

MACS₃

Single and Multi-Axis Control

For Positioning and Synchronization

The **MACS₃** is a freely programmable control system including 10 digital and one analog input. Two CAN busses provide a direct control of multiple axis or an easy extension of inputs and outputs. With these features and fast processing time, the **MACS₃** is an ideal choice to synchronize complex systems.

Applications

- ◆ Flying saws
- ◆ Belt synchronization, conveyor belts
- ◆ Coil winding applications
- ◆ Printing machines
- ◆ X/Y tables
- ◆ Electronic gearing
- ◆ Palletizing, packaging
- ◆ Feeding

Positioning Functions

The **MACS₃** handles all of the functions necessary for positioning, including:

- ◆ HOME
- ◆ Absolute and relative positioning
- ◆ Marker specific positioning
- ◆ Programmable speed profiles
- ◆ Speed, acceleration ramp, and braking ramp can be altered during motion

Synchronization Features

With the **MACS₃** it is possible to precisely synchronize a controlled drive to any guiding axle in terms of speed and angle. The following synchronization functions are available for this:

- ◆ Speed synchronization
- ◆ Position / angle synchronization with or without marker correction
- ◆ Ratio and offset can be altered online
- ◆ Any change of operation mode between synchronization, positioning, and speed regulation, even during motion
- ◆ Recording of master and slave position, speed, synchronicity errors, etc., even during operation

Control Functions

All of the macro language **APOSS** control commands are available for the **MACS₃**, for example:

- ◆ Extension of inputs and outputs using CANopen modules
- ◆ The **MACS₃** assumes CAN master functions as well as CAN drive functions
- ◆ Interrupt functions on inputs, bus bits, bus telegrams, etc.
- ◆ Timer function
- ◆ Calculation function, branching, etc.



CAM Functions

CAM disc and CAM switch controls can be realized with the **MACS₃**: The **APOSS** applications program includes the following features:

- ◆ Interactive curve editor
- ◆ Curve points and tangent points
- ◆ Synchronization with slave or master marker correction

Drives

The **MACS₃** can control the following drives:

- ◆ All amplifiers with ± 10 V or 0 ... 10 V input or CAN interface
- ◆ Frequency converters with and without CAN, e.g. Danfoss, Lenze
- ◆ Servo controls for brush and brushless motors



*Application sample:
Insertion system for regionalization and
supplementation of newspapers
(© FERAG AG)*

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		Value	Note
Electrical Data			
Supply voltage: Logic & I/O	Vcc	24 VDC \pm 25 %	
Current consumption (without load)	mA	approx. 120 mA	
CPU			
Micro control	CPU	MPC555 @ 40 MHz	
Work space memory	SRAM	256 kB	
Program memory	Flash EPROM	448 kB	operating system
APOSS application memory	Flash EPROM	128 kB	enough for about 20,000 commands
Inputs			
Digital 1 ... 10	13...30 VDC (high)	Ri = 5 k Ω	
Analog 1	0...10 V (10 bit)	Ri = 44 k Ω	
Encoder input – Slave	Differential line driver RS485	220 kHz	
Encoder input – Master	Differential line driver RS485	220 kHz, electrically isolated	
Outputs			
Digital 1 ... 6	Vcc – 1 V	IL < 500 mA	short circuit proof
Analog / reference	-10...+10 V (10 bit)	Ro = 100 Ω	
LEDs			
Power		●	
Error (Position error, limit switch, etc.)		●	
Moving		●	
7 segment display		3 digits	
Supply Outputs			
Encoder supply	+5 V DC	max. 100 mA	
Interfaces			
CAN interface	IS/DAIS 11898	2	
CAN protocol	device profile 402	CAN open	depends on application program
Serial interface	RS232 9600 Baud	only TX/RX lines	
Mechanical Data			
Length		110 mm	
Width		70 mm	without terminals
Height		75 mm	without terminals
Weight with cabinet		ca. 200 g	without terminals
Temperature Range			
Operation		0 ... +50 °C	
Storage		-20 ... +85 °C	
Air humidity (not condensing)		20 ... 80 %	
Operation Modes			
Speed mode		●	
Positioning		●	
Velocity synchronization		●	
Position / angle synchronization		●	
Position / angle synchronization with marker correction		●	
CAM mode		●	
Legend			
●	Included in the standard		