

Motion Control Products

zub products



are more flexible

zub 
machine control AG

zub machine control AG
Kastaniensteig 7, CH-6047 Kastanienbaum, Switzerland
Phone +41-41-348 00 30 · Fax +41-41-348 00 39
info@zub.ch · www.zub.ch

Application range

Positioning

- ◆ Low cost mechanical stop adjustment
- ◆ X/Y/Z-positioning of probes
- ◆ Work-piece and tool positioning in machines

Feeding

- ◆ Synchronous feeding of components (e.g. supplements, CDs)
- ◆ Position synchronization using marker correction, jerk limitation, and signal filtering

Labeling

- ◆ Synchronization of label ejection and goods
- ◆ Synchronous feeding with marker correction and online CAM profiling

Sawing

- ◆ Shaping products in a running process flow
- ◆ Flying saw with on-the-fly product length adjustment by online CAM profile calculation

Stitching

Feeder

Labeling machine

Flying saw



© from left: FERAG AG (1 and 2)
TEA - Fotolia; emmi - Fotolia
Title page: © Thierry Otto-loyas - Fotolia

Application range

Storage

- ◆ Cart positioning in high bay warehouses or storage systems (e.g. pharmacies)
- ◆ Positioning with on-the-fly target adaptation
- ◆ Jerk limited ramps for smooth motion profiles

Lifting

- ◆ Standalone control of lifting platforms
- ◆ Network-based controls for overstage and understage machinery in theatres

Winding

- ◆ Electronic servo traversing gear: Synchronization of the traversal with the speed of material
- ◆ Automatic tension control

Dosing

- ◆ High precision flow control of pumps
- ◆ Flow rate and dose control of analytic and infusion pumps
- ◆ Control of automated pipette systems

Storage system

Theatre platform

Rewinder

Pipette system



© von inks: APOSTORE GmbH
Casino Bern, zub AG; Vitalij Goss - Fotolia
Alexey Stiop - Fotolia

MACS3

1- to 3-axis control unit for servo drives and frequency converters

Programmability	yes
Development tool	included
Motion control licenses	free
Modes of operation	Standalone PLC CANopen master CANopen slave
Motion control features	Positioning Speed synchronization Position synchronisation Marker synchronization CAM profiling
PLC or PC networking	yes (CAN, RS232)
Standalone operation	yes
Plug & play functions	yes (DS402 slave)
Integrated amplifiers	no
Servo / FC control	yes (± 10 V, CAN)
Supply voltage	24V
Feedback inputs	2 (incremental)
Digital I/Os	10/6
Analog I/Os	1/1
Interfaces	2 x CAN, RS232
Housing	DIN rail module
Connector type	Tension spring clamp
Add-on options	CANopen I/O modules CANopen servo amplifiers

1- to 3-axis control

Positioning

Synchronization

Programmable

Compact design

2 x CAN, RS232



3-axis control

Positioning

Synchronization

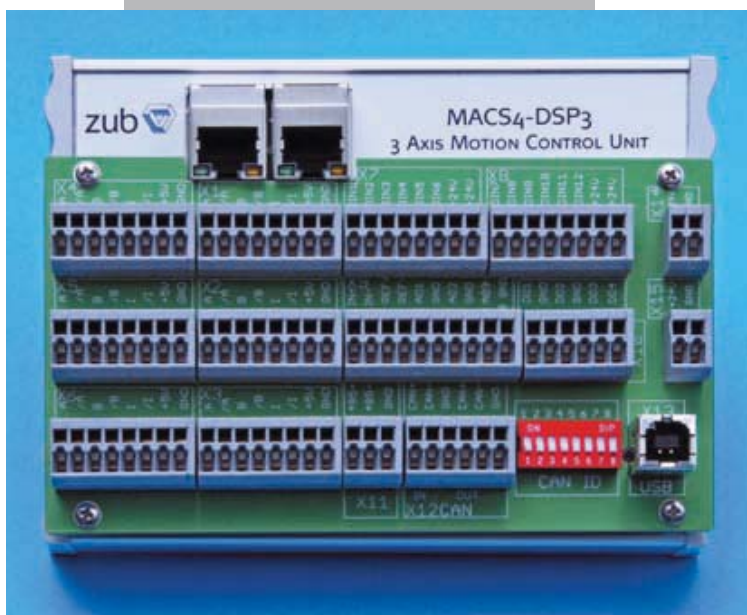
Programmable

EtherCAT, CAN, USB

MACS4-DSP

3-axis control unit for servo drives
and frequency converters

Programmability	yes
Development tool	included
Motion control licenses	free
Modes of operation	Standalone PLC EtherCAT slave CANopen master CANopen slave
Motion control features	Positioning Speed synchronization Position synchronizatzion Marker synchronization CAM profiling
PLC or PC networking	yes (CAN, EtherCAT, USB)
Standalone operation	yes
Plug & play functions	yes (DS402 slave)
Integrated amplifiers	no
Servo / FC control	yes (± 10 V, CAN)
Supply voltage	24V
Feedback inputs	6 (incr., SinCos, SSI)
Digital I/Os	12/4
Analog I/Os	1/3 (optional)
Interfaces	CAN, EtherCAT, USB, RS485
Housing	Alurail compact module
Connector type	Tension spring clamp
Add-on options	Bus interface plug-in Specialized I/O plug-in CANopen I/O modules CANopen servo amplifiers



MACS4-DC6

6-axis control unit with integrated power stages for DC motors

Programmability	yes
Development tool	included
Motion control licenses	free
Modes of operation	Standalone PLC EtherCAT slave CANopen master CANopen slave
Motion control features	Positioning Synchronization
PLC or PC networking	yes (CAN, EtherCAT, USB)
Standalone operation	yes
Plug & play functions	yes (DS402 slave)
Integrated amplifiers	yes (6 x DC)
Servo / FC control	yes (± 10 V, CAN)
Supply voltages	24 V, 12 - 48 V
Amplifier I_{cont}/I_{peak}	6 x 1.5/3.8 A
Feedback inputs	6 (incr., SinCos, SSI)
Digital I/Os	12/4
Analog I/Os	1/3 (optional)
Interfaces	CAN, EtherCAT, USB, RS485
Housing	Full metal compact module
Connector type	Tension spring clamp
Add-on options	Bus interface plug-in Specialized I/O plug-in CANopen I/O modules

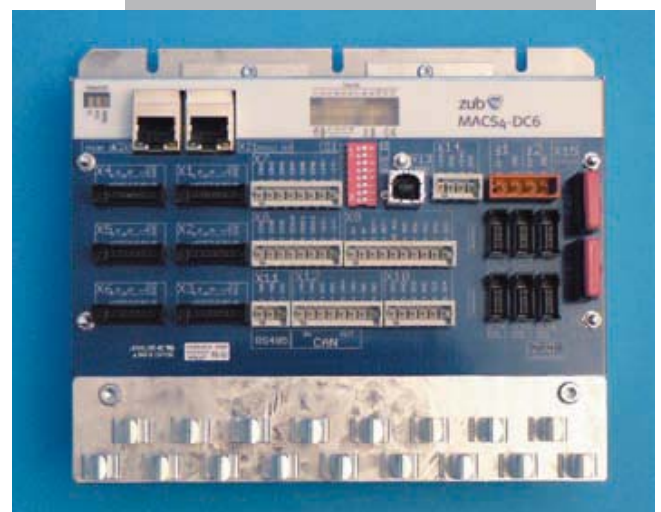
Low cost 6-axis control

Integrated amplifiers

Positioning

Programmable

EtherCAT, CAN, USB



OEM 3-axis control
 Integrated amplifiers
 Positioning
 Programmable
 CAN, USB

MACS4-DC3

2- to 3-axis control unit with integrated power stages for brush and brushless motors

Programmability	yes
Development tool	included
Motion control licenses	free
Modes of operation	Standalone PLC CANopen master CANopen slave
Motion control features	Positioning Synchronization
PLC or PC networking	yes (CAN, USB)
Standalone operation	yes
Plug & play functions	yes (DS402 slave)
Integrated amplifiers	yes (3 x DC or 2 x EC)
Servo/ FC control	yes (CAN)
Supply voltages	24 V, 24 - 48 V
Amplifier I _{cont.} /I _{peak}	3 x 3.0/7.0 A
Feedback inputs	3 x incr., 3 x SinCos
Digital I/Os	4/2
Interfaces	CAN, USB
Housing	Full metal compact module
Connector types	various
Add-on options	Bus interface plug-in CANopen I/O modules



DSA

CANopen servo amplifier for brush and brushless motors

CAN protocol	DS301 V3.0
CAN device profile	DSP402 V2.0
Special features	Configurable analog servo emulation
Modes of operation	CANopen slave Standalone analog servo
Control modes	Position Speed Current / Torque
PLC or PC networking	yes (CAN)
Standalone operation	yes (configurable)
Supply voltage	10 - 35 V or 10 - 60 V
Integrated power stages	1 (DC/EC motor)
Cont. / peak current	5-20A / 15-50A (type-specific)
Feedback inputs	Encoder (incr.), Hall, DC-Tacho
Digital I/Os	4/1
Analog I/Os	1/0
Interfaces	CAN
Housing	DIN rail module
Connector type	Tension spring clamp

CANopen servo amplifier

Analog servo feature

Positioning

Speed control

Current control



CANopen I/O modules

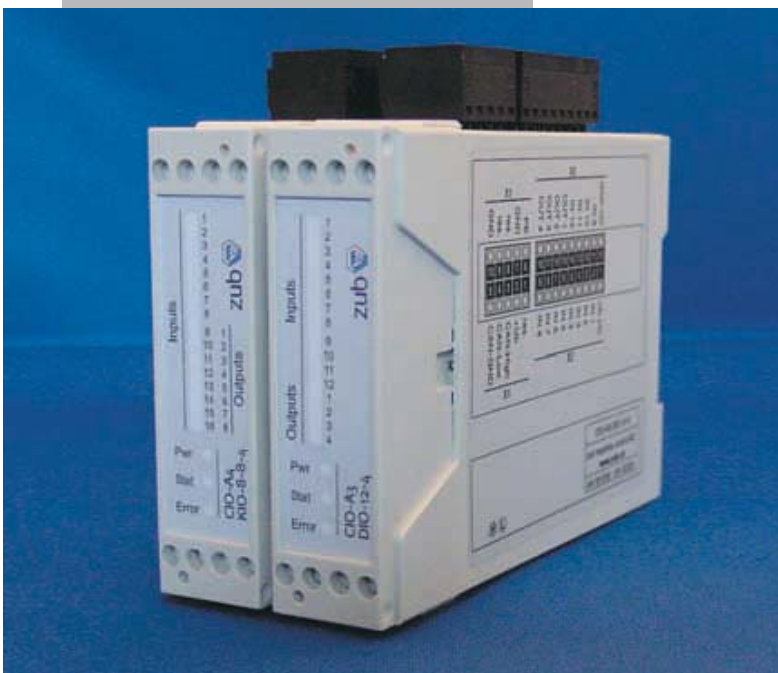
Small housing

Variable number of I/Os

CIO

CANopen I/O-modules

CAN protocol	DS301 V3.0
CAN device profile	DSP401 V2.0
Modes of operation	CANopen slave
PLC or PC networking	yes (CAN)
Standalone operation	no
Supply voltage	24V
Digital I/Os	CIO-A3: 12/4 CIO-A4: 8/8 ... 16/0 (variable)
Analog I/Os	CIO-A4: 4/0
Interfaces	CAN
Housing	DIN rail module
Connector type	Tension spring clamp



OEM

Cost optimized motion control units with or without integrated power amplifiers. Offering specialized features for series applications starting at 500 pieces per year.

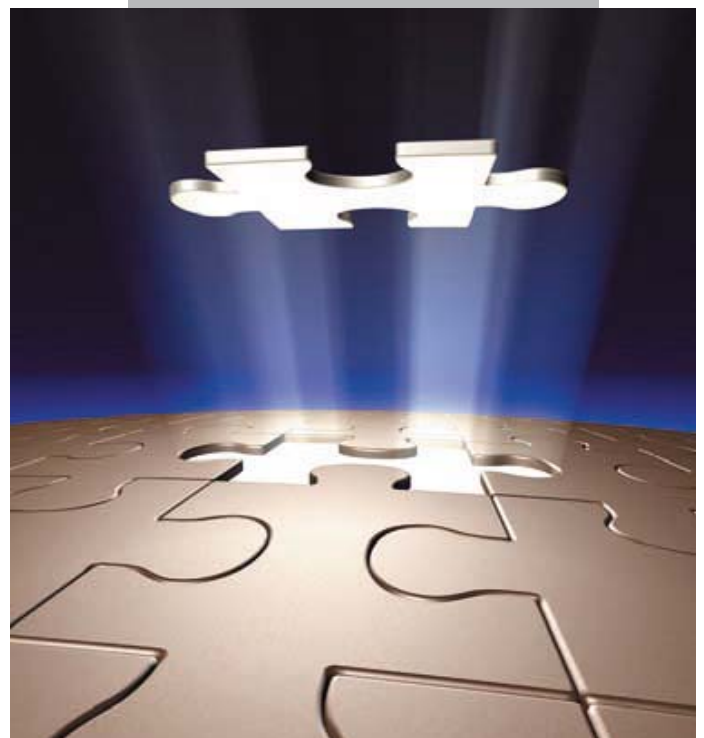
Programmability	yes
Development tool	included
Motion control licenses	free
Modes of operation	according to spec e.g. Standalone control e.g. EtherCAT-Slave e.g. CANopen-Master
Motion control features	Positioning Synchronization Speed control Current control
PLC or PC networking	yes (as specified)
Standalone operation	yes (as specified)
Plug & play functions	yes (as specified))
Servo / FC control	yes ($\pm 10V$, CAN)
Supply voltage	24, 48, 230 or 400 V
Integrated amplifiers	yes (as specified)
Motor types	DC, EC, stepper
Amplifier $I_{cont.}/I_{peak}$	according to spec.
Feedback inputs	according to spec.
Digital I/Os	according to spec.
Analog I/Os	according to spec.
Interfaces	CAN, USB, plus more according to spec.
Housing	according to spec.
Connector types	according to spec.

Custom built,
not just standard

Cost optimized

Compact in size

Specialized features



© James Steidl - Fotolia

Motion-Control Library for embedded systems

No runtime fees

Positioning

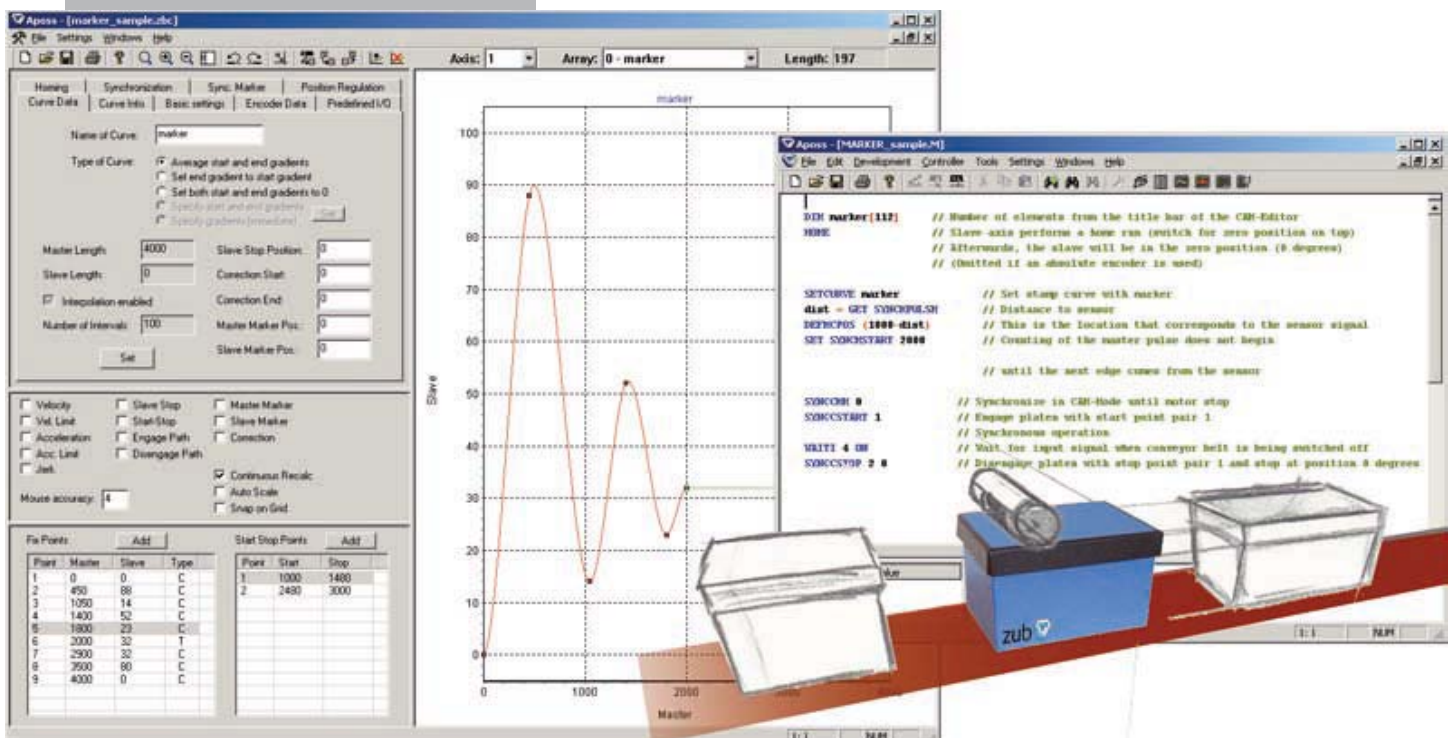
Synchronization





Current control

Motion-Lib

Motion-Control Library for the integration on single and multi-processor embedded systems.

Supported processors	16-Bit, 32-Bit, DSP (Motorola, TI, ARM)
Multi processor support	yes
Operating system	various supported, usable without operating system
Motion control features	Positioning Speed synchronization Position synchronization Marker synchronization CAM profiling Current control
Supported motor types	Servo-, stepper and asynchronous motors
Interrupt sources	I/O, bus, timer, position, error
Supported Interfaces	CAN, USB, EtherCAT, RS232, RS485
Licensing	OEM license without runtime fees



Part no.	Product code	No. of axis	Encoder	Digital I/O	Analog I/O	Interfaces ¹⁾	Power stages		
							No. of	Supply	Cont./peak current
	MACS₃: One-/multi axis motion control unit for all types of servo amplifiers and frequency converters								
001002	MACS ₃	1 - 3	2	10/6	1/1	2 x B, D	-		
	MACS₄-DSP: Multi axis motion control unit for all types of servo amplifiers and frequency converters								
001134	MACS ₄ -DSP ²⁾	3	6	12/4	-	A, B, E	-		
001242	MACS ₄ -DSP-EtherCAT	3	6	12/4	-	A, B, C, E	-		
001183	MACS ₄ -DSP-EtherCAT-ANA	3	6	12/4	1/3	A, B, C, E	-		
001174	MACS ₄ -DSP-ANA	3	6	12/4	1/3	A, B, E	-		
	MACS₄-DC6: 6-axis motion control unit with integrated amplifiers (12-48V DC) for DC motors								
001244	MACS ₄ -DC6 ²⁾	6	6	12/4	-	A, B, E	6	12-48V	1,5/3,8A
001245	MACS ₄ -DC6-EtherCAT	6	6	12/4	-	A, B, C, E	6	12-48V	1,5/3,8A
001246	MACS ₄ -DC6-EtherCAT-ANA	6	6	12/4	1/3	A, B, C, E	6	12-48V	1,5/3,8A
001247	MACS ₄ -DC6-ANA	6	6	12/4	1/3	A, B, E	6	12-48V	1,5/3,8A
	MACS₄-DC3: 3-axis motion control unit with integrated amplifiers (24-48V DC) for brush and brushless motors								
001166	MACS ₄ -DC3 ²⁾	3	6	4/2	-	A, B	3	24-48V	3/7A
	DSA-Cx: Compact CANopen amplifiers for brush and brushless motors (configurable as an analog servo replacement)								
001136	DSA-C ₃ -35/6	1	1	4/1	1/0	B	1	10-35V	6/15A
001137	DSA-C ₃ -35/9	1	1	4/1	1/0	B	1	10-35V	9/15A
001125	DSA-C ₄ -60/5	1	1	4/1	1/0	B	1	10-60V	5/15A
001122	DSA-C ₄ -60/7	1	1	4/1	1/0	B	1	10-60V	7/15A
001260	DSA-C ₂ -60/20	1	1	4/1	1/0	B	1	10-60V	20/50A
	CIO-Ax: Compact CANopen I/O-modules. Small housing for DIN rail mounting								
001206	CIO-A ₃ -DIO-12-4	-	-	12/4	-	B	-		
001207	CIO-A ₄ -KIO-8-8-4	-	-	8/8	4/0	B	-		

11/2009 · Subject to any kind of alterations, errors excepted.

Legend: 1) Interfaces: A = USB, B = CAN, C = EtherCAT, D = RS232, E = RS485

2) OEM versions with specialized connectors, housings, power stages and motion control features on request, starting at 500 pcs./year. Brand labeling possible.