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Data Sheet

MACS5-AMP3-Lite

1- to 3-axis controller with integrated Servo Amplifiers
For accurate positioning with incremental encoders & glass scales

The MACS5-AMP3-Lite is a cost-opti-mized OEM multi-axis motion controller specially designed for use in special machine engineering. A programmable controller is combined with integrated servo amplifiers in the compact housing.

The MACS5-AMP3-Lite can control, position, and synchronize up to three servo drives as well as execute autonomously entire process steps. It is possible to use different feedback signals simultaneously for each axis to achieve the most accurate positioning with automated slip compensation. There are direct encoder inputs for incremental encoders, SSI encoders, and Heidenhain glass scales.

The MACS5-AMP3-Lite can be used as device control standalone or using one of the interfaces in combination with a PLC. It is free programmable and even complex control tasks can be processed on its own. Each of the interfaces with its corresponding Windows DLL is available for controlling or visualization in PC systems.

zub Standards

- **Control functions:** Interrupts reacting on inputs, position data, bus bits, timer, etc.; arithmetic and bit handling; conditional branches and loops
- **Closed loop control:** Position and speed control, current control and current limitation
- **Positioning functions:** Absolute and relative positioning, configurable homing, configurable speed profiles
- **Synchronization Functions:** Velocity synchronization, position / angle synchronization, Synchronization including correction depending on slave / master marker
- **Free programmability** on C basis with powerful Motion control commands, support of hierarchical State machines by means of license-free automation software AposSIDE®
- **Interactive graphic editors** like CAM-, Array- and Path-Editor
- **Debugging & Optimization:** Smart-Oscilloscope and integrated graphic CAM-Editor
- **State-Machine Support:** AposSIDE® supports the automatic execution of hierarchic State Machines

Application Range

- X/Y/Z positioning in measuring systems, robots, analysis and handling devices
- Synchronization of highly dynamic drives, e.g. in labeling machines or feeding systems
- Standalone control of devices and simple machines

Overview of advantages

Compact and complete solution including internal power stages.

Highly accurate multi-axis position control without any license fees.

Free programmable motion and process control unit.

Direct encoder interfaces for incremental encoders and Heidenhain glass scales.

Ethernet and USB interfaces for data exchange with a PLC, a PC host, or a visualization system.

The MACS5-AMP3-Lite is an optimized solution for direct integration into devices due to its very compact size and its economical wiring. It adds motion control functionality and motor power stages to each PC and PLC based system or can even be used standalone.

MACS5-AMP3-Lite

Electrical Data			
Control unit: Supply voltage	24 V DC ±25 %	200 mA	without I/O load
Amplifiers: Supply voltage	12 - 50 V DC	Current requirement depending on requested motor power	
Memory			
Workspace and program memory	1 MByte SRAM	4 MByte Flash	Application & data
Closed loop Controls			
Number of drives and control type	3	Position, speed, current	
Position control	1 kHz	1 ms cycle time	PID control plus feed forward
Speed control	1 kHz	1 ms cycle time	PI control
Current / torque control	8 kHz	125 µs cycle time	PI control plus current limitation
Internal Servo Amplifiers			
Quantity and type of motors	3 x brush-type or 2 x brushless or 1 stepper or mixed operation		
Amplifier type and chopping frequency	4Q-PWM / 24 kHz		
Max. output current (configurable)	3.2 A continuous current / 7 A peak current (max. 5 seconds) per amplifier / motor		
Option High Power (.... -HP)	4 A continuous current / 8 A peak current (max. 5 seconds) per amplifier / motor		
Motion Control Functions			
Free programmable velocity, position, synchronization and process control. Highly accurate position control by single or duplex evaluation of encoders mounted on the motor shaft and moved load. Speed, position and CAM profiling synchronization with or without master / slave correction.			
Encoder Connections			
All encoder inputs are configurable as feedback signal inputs of the motor control or as master signal inputs for drive synchronization.			
Encoder 1 ... 3 (inputs)	Sin/Cos encoder	1 Vpp, max. 150 kHz	
Encoder 4 ... 6 (inputs, outputs)	Incremental encoder	5 V, max.32 MHz	Configurable as virtual master output (0,037 Hz ...625 kHz)
	or SSI-Encoder	max. 32 bit, 39 kHz... 5MHz	
Output supply voltage	5 V DC, max. 200 mA per encoder, max. 1A total		
Digital Inputs / Outputs			
Digital inputs 1- 4 can be configured as marker input signal for real-time encoder position latching			
Digital inputs	8	Low: < 4,6 V / High: > 18 V	max. 45 V, max. 200 kHz
Digital outputs	4	24 V, 100 mA, 300 kHz	short-circuit protection
Interfaces			
CAN interface	ISO/DIS 11898	max. 1 MBaud	Debugging feature
Serial interface	USB, Ethernet		Data exchange & visualization
Additional bus systems	On request: e.g. EtherCAT, Profinet/-bus, POWERLINK, Modbus, Sercos, CAN master/slave, etc.		
Display / LEDs			
Status	4		
Mechanical Data			
Type of housing and mounting	Compact metal housing		
Length x Width (incl. plugs) x Height	ca. 180 x <=107 (113) x <= 65 mm		
Weight	900 g	MACS5-AMP3-Lite	
	950 g	MACS5-AMP3-Lite-HP	
Connector types	DSUB, RJ45, Molex		
Customer specific connector types and housing designs, amplifier design			
Temperature Range			
Operation / storage	0...+40° C / –20...+85°C	20...80% humidity	non-condensing
Product names and Part number			
Part number	**001708 MACS5-AMP3-Lite**	**001712 MACS5-AMP3-Lite-HP**	