

Datasheet

MiniMACS6-AMP-4/50/10

Motion Control Unit with integrated High-Power Amplifiers

MiniMACS6-AMP-4/50/10 combines a cost efficient, programmable motion control unit with high power amplifiers in a compact housing. Each of the internal amplifiers offers 540 W continuous and 1.62 kW peak power for direct control of powerful drives.

The MiniMACS6-AMP-4/50/10 is the economic solution to move up to six brush-type or up to four brushless motors in the most dynamic and accurate way. Position feedback or master signals are processed by encoder inputs for direct connection of incremental and hall sensors. Four encoder inputs are available and supporting SSI, Sin/Cos or incremental encoders. A variety of digital inputs and outputs process sensor signals and commands actuators. The number of I/Os can easily be extended by CANopen I/O modules. Bus interfaces like two times CANopen and USB are integrated and allows communication with computers or other devices, commissioning, firmware updates and programming possibilities. Optionally, it can be extended with other industrial ethernet interfaces such as EtherCAT, etc. An easy but very efficient programming language combined with powerful motion control commands is the key for standalone control of machines and devices (without the need of a PC or PLC at all).



Figure: MiniMACS6-AMP-4/50/10-IF1

zub Standards

- **Control functions:** Interrupts reacting on inputs, position data, bus bits, timer, etc.; arithmetic and bit handling; conditional branches and loops
- **Closed loop control:** Position and speed control, current control and current limitation
- **Positioning functions:** Absolute and relative positioning, configurable homing, configurable speed profiles
- **Free programming:** C like programming with powerful motion commands, hierarchical state machine support with the extensive automation software AposSIDE®
- **Tools:** Smart-Oscilloscope

Application examples

- Special machine designs or
- Special devices asking for compact control unit
- X/Y/Z-positioning, portal robots, lab automation devices
- Robotic systems
- AGV controller
- Mobile Robots

Advantages

Compact multi-axis solution with integrated power amplifiers.

Configurable for brush-type and brushless motors up to 540 W continuous power and up to 1.62 kW peak power.

This controller can be integrated into CANopen and optionally in EtherCAT networks as a fully featured DS402 multi axis slave device.

No hidden additional costs: All motion control features, servo amplifiers, encoder inputs, bus interfaces and development tools are included!

MiniMACS6-AMP-4/50/10

| Electrical Data | | | |
|---|--|---|---|
| Control Unit: Supply voltage / Current | 24 V DC ±25 % | 200 mA | without I/O load |
| Amplifiers: Supply voltage | 12 ... 60 V DC | 40 Arms | |
| Memory | | | |
| Workspace and program memory | 1 MByte SRAM | 8 MByte Flash | Application & Data |
| Closed loop Controls | | | |
| Number of drives and control type | 1 ... 6 | Position, Speed, Current | Closed loop control |
| Position control | 1 kHz | 1 ms cycle time | PID-control with feed forward |
| Speed control | 8 kHz | 125 µs cycle time | PI control |
| Current / Torque Control | 24 kHz | 41 µs cycle time | PI control plus current limitation |
| Internal Servo Amplifiers | | | |
| Quantity and type of motors | 6 x brush-type or 4 x brushless or 3 steppers or mixed operation | | |
| Amplifier type & chopping frequency | 4Q-PWM / 48 kHz | | |
| Max. output current (configurable) | 10 A continuous current / 30 A peak current (max. 5 seconds) per servo amplifier | | |
| STO (Safe Torque Off) in preparation | | | |
| Motion Control Features | | | |
| Programmable velocity, position, synchronization and process control in structured text | | | |
| Highly accurate position control by single or duplex evaluation of encoders mounted on the motor shaft and moved load | | | |
| Optional "DS402 Multi-Axis drive" functionality for the integrations as EtherCAT Slave (CoE) | | | |
| Encoder | | | |
| All encoder inputs configurable as feedback signal inputs of the motor control or as master signal inputs for drive synchronization | | | |
| Hall sensors 1 ... 4 | | 5 V, max. 12 kHz | |
| Encoder 1 ... 4 (Inputs) | Incremental Encoder | 5 V, max. 32 MHz | |
| Encoder 1 ... 4 (Inputs) | Sin/Cos Encoder | + 1.2 V (differential), max. 150 kHz | extended incremental encoder |
| Encoder 1 ... 4 (Inputs) | SSI Encoder | up to 25 bit | single / multiturn |
| Output supply voltage (for Encoders/Hall) | 5 V DC, max. 200 mA per Encoder or Hall sensor, max. 1A for all encoders and Hall sensors | | |
| Digital Inputs and Outputs | | | |
| Digital inputs | 16 digital inputs | Low: < 4,6 V / High: > 18 V | max. 30 V, max. 1 kHz digital input 1-4 with hw-latch function |
| Digital outputs | 8 digital outputs | 24 V, 100 mA, 1 kHz | short circuit protection |
| Analog Connections | | | |
| Analog inputs | 4 analog inputs | 0 ... +10V, 12 Bit | eliminates 4 Digital Inputs and 2 Sin/Cos Encoder, activated by Parameter |
| Interfaces | | | |
| 1x CAN / 1x CAN | CANopen | max. 1 MBaud | 2 x CAN |
| USB 2.0 | | | |
| EtherCAT Slave (optional) | Option-IF1 | max. 100 MBaud | CoE |
| Ethernet (optional) | Option-IF1 | max. 100 MBaud | with integrated Ethernet switch |
| Other industrial ethernet interfaces such as Profinet, IO-Link and wireless options (e.g. Bluetooth) can be offered on request | | | |
| Displays / LEDs | | | |
| Status | 3 | | |
| Mechanical Data | | | |
| Type of housing and mounting | backplane mounting | | |
| Size (HxWxL) w. housing and -IF1 Option | ca. 34 x 110 x 141 mm | | |
| Weight | 600 g | | |
| Connector types | USB, RJ45 (optional -IF1), Molex CLIK-Mate | | |
| OEM versions with customized housings or connector types on request! | | | |
| Temperature Range | | | |
| Operation / storage | -30 ... +70°C / -30 ... +85°C | | 5 ... 90% humidity non-condensing |
| Product Versions | | | |
| Part number / description | 001755 MiniMACS6-AMP-4/50/10 | | |
| | 001756 MiniMACS6-AMP-4/50/10-OEM | | |
| | 001757 MiniMACS6-AMP-4/50/10-IF1 EtherCAT | | |
| | 001784 MiniMACS6-AMP-4/50/10-IF1 Ethernet | | |