably implemented.

A large drive library is available to the user: Functions such as absolute, relative and endless positioning, CNC functions and several reference types are provided. In addition, a diverse selection of motion control and technology modules are also available. Examples are coordinated movements such as synchronization with up to 9 axis in a space, circular interpolation, curved disks, flying saw or cam gears. This ensures a further reduction in programming and testing.

SIMULATION

Whether synchronization of axes in a space, CNC code or complex robot kinematics - all motion functions can be easily simulated.

MOTION DIAGNOSTIC VIEW

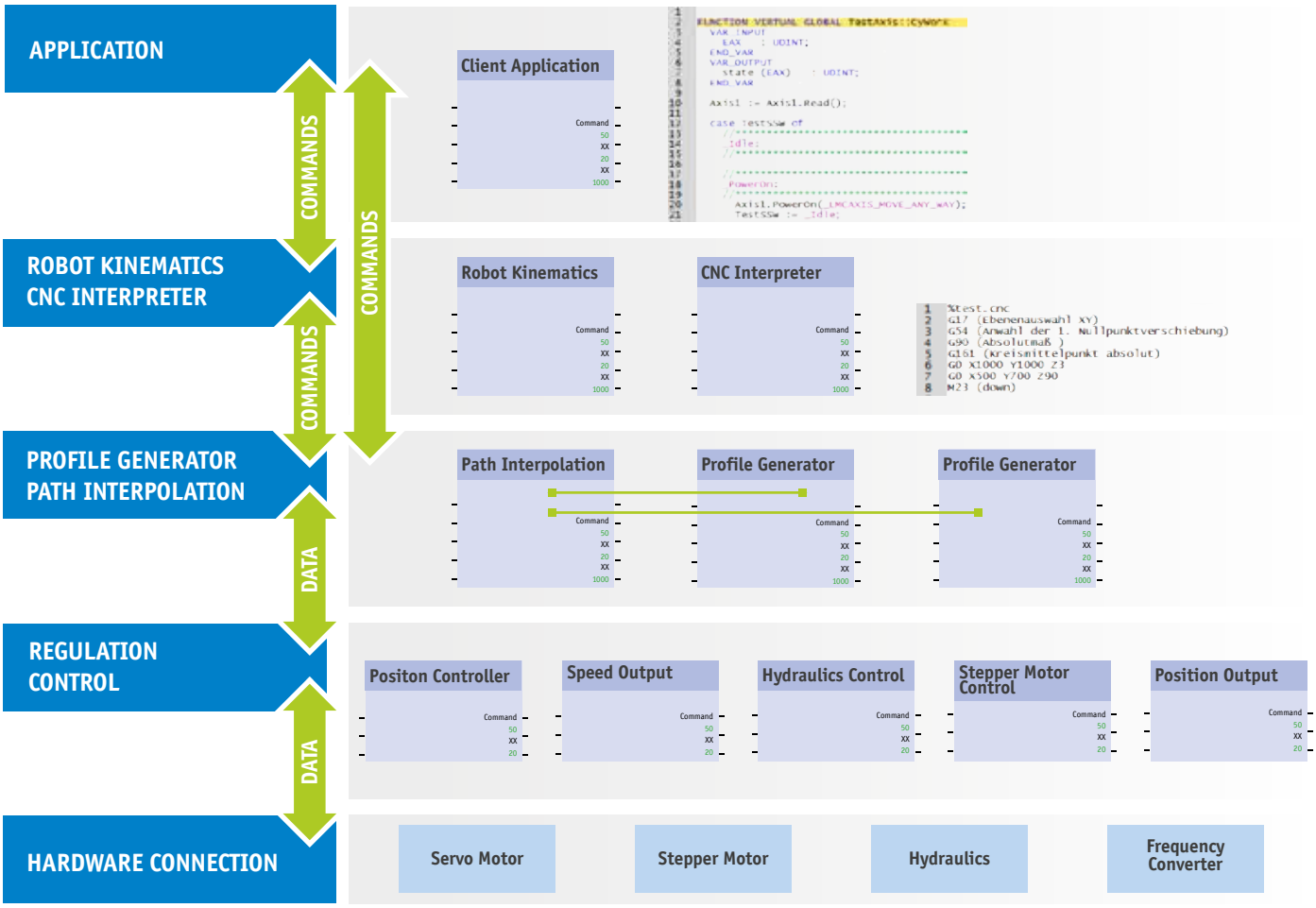
With the Motion Diagnostic View, initial Startup and diagnosis of the drive components are also reduced significantly. The axes can be comfortable parameterized and started and commands quickly sent – even troubleshooting is simple. The graphic representation provides additional comfort and clarity.

MODULAR CONSTRUCTION OF THE MOTION SOFTWARE

Object-oriented engineering with LASAL provides the user with the highest modularity. The Motion Control components and templates can also be combined as desired, whereby the implementation of various motion requirements of the application can be easily realized.

The modular construction of the software allows hardware-independent motion control. For the customer application, it is therefore irrelevant whether a hydraulic axis, servo motor or similar is operated. The instruction call is always the same.

During development of LASAL MOTION, a great deal of attention was given to ease of use and efficient axis commands. Several axes can therefore be synchronized with just one command call. Synchronization can be achieved through speed, position, position offset, with gearing or virtual axis.



The motion control is independent of the hardware used

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