maxon | zub

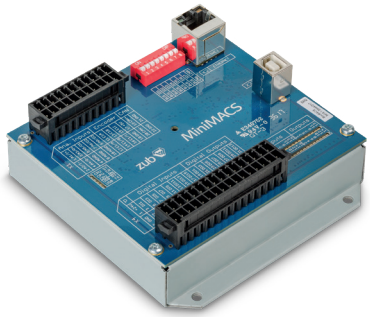
Data Sheet

# MiniMACS

## Low cost controller for Positioning and Synchronization
## Small price – full performance: CANopen, Ethernet, USB

The MiniMACS motion controller can control several amplifiers via the CAN bus, and is ideal for combination with DSA amplifiers from zub AG or with Danfoss/VACON frequency converters. The control unit positions and synchronizes with accustomed precision and efficiency. The low-cost device is developed for simple applications for 1 to 3-axis solutions. In terms of precision and functionality, the MiniMACS is the equal of the MACS5 model series in every respect.

Each MiniMACS controls and regulates autarkic the complex and high dynamic positioning and synchronization of servo and asynchrony motor axis. A single module can be used for autarkic control of small devices. In systems and mechanical engineering multiple MiniMACS modules can be linked by CAN, Ethernet, and USB to a PLC or PC network. Then the MiniMACS serve as a CANopen master of a sub-network and command servo amplifiers, frequency converters, and I/O modules. The MiniMACS is like all zub controllers free programmable and can be adapt the functionality exactly to the machine or device requirements or enable you even to enhance the DS402 features.




## zub Standards

- **Control Functions:** Interrupts reacting on inputs, position data, bus bits, timer, etc.; arithmetic and bit handling; conditional branches and loops
- **Positioning Functions:** Configurable homing, absolute and relative positioning, programmable velocity 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 AposslDE®
- **Interactive graphic editors** like CAM-, Array- and Path-Editor
- **Debugging & Optimization:** Smart-Oscilloscope and integrated graphic CAM-Editor
- **State-Machine Support:** AposslDE® supports the automatic execution of hierarchic State Machines
- **On-the-fly Flexibility:** The entire set of motion or regulation parameters and the mode of operation can be altered on the fly with automatic recalculation of the motion profile

## Application Range

The MiniMACS is appropriate for various applications like

- X/Y/Z-Positioning
- Storage: Cart positioning
- Feeding: Synchronous feeding
- Winding: Position synchronization
- Labeling: Marker synchronization

Did we miss your application? Please, call us!
zub machine control AG will offer you an appropriate solution for that as well.

## Overview of advantages

USB and Ethernet for PC, PLC or visualization

Cost-effective and powerful link between the process control and the drive.

License-free positioning and synchronization of up to 3 axes.

Flexible bus selection: USB and Ethernet for PC, SPS or visualization, CANopen interface for integration the MiniMACS as "intelligent" slave in PLC system concepts, CANopen master functionality for drives and I/Os.

| | | | |
|---|---|---|---|
| **Electrical Data** | | | |
| Supply voltage, current cons. | 24 V DC ±10 % | 100 mA @24 V | current consumption without I/O-load |
| **Memory** | | | |
| Workspace & program memory | 256 kByte SRAM | 1 MByte Flash | firmware, application, and data |
| **Control Characteristic** | | | |
| Axis control: number and type | 1 – 3 | PID with feed forward | |
| Position control frequency | 1 kHz | 1 ms cycle time | |
| **Motion Control Functionality** | | | |
| Velocity and position control with linear, S-profile, or jerk limited ramps<br>Velocity and position / angle synchronization with or without master / slave marker correction, CAM profile synchronization | | | |
| **Encoder Terminals** | | | |
| Encoder | Incremental encoder | 5 V, max. 5 MHz | |
| Additional supported encoder | CANopen absolute encoder (max. 1 Mbaud) | | |
| **Digital Inputs / Outputs** | | | |
| Digital Inputs | 16 | Low: < 4,6 V / High: > 18 V | max. 45 V, max. 1 kHz |
| Digital Outputs | 14 | 24 V, Push up 100 mA | 1 kHz |
| **Analog Inputs / Outputs** | | | |
| Analog inputs | 6 analog inputs | 0-10V, 10 Bit, max. 1 kHz | (not available, if analog opt. module in use) |
| Options | Alternatively it is possible to mount internally one of 2 analog option modules (replacing the standard analog inputs using the X9 connector):<br>Analog option 1 can be used to control up to three external servo amplifiers or frequency converters by a ±10 V command signal. Analog option 2 can be used to read in potentiometric position scales more precisely (i.e. 13 bit) than by the standard analog inputs. | | |
| Analog option 1 (...-IO1-...) | 1 analog input<br><br>3 analog outputs | ±10 V, 12 Bit, max. 1 kHz<br><br>±10 V, 12 Bit, 20 mA, 1 kHz | ±10 V reference voltage, (max. 20 mA) |
| Analog option 2 (...-IO2-...) | 6 analog inputs | 0-10 V, 13 Bit, max. 1 kHz | ±10 V reference voltage (nominal 7 mA, max. 35 mA) |
| **Interfaces** | | | |
| USB | | | data exchange & visualization |
| Ethernet | Ethernet TCP/IP | max. 100 MBaud | data exchange & visualization |
| CAN-Bus | ISO/DIS 11898 | max. 1 MBaud (switchable bus termination) | master and slave functionality |
| **Display / LEDs** | | | |
| 16 inputs / 14 outputs / 3 status / 2 Ethernet / 2 USB | | | |
| **Powerdown Save** | | | |
| User-defined data can be saved automatically at power-down (e.g. in case of mains failure) | | | |
| **Mechanical Data** | | | |
| Variant DIN housing | Aluminum rail housing with top hat rail mounting<br>Dimensions: 108 x 108 x 67 mm<br>Width x height x depth till the top edge of the Ethernet plug<br>Weight: 500 g | | |
| Variant compact housing | Sheet housing for rear panel mounting<br>Dimensions: 116 (98) x 108 x 42 mm<br>Total width (only construction) x height x depth till the top edge of the Ethernet plug<br>Weight: 300 g | | |
| Connector type | Wago MCS MII HD | | |
| **Temperature Range** | | | |
| Operation / storage | 0...+40° C / -20...+85° C | 20...80 % humidity | not condensing |
| **Typical product types** | | | |
| Artikel-Nummer | **001607** MiniMACS – in DIN housing<br>**001586** MiniMACS – in compact housing<br>**001729** MiniMACS – OEM-IO1<br>**001738** MiniMACS – OEM-IO2<br><br>**001668** MiniMACS – in compact housing -IO2<br>**001667** MiniMACS – in compact housinge<br>**001612** MiniMACS – DIN -IO2<br>**001730** MiniMACS – DIN -IO3 | | |