

# MACS2

## POSITIONING AND SYNCHRONIZING CONTROL

### Intelligent Drives

The **MACS2** is a freely programmable control system which can also accommodate additional inputs and outputs as required via the CAN bus. It is controlled by simple I/O commands. In addition to this, the **MACS2** assumes the function of a CAN master in the background.

### Applications

With these features, the **MACS2** is ideal for the following plant and machinery uses:

- ◆ Flying saws
- ◆ Belt synchronization, conveyor belts
- ◆ Coil applications
- ◆ Printing machines
- ◆ Conveyor chains
- ◆ Electronic transmissions
- ◆ Palletizing, packaging
- ◆ Feeding, positioning

### Positioning functions

The **MACS2** 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.

### Synchronizing Features

With the **MACS2** 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
- ◆ Virtual master function
- ◆ Ratio and offset can be altered online
- ◆ Any change of operation mode in between synchronization, positioning, and speed regulation, even during motion
- ◆ Recording of master and slave position, speed, synchronicity errors, etc., even during operation

### Control Functions and Bus Commands

All of the control commands of the macro language APOSS are available for the **MACS2**, for example:

- ◆ Extension of the inputs and outputs with CAN-open modules
- ◆ The **MACS2** assumes CAN master functions with the simplest commands
- ◆ Interrupt functions on inputs, bus bits, bus telegrams, etc.
- ◆ Timer function
- ◆ Calculation functions, branching, etc.



### CAM Functions

CAM controls and CAM boxes can be realized with the **MACS2**. The APOSS application program includes the following features:

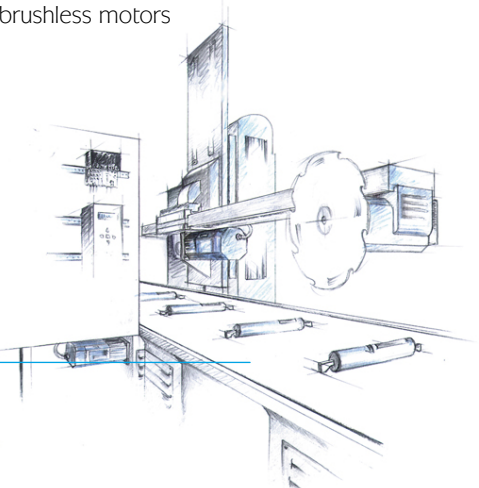
- ◆ Interactive curve editor
- ◆ Curve points and tangent points
- ◆ Synchronization with marker correction of the slave or master

### Drives

The **MACS2** can control the following drives:

- ◆ All amplifiers with  $\pm 10$  V or 0 ... 10 V input
- ◆ Frequency converters with and without vector control
- ◆ Servo controls for brushed and brushless motors

Application sample:  
Flying saw



# MACS2

		Value	Note
<b>Electrical data</b>			
Supply voltage, electronic/ I/O	Vcc	24 VDC ±25 %	
Rated voltage electronics	mA	ca. 120 mA	
Connection brushed motors		B, C	
<b>CPU</b>			
Micro control	CPU	MC 68332, 20 MHz	
Work space memory	SRAM	2 * 32 kB	
Program memory	Flash EPROM	2 * 128 kB	Operating system
APOSS application memory	Flash EPROM	1 * 128 kB	enough for about 20,000 commands
<b>Inputs</b>			
Digital 1 ... 4	13...30 VDC (high)	Ri = 5 kΩ	
Encoder inputs 2 (Master / Slave)	Differential line drive RS485	220 kHz	
	Absolute SSI Grey Code 25 Bit	220 kHz	
<b>Outputs</b>			
Digital 1 ... 2	Vcc – 1 V	IL < 500 mA	short circuit proof
Analog / set value	–10...+10 V (12 Bit)	Ro = 100 Ω	
Encoder output (Master)	Differential line driver RS485	150 Hz ... 150 kHz	
<b>Encoder</b>			
Encoder 1	Master (can be configured as input or output for axis synchronization)		
Encoder 2	Slave (actual position encoder of the controlled axis)		
<b>LED</b>			
Power		●	
Error (Position error, limit switch, etc.)		●	
Moving		●	
<b>Voltage outputs</b>			
Encoder power	+5 V DC	max. 100 mA	
<b>Interfaces</b>			
CAN interface	IS/DAIS 11898	electrically isolated	
CAN protocol	device profile 402	CANopen	depends on application program
Serial interface	RS232 9600 Baud	only TX/RX lines	
<b>Mechanical Data</b>			
Length		110 mm	
Width		45 mm	
Height		79 mm	
Weight with housing		ca. 140 g	
<b>Temperature range</b>			
Operation		0 ... +50 °C	
Storage		–20 ... +85 °C	
Air humidity (not condensing)		20 ... 80 %	
<b>Modes of operation</b>			
Speed mode		●	
Position mode		●	
S-ramps		●	
Velocity synchronization		●	
Position / angle synchronization		●	
Position / angle synchronization with marker correction		●	
CAM mode		●	
<b>Legend</b>			
●	Provided as standard		
○	Option		