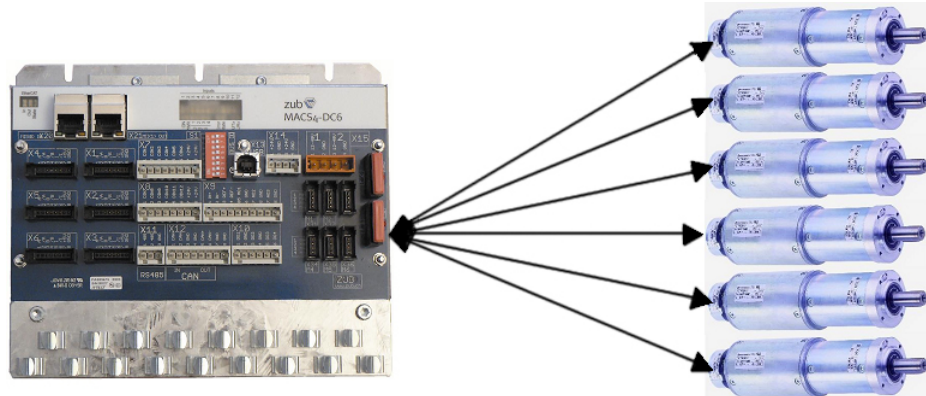


## 1 - 6 axis Positioning: Accurate and low-priced!



### *Compact & Versatile*

The MACS4-DC6 is a freely programmable motion control unit with integrated servo amplifiers. Positioning of up to 6 brushed DC motors with encoders can be controlled with high accuracy. Closed loop position, speed, and current / torque control is possible for all drives. Digital inputs and outputs are provided to connect additional sensors and actuators.

### *Control without a PLC*

The MACS4-DC6 can be used for process and drive control without a supervisor PLC. The number of inputs and outputs is easily extended by CANopen I/O-modules. This offers a very cost-effective and compact solution for small machines or tabletop devices.

### *Open Interfaces for PLCs and PC*

The MACS4-DC6 can be linked to PLCs or PCs by USB, CAN, or an optional EtherCAT interface.

The MACS4-DC6 is the "intelligent" slave unit, which unloads the PLC from motion control tasks and saves money. The total system costs are reduced by using MACS4-DC6 slaves. No expensive motion control libraries or external encoder input modules are necessary.

Existing system solutions can be upgraded easily with motion control functionality, without modification of existing PLCs. Just add MACS4-DC6 modules for these tasks, e.g. enhance your machine with automatic stop positioning instead of manual adjustment wheels.

### *High-level language Programming*

MACS4-DC6 development profits from the newest version of the globally used APOSS IDE, including a high performance smart oscilloscope for online debugging and data recording.

A modern "C"-style programming language, enhanced by powerful motion control commands, is used to implement all kinds of applications quickly and without any loss of flexibility.

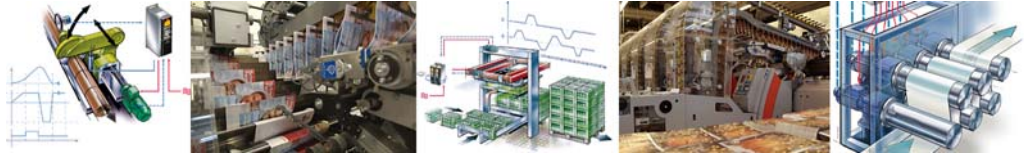
### *6-Axis CANopen Slave*

There are also "plug & play" solutions for PLC and PC-systems available. The MACS4-DC6 can be ordered with preinstalled application software, so that it behaves like a multi-axis CANopen or EtherCAT slave. Such a configuration lets the MACS4-DC6 look like an "intelligent bus terminal" which integrates all necessary encoder interfaces, power stages, and motion control features.

### *Expert Knowledge available*

zub machine control AG offers support as well as consulting and engineering services such as application programming or development of customized OEM products. The OEM range starts at brandlabelling, modified connector boards, and housings or integration of power stages for brushless or stepper motors.

Specify your requirements!  
We offer you a non-binding solution.  
Get the benefits of an exchange of ideas.



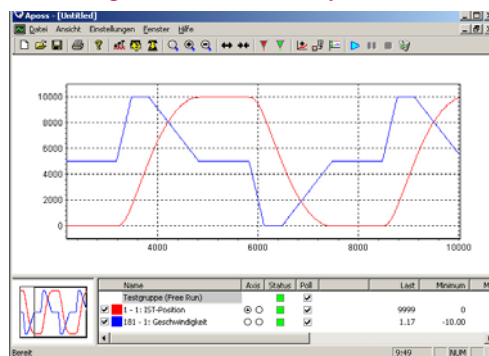
## The Development Environment

```

APOSS [Sample_PositionInput.m *] [Steuerung: #01 V24: COM1 9600 baud] [Haupt]
Datei Bearbeiten Entwicklung Steuerung Tools Einstellungen Fenster Hilfe
// MAIN LOOP
endless:
  if (in 1) or (in 2) then // If signal on input 1 or 2, ...
    print "Position move from ",pos x(1)," -> ";
    if (in 1) then // If input 1 is active, ...
      pose G_RollDist // ... move 5 motor turns forward
    elseif (in 2) then // otherwise if input 2 is active, ...
      pose -G_RollDist // ... move 5 motor turns backwards
    endif
    print pose x(1)
    waiti 1 on // Debounce input 1
    waiti 1 off // Debounce input 2
    delay 50 // Wait 50 milliseconds
  endif
  goto endless
  
```

The APOSS development suite can be used for any MACS control unit and is free of charge. The IDE consists of a modern editor with syntax highlighting, context-sensitive online help, and access to all variables at runtime.

## The integrated Oscilloscope



The integrated smart oscilloscope can be used for the recording of any internal and application data with a sample rate down to 2 milliseconds. This is the perfect tool for online debugging and optimization of running machine applications.

## The Programming Language

The structure and commands of the APOSS programming language are based on popular languages like Basic or C, but are enhanced by motion control features without the need for expensive add-on libraries.

Intuitive commands (acc, dec, vel, posa, posr) provide full functionality to “convert” application requirements into a moving motor shaft.

PLC data exchange or control of external I/O-modules is easy to establish and handle. All the communication is done and controlled in the background by APOSS.

## The Applications

Typical fields of applications are:

- ▶ Automated adjustment of mechanical stops in machines and manufacturing plants
- ▶ Multi-axis positioning and process control in all kind of tabletop devices
- ▶ Control of logically linked motors in small robots
- ▶ Speed and flow rate control of pumps

## The main Advantages

- ▶ Compact and complete control solution for device and machine integration
- ▶ Low-cost multi-axis positioning and process control even without a PLC
- ▶ “Intelligent” motion control slave for integration in PLC and PC-based systems
- ▶ Up-to-date interfaces like USB, CAN, RS485 and EtherCAT
- ▶ No hidden extra costs for motion control libraries or external encoder interface modules
- ▶ All motion control interfaces included:
  - 6 encoder inputs
  - 6 power stages
  - 12 digital inputs
  - 4 digital outputs

## The straight tip to save money

The MACS4-DC6 is very often even cheaper than six encoder input modules of a PLC. But the MACS4-DC6 offers far more than those: It is a freely programmable intelligent motion control slave. Compare the MACS4-DC6 solution with your total system cost or other products on the market.

## The costs: 100,- Euro/Axis

If you need 100 pieces of MACS4-DC6 per year, your price starts at 625 Euro/unit. This means approximately 100,- Euro per axis! Keep in mind that even the power stage is included in that price.

The base hardware can be equipped with an analog input/output option and an EtherCAT interface based entirely on the application needs.